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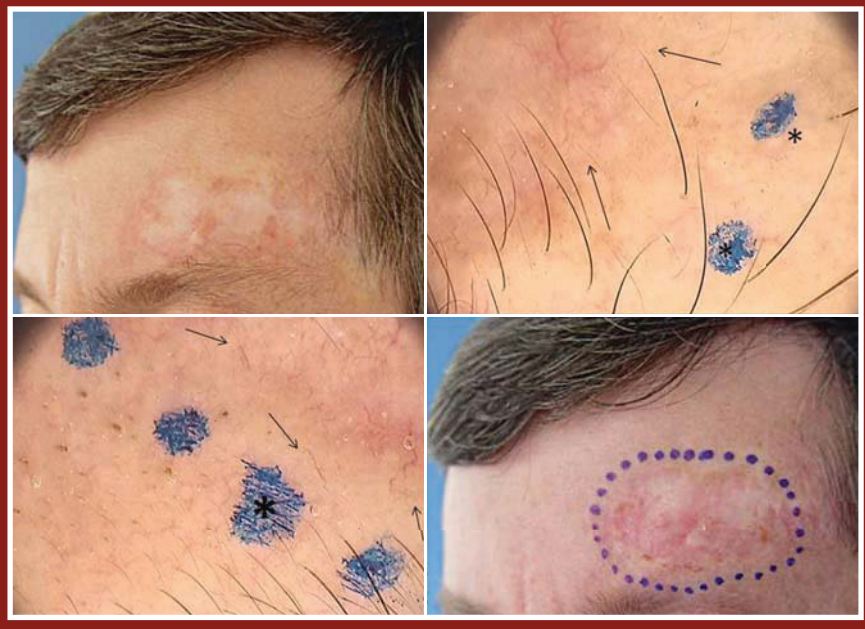

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A *Surgical & Cosmetic Dermatology* é uma publicação oficial da Sociedade Brasileira de Dermatologia (SBD) em parceria com a Sociedade Brasileira de Cirurgia Dermatológica. O conteúdo técnico-científico apresentado nesta publicação é de co-propriedade da Sociedade Brasileira de Dermatologia.

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INSTRUÇÕES AOS AUTORES

A Surgical & Cosmetic Dermatology, editada em 2009, constitui publicação médica destinada a difundir conhecimento e experiência nas áreas de Cirurgia Dermatológica e Cosmiatria. É uma publicação trimestral da Sociedade Brasileira de Dermatologia que conta com o apoio científico da Sociedade Brasileira de Cirurgia Dermatológica e do Colégio Íbero Latino de Dermatologia, que baseia sua política ética e editorial nas regras emitidas pelo The International Committee of Medical Journal Editors (www.icmje.org). Os manuscritos devem estar de acordo com os padrões editoriais para artigos submetidos a periódicos biomédicos estabelecidos na Convenção de Vancouver (Requisitos Uniformes para Manuscritos Submetidos a Revistas Biomédicas), regras para relatos de ensaios clínicos e revisões sistemáticas (metanálises).

Serão produzidos exemplares impressos da versão em língua portuguesa, com resumos e títulos em inglês. A versão da língua inglesa estará disponível no website da SBD.

Todos os artigos propostos à publicação serão previamente submetidos à revisão anônima e confidencial de no mínimo dois membros do Conselho Editorial ou dos Conselhos Nacional e Internacional de Revisores. Quando aceitos, estarão sujeitos a pequenas correções ou modificações que não alterem o estilo do autor.

As pesquisas em seres humanos devem ter a prévia aprovação de um Comitê de Ética em Pesquisa e obedecer aos padrões éticos da Declaração de Helsinki de 1975, revista em 2000.

ORIENTAÇÕES PARA O PREPARO DOS ARTIGOS

A preparação correta do manuscrito torna os processos de revisão e publicação mais eficientes. Assim, recomendamos alguns cuidados que podem facilitar significativamente a preparação dos manuscritos.

1- Os artigos devem ser originais e redigidos no idioma de origem do autor (português, espanhol ou inglês): a equipe editorial providenciará as versões necessárias.

2- O título do trabalho deve ser curto e conciso, informado em português e inglês, com até 150 caracteres sem espaços, acompanhado de um título resumido.

3- Os resumos em português e inglês devem acompanhar o formato adequado ao tipo de artigo.

4- Os autores devem informar o nome com suas abreviaturas, titulações máximas, instituições aos quais estão vinculados e local de realização do trabalho. Um deles deve ser designado como autor correspondente, com endereço completo, números de telefone comercial e fax e endereço de e-mail.

5- Os autores devem informar se houve conflitos de interesse e suporte financeiro.

6- As palavras-chave devem ser citadas em português e em inglês (Keywords), totalizando 3 a 10 por idioma, devendo ser incluídas em todos os tipos de artigos. Estas palavras deverão estar contidas no DeCS (Descritores em Ciências da Saúde) e/ou MeSH (Medical Subject Headings) que podem ser acessados na internet.

7- O número limite de palavras para os textos deve ser obedecido segundo o tipo de artigo, e computado excluindo as referências e os resumos em português e inglês.

8- Abreviaturas e acrônimos devem ser limitados aos de uso geral, não devendo constar no título ou no resumo.

9- Devem ser evitadas informações introdutórias extensas e repetitivas, dando-se preferência às mais recentes, ainda não publicadas. Evite textos com repetição da mesma informação no resumo, introdução e discussão.

10- Pesos e medidas devem ser expressos no sistema métrico decimal, e temperaturas em graus centígrados.

11- Drogas devem ser mencionadas por seus nomes genéricos, seguidos da dosagem e posologia empregadas, evitando-se a citação de termos comerciais ou marcas. Descrições de quaisquer equipamentos, instrumentos, testes e reagentes devem conter o nome do fabricante e o local de fabricação.

12- Após a sequência de itens para cada tipo de trabalho podem se acrescentados agradecimentos, antes das referências bibliográficas.

13- As referências bibliográficas devem ser listadas nas últimas páginas do artigo, e numeradas de acordo com a citação no texto (em ordem numérica seqüencial), seguindo o estilo Vancouver, como indicado pelo International Committee of Medical Journal Editors (ICMJE). Referências citadas em legendas de tabelas e figuras devem manter a seqüência com as citações no texto. Todos os autores devem ser citados se forem até seis; acima disso, devem ser mencionados os seis primeiros e "et al.". Seguem-se exemplos dos tipos mais comuns de referências. Exemplos de citações no texto retirados do ICMJE:

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13B. Capítulo de livro:

Reppert SM. Circadian rhythms: basic aspects and pediatric implications. In: Styne DM, Brook CGD, editors. Current concepts in pediatric endocrinology. New York: Elsevier; 1987. p .91-125.

13C. Texto na Internet:

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13D. Apresentação prévia em eventos:

Bruhat M, Silva Carvalho JL, Campo R, Fradique A, Dequesne J, Setubal A, editors. Proceedings of the 10th Congress of the European Society for Gynaecological Endoscopy; 2001 Nov 22-24; Lisbon, Portugal. Bologna (Italy): Monduzzi Editore, International Proceedings Division; c2001. 474 p.

14- Ilustrações (imagens, quadros, gráficos e tabelas) devem ser referidas em ordem numérica sequencial no texto em números arábicos (exemplo: Figura 3, Gráfico 7), cabendo ao Editor suprimir as redundantes. As legendas das figuras e gráficos e os títulos e notas de rodapé das tabelas devem descrever precisamente seu conteúdo com frases curtas, porém suficientes para a compreensão ainda que o artigo não seja totalmente lido.

15- As imagens deverão ter resolução mínima de 300 DPI, largura mínima de 1.200 pixels com altura proporcional, e serem gravadas nos formatos JPG ou TIF. Podem ser colocadas setas ou linhas para localizar as áreas de interesse. As legendas das imagens histológicas devem especificar a coloração e o aumento.

16- Os gráficos deverão ser elaborados em Microsoft Excel. As tabelas dispensam sua descrição no texto tendo a finalidade de suplementá-lo e não a de aumentá-lo. As unidades utilizadas para exprimir os resultados (m, g, g/100, mL etc.) figurarão no alto de cada coluna. Os pacientes devem ser identificados por números ou letras, e nunca pelos nomes, iniciais ou número de registro hospitalar.

17-As opiniões e declarações contidas na revista são de responsabilidade única e exclusiva de seus autores, não sendo, necessariamente, coincidentes com as da Equipe Editorial, do Conselho de Revisores ou da Sociedade Brasileira de Dermatologia.

Os autores deverão submeter seu manuscrito para avaliação do Conselho Editorial da revista no endereço eletrônico que se segue: http://www.sgponline.com.br/scd/sgp/

Todos os documentos como Consentimento de uso para publicação (Copyright), Conflito de interesses e Autorização para publicação de fotografias estão disponíveis no site da revista. Esses documentos devem ser assinados e encaminhados para o endereço abaixo:

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A revista aceita trabalhos inéditos e não publicados das seguintes categorias:

1- ARTIGO ORIGINAL

É o relato de uma pesquisa investigativa original clínico-cosmiátrica ou relacionada a procedimentos na área de Dermatologia. Exemplos: estudos experimentais, estudos clínicos, comparações e descrições de técnicas ou de métodos de avaliação, estudos de áreas afins (ex: estudos farmacêuticos em cosmiatria).

Resumo: deverá conter no máximo 200 palavras e ser estruturado seguindo os itens: Introdução, Objetivo, Métodos, Resultados e Conclusões. Não é permitido afirmar que os resultados ou outros dados serão apresentados ou discutidos.

O texto deverá conter até 4000 palavras, 10 ilustrações e 35 referências e seguir o formato IMRDC (Introdução e objetivo, Métodos, Resultados, Discussão, Conclusão)

Introdução: citar as razões que motivaram o estudo, descrevendo o estado atual do conhecimento sobre o tema. Utilizar o último parágrafo para especificar a principal pergunta ou objetivo do estudo, e a principal hipótese testada, se houver.

Métodos: Explicar como o estudo foi feito:

a- Tipo de estudo: descrever o seu desenho especificando a direção temporal (retrospectivo ou prospectivo), o tipo de randomização quando utilizada (pareamento, sorteio, sequenciamento, etc), se o estudo foi cego, comparativo, controlado por placebo, etc.

b- Local: indicar onde o estudo foi realizado (instituição privada ou pública), citar que a pesquisa foi aprovada pelo Comitê de Ética em Pesquisa de sua instituição, os procedimentos de seleção, os critérios de inclusão e exclusão, e o número inicial de pacientes.

c- Procedimentos: descrever as principais características das intervenções realizadas, detalhando a técnica e lembrando que o estudo de investigação deverá ser reprodutível.

d- Descrição dos métodos utilizados para avaliação dos resultados.

e- Inclusão da análise estatística descritiva e/ou comparativa com descrição do planejamento da amostra (representativa do universo a ser estudado), a análise e os testes estatísticos e apresentação dos níveis de significância adotados. A utilização de análises estatísticas não usuais é incentivada, porém neste caso, deve-se fazer uma descrição mais detalhada da mesma.

Resultados: descrever os principais resultados que devem ser acompanhados de estimativas pontuais e medidas de dispersão (p.ex., média e erro padrão) ou de estimativas intervalares (p.ex., intervalos de confiança), bem como os níveis descritivos dos testes estatísticos utilizados (p.ex. "p-value"). Esses achados também devem ser interpretados sob o ponto de vista clínico.

Discussão: enfatizar os novos e importantes resultados encontrados pelo estudo e que farão parte da conclusão. Relatar observações de outros estudos relevantes. Mencionar as limitações dos achados e as implicações para pesquisas futuras.

Conclusões: devem ser concisas e responder apenas aos objetivos propostos. A mesma ênfase deve ser dada para estudos com resultados positivos ou negativos.

2- ARTIGOS DE REVISÃO

Poderão ser abordados temas cirúrgicos ou de cosmiatria, procedimentos, algoritmos , compilações, estatísticas. Estes trabalhos têm formato livre, porem devem conter resumo não estruturado de até 100 palavras e conclusões ou considerações finais. Limite: texto até 6000 palavras, 10 ilustrações e 60 referências. Os artigos de revisão sistemática ou metanálises devem seguir orientações pertinentes (http://cochrane.bireme.br)

3- EDUCAÇÃO MÉDICA CONTINUADA

Publicação de cunho educacional, abordando profunda e completamente grandes temas de Cirurgia Dermatológica, Cosmiatria ou Laser. Deve conter resumo não estruturado de até 100 palavras. Limite: texto até 4000 palavras, 10 ilustrações e 40 referências. Para evitar duplicações, os autores devem comunicar o tema aos editores antes de escrever o artigo.

Os autores são solicitados a definir objetivos educativos para o artigo que transmitam o que o participante deve ter absorvido após completar a atividade de EMC (ex: identificar uma condição, conhecer seus tratamentos, selecionar a melhor técnica). O entendimento destes objetivos devem ser mensurados por meio de 10 perguntas com respostas em 5 alternativas, cujo gabarito deve também ser enviado.

4 - RELATO DE CASO

Descrição de casos ou serie de casos de particular interesse nas áreas de Cirurgia Dermatológica, Oncologia Cutânea, Cosmiatria, Tratamento de dermatoses inestéticas, Complicações, etc.

Resumo não estruturado de até 100 palavras, introdução com revisão de literatura, métodos, resultados, discussão e conclusão, sempre que pertinentes. Limite: texto até 1200 palavras, 8 ilustrações e 10 referências.

5- NOVAS TÉCNICAS

Descrição de novas técnicas ou detalhes de técnicas. Resumo não estruturado de até 100 palavras, introdução com revisão de literatura, métodos, resultados, discussão e conclusão. Limite: 1200 palavras, 8 ilustrações e 10 referências.

6- COMUNICAÇÕES

Artigos originais, breves, abordando resultados preliminares de novos achados de interesse para a Cirurgia Dermatológica, Cosmiatria ou Oncologia cutânea entre outros. Texto com formatação livre. Resumo não estruturado de até 100 palavras. Limite: texto até 1200 palavras, 8 ilustrações e 10 referências.

7- DERMATOSCOPIA APLICADA

Uma a seis imagens dermatoscópicas aplicadas à cirurgia dermatológica e cosmiatria, acompanhadas de curta descrição. Resumo não estruturado de até 100 palavras, texto até 800 palavras, 5 ilustrações e 5 referências.

8- CARTAS

Comentários objetivos e construtivos sobre matérias publicadas. Texto até 600 palavras, e no máximo 5 referências.

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Editorial

A reason to celebrate!

Dear SBD members,

We have just received the news that Surgical & Cosmetic Dermatology will be indexed in the SCOPUS database.

The database's Content Selection and Advisory Board has informed us that the title will be accepted for inclusion, with the following comments, among others:

"There is a real need for a scientific approach to cosmetic dermatology and an academic basis to some of the wilder frontiers of clinical practice. This is a young journal (2009), and I would usually recommend a 'wait and see' approach rather than immediate acceptance. However, the publishers and editors have already taken seriously the advice of LILACS and have moved rapidly to develop a high quality publication in English, which should help it reach the widest possible audience.

This journal and editorial team deserves to take on a much more influential worldwide role in advancing scientific cosmetic dermatology and plastic surgery."

To our authors, and editorial board and staff: we have good reason to celebrate!

Dr. Bogdana Victoria Kadunc
Chief Editor – Surgical & Cosmetic Dermatology

Original Article

A quality of life measurement for patients with cellulite

Celluqol® - instrumento de avaliação de qualidade de vida em pacientes com celulite

Author:
Doris Hexsel[1]
Magda Blessmann Weber[2]
Maria Laura Taborda[1]
Taciana Dal'Forno[3]
Débora Zechmeister-Prado[4]

[1] Dermatologist Physician – Porto Alegre (RS), Brazil
[2] Associate Professor of Dermatology, Medical Clinic Department, Universidade Federal de Ciências da Saúde de Porto Alegre (UFCSPA) – Porto Alegre
[3] Cosmetic Dermatology Preceptor, Dermatology Department, Pontificia Universidade Católica do Rio Grande do Sul, (PUCRS) – Porto Alegre
[4] Pharmacist – Porto Alegre

Correspondence:
Doris Hexsel
Dr. Timoteo, 782 – Moinhos do Vento
90570 040 - Porto Alegre – RS, Brazil
Tel.: (55 51) 3264 1234 /3026 2633
E-mail: doris@hexsel.com.br

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This study was carried out at the Centro Brasileiro de Estudos em Dermatologia (CBED) – Porto Alegre (RS), Brazil.

Conflicts of interests: none
Financial support: none

ABSTRACT

Introduction: *After puberty, most women develop some amount of cellulite. With the increasing number of dermatological consultations about treating cellulite, a broader understanding of the characteristics, wishes and expectations of these patients regarding their quality of life has become necessary.*

Objective: *To develop and validate an instrument to evaluate the quality of life of patients with cellulite.*

Methods: *The study consisted of two stages: in the first, instruments for assessing patients' quality of life were developed and validated; in the second, two questionnaires were administered to 100 females with cellulite, aged 18 to 45.*

Results: *The reliability of the results was assessed using factorial analysis and Cronbach's alpha test. With the use of exploratory factorial analysis, it was possible to test (1) the hypothesis that all questions in the shortened questionnaire measured a single factor (cellulite) and (2) the hypothesis that each block of questions in the full version of the questionnaire measured a single domain or factor among the parameters being assessed (dressing style, physical activity, partner, feelings and change in daily habits).*

Conclusion: *The validation analysis showed that both questionnaires effectively measure cellulite patients' quality of life.*

Keywords: *quality of life; questionnaires; cellulitis.*

RESUMO

Introdução: Após a puberdade, a maioria das mulheres desenvolve algum grau de celulite. O aumento do número de consultas dermatológicas relacionadas ao tratamento da celulite demandou compreensão mais ampla de características, desejos e expectativas desses pacientes com relação à qualidade de vida.

Objetivo: Elaborar e validar instrumento de avaliação da qualidade de vida para pacientes com celulite.

Métodos: O estudo teve duas etapas: a elaboração e a validação dos instrumentos de avaliação da qualidade de vida. Na segunda etapa, dois questionários foram elaborados e aplicados a 100 voluntárias com idade entre 18 e 45 anos, que apresentavam celulite.

Resultados: A confiabilidade dos resultados foi verificada por meio de análise fatorial e Teste α de Cronbach para avaliação estatística. Uma análise fatorial exploratória possibilitou testar a hipótese de que todas as questões do questionário resumido mediam um único domínio ou fator (no caso, celulite) e a hipótese de que cada bloco de questões do questionário completo media um único domínio ou fator entre os parâmetros avaliados (modo de vestir, lazer, atividade física, parceiro, sentimentos e mudança de hábitos cotidianos).

Conclusões: A análise de validação mostrou que ambos os questionários podem ser usados, com grau similar de eficácia.

Palavras-chave: qualidade de vida; questionários; celulite.

INTRODUCTION

The World Health Organization supports an inclusive view of health, according to which the state of being healthy does not refer merely to a lack of a disorder or illness, but also an individual's ability to lead a productive and pleasant life.[1] Although important, evaluating quality of life is neither an easy nor a simple task. As a result, several measurements that apply to several disorders or groups of patients have been developed and validated. [2,3]

Dermatology and other medical specialties – such as plastic surgery – involve caring for patients with aesthetic complaints. However, there is comparatively little discussion in the literature of quality of life in this area.

Cellulite is a condition that occurs mostly in women, affecting especially the thighs and buttocks, and constitutes an extremely frequent complaint. The term, which originated in the French medical literature more than 150 years ago, is globally known and used to characterize alterations on the skin's surface that resemble the appearance of an orange peel, cottage cheese or a quilt. Synonyms include: edematous adiposity and gynoid lipodystrophy.

Although its prevalence has not been established, most women develop some degree of cellulite following puberty. It is prevalent in women of all races, but is more common in Caucasians. [4] There are three hypotheses that try to explain cellulite's physiology: inflammatory factors and vascular or conjunctive tissue's septae alterations; [4] there is also a relevant hormonal component, since it affects almost all women and is rare in men. The first classification of cellulite was described by Nurnberger and Muller in 1978 and was based on the lesions' clinical aspect. [5] A new classification developed by Dal'Forno and Hexsel – the Cellulite Severity Scale – adds further clinical parameters,, evaluating cellulite qualitatively and quantitatively.6

There is an increasing search for a perfect physical appearance, and a lack of clinical studies in this field.

In Brazil, the rates of plastic surgeries and cosmetic consultations are among the highest in the world. Understanding the reasons that lead patients to undergo such a great number of procedures – including surgeries – to improve their physical appearance could lead to a decrease in the current number of unnecessary procedures.[7,8] The accelerated growth of dermatologic consultations about aesthetic complaints suggests there is a need for a more inclusive understanding of the characteristics, desires and expectations of patients that seek cosmetic procedures.

Noting the lack of a method to evaluate the quality of life in patients with cellulite, the authors were motivated to develop such an instrument to make it possible to verify, both quantitatively and qualitatively, the reasons why aesthetic imperfections are considered an inconvenience that disturb and interfere with people's daily life, apparently more intensively today than in previous times.

OBJECTIVE

This study is aimed at the elaboration and validation of an instrument for evaluating of the quality of life of patients with cellulite.

METHODS

A transversal study was developed to analyze female patients aged 18 or older who sought treatment for cellulite at the research unit of the Centro Brasileiro de Estudos em Dermatologia – Brazilian Center of Studies in Dermatology (CBED in Porto Alegre, RS, Brazil. Patients with a history of psychiatric disorders or decompensated systemic disorders such as systemic arterial hypertension and diabetes mellitus, were excluded.

The study was conducted according to Good Clinical Practices and the Declaration of Helsinki. The research study was approved by the ethics committee of the Universidade Federal de Ciências da Saúde de Porto Alegre (UFCSPA) and was assigned the number 281/06.

The study comprised two stages, each of which had two phases: the preparation and validation of a Portuguese-language assessment tool and the evaluation of patients' quality of life.

Stage I: Preparation of the quality of life evaluation tool

Based on information contained in the CBED's research unit database, patients who had already sought care relating to cellulite were identified and invited to participate in the study as a convenience sample. The sample used in that stage of the study was based on convenience, having been considered ideal when there was enough coincidence of answers, without the presence of new significant complaints. The patients were evaluated in light of the inclusion and exclusion criteria before the interview. Those who were eligible for participation were instructed about the objectives of the analysis and offered a Term of Free and Informed Consent to be signed in case of agreement. The patients took part in the study by answering a single open-ended question about which aspects of their lives are impaired by their cellulite: "We are trying to find out how much cellulite affects the patients' life. We would be grateful to have your help, though you are not obliged to do so. Please describe below how cellulite affects your life. You can take into consideration any aspect of your professional and social life, personal relationships, leisure activities, or any other situation. Although it would be important to know your age, you don't need to disclose it."

In the second phase of Stage I, patients' answers were qualitatively assessed and a database with the main complaints, grouped in wider domains, was created as described below:

Manner of dressing: choices of colors and fabrics, choice of tighter cuts and use of very short clothes.

Leisure: participation in group activities that involve exposing the body to a large number of people (beach, swimming pool) or a more restricted number of people (massage).

Physical activities: participation in sports activities that require exposing the body (swimming, water aerobics).

Table 1: Celluqol (full version)

How having cellulite makes you feel about:	Not bothered at all	Not bothered most of the time	Indifferent	Bothered most of the time	Bothered all the time
MANNER OF DRESSING					
1. choice of clothes' colors	1	2	3	4	5
2. choice of clothes' fabric	1	2	3	4	5
3. choice of tight cuts	1	2	3	4	5
4. wearing of very short clothes	1	2	3	4	5
LEISURE					
5. participation in activities that involve exposing the body to a large number of people (beach, swimming pool)	1	2	3	4	5
6. participation in group activities that require exposing the body to a restricted number of people (massage)	1	2	3	4	5
PHYSICAL ACTIVITIES					
7. HAVING CELLULITE	1	2	3	4	5
8. participation in sports activities that involve exposing the body (swimming, water aerobics)	1	2	3	4	5
PARTNER					
9. exposing the body to a partner	1	2	3	4	5
10. fear of losing partner	1	2	3	4	5
11. sexual life	1	2	3	4	5
12. the fact that a partner notices the cellulite	1	2	3	4	5
FEELINGS					
13. embarrassment	1	2	3	4	5
14. difficulties and doubts about the result of treatments, disbelief	1	2	3	4	5
15. guilt	1	2	3	4	5
16. frustration	1	2	3	4	5
17. discouragement	1	2	3	4	5
18. self-esteem	1	2	3	4	5
19. rebelliousness	1	2	3	4	5
CHANGES IN DAILY HABITS					
20. 20. changes in eating habits	1	2	3	4	5
21. 21. spending more than able to afford on treatments	1	2	3	4	5
22. restricting other expenses to treat cellulite	1	2	3	4	5

Partner: exposing the body to a partner, fear of losing the partner, restrictions in sexual life, bothered by the fact that a partner notices the cellulite.

Feelings: embarrassment, difficulties and doubts about the result of treatments, disbelief, guilt, frustration, discouragement, decrease in self-esteem, rebelliousness.

Changes in daily habits: changes in eating habits, spending more than able to afford on medications and creams, restricting other expenses to treat cellulite.

The results of this analysis also allowed the preparation of an initial questionnaire to assess the quality of life of patients who complained about cellulite.

Stage II: Questionnaire preparation and validation

With the identification of the domains and main points referred to in each of them, the initial version of Celluqol® was developed. The initial phase of Stage II included all questions (22 in total, Table 1) in order to validate those that would constitute the final questionnaire. A shortened 8-item version was developed (Table 2) and compared with the full version, to explore its use in daily medical practice.

The scores obtained from the full questionnaire ranged from 22 to 110 points, with the measured changes in quality of life assessed as follows:

From 22 to 44 points – cellulite does not affect quality of life
From 44 to 66 points – cellulite slightly affects quality of life
From 66 to 88 points – cellulite reasonably affects quality of life
From 88 to 110 points – cellulite intensely affects quality of life

The shortened questionnaire's scores ranged from 8 to 40 points, with changes in quality of life interpreted as follows:

From 8 to 16 points – cellulite does not affect quality of life
From 16 to 24 points – cellulite slightly affects quality of life
From 24 to 32 points – cellulite reasonably affects quality of life
From 32 to 40 points – cellulite intensely affects quality of life

RESULTS

After administering the full and shortened versions of the questionnaires to 100 volunteers, their validity and reliability were assessed using Cronbach's factorial and Alpha analyses for statistical evaluations.

FACTORIAL ANALYSIS

An exploratory factorial analysis allowed testing of the hypotheses that all eight questions of the shortened questionnaire measured a single domain or factor (cellulite) and that each block of questions in the full questionnaire measured a single domain or factor of the appraised parameters (manner of dressing, leisure, physical activity, partner, feelings and change of daily habits). A factor was considered dominant if its measured eigenvalues were greater than 1. A component of the matrix of a domain was considered to belong in the factor or domain when its weight was greater than 0.4.

In the evaluation of the shortened questionnaire, it was observed that only one could be deemed the main component, when the greater than 1 eigenvalues criterion was considered. The explained variance was 48.77%, and Cronbach's Alpha, 0.842 (Table 3). The factorial analysis of the full version of the

Table 2: Celluqol (shortened version)

How having cellulite makes you feel about:	Not bothered at all	Not bothered most of the time	Indifferent	Bothered most of the time	Bothered all the time
1. your body's appearance	1	2	3	4	5
2. manner of dressing	1	2	3	4	5
3. your eating habits	1	2	3	4	5
4. leisure or physical activities that involve exposing the body publicly (beach, gym, etc)	1	2	3	4	5
5. leisure or physical activities that require exposing the body in a limited way (massage, medical consultations etc)	1	2	3	4	5
6. your sexual life	1	2	3	4	5
7. 7. your negative feelings (guilt, embarrassment, frustration, low self-esteem, shame, fear, rebelliousness)	1	2	3	4	5
8. difficulties and doubts about the result of treatments, disbelief	1	2	3	4	5

Table 3: Exploratory factorial analysis and internal consistency (Shortened version)

Question (Q)	Evaluated parameter	Factor's weight in the only domain found
		1
Q1	Body's appearance	0,677
Q2	Manner of dressing	0,701
Q3	Eating habits	0,559
Q4	Physical activities with public exposure of the body	0,786
Q5	Physical activities with limited exposure of the body	0,718
Q6	Sexual life	0,839
Q7	Negative feelings	0,764
Q8	Doubts, disbelief regarding treatments	0,467
		48,77%
Applied % of the variance		
Cronbach's Alpha		0,842

Q = question

questionnaire presented five main components when the greater than 1 eigenvalues criterion was considered. The explained variance was 70.72%, and Cronbach's Alpha was 0.935 (Table 4).

DISCUSSION

Since no information was found about previous studies that have validated a specific questionnaire assessing the quality of life for patients with cellulite, it was unfeasible to forecast the variability of answers in the present study. A sample calculation to estimate a proportion was therefore carried out, maximizing the variance and considering a 95% confidence interval. This sample calculation supplied the estimate of 385 patients. Nevertheless the study was conducted with 100 patients. A preliminary analysis was subsequently performed to analyze the behavior of the data and the necessity of including a greater number of patients. As the data showed considerable consistency, it was not necessary to increase the sample size.

The factorial analysis of the shortened questionnaire found that each question measured a single factor or domain: cellulite. This single domain explains 48.77% of the variance, indicating that all questions in the shortened questionnaire effectively refer to cellulite. Since each matrix component presented expressive values, it was not necessary to exclude any questions. In addition, the Cronbach's Alpha (0.842) indicated good internal consistency for the shortened questionnaire (Table 2).

The factorial analysis of the full version of the questionnaire indicated that those questions measured five main factors or domains. Observing the matrix components, it was verified

Table 4: Exploratory factorial analysis and internal consistency (full version)

Question (Q)	Evaluated parameter	Factor's weight in the 5 domains found				
		1	2	3	4	5
	MANNER OF DRESSING					
QB1a	choice of clothes' colors				0,659	
QB1b	choice of clothes' fabric				0,884	
QB1c	choice of tight cuts				0,836	
QB1d	wearing of very short clothes				0,709	
	LEISURE					
QB2a	activities with public exposure of the body			0,549		
QB2b	activities with limited exposure of the body			0,675		
	PHYSICAL ACTIVITIES					
QB3a	physical activity in general			0,621		
QB3b	physical activities with exposure of the body		0,814			
	PARTNER					
QB4a	Exposure of the body to a partner		0,667			
QB4b	Fear of losing partner		0,837			
QB4c	sexual life		0,860			
QB4d	partner notices cellulite		0,725			
	NEGATIVE FEELINGS					
QB5a	embarrassment			0,505		
QB5b	doubts and disbelief about the result of treatments				0,467	
QB5c	guilt	0,669				
QB5d	frustration	0,715				
QB5e	discouragement	0,812				
QB5f	self-esteem	0,695				
QB5g	rebelliousness	0,697				
	CHANGES IN DAILY HABITS					
QB6a	eating habits					0,606
QB6b	restricting expenses to treat cellulite					0,797
QB6c	Restrição gastos					0,802
Applied % of the variance		70,7				
Cronbach's Alpha			0,935			

Q = questão

that all questions corresponding to the "manner of dressing" appeared together in the same domain with expressive values (Table 3). The questions regarding "leisure" and "physical activity" appeared together in the same domain, suggesting that they measure the same parameters. Of the questions considered, it was found that QB3a and QB4b could probably be combined into a single question due to their similarity, with the variables being grouped in a single domain (i.e., without differentiating between leisure and physical activity). All questions regarding the "partner" appeared in the same domain, indicating that they are in accordance with the questionnaire – as well as all questions regarding "changes in daily habits." The variables relating to "feelings" were generally consistent, appearing in different domains, except for QB5a and QB5b, which were the least expressive and did not appear in the same domain as the others, suggesting they could be modified or excluded. The 0.935 Cronbach's Alpha indicated good internal consistency in the full version of the questionnaire.

The questionnaire was easy to administer, and the patients did not have difficulty in understanding the questions. The average time of application was five minutes – rather reasonable for clinical use and research.

Comparisons of Celluqol with other quality of life questionnaires should be carried out in the future to assess the correlation of quality of life changes in patients with cellulite with that of patients in general.

CONCLUSION

The authors developed two questionnaires to evaluate the quality of life in female patients with cellulite. Administration of the measurement was straightforward, and the validation analyses demonstrated that both questionnaires could be used with similar efficacy. In daily clinic practice, the shortened version is recommended to evaluate cellulite as the main component of changes in patients' quality of life. The full version of the questionnaire presented five main components for evaluating patient quality of life; its use is recommended for clinical research. ●

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Dermatoscopy in the early detection, control and surgical planning of basal cell carcinomas

A dermatoscopia na detecção precoce, controle e planejamento cirúrgico dos carcinomas basocelulares

Original Article

ABSTRACT

Introduction: *Dermatoscopy can help practitioners analyze details that are imperceptible to the naked eye, such as basal cell carcinoma arboriform vascularization patterns, which can be linked to the tumoral limit. Clinical examinations might yet fail in the early detection and demarcation of the extension of such lesions.*

Objective: *To study the use of dermatoscopy in basal cell carcinomas, aiming at early detection and delimitation of their extension. Method: Basal cell carcinomas (n = 123) were studied prospectively and not randomly, using dermatoscopy, at the author's private practice. Suspect areas, mainly the nose, underwent dermatoscopic scanning. If the vascular pattern was identified, the tumor was delimited by dermatoscopy, and the incision was carried out using that marking. Surgical margins were checked using conventional cuts, cross sections or micrographic surgery.*

Results: *The vast majority of the tumors (92%) were located in the face, of which 59% were not well delimited, 21% were well delimited, and 20% were clinically undetectable. Although the vascular pattern was not observed in 18% of the tumors, in cases with a positive identification, it correctly delimited the tumors in 84% of cases (of which 44% were verified with conventional sampling, 48% with micrographic surgery and 8% with cross sections).*

Conclusion: *Dermatoscopy is an important tool in the early detection and delimitation of the superficial extension of basal cell carcinomas, and is helpful in the surgical planning and clinical control of such lesions.*

Keywords: *dermoscopy; carcinoma, basal cell ; mohs surgery ; blood vessels; capillaries.*

RESUMO

Introdução: A dermatoscopia observa detalhes imperceptíveis a olho nu, como os padrões de vascularização arboriforme dos carcinomas basocelulares, que podem estar relacionados com o limite tumoral. O exame clínico pode falhar na detecção precoce e delimitação da extensão dessas lesões.

Objetivos: Estudar a utilização da dermatoscopia nesses tumores visando a sua detecção precoce e à delimitação de sua extensão.

Métodos: Estudaram-se 123 carcinomas basocelulares com dermatoscopia, prospectivamente, de forma não randomizada, em clínica privada, efetuando varredura com o dermatoscópio em áreas suspeitas, principalmente no nariz. Caso o padrão vascular fosse identificado, o tumor seria delimitado pela dermatoscopia. A incisão se daria nessa marcação. Observou-se a margem cirúrgica com amostragem convencional, cortes seriados ou cirurgia micrográfica.

Resultados: 92% dos tumores se localizaram na face. Destes, 59% eram mal delimitados, 21% bem delimitados, e 20% clinicamente imperceptíveis. O padrão vascular não foi observado em 17,9% dos tumores, mas quando identificado, delimitou o tumor corretamente em 84% dos casos (destes, 44% verificados com amostragem convencional, 48% com cirurgia micrográfica, e 8% com cortes seriados).

Conclusões: A dermatoscopia é importante instrumento na detecção precoce e na delimitação de sua extensão superficial, auxiliando no planejamento cirúrgico e controle clínico dos carcinomas basocelulares.

Palavras-chave: dermatoscopia; carcinoma basocelular; cirurgia de Mohs; vasos sanguíneos; capilares.

author:
Luis Fernando Kopke[1]

[1] Masters in Dermatology, Universidade Federal de Minas Gerais (UFMG) – Belo Horizonte (MG), Brazil and postgraduate degree in Surgical Dermatology, University of Munich (LMU München), Munich, Germany

Correspondence:
Dr. Luis Fernando Kopke
Dapele Dermatologia
Rua Dom Jaime Câmara 77 – 8º Andar
88015-120, – Centro – Florianópolis – SC, Brazil
55 048 3025 3233
E-mail: luiskopke@kopkedermatologia.med.br

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INTRODUCTION

Although it is the most common cancer in humans, the clinical diagnosis of basal cell carcinoma (BCC) is not always straightforward. Presser and Taylor's 1987 study carried revealed only a 70% success rate in diagnosing the condition in an academic setting when using only clinical criteria.[1] In addition to difficulties in diagnosis, it can also be hard to delimit BCC tumors on a purely clinical basis – especially those of predominantly infiltrative growth, which require micrographic surgery since the safety margin concept is inadequate.[2]

Dermatoscopy has already demonstrated its great value in the evaluation of cutaneous tumors; it is an indispensable tool in daily dermatological practice.[3] Initially used to examine pigmented skin lesions, it is increasingly being applied to all types of cutaneous tumors. However, since most BCCs are not pigmented, dermatoscopy can identify these tumors by their vascularization. In their study of the vascularization of cutaneous tumors, Kreusch and Koch described arboriform vessels in 95% of the examined BCCs.[4] Additionally, Kreusch suggests that the tumorous limits of BCCs can coincide with the limit observed in their vascularization; the capillaries of such tumors emerge in the periphery of the lesions, crossing over the lesion.[5] Since the vascular pattern in BCCs differs substantially from that of telangiectasias of normal skin – often visible even to the naked eye – the isolated detection of that type of vascularization through dermatoscopy can signal the presence of a lesion in its initial stages, which is practically imperceptible in a clinical examination. Taking into account that patients with a history of BCCs are 40% more likely to develop a new BCC than the population in general,[6] with lesions occurring mostly in the face (especially in the nose),[7] the early detection of new tumors, when they are not yet clinically visible, would be very helpful in treating those patients.

While dermatoscopy has already demonstrated its utility in evaluating pigmented lesions, there has been little attention devoted to its use in non-pigmented lesions – particularly in BCCs. This study demonstrates the importance of dermatoscopy in the early detection and delimitation of BCCs, which could have an enormous impact on their control and surgical planning.

METHODS

BCCs (n = 123) were examined using dermatoscopy in a prospective, open study carried out at the author's private practice between September 2007 and July 2010. For tumors that could be identified clinically (i.e., without dermatoscopy), dermatoscopy was used to delimit the lesion in order to better plan the surgical treatment. The whole tumoral region, identified by the presence of the arboriform pattern, was marked. The incision was carried out using this marking, with no additional safety margin.

The decision to choose conventional or micrographic surgery was based more on the clinical situation than the accuracy of the dermatoscopic data. If micrographic surgery was indicated, the Munich method would be used so that the ratio of tumor/margin could be examined. In this method, the whole surgical piece – and not only the outer edge (surgical margin) – is studied using sequential parallel cuts carried out each 50-100 micra, extending from the bottom to the epidermal border of the specimen. In that way, even if the tumor has been totally extirpated without touching the surgical margin, it can still be seen in relation to the latter. If it was not possible to clinically identify the tumor, a dermatoscopic screening would be carried out in the suspected area, aiming to identify the characteristic vascular pattern. For patients with a history of BCCs who returned periodically for routine examinations, a dermatoscopic evaluation would be conducted all over the nose, even in the absence of clinical suspicion.

All cases were photographed both clinically and dermoscopically. A stereoscopic dermatoscope of great magnification (up to 60x) was used (Kocher GmbH, Mössingen, Germany) (Figure 1). The pictures were captured with a Sony Cybershot DSC F717 camera with an Optiview adapter (Optiview Ltda., São Paulo, Brazil) or with a Fotofinder® (Fotofinder Systems GmbH, Germany).

RESULTS

Of the 123 tumors observed, 92% were located on the face. Of those, 59% were clinically poorly delimited, 21% were well delimited, and 20% were clinically imperceptible. Among the latter (a total of 25 tumors) only five were not located on the nose, and were discovered using dermatoscopic screening in an area indicated by the patient as suspicious for having already presented a small amount of bleeding or desquamation. Nonetheless, there were no clinical indications of a BCC in these other areas.

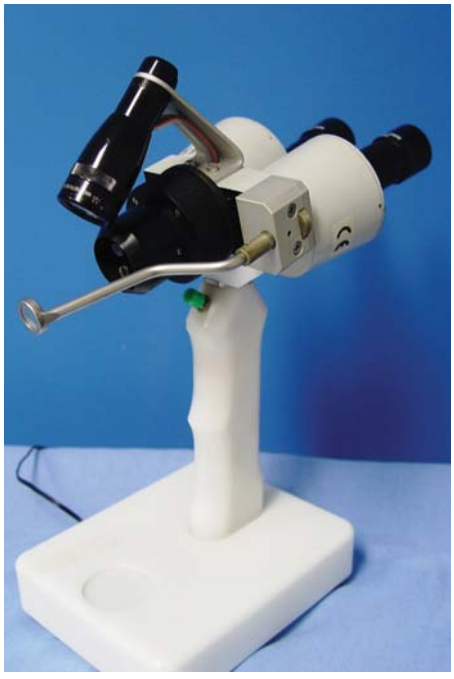

Figure 1: Stereo dermatoscope with 60x magnification capacity, manufactured by Kocher GmBh (Mössingen, Germany), used in most exams.

It was impossible to observe the vascular pattern in 22 (17.9%) of the 123 BCCs, even though a previous biopsy and the surgery itself demonstrated the histological presence of carcinoma. Among those 22 tumors, only one was clinically well delimited, and in only two cases a small amount of pigment was detected in the dermatoscopy. Of the 101 BCCs with arboriform vessels that were identifiable using dermatoscopy (82.1% of the total), all had their lateral limits demarcated by the dermatoscopic results; surgical margins were uncompromised in 84% of the cases. Of these 101 BCCs, 44 cases (44%) were verified using conventional sampling, 9 (8%) through serial cuts and 48 (48%) with the Munich method of micrographic surgery.

When analyzing only tumors excised with micrographic surgery, 16 (33%) cases presented compromised margins in the first stage, and five cases did not demonstrate the presence of a tumor in the second stage. In eight cases, the tumor was present until the second stage. In three cases there was residual BCC until the third stage.

One false positive case was observed, with dermatoscopic findings of arboriform vessels and histopathologic findings of an intradermal melanocytic nevus associated with sebaceous hyperplasia in a lesion located in the nose.

DISCUSSION

In this study, the percentage of BCCs that presented an arboriform vascular pattern was well below the one found by Kreusch and Koch.[4] This can perhaps be explained by the different sampling methods used in the two sites where the study was carried out. The author's private practice receives a great number of referrals for micrographic surgery of lesions that have recurred, in general, one or more times. Usually, the tumor is either hidden by flaps or does not present the usual clinical characteristics of BCCs anymore, or has lost its more visible and diagnosable characteristics in a previous surgery. Patients come in search of a solution to the problem of a compromised surgical margin, clinically presenting only a scar from a previous surgery. Four of the 25 cases of clinically imperceptible tumors had a similar history.

With the first dermatoscopic findings yielding negative results, the lesions were treated as cases where the surgical margins had been compromised, with the absence of clinically perceptible symptoms except for the scar. Since the histopathologic examination sample that had yielded a report of a compromised margin suggested a possible false positive case (specimen without dye in the margin, artefacts originated in the handling of the surgical sample, etc), [2] it was decided that the case would be periodically observed. Within six months to one year, still in the absence of clinical signs, the emergence of the vascular pattern could progressively be perceived by observation (scanning examination) of the suspicious site, suggesting the need for micrographic surgery. Such cases were not recorded as yielding negative results from the dermatoscopic perspective, but as examples of the 25 clinically imperceptible tumors found using dermatoscopy. It is important to note that, unlike dermatoscopes that are more commonly used, the equipment used in this study generates stereoscopic images of great magnification. The thin and delicate arboriform vascularization detected by that equipment may sometimes pass unnoticed by dermatoscopic examinations with lower optical resolutions, which may hamper or even prevent the identification of a tumor that is still clinically imperceptible.[5] Even the captured photographic images can be difficult when compared to the clearer and more direct visualization available using the dermatoscope used in the present study.

In the studied sample, only 21% of the BCCs were clinically well delimited. Only one tumor did not present the characteristic arboriform vascular pattern, meaning that 79% of the sample was composed of tumors without reliable clinical characteristics for the correct delimitation, which was made exclusively using dermatoscopy. Unlike the markings described in some publications [8,9] or communications issued in medical meetings,[10] those carried out in this study were based almost exclusively on the interruption of the vascular pattern, which was detected using dermatoscopy (imperceptible in clinical examinations). This pattern was not perceptible in the pictures published in the literature. The observed dermatoscopic pattern from this study is aligned with that described by Kreusch and Koch [4] and more recently revised by Zalaudek,[11] which was the only criterion used to delimit the tumors – rather than the presence of pigment, which was observed in only two cases.[5] Literature on the subject is still scarce, and the author is not aware of similar data published previously about using these vascular patterns for dermatoscopic delimitation of the lesions or even for early diagnosis. This may be due to the type of dermatoscope used (Figures 2 and 3).

The micrographic surgery method adopted for the verification of the surgical margin is particularly useful, for the Munich method can be used to assess the ratio of tumor/margin. Even with free surgical margins, the site where the tumor was located can be observed – which is not possible in peripheral methods of micrographic surgery.[12] When analyzing only cases that used micrographic surgery, residual tumors could not be found in the second phase in five out of 16 cases that had margins compromised in the first phase. In this manner, it is supposed that, for those cases, having found a tumor in the margins might have characterized what is known as 'coincident margins'. This paradox in the analysis of surgical margins has been described in another study,[2] however it was instrumental in demonstrating that the marking of the lateral margin using dermatoscopy was correct. Of the 48 cases that had micrographic surgery, only 11 (23%) presented margins that were compromised (of which eight cases presented two phases and only three presented three phases). Micrographic surgery was not indicated in order to double check the dermatoscopy, but rather was influenced by the clinical situation, mainly recurrences, poorly delimited borders or compromised margins in the previous surgery. The 84% rate of negativity of the surgical margins can be challenged, because this was verified through micrographic surgery in 48% of the sample. In comparison, Caresana and Giardini obtained 98.5% of negativity in their cases, yet there was no verification through micrographic surgery. Additionally,

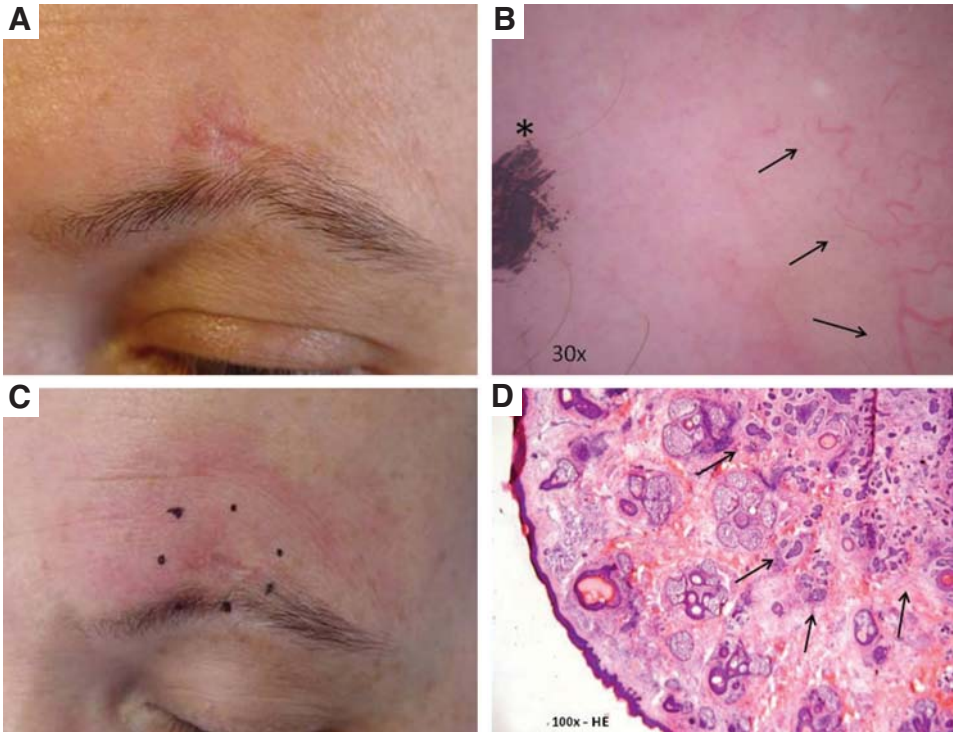

Figure 2: A. Poorly clinically delimited infiltrative BCC; **B.** Dermatoscopic aspects of the arboriform vascularization (arrows) and marking (*); **C.** Delimited lesion; **D.** Histologically, the tumor did not touch the border (arrows) (Munich method of micrographic surgery) (H&E, 100x)

they excluded sclerodermiform BCCs from their sample; all 200 tumors from their study were of the nodular type.[8]

This study's sample contained 79% poorly delimited or clinically imperceptible tumors, with an 84% negativity rate verified through micrographic surgery in almost half of these. It would be interesting to observe the real condition of the surgical margins of all cases through micrographic surgery, studying primary and recurrent tumors in separate groups of patients. This is the only way to more accurately evaluate the precision of tumor delimitation using dermatoscopy. Therefore, although the information collected using dermatoscopy can help, it should not function as an indication as to whether micrographic surgery should be performed. Dermatoscopy works more as a propaedeutic element that is complementary to the patient's complete clinic picture.

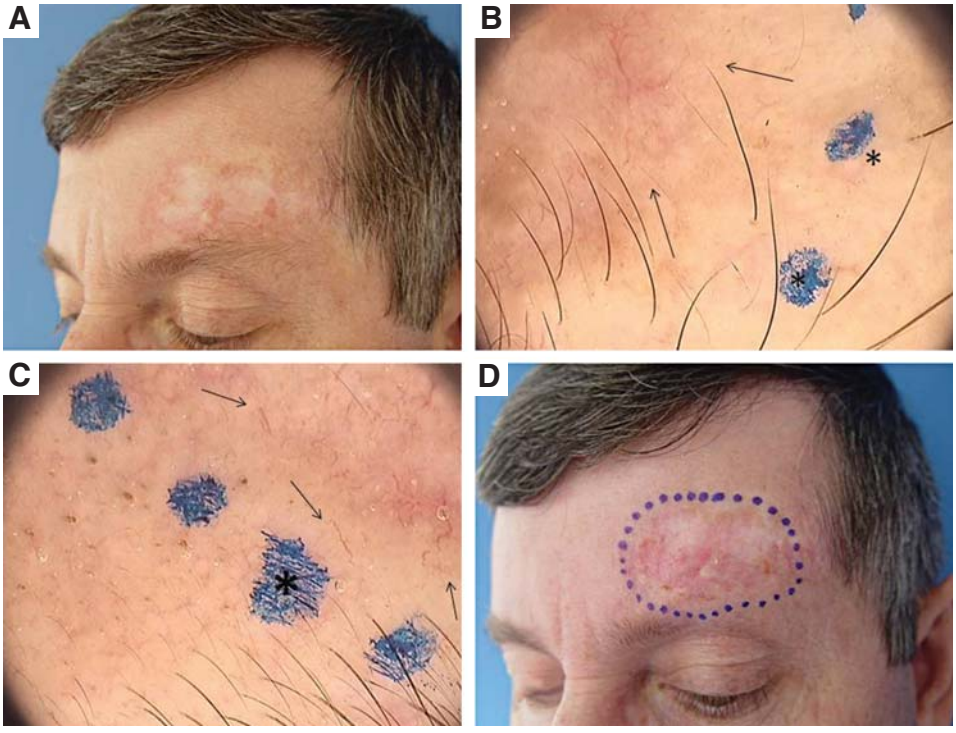

Figura 3: A. Recurrent, poorly clinically delimited infiltrative BCC; **B** and **C.** Dermatoscopic aspect of the arboriform vascularization (arrows) and marking (*); **D.** Lesion delimited using dermatoscopy (the tumor was not detected in the second phase of micrographic surgery)

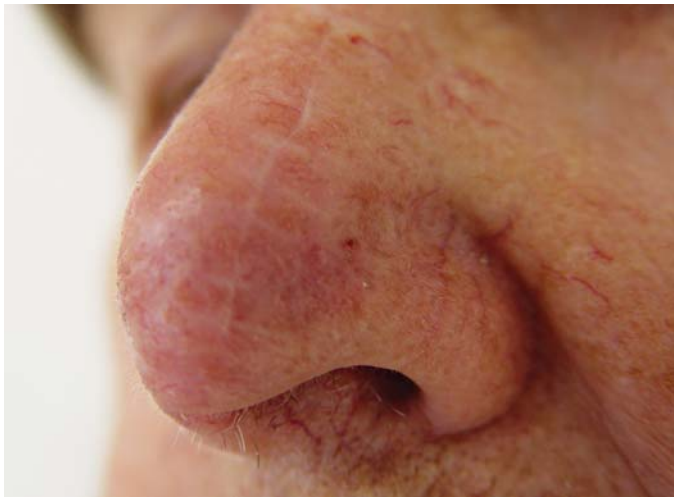

Figure 4: Patient with a history of multiple BCCs. In a routine control examination she underwent dermatoscope-based scanning in the nasal region. Despite the absence of any lesion clinically compatible with that diagnostic, an incipient BCC was found.

The discovery of 25 cases of clinically imperceptible tumors, discovered only by scanning, calls attention to the specificity of the arboriform vascular pattern as a predictive factor for BCCs. Since only five cases were not located on the nose, the study suggests that the dermatoscopic scan examination in that part of the body can reveal the presence of incipient tumors in patients with a history of several BCCs, especially because the nasal area is not extensive, and is the location of highest incidence for that type of lesion. Early detection allows more successful control and handling of BCCs (Figures 4 and 5).

CONCLUSIONS

Identifying the arboriform vascular pattern characteristic of BCCs using dermatoscopy is an important factor in the surgical planning and control of these tumors, for it contributes to their early detection, and is also helpful in determining the clinically obscure borders of the tumors. ●

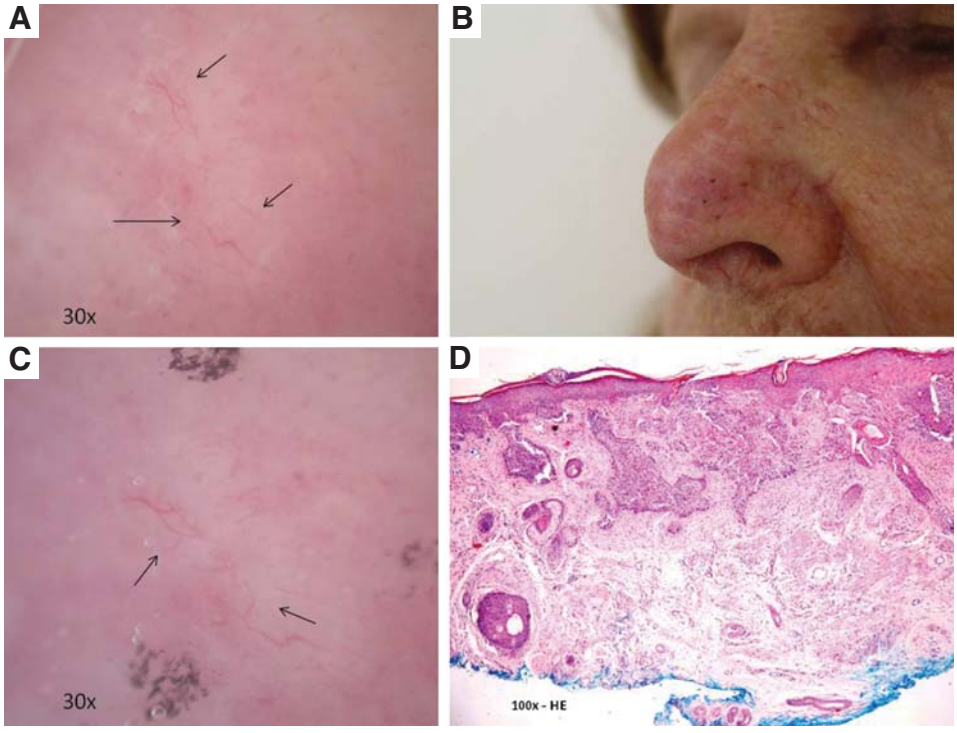

Figure 5: A. The dermatoscopic scanning of the nose of the patient depicted in Figure 4 showed thin isolated arboriform vessels (arrows). This type of vascularization could not be seen in the rest of the nose; **B.** Marking of the site (compare with Figure 4); **C.** Vascular pattern found (arrows) and marking (30x); **D.** Histopathologic picture confirming the finding (H&E, 100x)

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Original Article

Keloids in the ears: follow-up of 41 patients who had surgery and intralesional corticosteroid injections

Queloides em orelhas: seguimento de 41 pacientes submetidos à cirurgia e infiltração com corticosteróides

Authors:
Leticia Arsie Contin[1]
Ivander Bastazini Jr.[2]
Cinthia Janine Meira Alves[3]
Priscila Wolf Nassif[3]
Dejair Caetano do Nascimento[4]

[1] Resident Physician at Instituto Lauro de Souza Lima – São Paulo (SP), Brazil
[2] Preceptor, Medical Residents, Instituto Lauro de Souza Lima
[3] Dermatologist Physician – São Paulo (SP), Brazil
[4] Pharmacologist and Instructor, Dermatology, Instituto Lauro de Souza Lima

ABSTRACT

Introduction: Surgery combined with post-operative intralesional corticosteroid injections is considered a good treatment for keloids that occur in the ears, yet the recurrence rate for this procedure is not yet well established. There is no consensus about the minimum number of corticosteroid infiltrations needed to decrease the number of recurrences.

Objective: To correlate the rate of recurrence among patients who had surgery and post-operative intralesional corticosteroid injections to treat keloids in the ear lobe with the number of injections.

Methods: Retrospective study of 41 patients who underwent surgical excision of ear keloids combined with up to two (Group A) or 3 or more (Group B) triamcinolone acetonide intralesional injections sessions.

Results: The total recurrence rate was 37% (13% in patients from Group A and 24% in patients from Group B). Results were not more effective when the number of injections was equal to or higher than 3 (p = 0.74).

Conclusions: There was no statistical significance in the number of post-operative corticosteroid intralesional injections in the treatment of ear keloids. Further studies are necessary to corroborate these results.

Keywords: keloid; adrenal cortex hormones; ambulatory surgical procedures.

RESUMO

Introdução: *A cirurgia associada a infiltrações pós-operatórias de corticosteroides é considerada boa opção terapêutica no tratamento de queloides de orelha, mas o índice de recidivas ainda não é bem estabelecido. Não há consenso sobre o número mínimo de infiltrações de corticosteroides necessárias para que haja diminuição das recorrências.*

Objetivos: *Avaliar índice de recidiva entre pacientes submetidos à cirurgia e infiltrações de corticosteroides para tratamento de queloides em lóbulo de orelha, relacionando com o número de infiltrações realizadas no pós-operatório.*

Métodos: *Estudo retrospectivo de 41 pacientes submetidos à excisão cirúrgica de queloides de orelha e a sessões de infiltração com acetonido de triancinolona. Foram analisados dois grupos: A: Submetidos a até duas sessões de infiltração. B: submetidos a três ou mais infiltrações.*

Resultados: *O índice de recidiva total foi de 37%, sendo 13% nos pacientes no grupo A, e 24% nos do B. Resultados não mostraram mais efetividade quando o número de infiltrações é igual ou superior a 3. P=0,74.*

Conclusões: *Não houve significância estatística quando comparado o número de IC no pós-operatório de queloides de orelha. São necessários estudos mais amplos que corroborem tais resultados.*

Palavras-chave: *queloide; corticosteroides; procedimentos cirúrgicos ambulatórios.*

Correspondence:
Dra. Letícia Arsie Contin
Boulevard Lorena, 1157 / ap 35
01424-001 - São Paulo, SP – Brazil
E-mail: lecotin@hotmail.com

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INTRODUCTION

Keloids result from an abnormal response to healing in predisposed individuals. Factors linked to its occurrence are: genetic predisposition, with a higher incidence in Hispanics, Asians and blacks (in rates from 5:1 to 15:1 compared to Caucasians),[1,2] age (more common in young individuals), endocrine factors (pregnancy and menopause), and location in body areas with a greater number of melanocytes and trauma.[3] In patients with lesions in the earlobe, keloids appear mainly after piercing the ears The diagnosis is clinical and a number of techniques – combined or not with surgical interventions – are proposed for treating this condition, including intralesional corticosteroids, 5-fluoruracil, alpha and gamma interferon bleomycin or verapamil injections; the use of topical substances such as clobetasol, silicone gel or sheets , immunomodulators, retinoids and onion extract; cryotherapy, radiotherapy, the use of pressure earrings, ligature of sessile keloids and pulsed dye laser, among others.[1,4,5-7]

OBJECTIVE

To evaluate the recurrence rate among patients who underwent surgery and corticosteroids injections (CI) for the removal of keloids in the earlobe , making correlation with the number of injections carried out in the post-operative period.

MATERIALS AND METHODS

This was a retrospective study analyzing 41 patients' records (21 men and 20 women, aged 9-66) amounting to 46 operated keloids (five patients presented bilateral lesions). The study was approved by the Instituto Lauro de Souza Lima's ethics committee. Patients who had either never undergone treatment or had already been treated with cryosurgery or bleomycin injections but presented a recurrence of lesions or therapeutic failure, were included. The intramarginal excision and simple suture of the keloids, as well as the monthly triamcinolone (20-40 mg) CI (started on the 15th day of the post-operative period up to a total of six sessions), were carried out by the same assistant physician. The initial dose was 20 mg, and was increased to 40 mg in case there was a progression of the keloid between sessions. Due to the great number of patients who abandoned the treatment during the infiltrations period, two follow-up groups were established: A – operated patients who had up to two sessions of CI, and B – patients who had three or more CI sessions. After a minimum of one year from the end of the treatment, the patients were called and asked about the recurrence of the operated lesion. Reincidence was considered to have taken place if the patient described any recurrence, regardless of the lesion's size.

RESULTS

The total corresponds to the number of operated keloids.

In Group A there was recurrence in six patients, corresponding to 13% of the total number of lesions. Recurrence was observed in 11 patients from Group B, corresponding to 24% of the total number of lesions.

Comparing Groups A and B (See Table 1), there was no statistically significant difference between the number of infiltration sessions and the lesion recurrence e when the Chi-square test corrected by Fisher's exact test was used.

c 2 = 0.1048; p = 0.7462; 95% confidence interval (CI) (0.3682 – 1.684); Fisher: 95% CI (0.3682 – 1.684); p = 0.5546.

DISCUSSION

Keloids have a high rate of recurrence: according to which methodology is used, the rate varies from 0 to 100%.[1,3,7] Surgery using intramarginal excision is a treatment option, however it is associated with reincidence rates of 45-100%.[7] The combination of corticosteroids and infiltration in the post-operative period as an adjuvant therapy is one of the most established options, since corticosteroids inhibit collagen synthesis by increasing alpha-2 macroglobulins and alpha-1 antitrypsin. [8,9]

Although the effectiveness of combining surgery and post-operative infiltrations has been demonstrated, there is no consensus on doses or duration of treatments; several treatment plans have been suggested. Chowdri, Mattoo and Darzi propose two to five weekly injections of triamcinolone, followed by monthly injections for four to six more months.[5] In a review on keloids and hypertrophic scars, English and others suggest administering 20 mg/ml triamcinolone once every two or three weeks, repeated if necessary, combined with a brief cryotherapy jet prior to the procedure.[8]

A less aggressive approach was proposed by Rosen, Patel, Freeman and Weiss, consisting of one intra-operative and two post-operative infiltrations of 40 mg/ml triamcinolone acetonide. In cases with no recurrence, the follow-up was observational only. That study involved 92 keloids in the ears of 64 patients, with a reincidence rate that ranged from 14% (first time treatment) to 40% (recurrent keloids).[11]

In the post-operative period of 11 patients, Aköz, Gideroglu and Akan used pressure earrings combined with silicone gel, in addition to one session of CI with 20-40 mg/ml triamcinolone in the borders of the incision, after the 14th day after the procedure. The follow-up lasted 28 months on average, presenting a 89% cure rate.[1]

Triamcinolone is also Wolfram, Tzankov, Pulzl and Piza-Katzer's drug of choice. Their treatment plan consists of smaller doses (5 to 10 mg/ml) in intervals of three to six weeks, contin-

Table 1. Comparison of treatments A (surgery and up to two corticosteroid infiltrations) and B (surgery and three or more infiltrations)

	A	B	Total
Recurrence	6 (13%)	11 (24%)	17 (37%)
Without recurrence	13 (28%)	16 (35%)	29 (63%)
Total	19 (41%)	27 (59%)	46 (100%)

The total corresponds to the number of operated keloids. χ^2 = 0.1048; p = 0.7462; 95% confidence interval (CI) (0.3682 - 1.684); Fisher: CI 95% (0.3682 - 1.684); p = 0.5546..

uing until the scar stabilizes, until a new surgical intervention is necessary or until side effects appear.[3]

In the present study, a total reincidence rate of 37% was observed after surgery and infiltration. Aligned to the average results found in the literature describing the combination of those procedures, suggesting it is reasonably effective when compared to the date found in the literature for the isolated surgery. Nevertheless, when comparing these results to the recurrence rates in groups with fewer or greater numbers of infiltration sessions, no statistical significance was found. In fact, a greater recurrence rate was verified for the group with a greater number of infiltrations (13% in the group treated with up to two infiltrations and 24% in the group that received three or more infiltrations). This can be linked to the fact that recurrent keloids that had already been treated – thus implying a situation where recurrence rates tend to be higher – were indiscriminately included in the study.[11] There is also the hypothesis of a higher patient adherence to longer treatments in cases where the post-operative outcome was less favorable, for example with the fast growth of a new lesion or with previous recurrences.

Therefore, it is not possible to establish a minimum number of post-operative infiltrations. Factors other than the number of sessions and the corticoid dosage can have a decisive influence in the recurrence of a keloid, explaining, for instance, why some patients with bilateral lesions treated in the same way present recurrence in only one side.

CONCLUSION

Corticosteroids present side effects such as the risk of secondary infection, atrophies, telangiectasias, hypopigmentation and Cushing's syndrome.[8] The attempt to establish effective infiltration treatment plans of the shortest possible duration are, therefore, justified.

Although the adjuvant therapy was found to be efficient, there was no statistical significance between the two groups, meaning it is not possible to state that long infiltration schemes are necessary or possibly more efficient in the prevention of recurrences. Further studies to corroborate such results and identify new risk factors for the recurrence of keloids are, therefore, necessary. ●

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Original Article

Evaluation of the duration of injectable hyaluronic acid in nasolabial folds and perioral rhytids

Avaliação da permanência do ácido hialurônico injetável no sulco nasogeniano e rítides labiais

Authors:
Celia Luiza Petersen Vitello Kalil[1]
Ana Paula Avancini Caramori[2]
Mercedes Dalpias Balkey[2]

[1] Preceptor, Dermatology Department, Complexo Hospitalar Santa Casa de Porto Alegre – Porto Alegre (RS) and Dermatologist Physician, Posto de Saúde Santa Marta de Porto Alegre – Porto Alegre (RS), Brazil
[2] Former Resident Physician, Dermatology Department, Complexo Hospitalar Santa Casa de Porto Alegre

Correspondence:
Dra. Ana Paula Caramori
Monroe 179/1402
90810-220 – Porto Alegre – RS, Brazil

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ABSTRACT

Introdução: Hyaluronic acid has been increasingly used in aesthetic procedures.
Objective: To evaluate the degree of improvement and duration of results in patients who received treatment for wrinkles with hyaluronic acid.
Methods: Prospective, open, non-randomized, non-controlled study of 20 female patients who presented superficial wrinkles in the superior lips contour and a prominent nasolabial fold. The efficacy of hyaluronic acid was assessed using the Wrinkle Severity Rating Scale. The duration of results was assessed through biopsies. Safety was evaluated through clinical observation and reports of adverse events.
Results: A significant clinical improvement was observed after 15 days, which was sustained for 4 months. A minor worsening was observed after that period, although patients still presented favorable aesthetic results up to 12 months after the procedure. A majority of patients (n = 17) had a biopsy in the left retro-auricular region 180 days after the procedure. From this group, the substance was observed in 13 slides (76.4%).
Conclusion: Hyaluronic acid is an effective and safe product. This study has proven that the product remains in the dermis for up to 6 months.
Keywords: hyaluronic acid; residence time; skin.

RESUMO

Introdução: *O ácido hialurônico vem sendo utilizado em escala crescente em procedimentos estéticos.*
Objetivo: *avaliar o grau de melhora dos pacientes submetidos à aplicação de AH e o tempo de permanência do produto.*
Métodos: *estudo prospectivo, aberto, não randomizado e não controlado. Incluídas no estudo 20 pacientes do sexo feminino que apresentavam rugas superficiais no contorno labial superior e sulco nasogeniano proeminente. A eficácia foi aferida pela escala de classificação de gravidade das rugas (Wrinkle Severity Rating Scale - WSRS). O tempo de permanência foi avaliado através de estudo anatomopatológico, e a segurança, por observação clínica e relato de eventos adversos.*
Resultados: *Após 15 dias constatou-se importante melhora clínica que se manteve durante quatro meses, identificando-se, então, discreta piora; ainda assim, os pacientes apresentavam resultados estéticos favoráveis até 12 meses. Dezessete pacientes foram submetidas à biópsia na região retroauricular esquerda 180 dias após o procedimento. Nesse grupo, observou-se depósito de material em 13 lâminas (76,4%).*
Conclusões: *O ácido hialurônico é produto seguro e efetivo, e este estudo comprovou sua permanência na derme por período de até seis meses.*
Palavras-chave: *ácido hialurônico; tempo de permanência; pele.*

INTRODUCTION

Hyaluronic acid (HA) was first described by Karl Meyer as a substance contained in the vitreous humor of cats' eyes, in 1934. A natural polysaccharide, it is part of the intercellular matrix of the dermis and can also be found in the conjunctive tissue, bones and interstitial membranes.

It is an extremely biodegradable and biocompatible substance with a chemical structure that is consistent among all animal species. Its invariable chemical structure decreases the risk of immunological reactions, which is an advantage when compared to other filling substances. Cutaneous tests are not usually necessary before HA injections.

Dermatologists and plastic surgeons have used HA for cosmetic purposes since 1996, to fill wrinkles and scars, and increase the volume of lips, for example. Since then, different companies in the pharmaceutical industry have developed their own products with HA as the active ingredient.

HA is a powerful water retainer and is effective in adding volume to injected tissues. However its non-modified form has a short half-life, and is eliminated rapidly in the dermis. To be used as a filling agent to improve rhytids and scars or add volume, HA should be stabilized to give it a long half-life. The stabilization process varies by manufacturer and brand, which explains the differences in the viscosity of HA and the duration of the effects that are found in the diverse products on the market.[1] Since HA fillings are not permanent, the procedure must be repeated at variable intervals, according to the need (a few months on average).[2]

HA is currently the safest agent used in cosmetic fillers, and rarely presents adverse effects, which the physician must be aware of and inform the patient about before using the product. Most complications are not serious – primarily erythema or a burning sensation at the site of injection –and disappearances when the product is degraded.[3-5]

Although the duration of the effect is limited, products containing HA are the most popular among cosmetic fillers. They produce considerably significant results and few undesirable reactions. Physicians and patients prefer fillers containing HA due to their good tolerance, natural effect and few side effects.

OBJECTIVE

To evaluate the degree of improvement in patients who received HA injections in the nasolabial fold (NLF) and in the superficial rhytids in the upper lip margin (ULM) and the duration of the product in the retroauricular region.

METHODS

Female patients (n = 20) from the Dermatology Outpatient Clinic of the Complexo Hospitalar Santa Casa de Porto Alegre who presented superficial wrinkles in ULM and prominent NLF were included in this prospective, open, non-randomized and non-controlled study.

Patients who were pregnant, had acute or chronic disorders that could influence the evaluation of results, presented with a personal or family history of keloids or allergy to HA, and those who had previously been treated with any type of filler in the areas to be studied were excluded.

The present study was submitted to and approved by the Research Ethics Committee of the Complexo Hospitalar Santa Casa de Porto Alegre. All patients signed a term of free and informed consent prior to the start of the treatment.

The patients were photographed in frontal and angled perspectives, in a standardized way, on each visit with a Canon Rebel XT camera. A stereotactic device that allows the standardization of the positioning of the head and focal distance was used.

The patients received an intradermal application of 0.1 ml of Perfectha Derm® (Comedix Com Produtos Médicos e Farmacêuticos, Brazil) in the right and left retroauricular regions. In order to evaluate allergic reactions and to proceed the subsequent histological examination, the product injected behind the ears belonged to the same batch as the material involved in the study. The histological examination aimed to detect granulomas and verify the product's duration. Later on, the patients were given injections of Perfectha Derm® in the superficial rhytids of the ULM or in the NLF. The treatment's objective was to completely correct the rhytids, while avoiding overcorrection.

The sites to be treated were swabbed with chlorhexidine before each application. The patients who had HA treatment in the NLF received topical 4% lidocaine cream (Dermomax® Laboratório Ache, São Paulo, Brazil) before the procedure. The patients who received HA in the ULM had a regional block of the infraorbital nerves with 2% lidocaine, without vasoconstrictor. The HA was injected in the NLF and the ULM with 27G and 30G needles, respectively. The treated sites were massaged immediately after the injection. The HA was injected in the medium-deep dermis using the retroinjection technique, with the needle's bevel preferentially turned upward, according to the manufacturer's recommendation.

The HA's efficacy was assessed independently by two investigators at 15, 30, 60, 90, 120, 180 and 360 days after treatment, following a clinical evaluation and analysis of pictures. The severity of the wrinkles was scored according to the previously validated Wrinkle Severity Rating Scale (WSRS)[6,7] (Tables 1 and 2).

The biopsy of the right and left retroauricular regions was also carried out at 30 and 180 days after the procedure, respectively. Before the biopsies, those areas were anesthetized with 2% lidocaine without vasoconstrictor and a 2mm punch. The material that was obtained underwent histological evaluation. Adverse effects and severity level were appropriately reported.

RESULTS

Female patients (n = 20) aged 35-49 (average age 43) were included in the study. Eleven (55%) had treatment of the NLF, and nine (45%) received treatment of the ULM. Five patients (four from the NLF group and one from the ULM group did not complete the protocol, and were therefore excluded. The

Table 1. Wrinkle Severity Rating Scale (WSRS)

WSRS grades	
Graus	
5	Extreme: extremely long and deep creases with impairment of the physionomy, variable "V" shaped fold, of 2 to 4 mm, when skin is stretched
4	Severe: very long and deep creases, prominent physionomy, fold shorter than 2 mm when skin is stretched
3	Moderate: moderately deep creases, absence of folds when skin is stretched
2	Light: superficial yet noticeable crease; minor influence on the physionomy
1	Absent: absence of noticeable crease

volume of HA injected in each NLF varied from 1.6 to 2.3 ml (average 2 ml). In the ULM, it ranged from 1.1 to 1.7 ml (average 1.5 ml).

A significant degree of clinical improvement was observed after 15 days, which remained stable for approximately four months. Although a minor worsening was observed after that period, the patients presented favorable aesthetic results that lasted up to 12 months (Graph 1).

BIOPSIES

Eighteen patients had a biopsy in the right retroauricular region on the 30th day after the procedure. The analysis of the material, carried out by an experienced pathologist, demonstrated deposits of HA on 13 slides (72.2%).

The rest of the patients (n = 17) had a biopsy in the left retroauricular region 180 days after the procedure. In that group, deposited material was observed on 13 slides (76.4%) (Figure 1). The formation of foreign body granulomas was not observed in any case.

Adverse effects associated with HA and the procedure itself included ecchymoses, edema, erythema and local pain. These findings were of mild to moderate intensity, with a duration of a few days. Only one patient who received filling of the NLF presented the formation of a nodule around 30 days after the application of the product; the nodule disappeared after 15 days of massage with medium potency corticoid.

Table 2. Distribution of patients according to the initial evaluation with WSRS and treatment site

	EVALUATION	
WSRS	**ULM**	**NLF**
1 – Absent	-	-
2 – Light	1 (12,5%)	-
3 – Moderate	2 (25,0%)	3 (42,8%)
4 - Severe	5 (62,5%)	4 (57,2%)
5 – Extreme	-	-
Total	**8 (100,0%)**	**7 (100,0%)**

DISCUSSION

The results of this study confirm the efficacy of HA in the correction of NLF and ULM, proving it is a well tolerated treatment. The positive clinical improvement persisted for more than six months in most of the cases. Such results are in line with those obtained by Beer[8] and Carruthers and others[9] in previous studies. An interesting fact was the observation of intact material in the biopsies carried out in the left retroauricular region, proving that the product can remain in the dermis for up to six months.

The absence of deposited material in some slides can be explained by the fact that the material was obtained using superficial biopsies. The material was most likely present but was not captured due to insufficient depth in the collection procedure.

The durability of the product in the skin depends on the rate of degradation of the substance, the structure of the particle of the HA used and its concentration. Maintaining the treatment effect also depends on the texture of the skin, the type and severity of the problem to be corrected, the patient's age and the technique employed. The site to be treated is also an important factor, for areas that move more frequently tend to present less durable results.

The data reinforce that the use of HA produces good results in the correction of the nasolabial fold and labial rhytids.

CONCLUSION

As demonstrated in other studies, HA is a safe and effective product to be used in the treatment of NLF and ULM. It was proven, through cutaneous biopsies, that the product remains in the dermis for a period of up to six months.

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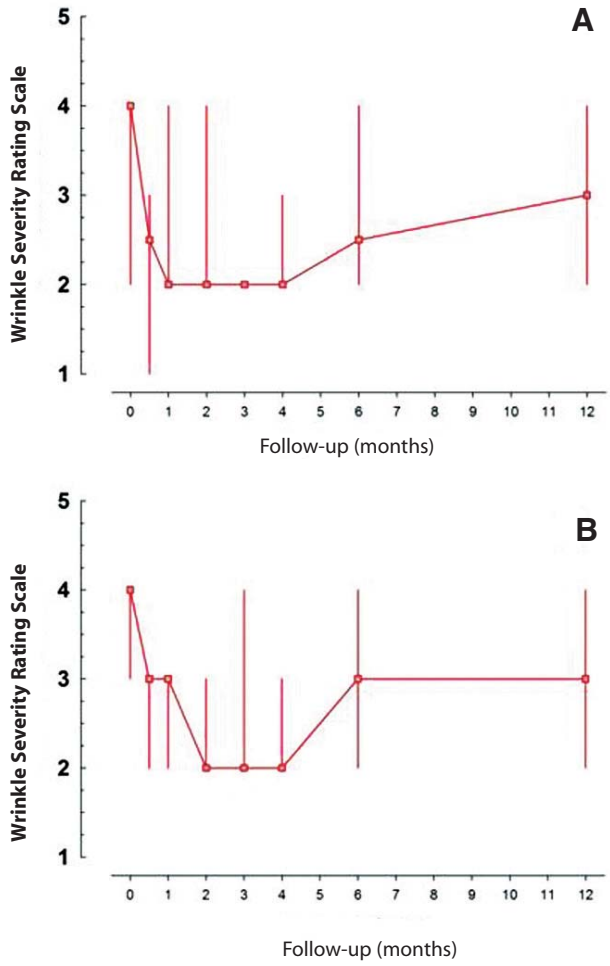

Graph 1 - Curves representing the median, and minimum and maximum values of the scores in the Wrinkle Severity Rating Scale in the sites **(A)** lip margin (n =8) and **(B)** nasolabial fold (n =7). Comparison of time points (using Wilcoxon's test)
0 vs 2: (A) p = 0.038 and (B) p = 0.024
0 vs 12: (A) p = 0.014 and (B) p = 0.025

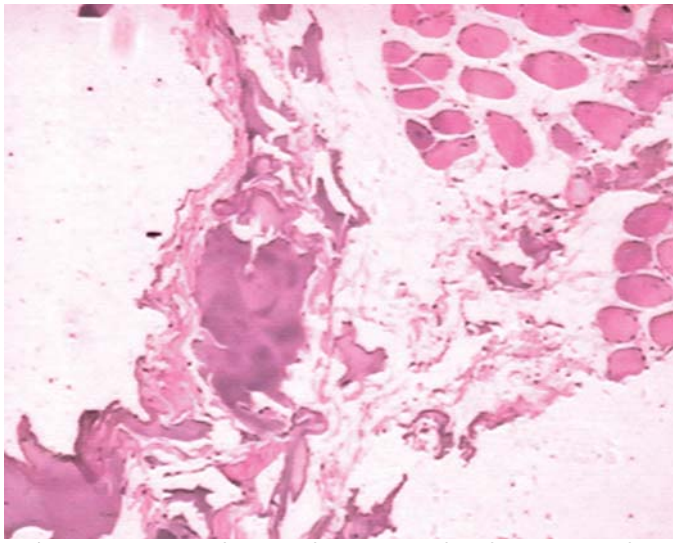

Figure 1 - Retroauricular region biopsy at 180 days demonstrating the presence of HA in the dermis

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Original Article

Safety in liposuction using local tumescent anesthesia: a report of 1,107 procedures between 1998 and 2004

Segurança em lipoaspiração usando a anestesia local tumescente: relato de 1.107 casos no período de 1998 a 2004

Authors:
Juliano Borges[1]
Celia Maria M. P. Cotrim[2]
Bruna Dacier[3]

[1] Dermatologist Physician and Director, Dermatologic Surgery Outpatient Clinic, Instituto de Assistência dos Servidores do Estado do Rio de Janeiro (IASERJ) – Rio de Janeiro (RJ), Brazil
[2] Instructor, Dermatologic Surgery, Hospital Geral de Bonsucesso (HGB) – Rio de Janeiro (RJ), Brazil
[3] Post-graduate degree in Dermatologic Surgery, Hospital Geral de Bonsucesso (HGB)

Correspondence:
Dr. Juliano Borges
Rua Otavio Correia 448/102 – Urca
22291-180 Rio de Janeiro – RJ
E-mail: julianoborges1@yahoo.com

ABSTRACT

Introduction: Liposuction is a cosmetic procedure that removes undesired body fat. More recently, it has been associated with complications and deaths, raising concerns about the risk involved in the procedure. Since the tumescent technique was described by Jeffrey Klein, surgeons from around the world have contributed to the development of the technique, making liposuction with microcannulas and local anesthesia a safe and effective procedure that achieves its objective. Nevertheless, severe complications and deaths are described in the literature when the procedure is performed under general anesthesia or with IV drugs, or when there is a breach of the protocols recommended for local tumescent anesthesia. Therefore, it is necessary to establish protocols for liposuction procedures that use local tumescent anesthesia, to promote safety.
Objective: To demonstrate that using local tumescent anesthesia in liposuction is safe.
Methods: Retrospective study of medical records of 568 patients who underwent 1,107 liposuction procedures assisted by local tumescent anesthesia between 1998 and 2004.
Results: There were no deaths or complications that required hospitalization.
Conclusions: When standardized protocols are observed, liposuction assisted exclusively by local tumescent anesthesia was shown to be a safe procedure.
Keywords: lipectomy; anesthesia, local; safety.

RESUMO

Introdução: *A lipoaspiração é procedimento cosmético para remoção de gordura corporal indesejada. Recentemente, tem sido associada com alta morbidade e mortalidade levando a dúvidas quanto ao risco do procedimento. Desde a descrição da técnica tumescente por Jeffrey Klein, cirurgiões dermatológicos de todo o mundo contribuíram para o desenvolvimento da técnica, tornando a lipoaspiração com microcânulas e anestesia local tumescente procedimento seguro e eficaz em seus objetivos. Porém, sua combinação à anestesia geral, infusão intravenosa de drogas ou quebra dos protocolos sugeridos para anestesia local tumescente implicou sérias complicações e mortes relatadas na literatura. Dessa forma, torna-se necessário estabelecer protocolos para lipoaspiração com anestesia local tumescente, reiterando a segurança do método.*
Objetivo: *Demonstrar que a lipoaspiração usando anestesia local tumescente é procedimento seguro.*
Métodos: *Estudo retrospectivo dos prontuários de 568 pacientes submetidos a lipoaspiração utilizando anestesia local tumescente no período de 1998 a 2004.*
Resultados: *Nenhuma morte ou complicação que necessitasse de hospitalização ocorreu.*
Conclusões: *A lipoaspiração usando exclusivamente anestesia local tumescente, demonstrou ser procedimento seguro quando respeitados protocolos padronizados.*
Palavras-chave: *lipectomia; anestesia local; segurança.*

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INTRODUCTION

Since its advent in the 1970s,[1] liposuction has gained popularity and become the most frequently performed cosmetic surgery in the world.[2] In 1987,[3] Jeffrey Klein described the tumescent technique, a procedure that has revolutionized the field. The description of the technique, which combines a saline infusion with anesthesia in the subcutaneous region until the state of tumescence is achieved, as the only method of anesthesia, was a watershed in surgery. The local tumescent anesthesia (LTA) technique solved many medical and cosmetic problems associated with liposuction.[2] When initially developed in France and Italy in the 1970s,[4] the surgery was carried out under general anesthesia, without any infusion of liquids (dry technique); over the years, a small amount of liquid started to be infused (wet technique). Nonetheless, both methods were associated with heavy blood loss, and usually required blood transfusions.[5] In addition, the instruments used were cannulas with a 1 cm diameter, which were substituted in the beginning of the 1980s for 6 mm cannulas. These instruments caused damage to neurovascular bundles, occasionally leading to irregularities in the body contour, in addition to seromas and frequent hematomas.6 It was with the tumescent technique that microcannulas (diameter from 1-4 mm) with multiple orifices became popular.7 Many authors suggest that LTA-assisted liposuction is the gold standard for fat removal surgeries.[5-7]

Currently, one-third of liposuction surgeries in the US are carried out by dermatologists using the LTA technique;[5] the majority are performed in outpatient clinics or in well equipped practices.[8] In India, there is a growing number of dermatologists who perform this type of procedure. The requirements are: training in dermatology, followed by training in dermatologic surgery and obtaining a certification to perform liposuction.7 In Brazil, some dermatologists with specific training also perform liposuction.[9]

Many physicians, especially non-dermatologists, use techniques that are described as tumescent, but are not. As discussed above, the wet technique is different from the tumescent technique, as is the method that combines other types of anesthesia with local anesthesia. The inaccurate use of the terms "tumescent technique," "tumescent liposuction" or " tumescent anaesthesia" to describe any liposuction procedure that uses a subcutaneous infusion of anesthetic, or subcutaneous infusion combined with other types of anesthesia (such as general, intravenous or peridural), has been a source of confusion even in the medical community, with rumors and the publication of complications and deaths [10-24] attributed to the tumescent technique. However, when analyzed in detail, all such articles reveal techniques that cannot be considered tumescent liposuction as the procedure is known and studied by dermatologists.

The use of LTA as the sole method of anesthesia is the gold standard in liposuction for dermatologic surgeons. No fatalities have been published since the introduction of this procedure, and more serious complications are extremely rare.[2] Observing the proposed protocol, and understanding the pharmacological characteristics of the infiltrated substances, is essential for a successful procedure. The objective of this study is to evaluate the safety profile of 1,107 liposuction surgeries performed in the surgical rooms of a private practice between 1998 and 2004.

METHODS

In this retrospective study, records of 568 patients who sought the authors' private practice during the study period for the removal of localized fat using liposuction were reviewed. After explanations about the procedure's characteristics and a physical examination of the proposed treatment area, a decision about whether to perform the procedure was made. For patients with non-realistic expectations, as well as obese individuals who sought the surgery as a way to lose weight, the surgery was not recommended. For the latter group, it was explained that the objective of the procedure was not to lose weight, but rather to remove undesired localized fat.

For those going forward with the procedure, a standard evaluation for surgical risk was requested from the cardiologist (physical examination, thorax x-ray, electrocardiogram, complete blood count, biochemistry, complete coagulogram and routine urine examination). Patients whose ASA classes came up different from I or II (surgical risk classification of classes I to VI, described by the American Society of Anesthesiologists, according to the presence and severity of the disorders affecting the patient) had the procedure contraindicated. Additionally, an abdominal ultrasound was requested for patients seeking abdominal liposuction to check the competence of the abdominal musculature. Patients with abdominal hernias had the procedure contraindicated, due to the association of that disorder with the perforation of the intestine. The patients who complied with all selection criteria were photographed and measured, and later signed the term of consent.

Given the absence of a well established consensus in Brazil, the international dermatologic guidelines for liposuction using LTA, [25-28] mainly those used in the US, were followed.

PREOPERATIVE CARE

In all cases, 500 mg of azithromycin was administered the night before, two hours before and the day after the procedure. A bath with chlorhexidine soap was recommended in the morning on the day of the surgery.

The ingestion of vitamins, alcohol and medication that could interfere with the coagulation of the blood were discontinued one to two weeks prior to the procedure. It was advised that drugs that interfered with the enzymes of the cytochromes P4501A2 or P4503A4, by inhibition or competition, were suspended or substituted with appropriate equivalents. That measure aimed at avoiding that the lidocaine's bioavailability implied a serial level higher than 6 microg/ml, which, according to reports, has been associated with symptoms of anesthetic intoxication.8 In the morning on the day of the surgery, the ingestion, before breakfast, of a tablet of lorazepan 2 mg and a tablet of dimenhydrinate 50 mg + pyridoxine hydrochloride 10 mg (Dramin B6®) was recommended as a means of inducing conscious sedation.

SURGICAL TECHNIQUE

The procedures were performed in an outpatient surgical center containing reclining surgical tables, , surgical lights, resuscitation equipment (including drugs and defibrillator) and air conditioning, which was previously disinfected. The surgeon swabbed his/her hands and arms with iodated degerming solution, using surgical cap, , protection glasses, surgical mask, overcoat and sterile gloves. The surgical center's doors were adapted to allow the surgical table to pass through quickly in case of an emergency.

After cleaning the patient's skin with iodated solution, pictures for documentation and marking were taken with the patient standing up.

In all studied cases the tumescent solution (Table 1) was then infiltrated with blunt-tipped infusion cannulas attached to the saline solution equipment. The infusion continued until the tumescence state was achieved in the deep and superficial planes of the previously marked areas.

The solution was allowed to diffuse among fat lobules for 20-30 minutes, to optimize the effects of the adrenaline and lidocaine. In the sites where the state of tumescence (characterized by local edema and firmness) was not reached, reinfiltration was carried out.

After this phase, the patient was positioned more comfortably to allow the surgeon to start working. After each change in the patient's position, a new local application of iodated solution was carried out. Multiple millimetric incisions were made so that the fat panniculus could be reached in several directions. The cannulas used, varying from 2-4 mm, were those recommended by Klein. The amount of infused anesthetic solution was measured so that the rate of lidocaine did not exceed 35 mg/kg per patient. The total amount of aspirated liquid – a slightly red anesthetic solution due to its contact with blood and fat – was left to rest for 30 minutes so that the separation in two phases allowed the calculation of the total aspirated fat in liters.

After the procedure, 1% silver sulfadiazine cream was applied to the incision areas, which had not been sutured in order to allow the drainage of liquids from the areas that received surgical intervention. Geriatric absorbents were placed in those sites to provide comfort to the patient who was instructed to use compressive belt for 24 hours uninterruptedly. For patients who received abdominal liposuction, a marble was placed in the umbilicus to avoid unattractive tissue adhesions. In those cases, 5kg bags of rice were used to provide compression to the treated area during recovery. For the first day after the procedure it was recommended that the patient remain under supervision due to the probability of dizziness. On the second day, once the marble and absorbents were removed, recommendations for the use of continuous compression belt (during the day and night) and the duration of use were discretionary. For abdominal liposuction patients, a piece of cardboard was prepared and put in place from the second day. Post-operative visits were scheduled weekly during the first month and as needed afterwards. Everyday activities were progressively resumed, depending on levels of post-operative pain.

Table 1. Klein's solution

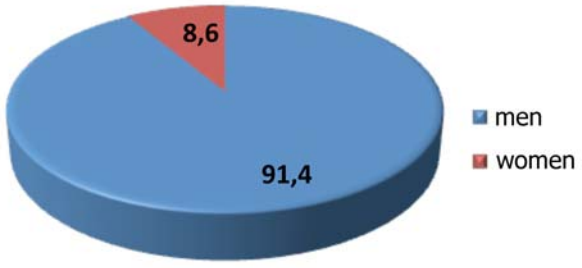
1,000 ml 0.9%	saline solution
1 ml 1/1,000	adrenaline
30-40 ml 2%	lidocaine without vasoconstrictor
10 ml 10%	sodium bicarbonate

RESULTS

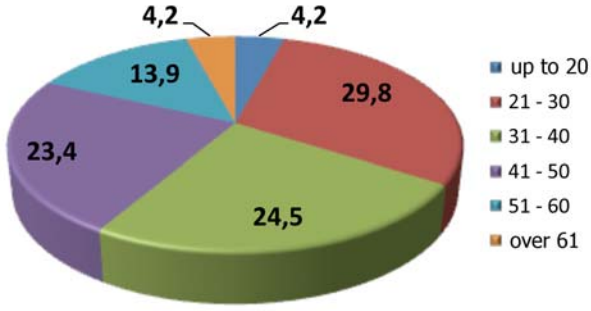
From 1998 to 2004, 568 patients were treated; 1,107 body areas received liposuction. The vast majority (519 or 91.4%) of the patients were women (Graph 1). Ages ranged between 15 and 77 years, with 77.7% between 21 and 50 years (Graph 2). Demand was higher among patients who weighed between 61 and 80 kg (62.9%) (Graph 3).

Liposuctioned patients were either at their normal weight (measured using body mass index) or presented overweight, reinforcing the idea that the liposuction is not aimed at treating obesity, but rather at removing localized adipocytes, to provide a more harmonious corporeal contour.

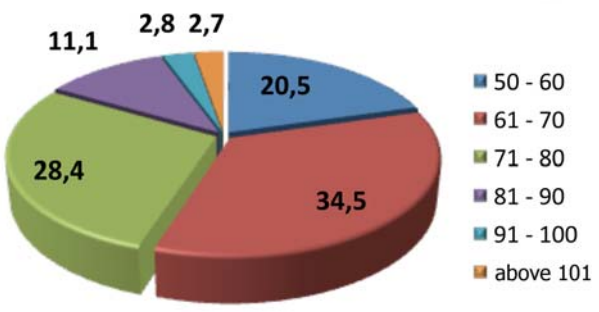
The most frequently liposuctioned areas were the abdomen, waist, coccyx region, dorsum and axillae (Graph 4). The sites where the procedures carried out in isolation were the abdomen, neck, inner thigh, outer thigh and hips. The abdomen, waist and coccyx region was the most frequent combination.



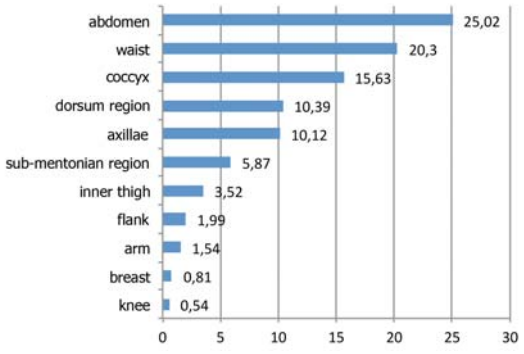
Graph 1: Distribution of patients by gender



Graph 2: Distribution of patients by age group



Graph 3: Distribution of patients by body weight



Graph 4: Distribution by treated area

Table 2. Injected and aspirated volumes

Procedure	Injected volume (ml)			Aspirated volume (ml)		
	Min	Max	Average	Min	Max	Average
Abdomen	1000	6000	2956	300	4800	2119
Waist	1000	2600	1647	400	1750	1000
Inner thigh	1500	5000	2722	750	4000	1733
Dorsum region	800	2000	1277	350	1300	727
Outer thigh	1000	4000	2328	800	2800	1428
Chin	200	500	308	80	300	145

Table 3. Degree of improvement observed by patients after surgery

Minor	0%-25%	0
Regular	25-50%	0
Moderate	50%-75%	0
Excellent	75%-100%	100%

The amount of injected tumescent solution and the aspirated volume of adipocytes varied according to the region and particular need of the case (Table 2), always observing the limit of 35 mg/kg. The abdomen and inner thigh received the greatest injected amounts (averages of 2.956 ml and 2.722 ml, respectively).

The patients' evaluation revealed an excellent degree of satisfaction (improvement of 75 to 100%) (Table 3).

SAFETY

The potential serious complications involved in this procedure (pulmonary or fat embolism, necrotizing fasciitis, sepsis, deep vein thrombosis, hyperhydration or lidocaine intoxication) as well as hospitalization, lawsuits or death, did not happen in our study. In none of the cases the amount of blood loss justified IV fluid replacement.

The guidelines on the maximum amount of fat removed (5-7% of the patient's weight, in liters of fat) were always observed, with a preference for performing additional surgeries should a greater amount of adipocytes need to be removed (beyond the safety limit). In the cases where a greater amount of fat was removed, drains were placed in the incision to facilitate the drainage of fluids, which were eliminated in a maximum of 72 hours after the procedure.

The following complications were observed in 1.8% of patients (Table 4): persistent hyperchromia in the scars (more than six months), infection in the wall with suppuration (in two patients who neglected the antibiotic therapy), allergy to the adhesive plaster of the bandage, seroma, persistent edema (more than three months), ecchymoses, hypertrophic scar and prolonged pain. There was a need for analgesia (dipyrone or paracetamol) after 21 days in only seven patients (1.2%). Hypertrophic scars were excised and sutured after six months; hyperchromias were treated with a combination of tretinoin, hydroquinone and topical corticosteroids; and the seromas were drained. Infections were treated with cephalexin (500 mg, 6 times a day for seven days; cases of persistent edema were treated with asiaticoside 40 mg/day in the morning and 400 mg/day of vitamin C and E, in addition to lymphatic drainage three times a week for three months. Ecchymoses were treated with topical heparinoid 72 hours after the procedure, 3 times a day.

Touch-ups due to imperfections were necessary in 26 patients (precisely the first cases). The orthostatic technique was used in these cases, with the patient being examined intraoperatively in several positions (including the standing position, to help visualize imperfections and their immediate correction).

DISCUSSION

This study documented and analyzed data from 568 patients who sought the authors' private practice during the study period for treatment of localized fat by liposuction using only LTA. Due to reports of liposuction resulting in fatal complications, which imply misleading conclusions about the safety of the procedure, such analysis was deemed important.

The development of the liposuction technique in the 1970s was marked by several complications and disastrous cosmetic results. The development of the tumescent technique with microcannulas by the dermatologist Jeffrey Klein was the watershed moment that marked the end of fatal complications and the improvement of the final cosmetic result.

Table 4. Complications in liposuction assisted by local tumescent anesthesia

Complications observed: 1.8% of the total
Persistent hyperchromia in the scars (more than 6 months)
Infection of the wall with suppuration
Allergy to the adhesive plaster
Seroma
Persistent edema (more than 3 months)
Hypertrophic scar
Ecchymoses
Lasting pain

There were no reports of serious infectious complications in this study, which can be explained by the use of azithromycin the night before the procedure and two days afterwards, and by the characteristics of the anesthesia. It is possible that both the lidocaine and the bicarbonate present in the solution had a bactericidal effect; additionally, the surgical incisions were left open so that spontaneous drainage could occur under compression to create an anterograde flow of fluids, avoiding retrograde contamination.[29-31] Furthermore, the cannulas were blunt and sterilized, with limited access to the subcutaneous layer of skin, and did not penetrate the fascia. This characteristic, combined with the disinfected surgical environment, can also help explain the low infection rates.

One of the great risks in the use of LTA in liposuction is the lidocaine intoxication This risk is eliminated, however, if the dose recommended by Klein is observed (35 mg/kg of patient weight). Currently some studies assert that a 55 mg/kg dose is safe and effective.[32] The present study, nevertheless, maintained the dose initially described as safe and had no complications associated with intoxication. It is important to note that a good pre-operative patient history, which identifies the use of substances that could increase the bioavailability of lidocaine, is essential. It is also important to highlight that the use of adrenaline in the anesthetic solution, in addition to the lipophilic characteristics of the substance, slows the systemic absorption of lidocaine,[2] which contributes to the safety of the procedure. In the present study there were no cases of intoxication for the anesthetic.

A recent publication[33] described 72 cases of important complications that occurred after liposuction procedures. Of these cases, four (of 17 cases in which tumescent anesthesia was used) resulted in death. Nevertheless, there are no descriptions of techniques, preventing the assessment of whether the correct protocol was used. Therefore it is not possible to determine whether the liposuction technique exclusively used LTA or whether the appropriate protocols were followed. All other cases of fatal complications described in the studied literature make reference to cases in which the general or peridural anesthesia was combined with LTA.

The risk of perforation is largely decreased with the exclusive use of LTA under conscious sedation, and is not described in the cases observed, in which the appropriate protocols were followed. An explanation for that is the space created by the anesthetic infiltration in the subcutaneous layer, distancing the cannula from the deep structures. In addition, a conscious patient reacts immediately to a cannula that touches the muscular structure, unlike a patient under general anesthesia. It is important to note that cases of abdominal hernia constitute a contraindication to the procedure, and are excluded in the preoperative period through ultrasonography. .

In the study of 1,107 liposuction procedures using only LTA according to the appropriate protocols, no serious complications occurred. These findings are compatible with the literature reviewed. In the present analysis, the liposuction technique described has proved advantageous, with a low risk of problems for the patients.

CONCLUSIONS

As there were no deaths, hospitalizations, serious processes or complications in the 1,107 described cases in which LTA was used observing the international dermatologic protocols, the procedure can considered safe.

In the literature reviewed, in the cases in which serious and even fatal complications were described, either another type of anesthesia was used or LTA was described without providing details about the protocol that was followed.

In order to prevent complications during liposuction surgery assisted by LTA, it is important that the international protocols and consensus developed by dermatologist physicians are strictly observed. Other protocols that associate combined anesthesias must be refuted. ●

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Cellium® GC: evaluation of a new natural active ingredient in 210 mg/ml topical solution, through scalp biopsy

Avaliação por biópsias de couro cabeludo da atividade de novo ingrediente ativo natural, o "Cellium® GC", formulado em solução tópica de 210mg/mL

Original Article

Authors:
Luís Carlos Cucé[1]
Consuelo J. Rodrigues[2]
Régia Celli R. Patriota[3]

[1] Professor Emeritus at the Faculdade de Medicina da Universidade de São Paulo (USP), São Paulo, Brazil
[2] Associate Professor at the Faculdade de Medicina da Universidade de São Paulo (USP), São Paulo, Brazil
[3] Assistant physician at the Hospital das Clínicas da Universidade de São Paulo (USP), São Paulo, Brazil

Correspondence:
Dr. Luis Carlos Cucé
Av. Rebouças, 3963, Pinheiros
05401-450 – São Paulo, SP, Brazil
Email: atendimento@vitalmax.com.br

ABSTRACT

Introduction: Androgenic alopecia is a progressive alteration of the scalp with few treatment options, which motivates the search for new local or systemic medications to control this pathology.

Objective: To evaluate patient tolerance for and identify the action mechanism of the Cellium® GC compound in the treatment of androgenic alopecia.

Methods: Male patients (n = 20) with androgenic alopecia participated in this open prospective study. The compound was used on the scalp twice a day, at home, for 12 consecutive weeks. Biopsies were carried out before and after treatment to evaluate the alterations in the cutaneous immune response, cellular proliferation and anti-apoptosis activity. Questionnaires were administered to evaluate efficacy and patient satisfaction.

Results: Nineteen patients completed the study, with an average satisfaction of 8.3 out of 10. Immunohistochemical analyses of scalp biopsies showed a significant increase in the cutaneous immune response after treatment: 73.9% increase in CD1A+ Langerhans cells (p = 0.003, t paired test), 41.7% increase in the cellular proliferation marker Ki-67+ (p = 0.012), and an 89% increase in BCL-2+ anti apoptotic proteins (p = 001). The product was also found to be tolerable and safe. Conclusions: Cellium® GC improved the skin's immune defense and the proliferation of keratinocytes, and produced high levels of patient satisfaction in the treatment of androgenic alopecia.

Keywords: alopecia; biopsy; keracinocytes; minoxidil.

RESUMO

Introdução: *A alopecia androgênica é alteração progressiva do couro cabeludo com poucas opções terapêuticas. Justifica-se, portanto, a pesquisa de novas drogas de uso local ou sistêmico direcionadas ao controle desta patologia. Objetivo: Avaliar a tolerância e identificar o mecanismo de ação do composto Cellium® GC no tratamento da alopecia androgênica.*

Métodos: *Estudo prospectivo e aberto em 20 portadores de alopecia androgênica. O produto foi utilizado no couro cabeludo duas vezes ao dia em regime domiciliar por 12 semanas consecutivas. Foram realizadas biópsias antes e depois do tratamento para avaliar as alterações da resposta imune cutânea, da proliferação celular e da atividade antiapoptose. A avaliação da efetividade e do grau de satisfação dos pacientes foi realizada por meio de questionários.*

Resultados: *Dezenove voluntários do sexo masculino completaram o estudo, com grau médio de satisfação de 8,3/10. Análises imuno-histoquímicas das biópsias de couro cabeludo revelaram aumento significativo da resposta imune cutânea depois do tratamento: 73,9% de aumento de células de Langerhans CD1A+ (p = 0,003, teste t pareado), 41,66% de aumento de Ki-67+, marcador de proliferação celular (p = 0,012), 89% de aumento de proteínas antiapoptóticas BCL-2+ (p = 0,001). O produto também foi bem tolerado e seguro.*

Conclusões: *Cellium® GC melhora as defesas imunológicas da pele e a proliferação dos queratinócitos, e confere satisfação aos voluntários no tratamento da alopecia androgênica.*

Palavras-chave: *alopecia; biópsia;queratinócitos; minoxidil.*

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This study was carried out at the Dermatology Outpatient Department of the Hospital das Clínicas da Universidade de São Paulo, São Paulo, Brazil.

Conflicts of interests: The authors wish to thank Legacy Healthcare (Epalinges, Switzerland) for providing the topical solution (Cellium® GC) used in this study.

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INTRODUCTION

Androgenetic alopecia (AGA) is biologically natural process that, under normal circumstances, has no negative impact on the clinical state of humans; however, it has a negative impact on quality of life. It affects more than 50% of men aged 50 as well as a significant proportion of women.[1] The development of AGA is dependent on the interaction of genetic and hormonal factors, with a multifactorial etiology having been advanced.[2]

Two drugs are indicated for the treatment of the condition, based on scientific evidence: minoxidil and finasteride. Nevertheless, the search for new substances with a similar purpose is ongoing.[3]

A new, biologically active substance (Cellium® GC; Legacy Healthcare, Epalinges, Switzerland), the combination of active principles extracted from plants, has been developed into a solution for topical use for the treatment of excessive hair loss. In the concentration of 210 mg/ml, Cellium® GC has been shown to be effective in preventing hair loss and promoting hair growth. A preliminary clinical study showed that Cellium® GC in a concentration of 210 mg/ml significantly increases the number of hairs in the anagen phase and significantly reduces the number of hairs in the telogen phase, leading to normalisation of the anagen/telogen ratio 6 weeks post-treatment.[4] In addition, a different study involving male patients who presented with AGA showed that topical application of Cellium® GC to the scalp is well tolerated and accompanied by a high degree of satisfaction with regard to its efficacy.[5]

Bearing this in mind, it is important to understand the action mechanisms of this new active agent. When tested in vitro using endothelial cells, Cellium® GC showed the ability to stimulate angiogenic response6, while an in vivo study showed a significant increase in the concentration of perifollicular collagen.[5] Nevertheless, it is proving difficult to link the results of the two studies to the efficacy of the active substance with regard to either hair growth or hair loss. Therefore, further testing, aimed at identifying any additional action mechanisms responsible for the efficacy y of Cellium® GC at a concentration of 210 mg/ml in patients affected by AGA, is warranted.

Action mechanisms which were investigated further include the topical effect of the substance on cutaneous immunological defenses, keratinocyte proliferation and anti-apoptotic activity.

Study design

Participants of this open, monocentric, prospective 12-week study were their own witnesses.

Study population

Twenty volunteers presenting with clinically diagnosed AGA were recruited by the Dermatology Ambulatory of the Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo, São Paulo, Brazil from 14 January to 20 June 2008. The study was carried out in accordance with the Declaration of Helsinki, while laboratory analyses complied with the principles set out by the Best Laboratory Practice guidelines as defined by the Instituto Nacional de Metrologia, Normalização e Qualidade Industrial (Inmetro; National Institute of Metrology, Standardization and Industrial Quality, Brazil).

Participants had to meet the following inclusion criteria: men, aged 20–40 years, Fitzpatrick skin phototypes II and III, presenting with AGA, classified as type I–VII according to the modified Norwood–Hamilton scale, absence of treatment with minoxidil or finasteride for at least 5 months prior to recruitment, and absence of modifications in habits and hair styling during the study period. The exclusion criteria were: women, treatment with minoxidil or finasteride in the 5-month period preceding recruitment, iatrogenic or traumatic alopecia, concomitant use of other scalp treatments, seborrheic dermatitis, psoriasis, or any scalp dermatitis.

METHODS

The study was approved by the ethics committee of the patient care service and all volunteers signed an informed consent form. Participants had to attend two clinical examinations for data collection and scalp biopsies [the first time before the start of treatment (W0 phase) and the second 12 weeks after treatment (W12 phase) with Cellium® GC 210 mg/ml (Legacy Healthcare, Epalinges, Switzerland)]. Additionally, questionnaires completed by the investigator, based on answers given by both the volunteers and their families, were collected (in the W12 phase).

Side effects and cosmetic tolerance were evaluated by the investigator using a scale of 1–3 for intensity and 1–8 for the dermatological examination.

Biopsies from the vertex scalp were obtained out using a 4 mm punch. The samples were fixed in phosphate-buffered formalin (pH 7.2) at room temperature for 24 h, and were later embedded in paraffin wax. The paraffin slides were hematoxylin and eosin stained for histological examination.

Sections of 3μ were prepared from the paraffin-fixed samples and the longitudinal biopsy slides were processed using the avidin-biotin-peroxidase (ABC) immunohistochemistry technique.7 Following deparaffinization, the slides were hydrated and incubated in 0.3% H_2O_2 in methanol for 20 minutes to reduce endogenous peroxidase activity. The slides were then incubated at 4 °C overnight with primary antibodies (Dako Denmark A/S, Glostrup, Denmark) diluted in tris-buffered saline solution (TBS) containing 0.5% bovine serum albumin. The primary antibodies used in the study were: cluster of differentiation 1a (CD1A) in Langerhans cells; antigen identified by monoclonal antibody Ki-67 (a cellular proliferation marker), heat shock protein 47 (HSP47), B-cell lymphoma 2 (BCL2) (an apoptosis regulator protein). The slides were then washed twice in TBS and then incubated with goat-anti-mouse/goat-anti-rabbit biotinylated antibodies [Dako Duet streptABComplex/HRP kit (code number: K 0492), Dako Denmark A/S, Glostrup, Denmark]. After incubation for 1 h at 37 °C with the second antibody, the slides were incubated using

the VECTASTAIN ABC kit (Vector Laboratories, Burlingame, CA, USA) at room temperature for 30 minutes, then developed with diaminobenzidine (Sigma-Aldrich, Barcelona, Spain) and embedded in Entellan® (catalogue number: 107961; Merck KGaA, Darmstadt, Germany). The slides were then counterstained with Mayer's hematoxylin for 2 minutes. All histological slides were processed simultaneously for each marker. The negative controls were slides without primary antibody. The positive controls were slides of other tissues showing positive reactions to each specific antibody.

Microscopic analysis was carried out using a CCD Sony camera linked to a Zeiss Axioplan optical microscope. Images were processed using the Kontron 300 image analyzer (Zeiss, Feldbach, Switzerland). Ten different fields were randomly selected and the dermal area was determined through the analysis of images (200x magnification). The immunohistochemical reaction threshold level was set for each slide after the contrast had been enhanced so that the cells could be easily identified. The area occupied by the cells was determined by means of digital densitometric recognition, by adjusting the measurement threshold level up to the gray density.

TREATMENT

The investigator supplied each volunteer with a specific treatment in its commercial version (without randomization or coded label). The treatment set included two 110 ml clear glass vials supplied with a pumping system and containing a brownish solution. Specifically, the solution contained 210 mg/ml of Cellium® GC, a combination of active principles extracted from four plants (Allium cepa, Citrus medica limonum, Paullinia cupana and Theobroma cacao). The treatment began after the S0 phase, with volunteers applying approximately 1 ml of the topical solution on either dry or wet scalp twice a day (total daily dose: 2 ml), at 12-h intervals over a period of 12 weeks. Previous clinical trials4 showed that the effective target-dose is 1 ml, applied twice a day. Patient adhesion to treatment was assessed by analysing product consumption for each patient.

STATISTICAL ANALYSIS

Statistical analyses were carried out using the paired t-test, unidirectional variance analysis, the Kruskal–Wallis, Tukey's, and Dunnett's tests, using the SigmaStat software (Jandel Corporation, California, USA) for the immunohistochemical analyses. The data were deemed significant when $p < 0.05$.

RESULTS

Twenty participants of an average age of 32.5 years (range: 23–40 years) were recruited to take part in the study. Five participants refused to undergo scalp biopsy in the W12 phase, while one participant did not answer the questionnaire about efficacy. All of the participants applied the topical solution twice daily according to the protocol. Average daily consumption of Cellium® GC (Legacy Healthcare, Epalinges, Switzerland) was 1.45 g (range: 0.87–1.95 g).

Questionnaire assessment (n = 19) indicated good efficacy with regard to hair growth, as described by both volunteers and their families. Volunteers' satisfaction with the product reached an average of 8.3/10. Evaluation by the volunteers showed good effectiveness and cosmetic acceptance given that 90% of participants observed new hair growth, 63–73% observed faster hair growth, 84% observed more hair, 68% experienced a pleasant sensation following application, and 65% classified the product as good or very good.

With regard to product safety, dermatological examinations of the scalp in the W0 and W12 phases did not reveal adverse reactions to the product.

Scalp biopsies showed the epidermis as being of normal thickness and also revealed inflammatory infiltrate of mononuclear cells around vessels and annexes (n = 15), while elastosis was observed in the dermis. The histomorphometric analyses of the slides, carried out once the slides had been processed with the biomarkers outlined previously (namely antibodies for the detection of CD1A protein in Langerhans cells, monoclonal antibody Ki-67, HSP47 and BCL2), will be detailed next. The data shown include an increase of statistically significant percentages as well as microphotographs of the slides.

Histomorphometric analyses

The histomorphometric analysis of CD1A+ Langerhans cells was carried out by determining the fraction of CD1A+ Langerhans cells in the epidermis. There was a statistically significant increase of 73.9% in the fraction of CD1A+ Langerhans cells in the epidermis after treatment with 210 mg/ml Cellium® GC topical solution ($p = 0.003$, paired t-test) (Table 1 and Figure 1). The result was confirmed by the Kruskal–Wallis test ($p = 0.003$).

The analysis of Ki-67+ cells was carried out by determining the fraction of Ki-67+ cells in the epidermis. There was a statistically significant increase of 41.7% in the fraction of Ki-67+ cells in the epidermis after treatment with 210 mg/ml Cellium® GC topical solution ($p = 0.012$, paired t-test) (Table 2 and Figure 2). That result was confirmed by the ANOVA ($p = 0.003$) and Tukey's ($p < 0.05$) tests.

The analysis of HSP47+ cells was carried out by determining the fraction of HSP47+ cells in the dermis. No statistical differences were observed in the fraction of HSP47+ cells in the dermis before and after treatment with 210 mg/ml Cellium®

Table 1: Fraction of epidermal CD1A+ Langerhans cells before and after treatment in 15 participants

Parameter	Average (%)	SDDP
Fraction of CD1A+ Langerhans cells before treatment	7,3	2,23
Fraction of CD1A+ Langerhans cells after treatment	12,7	5,55

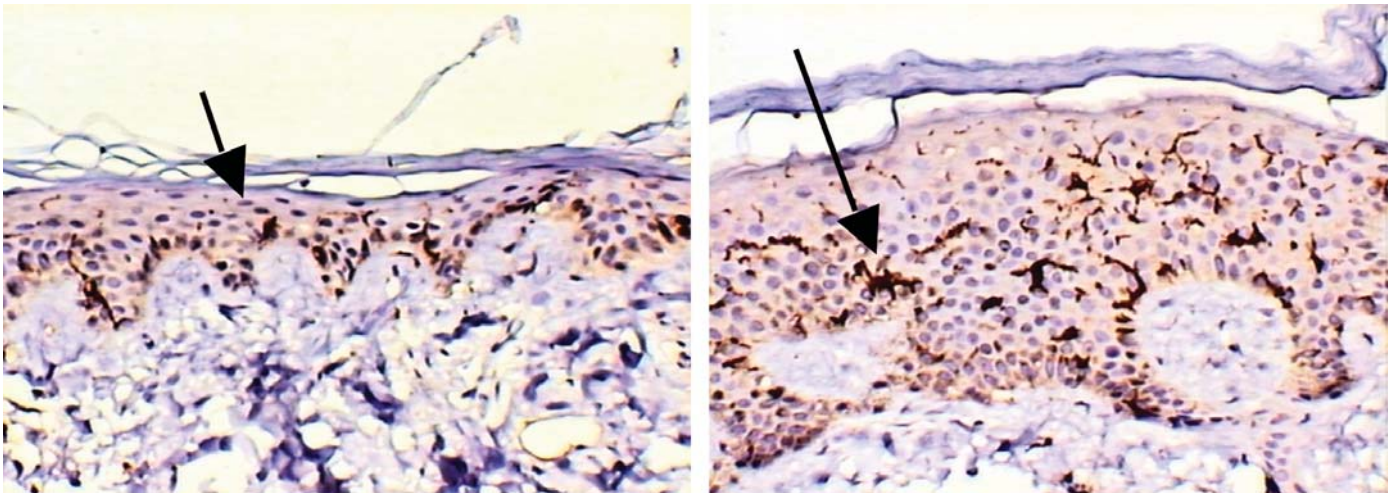

Figure 1: Fraction of epidermal CD1A+ Langerhans cells (arrows) in patient No. 9 before and after treatment

Table 2: Fraction of epidermal Ki-67+ cells before and after the treatment in 15 participants

Parameter	Average (%)	SD
Fraction of Ki-67+ cells before treatment	12	4,17
Fração de células Ki-67+ pós-tratamento	17,8	5,69

GC topical solution (p = 0.938, paired t-test) (Table 3 and Figure 3). The result was confirmed by the ANOVA test (p = 0.942).

The analysis of BCL2+ cells was carried out by determining the fraction of BCL2+ cells in the epidermis. There was a statistically significant increase of 89% in the fraction of BCL2+ cells in the epidermis before and after treatment with 210 mg/ml Cellium® GC topical solution (p = 0.001, paired t-test) (Table 4 and Figure 4). The result was confirmed by the Kruskal–Wallis test (p = 0.006) and by the Dunnett's test (p < 0.05).

DISCUSSION

Application of the 210 mg/ml Cellium® GC (Legacy Healthcare, Epalinges, Switzerland) topical solution twice daily for a duration of 12 weeks was not followed by an increase in the response of thermal shock proteins or in the collagen-specific molecular chaperone HSP47. The latter is expressed in inflammatory cells. Only a few inflammatory cells were observed in the dermis during the study, which supports the findings of Keagle et al.[8] who also observed this. This agrees with the response of the inflammatory cells observed during the course of the study, with HSP47+ cells showing diffused location in the dermis, mainly around the vessels. The study's results also show that a 12-week application of Cellium® GC 210

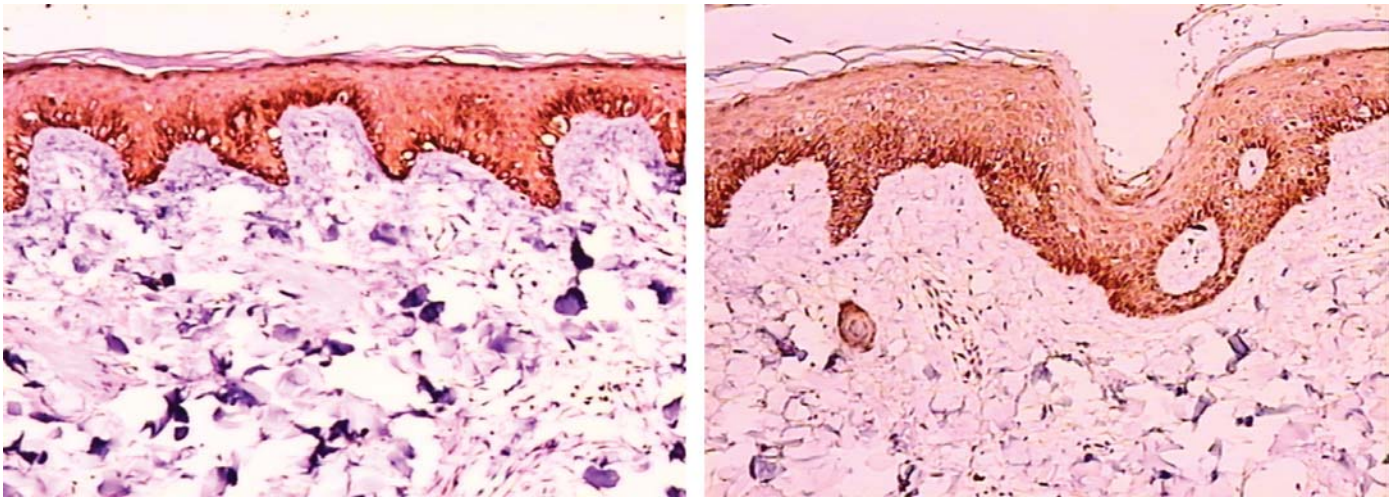

Figure 2: Fraction of epidermal Ki-67+ cells in patient No. 19 (brown) before and after treatment

Table 3: Fraction of dermal HSP47+ cells before and after treatment in 15 participants

Parameter	Average (%)	SD
Fraction of HSP47+ cells before treatment	6.6	1.77
Fraction of HSP47+ cells after treatment	6.7	2.08

Table 4: Fraction of epidermal BCL2+ cells before and after treatment in 15 participants

Parameter	Average (%)	SD
Fraction of BCL2+ cells before treatment	1.722	0.786
Fraction of BCL2+ cells after treatment	3.235	1.624

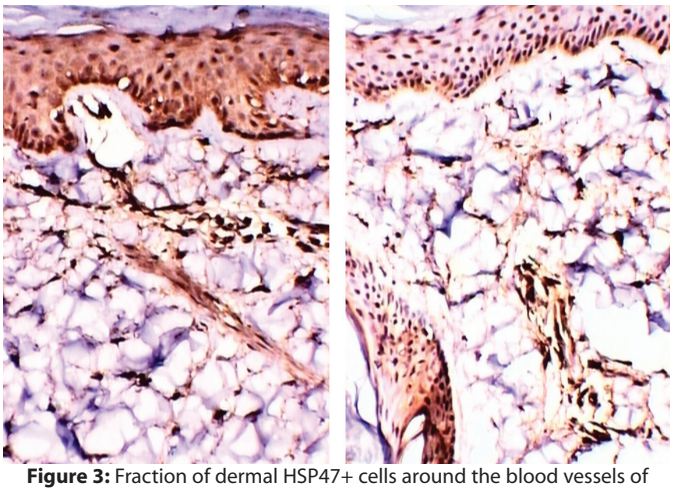

Figure 3: Fraction of dermal HSP47+ cells around the blood vessels of patient No. 16 before and after treatment

mg/ml was followed by an increase in Langerhans cells which play a central role in the skin's immune defense system. Furthermore, an increase in the fraction of Ki-67+ cells (the Ki-67 proliferative index) was observed. Ki-67+ cells in the normal human epidermis are localised mainly in the suprabasal cells layers. In the present study, Ki-67+ cells were either dispersed through all the suprabasal cell layers or agglomerated in specific areas, as also observed by Tilli et al.[9]

BCL2 is a cytoplasmic protein which plays a key role in apoptosis regulation. BCL2 promotes cell survival by inhibiting the mediators needed for the activation of proteases (caspases).10 BCL2 is an essential survival mechanism in normal melanocytes, in correlation with its derivation from the neural crest.11 In several cell types (including melanocytes), the regulation of cell survival and cell death may involve a dynamic interaction between proteins such as BCL2-associated X (BAX) protein, which accelerate programmed cell death, and apoptosis repressors such as BCL2).[12] Overexpression of BCL2 results in cell cycle arrest in the G1 phase of the cell cycle or in a delay in the G1/S transition.[13] In the present study, a significant increase in the expression of BCL2 in the epidermis was observed, probably involving the activity of melanocytes. This finding can be extended to the cells of hair follicles, so that an increase in cellular proliferation, coupled with anti-apoptotic activity, can promote hair growth. In normal skin, however, the proliferation marker Ki-67+ significantly associates with the pro-apoptotic marker protein 53 (p53). Nevertheless, in skins exposed to high UV radiation, Ki-67+ associates with the anti-apoptotic marker BCL2. The imbalance in proliferative/apoptotic signaling can lead to a dysfunctional epidermis which is

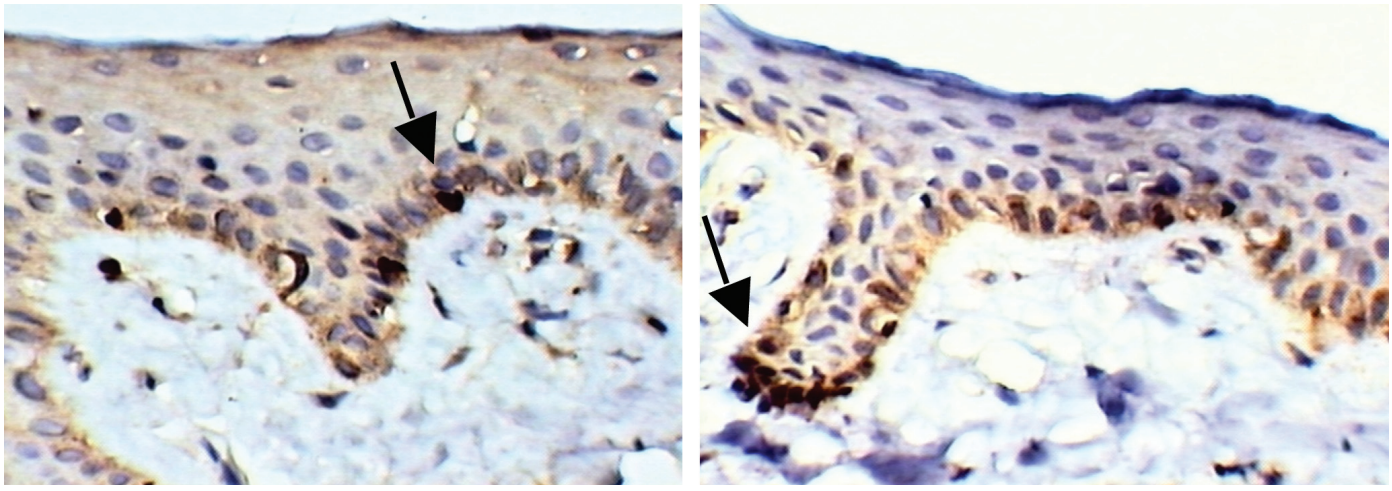

Figure 4: Fraction of epidermal BCL2+ cells (arrow) in patient No. 5 before and after treatment

permissive to aberrant proliferation. In response to genotoxic agents, wild-type p53 accumulates and induces apoptosis. It is then suggested that expression of the pro-apoptotic marker p53 should be investigated when treatment with Cellium® GC 210 mg/ml is applied.

CONCLUSIONS

In light of the results obtained in the present study, the application of the Cellium® GC 210 mg/ml topical solution on the scalp twice daily for 12 consecutive weeks, as carried out by 19 male volunteers presenting with AGA (classified as type I–VII according to the modified Norwood–Hamilton scale), was shown to provide participants with satisfaction regarding hair growth (average satisfaction = 8.3/10). In addition to subjective evaluation, the immunohistopathological analyses of scalp skin biopsies revealed an increase in the skin's immunological defenses, and in the proliferation and anti-apoptotic action of keratinocytes in the dermis and epidermis. Thorough analysis of both clinical and subjective evaluation should ensure that the combination of active ingredients extracted from plants and made available in solution form, are well tolerated, safe and effective. Therefore, a topical solution containing Cellium® GC 210 mg/ml is seen as a viable option in the treatment of AGA.

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Classification of periorbital wrinkles and treatment with Botulinum Toxin Type A

Classificação das rugas periorbitárias e tratamento com a toxina botulínica tipo A

Original Article

ABSTRACT

Introduction: Periorbital wrinkles are an important component of facial aging that can be minimized with botulinum toxin treatment.
Objective: To treat periorbital wrinkles through botulinum toxin injections in the orbicularis muscle, using classic lateral points and additional points in the lower eyelid, which were developed based on the classification of these wrinkles.
Methods: Clinical and photographic data from 530 patients who had periorbital wrinkles classified and treated between 2002 and 2007 were analyzed.
Results: Thirty percent of patients over 45, and 80% of those under 45, demonstrated complete improvement of the wrinkles after treatment in the classic points. The remaining patients needed treatment in the additional points in the lower eyelids.
Conclusion: The classification of wrinkles helped improve treatment. Despite the considerable benefit offered by injecting in the classic points, the necessity of treating additional points in the lower eyelids with botulinum toxin was verified. The presence of subcutaneous cellular tissue and the patient's age should also be taken into consideration.

Keywords: aging; eyelids; classification.

RESUMO

Introdução: *As rugas peri orbitárias constituem importante componente do envelhecimento facial e podem ser minimizadas através do tratamento com toxina botulínica.*
Objetivo: *Tratamento de rugas periorbitárias através de injeções de toxina botulínica do músculo periorbicular, abrangendo os pontos laterais clássicos e outros adicionais na pálpebra inferior, desenvolvidos a partir da classificação destas rugas.*
Métodos: *Foram revisados dados clínicos e fotográficos de 530 pacientes, no período de 2001 a 2007, que tiveram suas rugas periorbitárias classificadas e tratadas com toxina botulínica.*
Resultados: *30% dos pacientes com idade superior a 45 anos e 80% daqueles com idade inferior a 45 anos apresentaram melhora total das rugas após tratamento nos pontos clássicos. Os demais necessitaram tratamento nos pontos adicionais da pálpebra inferior.*
Conclusão: *A classificação das rugas facilitou o encaminhamento ao melhor tratamento. Apesar do grande benefício trazido pelos pontos clássicos, verificamos a necessidade do tratamento com toxina botulínica nos pontos adicionais. Devem ser também levadas em consideração a presença de tecido celular subcutâneo e a idade do paciente.*

Palavras-chaves: *envelhecimento; pálpebras; classificação.*

Authors:
Bhertha M. Tamura[1]
Marina Y. Odo[2]

[1] Faculdade de Medicina da Universidade de São Paulo, São Paulo, Brazil
[2] Dermatology Department, Universidade de Santo Amaro, São Paulo, Brazil

Correspondence:
Dr Bhertha Miyuki Tamura
Rua Ituxi, 58/603 - Saúde
04055-020 - São Paulo - Brazil
Email: bhertha.tamura@uol.com

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INTRODUCTION

Dynamic wrinkles, which result from the muscular activity linked to facial mimicry, are an important component of facial aging, along with photoaging, cutaneous sagging and volume alterations caused by osseous and subcutaneous tissue reabsorption.[1,2]

The systems and scales classifying and standardizing facial wrinkles have been useful not only in assisting in the choice for the best individualized treatment, but also in comparing results among different treatments that are also used in the preparation of scientific investigation protocols.[3]

With regard to dynamic wrinkles, several studies have been published suggesting classification systems for the glabellar,[4] nasal,[5] and frontal[6] regions.

Dynamic palpebral wrinkles are a frequent complaint from patients. They are mainly caused by the hyperactivity of the orbicularis oculi muscle of the eyelid, whose contraction can be effectively prevented by using botulinum toxin type A (BoNTA), a neurotoxin produced by the Clostridium botulinum bacterium which blocks the release of acetylcholine in the neuro-muscular junction.[7]

The classic application points for treating periorbital wrinkles using (BoNTA) are well known. (BoNTA) administration using the classic application points mainly acts on the orbicularis oculi muscle, lateral to the external canthus. According to Carruthers and other authors,[8,9] three classic points are utilised for the application of BT in this region. Such points are distributed between the brow and the zygomatic arch, the distance between each being 0.5–1 cm. They are located between 1 and 2 cm from the bone border, forming a semi-circle.

Notwithstanding, the orbicularis oculi eye muscle is circular and the majority of its insertion points are located in the soft tissues, which allow it to work as the sphincter muscle of the eyelids. Therefore, unlike other muscles which have osseous insertion points that can be fully relaxed with only one application point, the orbicularis oculi muscle will not be fully relaxed if only one of its insertion points is blocked. As a result, additional application points of BT into this muscle – in addition to those in the lateral region – have been developed over the last few years.

Based on some of the common features of palpebral wrinkles and with the objective of obtaining better aesthetic results from the application of BT, the authors devised a treatment for the orbicularis oculi muscle, based on a classification system for periorbital wrinkles, which includes the classic lateral points together with additional ones located in the lower eyelid.

METHODS

A prospective, longitudinal, analytical study was carried out. The effects of BoNTA on the wrinkles of the periorbital region were assessed by means of clinical examination and photographic documentation in 530 patients treated at the authors' private practices from 2001 to 2007. The study was carried out in accordance with the ethical principles set out in the Declaration of Helsinki 2000.

A detailed understanding of the regional anatomy, particularly of the orbicularis oculi muscle, was instrumental for the study's objective. This anatomical structure is located immediately below the epidermis, in an area where subcutaneous tissue is either scarce or absent. It has the shape of an elliptical muscular sheet subdivided into three parts: (a) the pars orbitalis arises in the frontal process of the maxilla and in the nasal process of the frontal bone, and surrounds the opening of the orbit and inserts close to the origin. It covers the orbital margin and connects to several fibers of the frontalis muscle; (b) the pars palpebralis begins in the medial palpebral ligament, passes through each eyelid and inserts into the lateral palpebral raphé; (c) the pars lacrimalis (or Horner's muscle) arises in the posterior lachrymal crest, in the pre-septal medial portion, passing behind the medial palpebral ligament and crossing the lachrymal sac to join the palpebral portions (Figure 1). Other authors subdivide this muscle into two parts: palpebral and orbital.[10]

The zygomaticus major and minor muscles are also important since they can be involved in the interesting muscular complex of the periocular region. They arise in the malar bone (the zygomaticus major laterally and the zygomaticus minor medially,) and insert into the orbicular muscle of the mouth (the orbicularis oris muscle).[11] If incorrectly relaxed by an injection of BT in the palpebral region, these muscles can cause undesirable asymmetries in the perioral region. Therefore, both muscles must identified correctly.

Based on observations of the anatomical details and muscle dynamics in these patients, and considering the specific characteristics of individual patients, the authors developed the following classification system for the wrinkles of the periorbital region (Figure 2):

- Type I – Wrinkles lateral to the external canthus of the eye, extending from the brow to the zygomatic arch
- Type II – Wrinkles lateral to the external canthus of the eye, extending from the line of the external canthus of the eye to the zygomatic arch (absence of wrinkles in the superior lateral region)
- Type III – Presence of wrinkles in the line of the external canthus only

These three types of wrinkle can occur together with:

- A – Absence of lower eyelid wrinkles
- B – Presence of lower eyelid wrinkles, according to the following sub-classification:
  - B1 – Lateral wrinkles
  - B2 – Medial wrinkles
  - B3 – Wrinkles in the internal canthus

Patients included in the study were observed and classified according to this system and possible combinations thereof. Patients were asked to move their facial mimicry by forcing a smile, to allow the identification of the exact position of the orbicularis oculi muscle. Additionally, the lateral border of the orbicular bone was palpated. After classification of the wrinkles

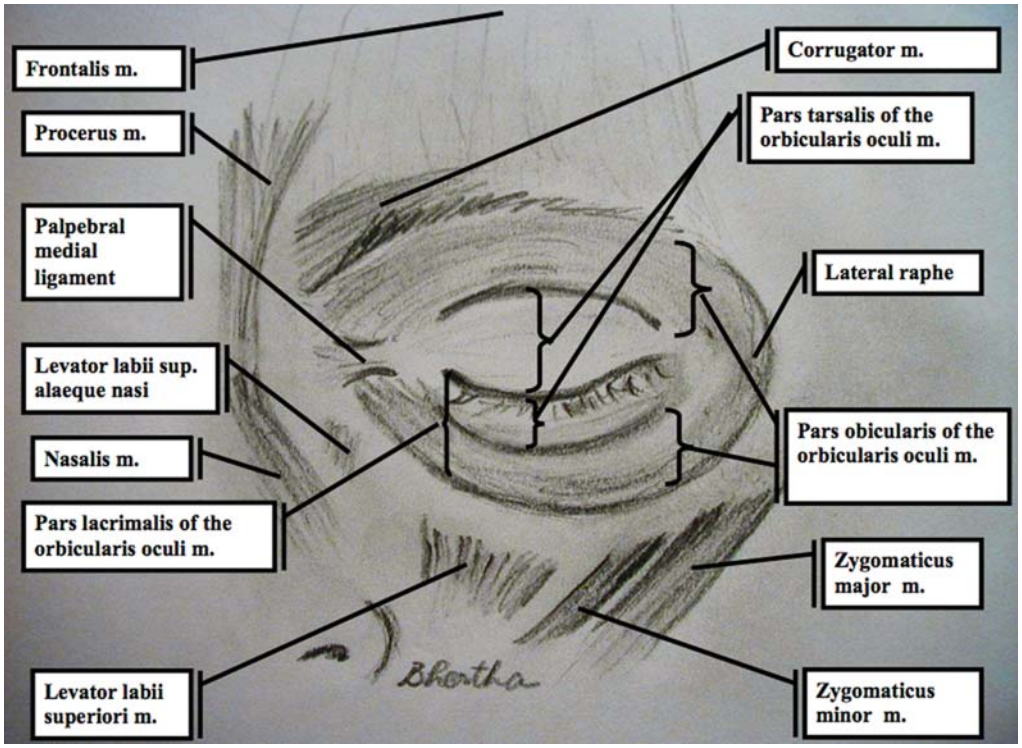


Figure 1: Superficial anatomy of the periorbital region.

was carried out, standardized photographs were taken of all patients, both when the orbicularis oculi muscle was at rest and when it was contracting. One hundred units of BoNTA (Botox®; Allergan, Inc., Irvine, CA, USA) were diluted in 2 ml of saline solution and 30G × 1/2" needles were used to inject the toxin.

The initial application was made in three points for Type I patients, in two points for Type II patients and in a single point for Type III patients, with 2–3 units of BoNTA being injected into each point.

When a fourth point, below the three classic points, was needed to achieve the desired effect, the exact insertion point of the zygomatic muscles was measured and BoNTA was applied superficially (2 mm deep) to avoid asymmetries in the perioral region.

At the second follow-up visit, 1 month after initial application, when wrinkles in the lower eyelid were identified, doses of 0.5–1.0 unit of BT were applied in additional points, according to the location of the wrinkles (Figure 3):

- Type B1: This was observed in the lateral region of the lower eyelid and, after palpation of the orbicularis oculi muscle on the zygomatic arch, was treated with an intradermal injection of BoNTA into the point located 1 cm medially and inferiorly in relation to the most caudal point of Types I or II.
- Type B2: This was observed in the medial region of the lower eyelid and treated with an intradermal injection into the point located between the ciliary border and the orbital border, in the mid-pupillary line.
- Type B3: This was observed in the medial and inferior region in relation to the internal canthus of the eye, becoming

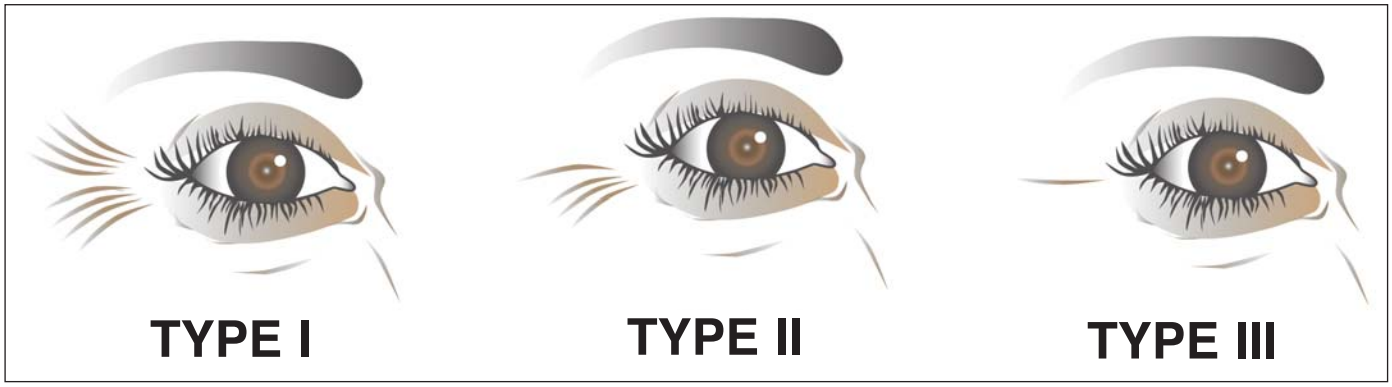


Figure 2: Primary classification of the wrinkles located in the periorbital area.

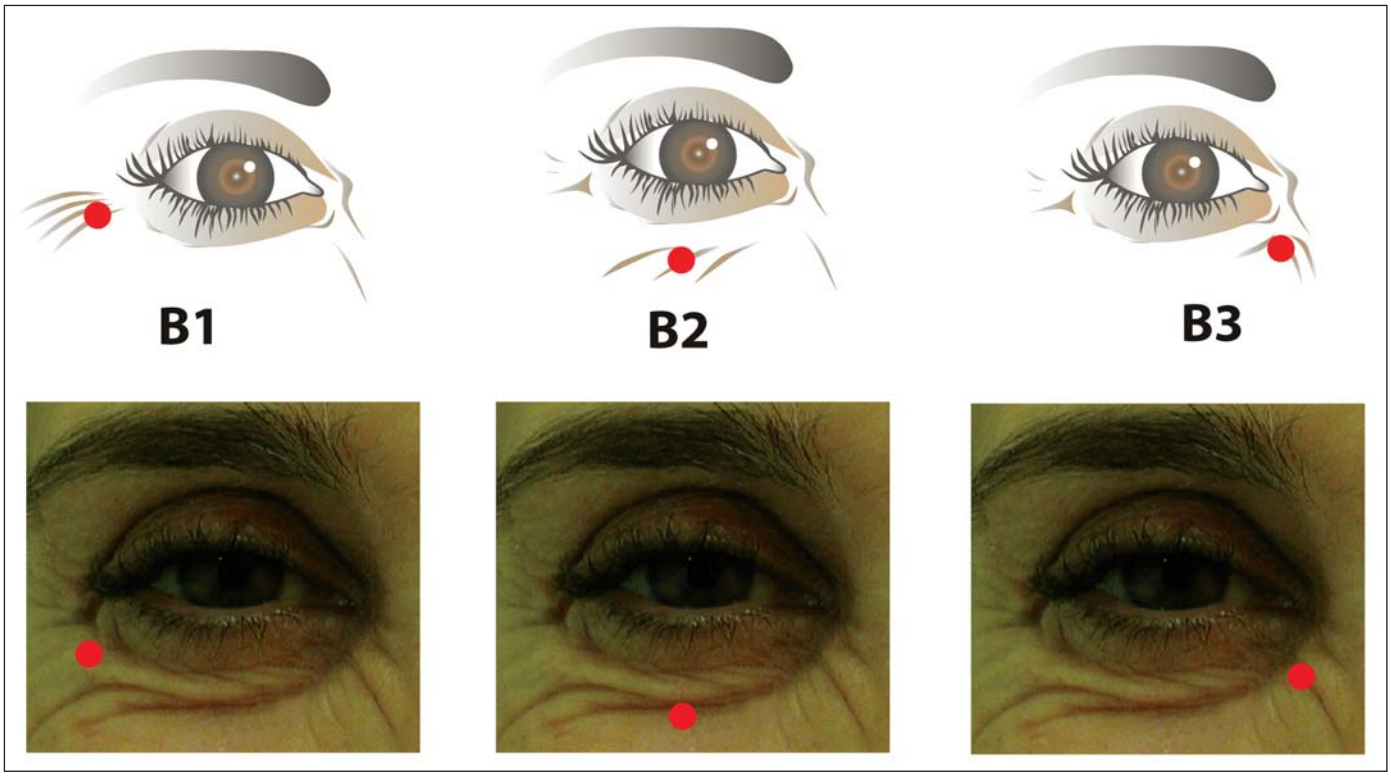


Figure 3: Classification of the wrinkles of the lower eyelid, with their respective application points

noticeable when the pars palpebralis of the orbicularis oculi muscle exerts a more evident contraction than that of the pars orbitalis; it was treated with intradermal injection into a point located 5 mm below the internal canthus of the eye, in the center of the contraction area.

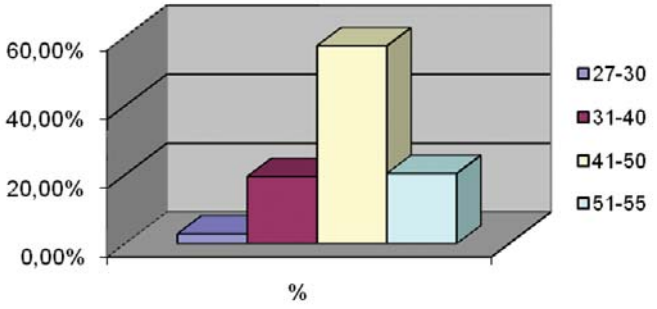
In some cases, a few wrinkles persisted in the external canthus of the eye, within the orbital border . In those cases, 0.5 unit of BoNTA was injected into the dermis, between the external angle of the eye and the external margin of the orbital border.

All patients were clinically assessed and analyzed using standardized photographs taken before treatment and 30 days after each treatment session.

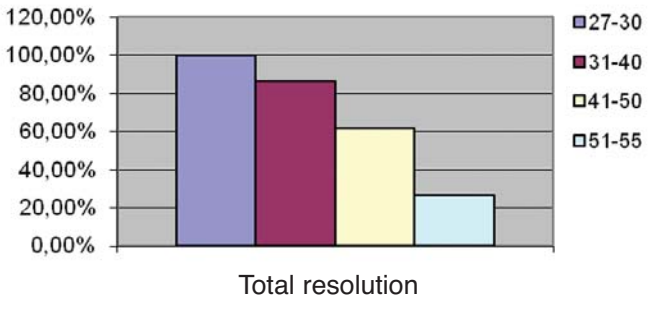
RESULTS

The ages of the 530 patients ranged from 27 to 55 years (average: 49 years), with 280 patients older than 45 and 250 younger than 45 (Figure 4). Ten percent were of Asian origin, 0.1% were of Afro-Brazilian origin, 89% were white, and 90% were women.

Eighty percent of patients younger than 45 (200) and 30% of patients over the age of 45 (84) presented total improvement of the wrinkles after the first session (Figure 5). The remaining patients needed treatment in the additional points of the lower eyelid, with the number of units and points varying according to the individual patient (Figure 6).



Graph 1: Patients distribution by age group



Graph 2: Percentage of resolution with classic points

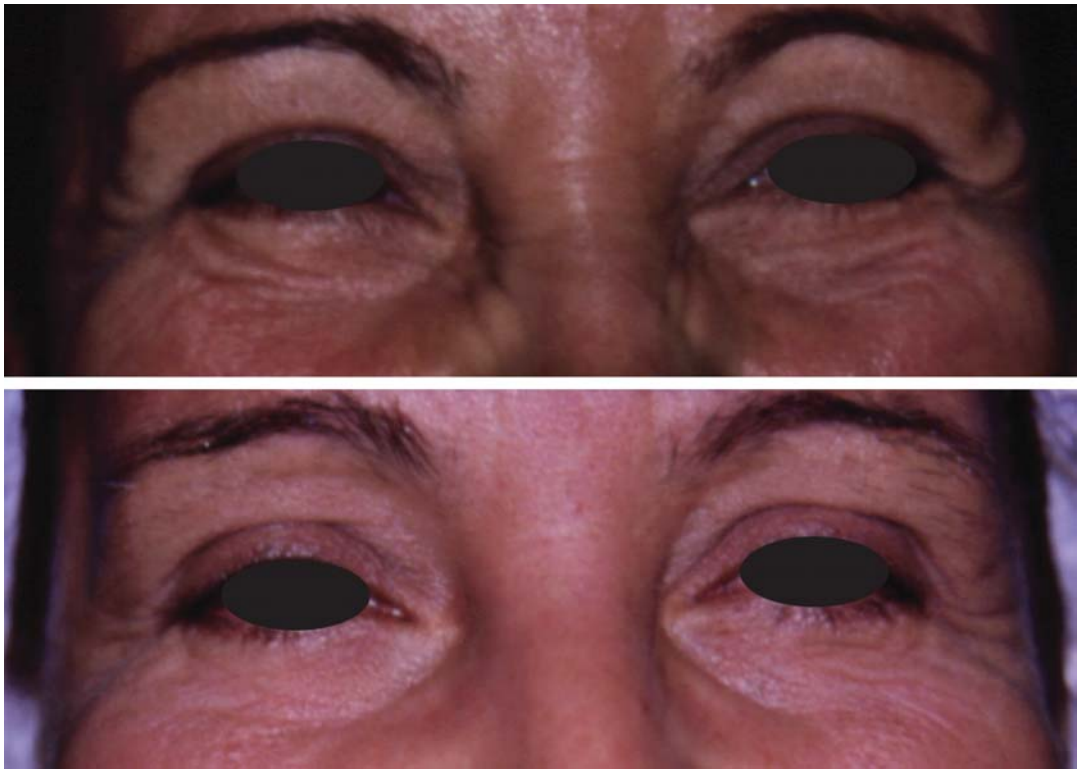


Figure 4: Patient with Type I-B2/B3 wrinkles, pre- and post-treatment

Patients with no palpable subcutaneous tissue mainly presented Type I-B1, Type I-B2 or Type I-B3 wrinkles. Individuals with palpable subcutaneous tissue mainly presented Type II, infrequently combined with B1 or B2. The anatomical difference between the presence and absence of palpable subcutaneous tissue was more important than age. The most frequent complications were local pain (5%), edema (4%), ecchymosis (1%), and pseudo-herniation of fat (0.1%).

DISCUSSION

The classic points of BoNTA injection, as described by Carruthers in 1998, are located in the lateral portion of the orbicularis oculi muscle.[8] Despite being very useful in the treatment of wrinkles, they occasionally are not enough to achieve a successful outcome, therefore leading to the search for improved results.

In 2000, Talarico described cases of patients in which the external canthus of the eye and the superior line of implantation of the ear were unusually distant from each other and required a second line of points intercalated with the three classic points.[12]

Different classification systems for dynamic wrinkles in different facial regions have been published, leading to an important advance in obtaining better results with BoNTA application.[4-6]

Additionally, in-depth study of facial anatomy ensures that safety is maintained when injecting BoNTA, which causes temporary chemical denervation of the neuromuscular junction fibers.

In addition to a detailed understanding of the different parts of the orbicularis oculi muscle, further important anatomical regions must also be detected and considered when treating this region, namely the orbital rim (which must always be located by means of palpation), the infrapalpebral skin, and the insertion points of the zygomaticus major and minor muscles.

Based on anatomical studies of the palpebral region, on the perception of how the muscular system of each individual patient is structured and works, and on the data from patients who needed additional injection points (in addition to the classic points), the authors developed a classification system mainly aimed at the treatment of the wrinkles in the lower eyelid.

In 2003, Kane published a classification of periorbital wrinkles, which, however, did not comprise the lower eyelid.13Flynn described a point located 3 mm below the cilia of the lower eyelid, in the medial region of the lower eyelid, , in the region of the pre-septal orbicularis oculi muscle, taking the midpupillary line as reference, , with a view to increasing the ocular opening. The result of the BoNTA injection into this point is very good. However, if the patient presents a flaccid periocular musculature and excess or ptosis of the inferior periorbicular fat tissue, those features can become even more evident.[14] The point developed to treat B2 wrinkles is also located in the midpupillary line, but in a more inferior location.

In order to avoid the undesirable effects of BoNTA application in the palpebral region, careful clinical examination and critical analysis of the medical history of the patient, which focuses on several important features – such as the existence of

visible adipose tissue in the infraorbital region, the presence of sagging in the muscle or at the edge of the eyelid, the patient complaining about ocular edemas – are fundamental.

If any of these important features apply, the authors do not recommended that BoNTA is applied to the lower eyelids, since this could lead to a worsening of the condition.

Additionally, the precautions that must be taken when treating the palpebral region by injecting BoNTA are very important. With regard to the classic points, the substance should be applied laterally to the orbital rim; in the infrapalpebral points the injection must be made into the superficial dermis to avoid paralysis of the oculomotor muscle and, in turn, the needle must always be directed against the ocular conjunctiva, to avoid undesired traumas.

Other observations that ensure the safety of this procedure are: the number of points and units, according to individual variations, and small doses and volumes.

In the present study, we demonstrated that the classification of wrinkles and the use of the classic points, together with new, additional ones, in the lower eyelid brought considerable benefits to patients. The results improved as the skills acquired with practical experience minimized any side effects.

As well as needing additional sites for the application of BoNTA, it was also observed that the presence of subcutaneous cellular tissue in the region and the patient's age are important factors that should be taken into account.

Finally, physicians should inform the patient that, in spite of the application of BoNTA in several points, its isolated use frequently does not eliminate all periorbicular wrinkles, and that the combination of additional procedures to obtain the best possible results is often necessary.

Patients do not always identify or complain about wrinkles in the region where the additional points are located, however, the application of BT in those sites can lead to surprisingly good aesthetic results.

Finally, the clinical pearl is that most wrinkles can be easily treated. Nevertheless, the anatomical dynamics and intrinsic facial mimicry, as well as the presence of subcutaneous fat and the quality of skin and muscle tone may require additional points so that the best results can be achieved.

CONCLUSIONS

The classification of wrinkles allows for a better treatment outcome. In spite of the great benefit brought about by the identification of the classic points, the authors verified the need for treating additional points with BoNTA. The age of the patient and the presence of subcutaneous cellular tissue must also be taken into account. ●

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Complications in laser dermatologic surgery. Part II: fractional and non-fractional ablative laser and fractional non-ablative laser

Complicações com o uso de lasers. Parte II: laser ablativo fracionado e não fracionado e laser não ablativo fracionado

Continuing Medical Education

ABSTRACT

Conventional ablative lasers remove the epidermis and part of the dermis completely, and achieve excellent results in the treatment of photoaging. Non-ablative lasers have become more popular, since they inflict less thermal damage on the dermis and do not remove the epidermis, thus reducing the recovery time and the risk of side effects. Fractioning has recently been introduced in non-ablative lasers, with the goal of developing a system with the efficiency of the ablative and the safety of the non-ablative lasers. Fractional ablative lasers form total dermal-epidermic ablation columns, whereas fractional non-ablative lasers generate microscopic zones of dermal-epidermic thermal lesions, yet they preserve the stratum corneum.

Keywords: lasers; carbon dioxide; postoperative complications; rejuvenation; photoaging

RESUMO

Os lasers ablativos convencionais removem completamente a epiderme e parte da derme e promovem excelentes resultados no fotoenvelhecimento. Apesar disso, os lasers não ablativos tornaram-se mais populares devido ao reduzido tempo de recuperação e menor risco de efeitos colaterais, pois causam dano térmico na derme e não removem a epiderme. Recentemente foi introduzido o fracionamento nesses lasers com o objetivo de se obter sistema tão eficiente quanto o dos ablativos e tão seguro quanto o dos não ablativos. Os lasers ablativos fracionados formam colunas de ablação total dermoepidérmica, e os não ablativos fracionados criam zonas microscópicas de lesão térmica dermoepidérmica deixando íntegro, entretanto, o extrato córneo.

Palavras-chave: *lasers; dióxido de carbono; complicações pós-operatórias; rejuvenescimento; fotoenvelhecimento*

INTRODUCTION

Laser-assisted ablative resurfacing of the skin is a precise and effective way of removing the external layer of damaged skin and stimulating neocollagenesis and retraction of the skin.[1,2,3] Based on the principle of selective photothermolysis, early laser resurfacing technologies could only be applied to continuous waves systems, namely the 10,600 nm CO_2 and 2,940 nm Erbium:YAG laser systems.[4-6] They are indicated for skin rejuvenation and scar treatment, offering highly satisfactory results. However, they have a protracted postoperative period and unacceptably high side effects due to prolonged exposure to the energy produced by the laser.[2,4,5,7,8]

In an attempt to improve collagen stimulation with regard to short infrared non-ablative lasers (800–1450 nm diode lasers and long-pulsed 1064 nm Nd:YAG lasers) and mitigate the

Authors:
Francine Batista Costa[1]
Ana Beatriz Palazzo Carpena El Ammar[2]
Valeria B. Campos[3]
Célia Luiza Petersen Vitello Kalil[4]

[1] Preceptor and Head of the Cosmiatry Ambulatory of the Complexo Hospitalar da Santa Casa de Porto Alegre da Universidade Federal do Rio Grande do Sul (UFRGS) – Porto Alegre, (RS) Brazil.

[2] Dermatologist physician – Rio Grande do Sul (RS), Brazil.

[3] Dermatology and Laser Fellow at the Harvard Medical School – Boston, Maine, USA; Master in Dermatology from the Faculdade de Medicina da Universidade de São Paulo (USP) – São Paulo (SP), Brazil.

[4] Preceptor and Head of the Cosmiatry Ambulatory of the Complexo Hospitalar da Santa Casa de Porto Alegre da Universidade Federal do Rio Grande do Sul (UFRGS) – Porto Alegre, (RS) Brazil.

Correspondence:
Célia Luiza Petersen Vitello Kalil
R. Padre Chagas, 230/01
90570-080, Porto Alegre, RS, Brazil
Email: clpvkderma@via-rs.net

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drawbacks of epidermal ablation, fractional non-ablative lasers were developed. Non-ablative laser technology stimulates collagen through dermo-epidermal coagulated microcolumns, without ablation of the epidermis.[4-6] Fractional, non-ablative lasers use wavelengths of 1,565 nm, 1,550 nm (Erbium glass laser), 1,540nm (Erbium glass rod laser), and 1,440nm, which are suitable for the treatment of acne, post-surgery or trauma scars, dyschromias, photoaging, melasma, striae, sagging, and deep rhytids.[4,9] Results are satisfactory, recovery occurs in 2 or 3 days, and side effects are minimum. Nevertheless, many sessions are required, making it a high-cost procedure.[4-6]

Further research was carried out to obtain skin resurfacing as effective as that provided by traditional ablative lasers, however, with a safety level similar to that offered by fractional, non-ablative lasers. Fractional CO_2 ablative and Erbium:YAG lasers – which remove only columns of the epidermis – were introduced in 2006,[5] providing greater depth control and more selective thermal damage, meaning a significant reduction in the occurrence of serious side effects, but without compromising treatment efficacy (Table 1).[2,4,8,10]

However, the majority of complications associated with laser resurfacing are not linked to laser type, but rather to the depth of cutaneous damage, which in turn is linked to the excessive number of passes, density (the number of microscopic thermal lesions per area), pulse duration, and fluence used.[1,2,6] Additionally, it is necessary that both papillary and superior reticular dermis are reached by the procedure to stimulate collagen synthesis and for cutaneous surface leveling to take place, respectively. Therefore, it is essential that the depth of cutaneous resurfacing is controlled to obtain good results with minimum side effects.[2]

Despite the known efficacy and safety of ablative lasers[2,7,8] and the reported low rates of serious complications, side effects can occur even with experienced professionals.[6,11,12] Complications are rare and must be distinguished from any expected side effects experienced by all patients undergoing ablative laser procedures (e.g. erythema, edema, moderate pruritus, sensation of localized heat, and exudative areas).[1,3,6]

Likewise, side effects must also be distinguished from operational errors.[11] Operational errors can result from insufficient training, inadequate selection of patients, incorrect indication and diagnosis, application of overlapping pulses, excessive use or misuse of parameters, and inappropriate postoperative management – factors likely to potentially increase the morbidity rate of any laser system.[3,6,11,13]

This study aims to review the side effects lasers can cause and suggest how these can be handled, since there is little literature about this subject. This is key to better patient care, thereby preventing morbidity and sequels.

For pedagogical reasons, the subject has been subdivided into early and late side effects. This review is based on articles available on the PubMed database, selected according to the following parameters: keywords used – lasers, carbon dioxide, postoperative complications, rejuvenation, and photoaging; and publication timeframe: 1999-2010. All articles had to be related to dermatology. Descriptions of how those side effects that did not present consensus were handled and those which were occasionally controversial , were also drawn from the literature. Early side effects were considered those occurring in the first 7 days of the postoperative period, while late side effects were those that became apparent around the second week (Table 2).[14,15]

In a retrospective study, Berwald et al.[15] described the complications encountered within their 8-year experience with CO_2 and Erbium:YAG lasers in 749 patients with phototypes I–V who underwent ablative resurfacing. All patients underwent systemic prophylaxis for the herpes virus that did not include antibiotics and antifungals. Erythema in the postoperative period was closely observed, receding before the sixth week. Post-inflammatory hyperpigmentation (PIH) occurred in 32% of cases, hypopigmentation in < 1%, and infection in 2% of patients. Irritative dermatitis was the most frequent early complication, occurring in 10.6% of patients.

In a retrospective review, Graber et al.[16] evaluated short- and long-term (1 year) side effects of 961 consecutive 1,550 nm fractional, non-ablative laser procedures in 422 patients. Side effects occurred in 73 (7.6%) procedures, with acneiform eruption (18 cases), herpetic infection (17 cases), and erosion (13 cases) being the most frequent. The least frequent side effects were PIH (7 cases), prolonged erythema (8 cases), prolonged edema (6 cases), and dermatitis (2 cases). Impetigo and purpura occurred only once. When phototypes and occurrence or absence of side effects were compared, it was possible to verify that patients with higher phototypes had more complications ($p = 0.007$). The result was all the more evident when evaluating PIH incidence (0.26% in phototype II patients and 2.6%, 11.6%, and 33% in phototypes III, IV, and V, respectively). The authors wish to emphasize that the rates of fractional, non-ablative laser side effects are significantly lower than those described for ablative CO_2 and Erbium:YAG lasers.

With the aim of providing the widest possible perspective on the subject, the most common side effects in skin resurfacing using fractional and non-fractional ablative lasers and fractional, non-ablative lasers are reviewed here together with several rare complications.

EARLY SIDE EFFECTS

Pain and edema

Post-resurfacing pain is a common event and is treated with systemic analgesics. Occlusive bandages control pain, but they also increase the risk of infection.[14] Pain rarely occurs after the second day of the postoperative period and must be investigated if it occurs (dryness and infection are common causes).[3] Compresses or cold water sprays can be useful. Oral analgesics (codeine) combined with an anxiolytic (lorazepam 1-2 mg, twice or three times daily) are considerably effective in the control of pain.[14]

Edema usually varies from mild to moderate, with peaks on the second and the third day, and can last for up to 1 week.[9,10] Nevertheless, it can appear dramatic, even alarming, and become uncomfortable for the patient.[3,10] Its intensity can be relieved

Table 1: Currently available laser equipment*

Manufacturer	System	Laser type	Wavelength (nm)
Ablative			
Alma	Harmony	Er:YAG	2,940
CO2 Pixel		CO2	10,600
CO2 Omnilift Pixel		CO2	10,600
Cutera	Cutera Fractional Pearl	Er:YSGG	2,790
Cynosure	CO2 Affirm	CO2	10,600
Eclipsemed DOT	DOT SmartXide	CO2	10,600
SmartXide CO2 10.600			
Ellipse Inc.	Juvia	CO2	10,600
Focus Medical	Er NaturaLase	Er:YAG	2,940
Fotona	Plus SP	Nd:YAG/Er:YAG	1,064/2,940
Dualis SP	Nd:YAG/Er:YAG	1,064/2,940	
Dualis XS	Er:YAG	2,940	
Fidelis XS	Er:YAG	2,940	
Lasering	SX Mixto	CO2	10,600
Lumenis	Active FX Ultrapulsed	CO2	10,600
Deep FX Ultrapulsed	CO2	10,600	
Lutronic	eCO2	CO2	10,600
Matrix	LS-25	CO2	10,600
Palomar	Lux 2.940	Er:YAG	2,940
Quantel	EXEL O2	CO2	10,600
FX4 e FX12	Er:YAG	2,940	
Sciton	Profractional	Er:YAG	2,940
Sellas	Cis F1	CO2	10,600
Solta Medical	Fraxel re:pair	CO2	10,600
Non-ablative			
Cynosure	Affirm	Nd:YAG	1,440 ± 1,320
Palomar	Lux 1.540	Er:Glass	1,540
Lux 1.540	Nd:YAG	1,440	
Lux DeepIR	Infrared	850 - 1,350	
Sellas	1.55	Erbium fiber	1,550
Solta Medical	Fraxel re:store	Erbium fiber	1,550
Syneron	Matrix RF	RF bi-polar/Diode	915

CO_2, carbon dioxide; Erbium:YAG, erbium:yttrium-aluminum-garnet (laser); Erbium:YSGG, erbium:yttrium-scandium-gallium-garnet (laser); Nd:YAG, neodymium-doped: yttrium-aluminum-garnet (laser); RF, radiofrequency;.
*Adapted from: Metelitsa AI. et al.[4]

with the application of ice bags or cold water compresses during the immediate postoperative period.[10] The use of an oral or intramuscular corticosteroid (40–60 mg prednisone daily for a variable period of 3-5 days) can be useful in isolated cases.[10]

Two studies, using 1,550 nm and 1,540nm Erbium:YAG lasers respectively, concluded that patients had more pain and edema when higher fluences, higher densities, and a greater number of pulses were used.[17,18]

Pruritus

Pruritus can affect more than 90% of cases[3,10,14] and last from 3 to 21 days.[3,9] Most patients are affected in the first 2 weeks, with pruritus usually being secondary to physiological healing.[3,19] A number of other factors can contribute to its occurrence: dryness, crust formation, irritation induced by emollients or topical medications, an infectious picture, and psychological discomfort.[3,10,14,19] Desquamation and post-fractional, non-ablative laser xerosis occur in 60% and 87% of cases, respectively.[10] Once infections and contact dermatitis are excluded, pruritus can be treated with cold compresses, oral antihistamines, such as difenhidramina 25–50 mg every 4 or 6 h or cetirizine 10 mg, and/or lorazepan 1–2 mg three times daily. Hydrocortisone ointment or cream also produces good responses, depending on the patient's dryness or skin type.[3,14,19] Patients

Table 2: Early and late side effects

Early side effects	Late side effects
Petechia	Milia
Contact dermatitis	Acne
Bacterial infection	Persistent erythema
Fungal infection	PIH
Viral infection	Hypopigmentation
Abscess	Scars
	Ectropion and synechia

PIH, post-inflammatory hyperpigmentation

must be advised not to scratch the affected area as excoriation can cause permanent scarring.[14]

Purpura

Although it has little consequence in the long term, purpura can persist for several weeks after complete re-epithelialization has taken place, though it can resolve without treatment.[3] A case of delayed purpura, beyond the third postoperative day, was reported with a fractional, non-ablative laser.[4,16] It can also occur when striae are treated.[9] The use of non-steroidal, anti-inflammatory substances and aspirin should be avoided, as well as skin fractionation, due to the fragility of the skin during the recovery period.[4]

Contact dermatitis

Generally, contact dermatitis is irritative and rarely a true type IV delayed hypersensitivity reaction. Use of the patch test fails to demonstrate allergic dermatitis.[2,6] The estimated incidence ranges from 5 to 10%,[3] although such incidence rates may have decreased due to little use of topical medications up to the point where the skin is completely re-epithelialized.[2,3,10,14]

Contact dermatitis is characterized by erythema, a burning sensation, and pruritus during the first 4 weeks after laser treatment.[2] The cutaneous surface, deprived of its epidermal barrier, or the thin re-epithelialized skin become susceptible to topical irritants, such as perfumes, propylene glycol, lanolin, cleansing products, emollients, and ointments.[2,3]

It is important to verify whether patients are self-medicating, especially with phytotherapy, and to remind them to avoid using make-up in the first 2 postoperative weeks.[2,3,6,10,14] The condition is treated with the suspension of probable irritant agents and the implementation of cold compresses combined with the administration of medium-potency non-fluorinated, topical corticosteroids, and oral antihistamines for the relief of pruritus and cutaneous eruptions.[2,6] In more serious cases, supervised use of ultra-high potency topical corticosteroids is indicated to avoid any delay in cutaneous healing.[2,6]

Bacterial infections

The risk of post-resurfacing infection is mentioned in the literature as it can potentially lead to scar formation.[19,20] Infection rates are higher when procedures are carried out on the full face when compared to localized treatments.[3] Rates of bacterial infection in traditional resurfacing tend to be low (0.5–4.5% of cases), and even rare when fractional, non-ablative lasers are used, occurring in only 0.1% of cases.[4,21]

A study showed that more than 50% of infections were polymicrobial infections, involving the following microorganisms: *Pseudomonas aeruginosa* (41%), *Staphylococcus aureus* (35%), *Staphylococcus epidermidis* (29%), and different species of *Candida* (24%).[14] *S. aureus* has been reported in other studies as the most common infectious agent in open wounds,[2] whereas gram-negative bacteria, including *P. aeruginosa*, were the most common bacteria in wounds dressed with occlusive bandages when applied for more than 48 h or in patients who made use of prophylactic oral antibiotics.[1,2]

The signs of bacterial infection develop between the second and 10th day of the postoperative period,[2,10,14,20] manifesting as sudden or persistent pain (50% of cases), pruritus (29% of cases), areas of accentuated erythema, yellowish and strong smelling secretion, pustules, and erosions with crusts (Figure 1).[2,3,4,10,14,19]

The most serious clinical consequence of coagulase-positive infection by *S. aureus* is toxic shock syndrome, which can occur in patients who ignore the severity of the infection,[3] or as secondary to impetiginization resulting from superficial infection by gram-positive *Streptococcus pyogenes* or, less frequently, *S.*

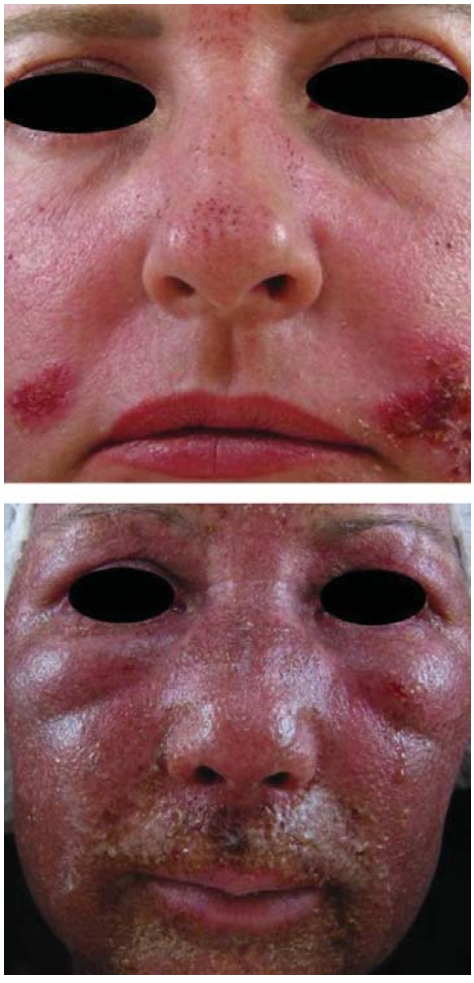

Figure 1: Perioral bacterial infection after CO_2 laser treatment.

aureus,[1,14] which is characterized by meliceric discharge and the absence of pain.[14]

Christian et al.[20] described late infections following full face CO_2 laser resurfacing that appeared 3–5 weeks after the end of the oral antibiotic period, suggesting that late infections can be related to exogenous infection sources, such as contaminated emollients. Christian and colleagues recommended that the face be thoroughly cleaned with chlorhexidine before the procedure and that intranasal mupirocin cream and gentamicin in otological solution be used before the procedure and in the postoperative period to minimize the risk of infection.

Studies suggest that most infections occur with the use of occlusive bandages after facial resurfacing, at rates which range from 0 to 20%.[14,20] However, further and extensive studies are needed to determine those rates more precisely.[20] Occlusive bandages in the postoperative period reduce patients' discomfort and accelerate healing. Open bandages nevertheless need the continuous and frequent use of emollients to prevent the wound from becoming overly dry. This shows the controversy that exists regarding possible lines of action in the postoperative period.[20]

When infection is suspected, secretions must be cultured and an antibiogram test must be carried out.[2,4,22] Wood's lamp can be used to diagnose infection by *P. aeruginosa*, which can be visualized in the wound as it fluoresces green under the lamp.[14] Wound care must be meticulous, with frequent bandage changes and the application of acetic acid compresses for 10–15 min every 2 h, aimed at reducing bacterial colonization. The acetic acid solution for the compresses can be obtained by dissolving a teaspoon of white vinegar in a glass of cold water.[2,3,6] Patients must be advised to always wash their hands with antibacterial soap before changing the bandage. Towels used for washing the face must not be reused during the recovery process.[6]

In the present study, bacterial infection incidence was of 7.6% when antibiotic prophylaxis was absent, falling to 4.3% in patients who received prophylactic ciprofloxacin systemically. The use of topical intranasal mupirocin was not effective in reducing the risk of bacterial infection.[3] Although recommended for patients with an increased risk of infection (immunosuppressed patients and patients with cardiac valvulopathy), the routine use of prophylactic antibiotics is controversial.[2,4]

When bacterial infection is suspected, a wide-spectrum systemic antibiotic (penicillin, first-generation cephalosporin or ciprofloxacin) is administered while waiting for the results from the bacterial culture and antibiogram.[2,14]

FUNGAL INFECTIONS

Candida albicans is the most frequent agent in fungal infections occurring after skin resurfacing.[1,2,14,19] The incidence of cutaneous candidiasis is reported to range between 1 and 3%.[3,19]

The infection starts between the seventh and the 14th day of the postoperative period.[2,4,14] Patients present with pruritus, pain, and whitish erosions on a highly erythematous base,[2,10,14,19] as well as satellite lesions outside the treated area.[14] A direct mycological examination must be carried out if infection is suspected.[2]

Treatment is carried out by changing the bandage frequently, cleaning the area with diluted acetic acid, and by applying topical antifungals, such as silver sulfadiazine[2] or nystatin cream[14] and/or 200–400 mg fluconazole administered orally once daily.[2,14,22] In a study where ketoconazole or prophylactic oral fluconazole were administered, no fungal infection was observed.[14] While antifungal prophylaxis is rarely administered to patients who undergo laser resurfacing, it is, however, necessary in those who present increased risk due to a history of angular cheilitis, diabetes, immunosuppression, or oral, nail, or vaginal candidiasis.[19] Rokhsar et al.[3] recommend the use of 100 mg fluconazole four times daily, for 5 days, independently of a previous history of candidiasis.

Viral infections

Herpetic infections occur in fractional ablative laser and in non-ablative laser-based resurfacing in 0.3–2% of cases.[4] Nonetheless, infection rates increase when traditional ablative lasers are used, with 2–7% of cases presenting reactivation of the herpes simplex virus (HSV).[4,14] HSV reactivation in the postoperative period can be highly detrimental,[2] and it is very important to diagnose and treat the infection early to prevent scar formation.[2,10] Infection generally occurs in the first week after laser resurfacing[14] and is characterized by delayed healing, pruritus, superficial dysesthesias, and erosions rather than by classic vesicopustules, due to the absence of the epidermis.[2,4,6,14]

Given that most patients present subclinical levels of HSV, prophylactic use of oral antivirals such as aciclovir, famciclovir, or valaciclovir is recommended preventively in perioral or full face ablative resurfacing.[2,4,6,13] Nevertheless, prophylaxis is only administered when fractional, non-ablative laser resurfacing is used, when there is previous history of the infection.[4] Prophylaxis must start 1 or 2 days before the laser procedure and continue for 5–7 days or until the skin is completely healed.[2] Several authors prefer famciclovir,[14] administered in a 500-mg dose twice to three times daily (due to increased bioavailability), as well as a 500-mg valacyclovir dose, administered twice daily in patients without a history of HSV, and administered three times daily in patients with a previous history of HSV.[3] Prophylaxis notwithstanding, herpetic infection sometimes does occur.[2,6] In such cases, doses of oral antivirals equivalent to those used in treating the herpes zoster virus must be used.[2] Although not yet described in fractional lasers, if a situation of disseminated herpes should occur, intravenous therapy with hospitalization would be justified.[2,4,6]

Other infections

A study described a rare case of viral warts spreading on the face after CO_2 continuous wave laser skin resurfacing, with spontaneous resolution after 5 days. The authors believe that even though the patient was healthy, the triggering factor was immunosuppression combined with the subclinical presence of papillomavirus in the area of resurfacing.[23]

Rao et al.[2] described a case of post-resurfacing facial infection by *Mycobacterium fortuitum*, with the patient presenting

painless, erythematous nodules that improved after multiple incisions and drainage combined with the administration of oral ciprofloxacin for 4 weeks. Infection by mycobacteria usually starts between the fourth and sixth week of the postoperative period. In spite of this being a rare condition, it should be considered in the differential diagnosis when the patient presents delayed infection and does not respond to the conventional treatment for ulcerations and to the use of antibiotics, antifungals, or antivirals.

Rendon-Pellerano et al.[13] described a case of *S. aureus* infection in the mandibular line and ipsilateral auricular pavilion which started 10 days after CO_2 laser resurfacing, subsequently developing into a parapharyngeal abscess due to a delay in antibiotic administration.

LATE SIDE EFFECTS

Milia cysts

Milia cysts were observed in 11–14% of patients who underwent traditional ablative resurfacing[4,10,14] and in up to 19% of patients who underwent fractional, non-ablative laser resurfacing.[4] They usually develop between 3 and 8 weeks after the laser procedure and are secondary to the depth of cutaneous damage and the use of occlusive bandages, oils, or creams during the healing process.[2,4,10] Most cases resolve spontaneously, simply with regular cutaneous cleansing in the postoperative period.[2,14] Other measures that aid resolution include the topical application of either tretinoin or glycolic acid, and manual extraction using a sterilized needle.[2,10,14]

Acne

Common in traditional post-ablative resurfacing, acne can occur in up to 80% of patients.[2,4] With the use of fractional lasers, acneiform eruption rates are lower (between 2 and 10% of cases).[4] Aberrant follicular epithelialization during healing can contribute to the exacerbation of acne 1 or 2 weeks after laser resurfacing.[6,9] Patients who presented acne before the procedure are more prone to develop that clinical picture.[2,9,14,16] The use of vaseline-based ointments, occlusive bandages and medium- and high-potency topical corticosteroids also seems to be involved in the intensification of this clinical picture in patients with dark skin or previous history.[14] Niwa et al.[24] described a case of acneiform eruption in the sixth day of the postoperative period, attributed to excessive use of vaseline, in a sample of 12 patient who underwent 2,940 nm fractional laser resurfacing.

Kim et al.[7] described a case of transient acneiform eruption after the treatment of acne scars with fractional, non-ablative laser (1,550 nm). The clinical picture probably occurred due to fissures visible on the tip of the laser handpiece. The cutaneous lesions were treated with minocycline and low doses of oral prednisolone for 4 days.

Oral antibiotics such as tetracycline, doxycycline and minocycline are used early and in short courses to avoid scarring.[2,4,6,14] In addition, topical occlusives and exceptionally thick or oily sunscreens are stopped.[14,22] Usually, the condition is self-limiting and the use of non-comedogenic emollients is recommended.[4] More resistant cases can be treated with a night-time combination of erythromycin, benzoyl peroxide, and tretinoin gel, once the lesion has healed. Topical isotretinoin is contraindicated because of the possible development of hypertrophic scars in the damaged skin.[14]

Erythema

Transient, post-resurfacing cutaneous erythema is expected to occur in 100% of patients and has a more prolonged duration when ablative procedures are used. However, persistent erythema can be a challenging complication.[2,4] It can last from 1 to 8 months (average: 3.5 months) when the ablative CO_2 laser procedure is used.[1,4,6] In non-ablative resurfacing, erythema can be considered as persistent if it lasts for more than 4 days. Persistent erythema is reported in less than 1% of cases when non-ablative procedures are used, reaching more than 12.5% when an ablative laser is used.[4]

Even though fractional Erbium:YAG procedures are slightly more aggressive than traditional lasers, the erythema caused by fractional Erbium:YAG procedures improves faster than the erythema caused by CO_2 laser.[3,12,14] The short-pulse CO_2 laser seems to cause less residual thermal damage, which can be translated into a lower degree of erythema.[3] When induced by short-pulse Erbium:YAG laser, erythema is usually less severe and of shorter duration, persisting, on average, for several weeks.[6] In the older Erbium:YAG laser system, erythema lasted less than 4 weeks, while in the fractional laser system – depending on the parameters used – erythema can persist for 12 weeks or longer. This is due to the greater depth of penetration of the laser beams used in fractional techniques and the consequent improvement in clinical results.[10]

The mechanism of erythema development is uncertain. However, it may be associated with the increased blood flow of the inflammatory response, the immaturity of the epidermis, the reduced absorption of light by melanin, and the decreased optical dispersion of light in the dermis.[2,14] The upper eyelids are particularly prone to erythema, possibly due to the reduced thickness of the tissue. The greater the number of laser passes, the deeper the resurfacing and more notable the improvement. However, such advantages are accompanied by more protracted healing and persistent erythema in the postoperative period.[3]

Erythema is proportional to the depth of skin resurfacing and prevails in areas of delayed healing and where ablation has reached the reticular dermis.[2,3,10] Other factors associated with a greater risk of persistent erythema are: a large number of passes or overlaps of the laser radiation, aggressive intra-operative debridement of dry skin, contact dermatitis in the postoperative period, delayed healing owing to infection, trauma, or use of irritant substances.[2,14]

The use of topical ascorbic acid after re-epithelialization seems to reduce the duration and severity of erythema through its anti-inflammatory action.[2,4,6,10,14] The role of corticosteroids in reducing erythema in the postoperative period is controversial.[2] One percent hydrocortisone cream can be used two to four times daily after re-epithelialization.[14] Some studies have shown

that topical use of ascorbic acid on the de-epithelialized cutaneous surface can cause persistent erythema and the formation of telangiectasias.[2,6] Notwithstanding, erythematous areas whose rigidity and infiltration may suggest that the incipient formation of scars must be promptly and assertively treated with powerful corticosteroids or pulsed dye laser irradiation.[6] Following complete re-epithelialization (usually 10–14 days after resurfacing), most patients can camouflage the erythema using make-up while waiting for it to disappear gradually.[3]

In the treatment of persistent and recalcitrant erythema, Zhang et al.[2] suggest the use of pulsed dye laser or intense pulsed light (IPL). Sub-purpuric doses administered every 1 or 2 weeks can be used until the erythema disappears. Application of a red light-emitting diode (LED) can be beneficial in reducing the erythema's duration and intensity due to its anti-inflammatory and healing effect.[4,5,10]

Hyperpigmentation

Post-resurfacing hyperpigmentation can be transient or long-lasting. Transient hyperpigmentation is one of the most common post-ablative resurfacing complications, occurring in one-third of patients, independently of phototype. It is, however, considerably less frequent when fractional lasers are used.[2,4,6,13] Notwithstanding, patients with higher phototypes (III–IV; who have freckles, melasma, or dyschromias) present an increased risk of PIH.[1,2,7,12,14,22,25] Suntanned patients – whose melanocytes have been stimulated – present greater risk of PIH, which can endure for months.[2] Transient PIH and melasma recurrence can occur with fractional, non-ablative laser use.[9] Fractional, non-ablative lasers can be used in all phototypes, but greater caution should be taken when treating phototypes at the upper end of the scale (Figures 2 and 3).[9,16]

Post-resurfacing PIH usually appears 32 days after the procedure and lasts an average of 112 days.[14] It occurs in 35–40% of patients with Fitzpatrick skin types I–III.[10,12,14,22,25] In one study, it occurred in 68% (n = 22) of phototype IV patients.[3] PIH severity and duration are correlated to the cutaneous depth of the resurfacing procedure[2] and intense and prolonged erythema.[7] Another study described two cases of transient PIH in a sample of 12 patients who underwent 2,940 nm fractional laser resurfacing, with clinical resolution in 2 months following the use of corticosteroids and topical whitening substances.[24]

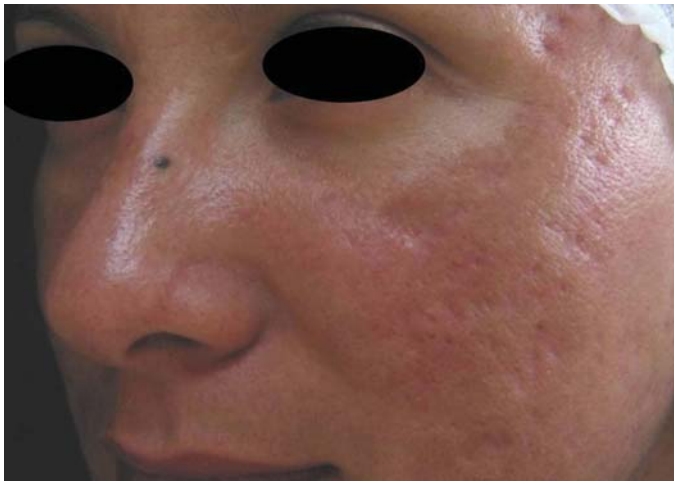

Figure 2: Post-inflammatory hyperpigmentation in the malar region after CO_2 laser treatment.

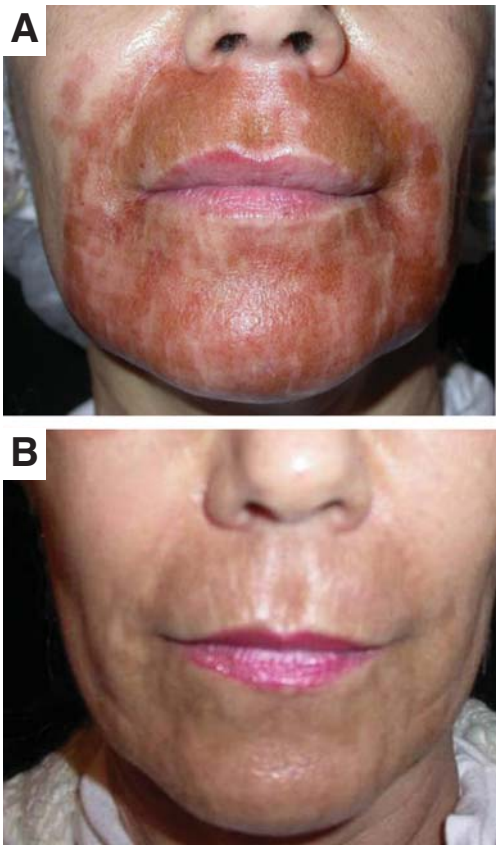

Figure 3: (A) Postoperative image of the perioral region after 2,940 nm Erbium:YAG laser and (B) transient PIH.

PIH risk in patients with a higher phototype is decreased when using the Erbium:YAG laser, when compared to the CO_2 laser.[10] Even though PIH after resurfacing with variable-pulse Erbium:YAG laser lasts longer than PIH observed after treatment with short-pulse Erbium:YAG laser, the former does not lead to a PIH that is as persistent as the one observed after multiple passes of CO_2 laser (average of 10.4 weeks using a variable-pulse Erbium:YAG laser and of 16 weeks using a CO_2 laser).[6,7,10] In addition, the use of an Erbium:YAG laser with scanner in dual mode can induce alterations in pigmentation more frequently than when using the handpiece alone.[7]

It may be necessary to carry out pre-laser tests on small areas to adjust the parameters to be used in each patient. Higher fluences, lower densities, and prolonged pulse intervals are generally used when resurfacing darker skins with a fractional laser.[4] Moreover, examining the patient's existing scars can help to determine their tendency to develop hyperpigmentation.[14]

PIH must be treated early. However, aggressive treatments before re-epithelialization is complete must be avoided, as they can worsen the condition.[2,14,22] The regular use of wide-spectrum sunscreen and avoiding exposure to the sun for at least 6

or 8 weeks before and after the procedure are important if one is to avoid PIH.[2,10,14,16] In addition to sunscreen, whitening agents such as hydroquinone, tretinoin and kojic, azelaic, ascorbic, and glycolic acids are also first-line treatments.[2,4,7,10,12,14] In persistent cases, superficial peelings of 30–40% glycolic acid and 30% salicylic acid, or microdermabrasion (either fortnightly or every 3 or 4 weeks) can accelerate the resolution of dyschromia.[2,10,14]

Patients who present increased PIH risk must have their skin prepared during the 3 months prior to the procedure, rather than the standard 6-week period.[2] The preparation can be carried out with a combination of hydroquinone and glycolic acid or tretinoin, or hydroquinone cream used alone that, according to some studies, reduce the risk of PIH due to the inhibition of melanin production.[14] As the result of two recent studies (involving 22 and 100 phototypes I–III patients, respectively) on the use of depigmenters before the laser procedure, and where no difference was found in the incidence of PIH post-resurfacing, pretreatments aimed at reducing hyperpigmentation have become controverted.[3,6] The lack of variability in results could be due to the fact that topical agents exert their effect primarily on the superficial epidermis and therefore do not reach the deeper melanocytes (found between the hair follicles or adnexal structures), which strengthen hyperpigmentation.[6]

Kontoes et al.[26] described IPL effectiveness in three patients with persistent erythema and hyperpigmentation secondary to CO_2 laser resurfacing. IPL was applied in those patients 1 week after complete re-epithelialization, when the erythema was still in the initial stage. IPL was carried out with 515–590 nm filters, 25.0–31.5 J/cm^2 fluences, variable pulses, and two or three sessions at 4-week intervals.

Hypopigmentation

Hypopigmentation is an uncommon, late, and permanent complication that does not depend on the patient's phototype – although some authors relate it more frequently to phototypes I–III.[1-3,14,22,25]Its incidence is estimated in 6–20% of patients, becoming visible between 3 and 10 months after ablative laser resurfacing.[2,10,12,14,27] There are no reports of hypopigmentation when fractional, non-ablative lasers are used.[9] True hypopigmentation reflects the reduced number of melanocytes and is correlated to the presence of persistent erythema, to resurfacing depth, and to the degree of thermal damage.[2,3,7,10,15]

In most average-depth procedures, which are usually carried out on highly photodamaged skin, true hypopigmentation is rare and must be distinguished from pseudo-hypopigmentation or relative hypopigmentation.[2,6] Pseudo-hypopigmentation occurs when the new skin is fairer than that in adjacent areas, due to its healthy condition when compared to photodamaged skin.[2,7,28] This can also occur transiently in patients of darker skin due the greater contrast in skin color, however, the pigmentation process is quicker.[2,7,13]

Hypopigmentation is an extremely rare side effect in fractional laser-assisted resurfacing. A case was described in which transient hypopigmentation was observed on the 15th day of the postoperative period. This was attributed to the prophylactic use of tretinoin and hydroquinone, with resolution occurring after suspension of the latter. Post-laser persistent hypopigmentation lasting for several months was observed in two patients who had hypertrophic scarring in the cervical region.[4]

There is no evident difference in hypopigmentation rates when short-pulse (90 ms) CO_2 laser is compared to longer-pulse (950 ms) lasers or to Erbium:YAG lasers.[3] Hypopigmentation seems to be less common (4% of cases) and occurring later when Erbium:YAG lasers are used than when CO_2 lasers are used.[10]

It is important that any previous ablative treatment history (for example, dermabrasion or chemical peelings) is verified, as it increases the risk of hypopigmentation.[25,27]

In order to avoid hypopigmentation, the depth of resurfacing must be controlled, photodamage severity must evaluated, and the procedure must be carried out within cosmetic units.[2] It is also important to highlight that the mandibular line is very susceptible to hypopigmentation and scars, so it must always be treated with a single laser pass only.[3]

In the management of hypopigmentation, topical psoralen and ultraviolet A can be used to stimulate melanin synthesis.[2,10,28] Exciplex laser[10,28] and the application of chemical peelings can also be used to soften demarcation lines.[2] Further options used to minimize color contrast in the skin include: repeating CO_2 resurfacing, using vascular or pigment lasers (for example, the Q-switched Alexandrite laser) or 1,550 nm lasers.[3,27]

Temporary hyperpigmentation and hypopigmentation are frequent complications in Erbium:YAG laser resurfacing. The patient's phototype and the intensity of the thermal damage caused during treatment with long-pulsed (modulated) Erbium:YAG lasers are important factors regarding the incidence and duration of these complications.[7]

Scars

Scars are serious and devastating post-resurfacing complications.[1,2,29] Most patients who undergo fractional Erbium:YAG laser resurfacing re-epithelialize in 5–7 days (from 7 to 21 days in non-fractional lasers). Areas with deeper vaporization take relatively longer to heal. Minimal scars have been seen in a small number of patients when the procedure – both in ablative and in non-ablative fractional lasers – has been more aggressive or when a less careful technique was used.[9,14]

Although less than 1% become permanent,[10,14] transient scars can occur in up to 2.8% of cases.[14] Scars can be atrophic, hypertrophic, or keloidian, and are difficult to treat.[2] Sixty-four percent of physicians who use CO_2 lasers had at least one case of hypertrophic scarring.[14] Those scars usually develop in areas with pruritus, prolonged erythema, and delayed healing that have become hardened or red.[2,10,29] Delayed healing (14–21 days after laser application) increases the probability of scars (Figure 4).[14]

They frequently occur in areas that present post-resurfacing contact dermatitis or infection, or where ablation reached the reticular dermis.[2,28] In addition, certain anatomical areas such as the cervical, perioral, and periorbital regions, or those with osseous projections such as the mentum, mandible, and malar

region, are prone to the formation of scars (Figure 5).[2,4,10,12,14,29] Patients of higher phototype also present a greater predisposition for keloid scar formation. This is due to higher levels of melanin and the increase needed in the absorption of laser light (at least 40% greater in phototypes III–VI when compared to I and II). Therefore, extra care is recommended when choosing laser parameters for patients with phototype III or higher.[25]

In patients with keloid scars,[2,14] a history of radiotherapy,[2] rithydoplasty, blepharoplasty, peeling, or dermabrasion,[1] or the use of oral isotretinoin 6 months before or 3 months after the procedure[2] present an increased risk of hypertrophic scarring.[1,2,14] The patients selected for resurfacing must not be using oral isotretinoin – preferably for 1 year, or ideally for 2 or more years.[14]

The diagnosis and early treatment of scars are important for the control of the condition.[2] In order to stimulate healing, areas with slow healing must be treated with pulsed dye laser at low fluences and with weekly frequency.[2,14] Hardened or highly erythematous areas must be treated with a 1064 nm Nd:YAG laser and a 585 nm pulsed dye laser, in addition to topical application of an ultrapotent or intralesional corticosteroid[2,4,6,10,27] and silicone gel sheets.[2,14,27] Minor scars can be treated with 0.05% clobetasol gel, once daily for 5 days, being repeated once. Also, 1–10 mg/ml intralesional triamcinolone can be used. Triamcinolone can be combined with 5-fluouracil (5-FU) and injected one to three times a week (0.1 ml of 10 mg/ml triamcinolone added to 0.9 ml of 50 mg/ml 5-FU, 1:9 dilution).[14,28] An occlusive fluorinated corticosteroid is recommended by some authors.[14] Manual massage of hardened areas can be beneficial when applied for 10–15 min, three or four times daily.[3]

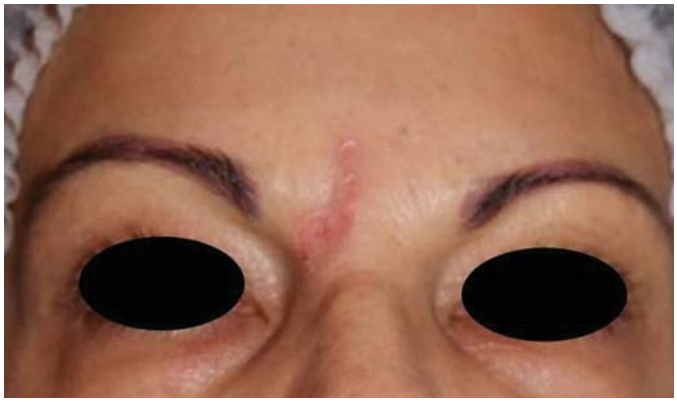

Figure 4: Delayed healing in the glabella after 1,540 nm Erbium:YAG laser due to excessive overlapping of pulses.

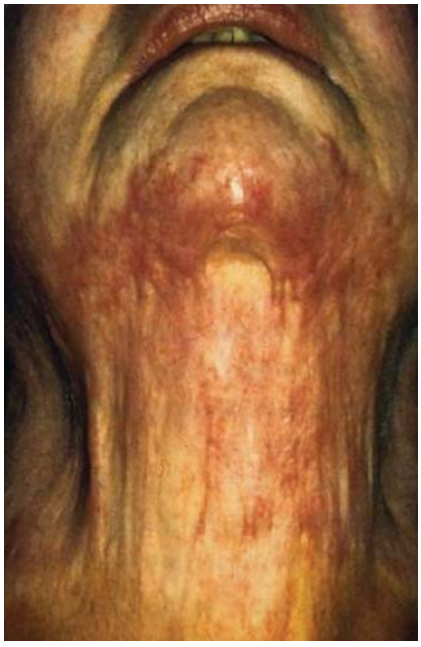

Figure 5: Hypertrophic cervical scars after continuous CO_2 laser treatment.

Ectropion

Although a rare condition, ectropion can occur mainly in the lower eyelids after aggressive laser procedures – even when fractional lasers are used.[4,14,29] Other factors that increase the risk of ectropion are flaccid eyelids and previous blepharoplasty.[4,10,13,14,28,29] A small number of patients can present light and transient palpebral retraction in the immediate postoperative period, though this is solved spontaneously.[10,14]

Low energy densities and few passes are recommended for infraorbital treatment to reduce risks. In addition, excessive collagen contraction during the procedure must be closely monitored, as it can lead to exaggerated eversion of the eyelid.[4,5,29] Appropriate handling includes massaging the affected eyelid using an upward motion and using topical corticosteroids, such as clobetasol, or intralesional triamcinolone, in combined fashion. Surgical correction may be needed if the problem persists.[10,14,29]

Synechia

Synechia is the improper adhesion of the re-epithelialized surfaces, which results in the formation of an abnormal membrane during the healing process. It usually occurs in the lower eyelids on the first days of the postoperative period. Intervention must be carried out early on, with a local injection of lidocaine followed by gentle rupture of the membranous surface with a 30G needle. A corrective bandage is then applied for 3 or 4 days.[3,28]

OTHER SIDE EFFECTS

Delayed healing of wounds, excessive skin sensitivity to creams and traumas, and blisters are described in the literature. Blisters can occur mainly with the use of fractional lasers at high fluences and densities. It is recommended that the use of topical retinoid be discontinued several days before the fractional, non-ablative laser procedure, following reports of blister formation in patients who were using such substances during treatment.[9]

Small linear excoriations ranging from 2 to 16 mm can occur after fractional laser treatment. The most sensitive places are the upper lip, lower eyelid, and the forehead – probably due to the difficulty of keeping the laser handpiece in complete contact with the skin in those area.[4] There are reports of bruises to the skin, particularly in regions other than the face, which are

dependent on the handpiece configuration of the fractional laser used (microthermal zones), especially in 1,440 nm and 1,540 nm lasers. Spontaneous resolution takes place in 2 or 3 weeks.[9]

A heat-induced 'recall' phenomenon has been observed after resurfacing when using 1,320 nm and 1,440 nm fractional lasers. Following resolution of post-laser transient erythema, some patients present a reappearance of erythematous macules after hot baths or prolonged direct exposure to sunlight. Although the precise mechanism for this is still unknown, it seems that participation of neurogenic or histamine cells, or of mastocytes, may be involved. The phenomenon usually resolves in 48 h without leaving sequels.[4]

A recently described complication in two cases relates to eruptive, post-fractional resurfacing keratoacanthomas. The two patients presented actinic keratoses in the treated region and, after an interval of 4–6 weeks into the postoperative period, developed the condition. The authors believe that the fractional laser used caused follicular trauma and thereby favoured the development of low-risk tumors.[4,14] Rendon-Pellerano et al.[13] described a case of granulomatous reaction in the vermilion border, starting on the third day after CO_2 laser resurfacing, which was treated with topical and systemic corticosteroids and improved in 4 months without scar formation. The incidence of such complications is very low.[14]

FINAL CONSIDERATIONS

In general, carefully searching for signs of infection or slow re-epithelialization in the first 10 days is of paramount importance. Areas that did not re-epithelialize, present excessive erythema or become painful – uncommon findings in the postoperative period – must undergo culture. Persistent erythema is noticed in those who undergo vaporization at significant depths, and can persist for about 3 months or longer. PIH can start to manifest in 4–6 weeks and is almost certain to occur in patients with a higher phototype. It must be treated aggressively with a depigmenting agent, followed by ensuring full protection against the sun by means of blocking agents. A rarer side effect is the formation of incipient scars which can take place between the sixth and 12th week. It is important to pay attention to signs of this as indicated by the excessive stiffening of the skin and persistent erythema. If those signs are evident, the use of a topical fluorinated corticosteroid must be implemented. If areas of slow healing begin to develop strings, fibroses, or stiffening with elevation of the skin, intralesional injection with triamcinolone (alone or combined with 5-FU) must be carried out.

CO_2 and Erbium:YAG laser resurfacing are relatively safe and effective methods for cutaneous rejuvenation and scar correction. The technological developments that allowed the fractionation of laser rays reduced the risk of significant thermal lesions; however, well-designed studies that ratify this decrease in the occurrence of side effects are lacking. In spite of technological improvements, side effects can occur even with experienced professionals. Additionally, there is no consensus in the literature about the handling of side effects resulting from the use of lasers. Preventive measures, combined with prompt recognition of side effects and their appropriate treatment, reduce their occurrence and sequels in the long term. ●

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QUESTIONS FOR CONTINUING MEDICAL EDUCATION (CME)

1. What is the wavelength of a CO2 laser?
a) 810 nm
b) 2,940 nm
c) 1,540 nm
d) 1,550 nm
e) 10,600 nm

2. Which laser's wavelength is in the short infrared spectrum?
a) 800 nm diode laser
b) 1,450 nm diode laser
c) 1,064 nm Nd:YAG laser
d) All of the above
e) None of the above

3. What are fractional, non-ablative lasers indicated for?
a) Acne scars
b) Postsurgical or trauma scars
c) Melasma
d) All of the above
e) None of the above

4. What is an advantage of fractional, non-ablative lasers compared to fractional, ablative lasers?
a) Greater efficacy
b) Fewer sessions needed
c) Fewer side effects
d) All of the above
e) None of the above

5. All of the answers below are the early side effects of laser-assisted post-resurfacing, except for:
a) Petechiae
b) Hypopigmentation
c) Contact dermatitis
d) Fungal infection
e) Abscess

6. Milia cysts are late side effects observed in patients who undergo ablative resurfacing. After the laser procedure, when do they specifically occur?
a) In the second week
b) Between the third and eighth week
c) After the 10th week
d) They are not a late side effect
e) They are not a post-ablative resurfacing side effect

7. What is the post-resurfacing side effect expected in 100% of patients?
a) Transient cutaneous erythema
b) Acne
c) Transient hyperchromia
d) Persistent erythema
e) Milia cysts

8. Non-fractional post-ablative resurfacing hyperpigmentation:
a) Is one of the most common complications
b) Rarely occurs
c) Never occurs
d) Usually appears 1 month after the procedure
e) Options a) and d) are correct

9. After ablative resurfacing it is important to monitor for signs of incipient scar formation, indicated by excessive stiffening of the skin and persistent erythema. When do these signs appear?
a) Between the third and fourth week
b) Between the sixth and 12th week
c) After the fourth postoperative month
d) They do not constitute a late side effect
e) They do not constitute a side effect of ablative resurfacing

10. True hypopigmentation is a(n) _____ side effect:
a) Uncommon
b) Late
c) Permanent
d) All of the above
e) None of the above

Key

Palazzo Carpena El Ammar AB, Batista Costa F, Petersen Vitello Kalil CL and Campos VB. Complications in laser dermatologic surgery Part I: Non-fractional non-ablative lasers. Surg Cosmet Dermatol 2011; 3: 47–53.

1-c, 2-e, 3-a, 4-b, 5-b, 6-b, 7-b, 8-c, 9-b, 10-b

Answers must be sent using the website www.surgicalcosmetic.org.br.
The deadline for submitting answers will be provided by email with a direct link for accessing the journal.

Axillary hyperhidrosis treatment update

Atualização no tratamento de hiperidrose axilar

Review Article

Authors:
Gabriel Teixeiro Gontijo[1]
Gustavo Vieira Gualberto[2]
Natália Augusta Brito Madureira[3]

[1] Dermatology discipline Instructor at the Faculdade de Medicina da Universidade Federal de Minas Gerais (UFMG) – Belo Horizonte (MG), Brazil. Dermatologic Surgery preceptor at the Dermatology Service of the Hospital das Clínicas da Universidade Federal de Minas Gerais (UFMG).
[2] Dermatologist physician, Belo Horizonte (MG), Brazil.
[3] Undergraduate student at the Faculdade de Medicina da Universidade Federal de Minas Gerais (UFMG)

ABSTRACT

Introduction: Axillary hyperhidrosis is a common problem that can affect sufferers' personal and professional lives. Clinical histories and physical examinations are important tools to assess the severity of the condition and to indicate the most appropriate therapy for each case. There are a number of treatments for axillary hyperhidrosis, including topical and systemic therapy, iontophoresis, botulinum toxin, and surgical procedures. The authors have conducted a review of the most important treatments.

Keywords: hyperhidrosis; ambulatory surgical procedures; botulinum toxins; laser therapy; therapeutical approaches

RESUMO

Introdução: *Hiperidrose axilar é problema comum que pode afetar a vida profissional e social. A história clínica e o exame físico são ferramentas importantes na avaliação da gravidade e para indicação da terapia mais apropriada para cada caso. Existem vários tratamentos, incluindo terapia tópica e sistêmica, iontoforese, toxina botulínica e procedimentos cirúrgicos. Os autores apresentam revisão das opções terapêuticas mais importantes.*

Palavras-chave: *hiperidrose; procedimentos cirúrgicos ambulatoriais; toxinas botulínicas; terapia a laser; condutas terapêuticas.*

INTRODUCTION

The human skin has countless eccrine glands which secrete the fluid known as sweat. Sudoresis (profuse sweating) helps in eliminating heat and in balancing body temperature. Hyperhidrosis is a disorder characterized by the excessive production of sweat. Hyperhidrosis can be focal (localized), when it involves specific areas of the body, or generalized when it involves the whole body. Generalized hyperhidrosis can have a physiological cause or be linked to an autonomic dysfunction secondary to neurological, endocrinological, or metabolic disorders, feverish disorders, malignancies and medications.[1-4]

Focal hyperhidrosis is usually localized and symmetrical, manifesting more frequently in the axillae, hands, feet, and face.[1,2] Eccrine glands are distributed all over the body, with a greater concentration in the palmoplantar and forehead regions, being innervated by cholinergic fibers of the sympathetic nervous system. The physiopathology of focal hyperhidrosis is little understood. Affected patients do not present any histological alteration or change in the number of eccrine glands.[1,3,5]

The most probable cause of focal hyperhidrosis is the neurogenic hyperexcitability or overactivity of the reflex circuits involving normal eccrine glands. Such hyperexcitability can be caused by a complex dysfunction of the sympathetic and parasympathetic routes of the autonomous systems. In addition, many patients present an exaggerated response to physical and emotional stimuli, as well as to increases in temperature.[1,3,5-7]

Correspondência para:
Dr. Gabriel Gontijo
Praça da Bandeira, nº 170/ 4º andar - Bairro Mangabeiras
30130-050 – Belo Horizonte - MG
Telefone: (31) 3227-7733
E-mail: gabrielgontijo@terra.com.br

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Approximately two-thirds of patients describe a positive family history, suggesting the influence of genetic factors.[1] In the USA, a comprehensive epidemiological study showed that 2.8% of the population suffer from hyperhidrosis, and nearly half of that percentage report axillary hyperhidrosis. Of the half reporting axillary hyperhidrosis, one-third present with serious hyperhidrosis, with symptoms that frequently or permanently interfere in daily activities and are considered by patients as intolerable or almost intolerable.[2,8,9]

Focal hyperhidrosis can lead to a wide range of secondary medical conditions, such as bacterial or fungal supergrowth, muscular cramps, eczematous dermatitis and other dermatological conditions, in addition to anxiety and other psychological disorders. However, patients deem the impact on quality of life as the most important factor.[7] Hyperhidrosis can have significant effects on patients, interfering with their social, professional and daily relationships, causing a negative impact on quality of life, and potentially leading to social stigmatization.[1,2,10]

For practical diagnostic purposes, each patient's personal situation should be considered, meaning that any sudoresis that significantly interferes with the patient's daily life (physically or psychologically, either in the social or professional spheres) should be treated as abnormal.[3,5]

The Hyperhidrosis Disease Severity Scale (HDSS) is specifically used for that disorder, providing a qualitative measure of the condition's severity, based on how it affects patients' daily activities. Patients select statements that best reflect their experience with hyperhidrosis in each of the areas being assessed (Table 1).

Scores of 3 and 4 indicate serious hyperhidrosis, while scores of 1 and 2 indicate mild or moderate hyperhidrosis. HDSS is a practical, simple, and easy-to-understand diagnostic tool that can be quickly implemented and has shown good correlation with other types of questionnaire. A point of improvement in this scale is associated with a 50% reduction in the production of sweat, while two points are associated with an 80% reduction.[1]

AXILLARY HYPERHIDROSIS TREATMENTS

Topical treatment

Aluminum chloride and aluminum chlorohydrate salts are the most common topical treatments for axillary hyperhidrosis. Used in different concentrations – but never above 20% – the salts form a compound with mucopolysaccharides, generating a precipitate that presumably blocks the epidermal ducts or promotes the atrophy and vacuolation of glandular cells.[5,11]

Usually, the product containing the salts is applied daily on dry skin (occlusion is recommended for better results) at nighttime and washed off in the morning. As symptoms improve, use is decreased. Common side effects are a burning sensation and irritation. They occur mainly in the presence of high concentrations and can limit the benefits of the treatment.[5,11] Other topical products, such as aldehydes, anesthetics, and anticholinergics, were investigated, but without showing significant benefits.[5]

Iontophoresis

Iontophoresis involves the introduction of ionized particles into the skin by means of an electric current in a liquid element (usually pure water). The exact action mechanism is unknown, however, it is believed that iontophoresis either stimulates the occlusion of glandular ducts or affects the electrochemical gradient of sudoral secretion, or can promote a feedback mechanism.[5,11]

It can cause skin dryness, desquamation and fissures in the treated site, especially in the axillae, and this limits its use in that area. Treatment is contraindicated in pregnant women, patients with a pacemaker or large metallic prostheses, and epilepsy sufferers.[5,11]

Systemic treatment

The use of oral anticholinergics, such as atropine and glycopyrrolate, is limited by the frequent presence of side effects, such as oral and ocular dryness, constipation, and difficulty in urination. This type of treatment would, however, be suitable in cases which do not respond to topical treatments, iontophoresis, or botulinum toxin.[11] In spite of the side effects, the use of anticholinergic agents is recommended before considering surgical intervention.[1]

Botulinum toxin

Botulinum toxin Type A is known for being able to block sympathetic, post-ganglionic cholinergic fibers in the area where sudoriparous glands are located. It has been used in the treatment of focal hyperhidrosis since the 1990s and several studies have demonstrated its efficacy, safety, and good tolerability as an alternative to topical, systemic, and surgical treatments.[2,5] The US Food and Drug Administration (FDA) currently approves the use of type A botulinum toxin as a therapy to treat axillary hyperhidrosis only.[5,11]

Although many studies have shown that doses > 50 units per axilla lead to little significant improvement, 50–100 units per axilla are frequently used. It is recommended that tests involving painting the affected area with iodine dye, followed by powdering the affected area with starch, are carried out prior to the procedure, as the emergence of blue-black staining indicates the presence and location of sudoresis (Minor test; Figure 1).

Table 1: Hyperhidrosis Disease Severity Scale.

My axillae's sweat is never noticed and never interferes with my daily activities.	Score 1
My axillae's sweat is tolerable, but sometimes interferes with my daily activities.	Score 2
My axillae's sweat is almost intolerable and frequently interferes with my daily activities.	Score 3
My axillae's sweat is intolerable and always interferes with my daily activities.	Score 4

For better results, patients should discontinue the use of antiperspirants or other topical treatments 5 days before the Minor test. Several intradermal injections are applied at intervals of approximately 1.5 cm. These injections can be made into the superficial adipose tissue without adverse effects or significant reduction in efficacy.[5]

There are no restrictions in patients' daily life and activities after the procedure. The toxin's action usually starts to take effect after 7–10 days and can last from 6 to 8 months. The pain associated with the procedure is usually minimal, with a considerable improvement in quality of life after treatment and no significant side effects having been described.[5] Recent research indicated that no immunological alterations were found in the skin of patients with axillary hyperhidrosis treated with botulinum toxin.[12]

SURGICAL PROCEDURES

When clinical options do not offer satisfactory results, a variety of surgical procedures, including thoracic and localized surgery (sympathectomy), can be used.

Sympathectomy

Sympathectomy can be carried out non-surgically, using a phenol or alcohol injection guided by computerized tomography. Surgical intervention can be carried out through open or endoscopic techniques (the latter being more popular). In endoscopic sympathectomy, the sympathetic ganglia are destroyed by excision, ablation or clipping. This modality has been used more frequently to treat palmar hyperhidrosis with high success rates. The main problem associated to sympathectomy for focal hyperhidrosis is the high incidence rate of compensatory sudoresis in other regions of the body (around 88%).[5] Compensatory sudoresis typically starts between 2 and 8 weeks after surgery, frequently in mild form, however, there have been reports of severe cases affecting a great number of patients, and this can greatly reduce the satisfaction indices associated to the procedure. In addition to compensatory hyperhidrosis, complications include paresthesia of the chest wall (approximately 50%), pneumothorax (7%), Horner's syndrome (< 1%), hemothorax (< 1%), and rare cases of cardiac arrest or arrhythmias.[5]

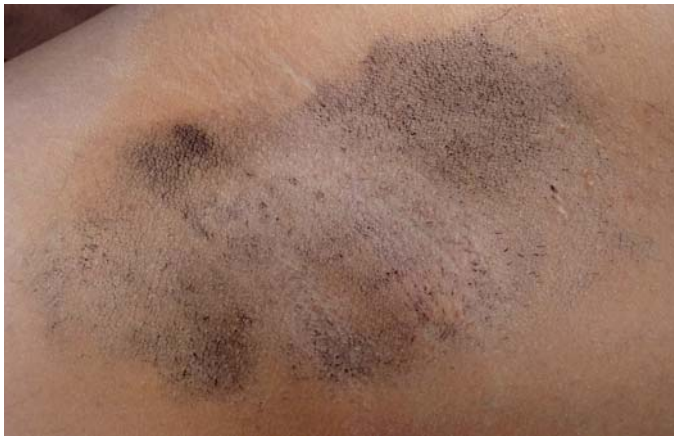

Figure 1: Hyperhidrosis area evidenced by means of the Minor test

The patient satisfaction index is lower when sympathectomy is carried out to treat axillary hyperhidrosis when compared to palmoplantar hyperhidrosis.[13]

Localized surgery

Localized surgery can be used to treat axillary hyperhidrosis and can be carried out under local anesthesia, with or without the systemic administration of an anxiolytic agent. Patients usually undergo delineation of the axillary region by means of the Minor test, and this is followed by the injection of local anesthesia with vasoconstrictor (tumescent or not).[14]

In all techniques, the target is the complete removal of the glandular structures of the subcutaneous tissue and deep dermis.[15] Disadvantages include the potential for scars, partial alopecia, or hyperpigmentation. Ecchymosis, partial alopecia, and pain can occur as self-limiting or short-term effects. With surgeons becoming more experienced and with techniques, medical equipment and technology being developed further, the appeal of using such procedures to treat axillary hyperhidrosis has increased substantially, bringing improved results and resulting in fewer complications.[14]

Some authors suggest classifying localized surgery for axillary hyperhidrosis into three main groups:

Axillary skin and adjacent tissue resection (the most radical type of surgery)

Subcutaneous removal of tissue without excision of the skin (incision to access the subcutaneous glandular tissue only; less invasive) with:

Open curettage, with visualization of the curetted tissue

'Blind' curettage, without direct visualization of the curetted tissue (e.g. liposuction with curettage, ablation with laser through an optical fiber)

Combination of the two methods, resulting in the partial resection of the skin with the combined removal of the subcutaneous tissue and adjacent tissues.[15]

Skin and subcutaneous resection

Since 1963, when the first study recommending elliptic excision was published, many excisional techniques to remove or modify the sweat-producing tissue of the axilla have been described. Success rates have ranged from 50 to 90%. Case reports have shown that excisional surgery, at any depth in the skin, can suffer from complications caused by infection, bleeding, delayed healing, necrosis, poor healing, or cicatricial contracture. Scars and restriction in movement remain the most important complications when using this kind of invasive surgery.[5]

While some authors believe that radical surgery is more effective, others describe minimally invasive techniques (such as liposuction with curettage) as equally good, leading to better aesthetic results and fewer complications.[15]

Removal of subcutaneous tissue without skin excision

If a minimally invasive approach is chosen, there is consensus that the final condition of the axillary skin must be similar

to that of a total skin graft, obtaining maximum removal of the sudoriparous glands.[13,15,16]

The removal of glandular tissue through curettage or ablation can be carried out in a 'blind' manner (i.e. without visual control; e.g. liposuction with curettage) or with visual control – usually with the eversion of the surgical wound borders to allow visualization of the glandular tissue.

Liposuction with curettage

With the aim of reducing the postoperative morbidity associated with excisional techniques, Jemec[17] proposed the subcutaneous curettage of the axillary area. The curettage is carried out under the skin through a small excision, in an attempt to destroy the area's eccrine glandular tissue. Jemec's study describes a high efficacy level, with 17 of 20 patients reaching significant improvement. Since the end of the 1980s, axillary liposuction has been recommended to destroy and remove glandular tissue, with acceptable efficacy and fewer side effects than traditional surgical techniques.[5]

Several studies reported high satisfaction rates when liposuction with curettage was used, usually presenting clinical improvement of hyperhidrosis in at least 80% of patients, with minimal adverse effects, speedy return to daily routine, and resulting in almost undetectable scars.[9,18,19] Although rarely in a complete fashion, hyperhidrosis can recur in some cases.[9] Adverse effects, including ecchymoses, minor local infections, mild cutaneous erosions, loss of axillary hairs, temporary paresthesia, seromas, hematomas, desquamation, and low-intensity postoperative pain, were minimal in all studies.[9,16,18,19]

The efficacy of liposuction with curettage is ratified when the aspirate obtained during surgery is analyzed – when normal or destroyed glands, as well as portions of conjunctive tissue, are found – showing that the procedure is effective in removing the glands, as well as allowing the curettage of the deep dermis.[15]

Studies showed that sharp holes cannulas can be as effective as the incisions made with scissors, with some studies showing that blunt tip cannulas are less effective in axillary hyperhidrosis surgery.[15,16,20,21]

Some authors suggested that manual curettage is carried out after liposuction with curettage, aiming at a more complete removal of the glands,[19] while others concluded that the use of aggressive curettage after liposuction with curettage increased the rate of complications and, when compared to liposuction with isolated curettage, did not optimize the improvement in sudoresis.[22]

Less experienced surgeons must be careful, avoiding curettage's excessive aggressiveness, which can result in cutaneous necrosis. Several end points were described that are likely to indicate when curettage should be stopped. Those end points include: complete elevation of the axillary skin over the subcutaneous adipose tissue, minor lividness of the axillary skin, rolling 'skin to skin' that allows the palpation of hair follicles, and the sound made by suction via the cannula (indicating the complete dissection of adipose tissue and dermis).[16]

While liposuction with curettage shows high rates of sudoresis reduction, with stable results at the 1 year follow-up, patients with milder hyperhidrosis do not present significant improvement when treated with liposuction with curettage.[23]

In cases of therapeutic failure or recurrence after liposuction with curettage, the procedure can be repeated with good probability of improvement and few complications.[16]

Laser ablation of glandular tissue

There are few scientific descriptions of the use of laser in the ablation of axillary glandular tissue when treating hyperhidrosis. In a recent study, 17 patients with axillary hyperhidrosis were treated with 1064 nm Nd-YAG pulsed laser. The laser was introduced into the subcutaneous tissue through a 300 mm optical fiber inserted in the skin through a 18G disposable epidural needle. The tip of the optical fiber extended 2 mm beyond the needle's end tip. Although the procedure is well tolerated and causes little discomfort, preoperative sedation can be carried out. After the injection of anesthetic, one or more incisions are made in the axillary region 3 cm from the treated area, whenever possible. After adequately protecting the eyes of the patient and of the medical team, the needle is inserted through the incisions, creating subcutaneous channels. The needle containing the laser is moved within the tissue in direct contact with the dermis to reach the sudoriparous glands. It is important that the needle is moved slowly (approximately 1–2 cm/s). The treated area usually exceeds the area determined by the Minor test by 3 cm. Treatment duration is short (average: 30 min). Cold compresses or cooled air are applied before, during, and after the procedure to minimize postoperative edema and discomfort, and to reduce the possibility of skin burns. A non-adhesive, non-compressive bandage is left on for 24 h. The postoperative period was well tolerated in all patients, without pain or significant discomfort. Side effects, including edema, small burns and seroma, were limited, mild, and temporary. The patient satisfaction index exceeded 80%.[24]

Combined surgery (partial resection with removal of glandular tissue)

After demarcation of the affected area (for example, using the Minor test), a deep elliptical excision is made in the center of the demarcated area, down to the adipose tissue. The remaining axillary skin delimiting the hyperhidrotic area is detached. The wound's borders are everted and the glandular tissue is removed by ablation, curettage or using surgical scissors. After the procedure, the tissue is sutured both deeply and superficially. In some cases, deep stitches reaching the muscular fascia can be made to better accommodate and anchor the axillary tissue, reducing the risk of seromas and hematomas. Occlusive dressing is left on for 24 h. In 15 patients, a 65% average reduction in sweating with long-term results and minimum adverse effects was obtained when using this technique.[25]

DISCUSSION

A Canadian committee has developed an algorithm that takes into account the severity and location of the disorder. It was recommended that mild axillary hyperhidrosis is initially treated topically with aluminum salts. Botulinum toxin should

be the second-line therapy in cases that do not respond to aluminum salts. In severe cases of axillary hyperhidrosis, botulinum toxin and topical aluminum chloride are first-line therapies, with local axillary surgery being considered after failure of other therapeutic options and before undergoing endoscopic thoracic surgery.[1,11]

With regard to localized surgical methods, combined surgery and liposuction with curettage proved effective, with high patient satisfaction indices and a good safety profile. Compensatory hyperhidrosis did not occur and, in most cases, complications were minimal and transient.[9] Nonetheless, combined surgery presents some disadvantages. Wide and deep excisions need subcutaneous drainage for 1–2 days. Possible risks in the acute postoperative phase are hematoma, seroma, pain, and infection. Atrophic or hypertrophic scars can occur subsequently.[9,26] This is a more invasive method that results in longer hospitalization, higher incidence of local infection, and can result in additional surgery due to complications. However, it has also proved more effective than liposuction with curettage in permanently reducing hyperhidrosis. Nevertheless, ease of execution, the minimum degree of invasion and scar formation, and the good results using liposuction with curettage are the significant advantages of opting for excisional surgery. Therefore, liposuction with curettage has been suggested by several authors as the primary surgical treatment of choice for axillary hyperhidrosis.[9] With regard to laser treatment, in spite of the good results obtained in some studies, there is a lack of more sophisticated studies showing the method's effectiveness and safety profile.

Additionally, localized surgical methods also present good results in the treatment of axillary bromhidrosis – especially when accompanied by hyperhidrosis – justifying t use in these conditions.[23,27] ●

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Case Report

Congenial melanocytic nevus – surgical treatment

Nevo melanocítico congênito - tratamento cirúrgico

Authors:
Ed Wilson Tsuneo Rossoe[1]
Lucia Mensato Rebello Couceiro[2]
Gabriele Spercoski Gonçalves Salles[2]
Antônio José Tebcherani[3]
Tereza Cristina dos Santos[4]

[1] Oncologic Surgery Preceptor, Complexo Hospitalar Padre Bento de Guarulhos (CHPBG) – São Paulo (SP), Brazil
[2] Dermatology Specialist Candidate, Complexo Hospitalar Padre Bento de Guarulhos (CHPBG)
[3] Director, Dermatopathology Laboratory, Complexo Hospitalar Padre Bento de Guarulhos (CHPBG)
[4] Dermatology Fellow, Complexo Hospitalar Padre Bento de Guarulhos (CHPBG)

Correspondence:
Dr. Ed Wilson Tsuneo Rossoe
Rua Visconde de Itaboraí, 471
033080-050 – São Paulo – SP, Brazil
email: esonr@uol.com.br

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ABSTRACT

Giant congenial melanocytic nevi are uncommon lesions that have a higher risk of developing into cutaneous melanomas. When located on the face, they can cause neurological problems, including leptomeningeal melanocytosis and epilepsy. They can also be unattractive. A case of a 17-year-old female patient with congenial melanocytic nevus affecting one-third of the right side of her face is reported. The patient underwent the lesion's resection and reconstruction with a partial skin graft in a single surgery. The objective of this study was to demonstrate a therapeutic proposal for congenial melanocytic nevi located in the periorbicular region.

Keywords: nevus, pigmented; nevi and melanomas; skin; transplantation, autologous

RESUMO

Nevos melanocíticos congênitos gigantes são lesões raras que apresentam risco aumentado de transformação em melanoma cutâneo. Quando localizados na face podem causar deficit neurológicos, incluindo melanocitose leptomeníngea e epilepsia. Implicam risco de comprometimento estético importante. Relata-se caso de paciente do sexo feminino, de 17 anos, com nevo melanocítico congênito acometendo um terço da hemiface direita. Foi submetida à ressecção da lesão e reconstrução com enxerto de pele parcial em um único tempo cirúrgico. O objetivo deste trabalho é demonstrar proposta terapêutica para nevos melanocíticos congênitos localizados em região periorbital.

Palavras-chave: *nevo pigmentado; nevos e melanomas; pele; transplante autólogo*

INTRODUCTION

Congenital melanocytic nevi are present at birth and appears as a dark plaque, with hairs and a verrucose or thick surface. They occur in 1% of newborns.[1,2] Although most melanocytic nevi are small, some reach large sizes. There are several definitions for giant melanocytic nevi (GMN), according to their size and location. Kopf and others suggest an arbitrary dimension for giant nevi of 20 cm; Pilney and colleagues consider a nevus in the face to be giant if it cannot be completely excised and sutured primarily in a single surgery; and Perhs measures it in palms (of the hand).[3]

The exact incidence of melanoma in GMN is unknown, nevertheless it is believed that there is a 4-10% risk of occurrence during an individual's life. [1] Rhodes calculated the risk of melanoma as 16 times greater in patients with GMN than in the general population.[3] Lesions in the head, neck and posterior

middle line, and giant lesions with satellite lesions are at risk of leptomeningeal and neurocutaneous involvement.

Large pigmented facial nevi are unattractive and cause psychosocial difficulties.[3] The purpose of the treatment is the total removal and reconstruction of the lesion, focusing on aesthetics and function.

A number of reconstruction techniques are proposed, such as cutaneous grafts of partial or total thickness, flap rotations, tissular expanders or the use of cultivated autologous skin cells. This study's objective is to describe a surgical treatment for facial GMN, with reconstruction through partial skin graft.

CASE REPORT

A 17-year-old female patient, originally from the city of Barretos, SP – Brazil, presented at the medical visit with a blackened asymmetric plaque, with regular borders, occurring in the right middle third of the face, encircling the periorbital, maxillary and malar regions, and the lower third of the ipsilateral frontal area, measuring 9 cm at its longest axis (Figure 1). The clinical general and neurological examinations did not present alterations.

The patient underwent the total exeresis of the lesion (Figure 2); the reconstruction was conducted using a partial skin graft from the right thigh. The attachment was made with a brown's dressing (Figures 3 and 4). A hypertrophic scar formed during the healing process, which improved after intralesional injections of corticosteroid (40 mg/ml triamcinolone acetonide, injectable suspension). Two 20 mg/ml applications were carried out at an interval of 30 days, combined with the use of a silicone sheet for local compression. Satisfactory results were verified in the post-operative period (Figures 5 and 6). Cosmetic camouflage with tattoo was carried out in the superciliary region.

the histologic examination showed groups of nevus cells without atypias in the dermal-epidermal junction and in the superficial and medium dermis, which characterized a compound melanocytic nevus (Figure 7).

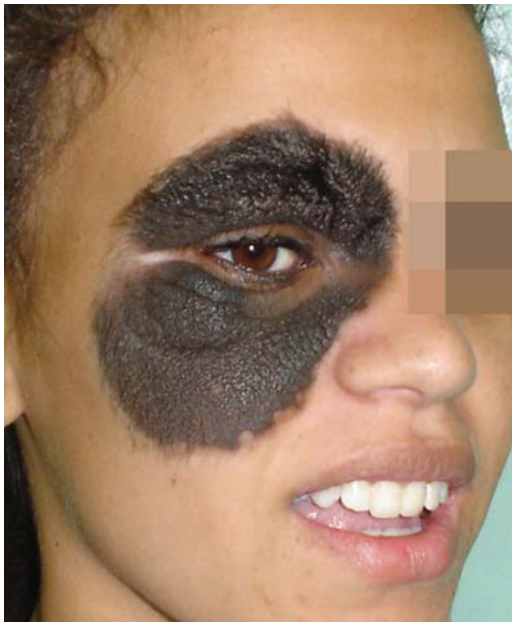

Figure 1- Melanocytic nevus on the right side of the face

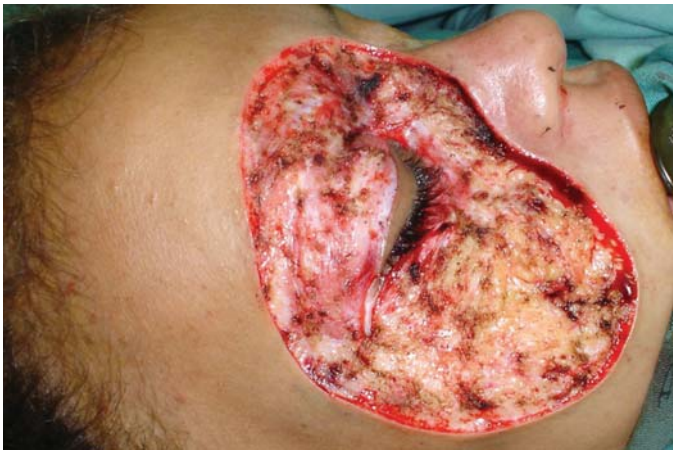

Figure 2 - Surgical exeresis of the nevus

DISCUSSION

In 1832, the magazine *Monograph of Dermatology* published a report of a "waist coat and drawers type nevus." A more accurate description of a GMN was made in 1869, with its malignant potential noted by Jablokoff and Klein ten years later. In 1939, Conway described 40 cases; in 1959, Russel and Reyes reported on 53 cases; and Greeley and others presented 56 cases – of which half involved the face and hand.[4]

Approximately 2% of all melanomas occur in children and teenagers. Due to delayed diagnoses and the tendency towards a greater thickness (> 1.5 mm), melanomas tend to be more aggressive in that age group. One-third of cases originate from congenital melanocytic nevi. Signs suggesting melanoma include nodules, irregularities in the borders and texture, and colorimetric variations. In addition, malignant cells can also originate from dermic melanocytes and subcutaneous tissue, which hampers visual monitoring.[1]

Margulis and colleagues referred to the functional problems, such as ptosis, that periorbital GMN can cause due to the weight they exert on the upper eyelid, ectropion secondary to the exophytic growth in the lower eyelid and chronic irritation of the cornea due to unordered growth of cilia.[5]

There is controversy about when the lesions should be removed. Although the real risk of malignization and what constitutes a dangerously large lesion are not known, many recommend early excision.[3] Arons and colleagues agree with Rhodes that treatment should start when the infants are 10-14 months old.6 Warner and others prefer to start at six months due to the good elasticity of the skin at that age and the increased risk of malignant transformation at the age of three.[1]

Several therapeutic procedures, such as topical application of nitric acid, phenol, cryotherapy, electrodissection, irradiation, dermabrasion and, more recently, laser have been proposed. The great disadvantage of those treatments is that histological evaluation of the lesion is impossible.

Margulis and colleagues treated 44 patients with palpebral

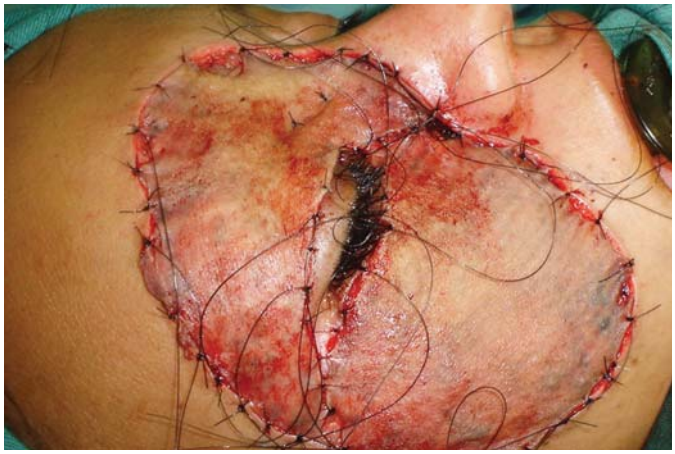

Figure 3 - Grafting

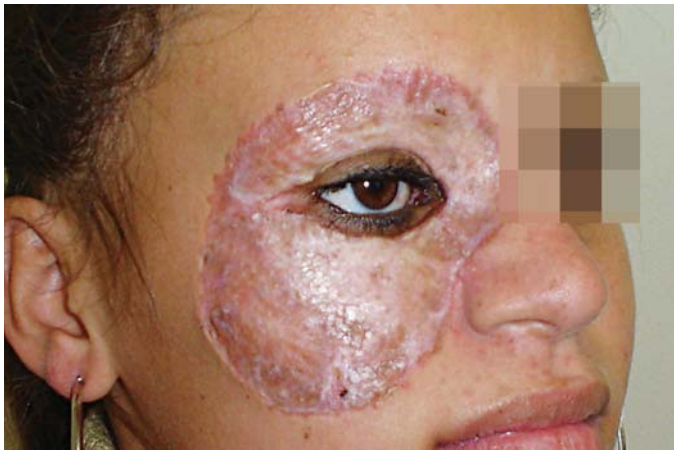

Figure 5 - Two months after the procedure

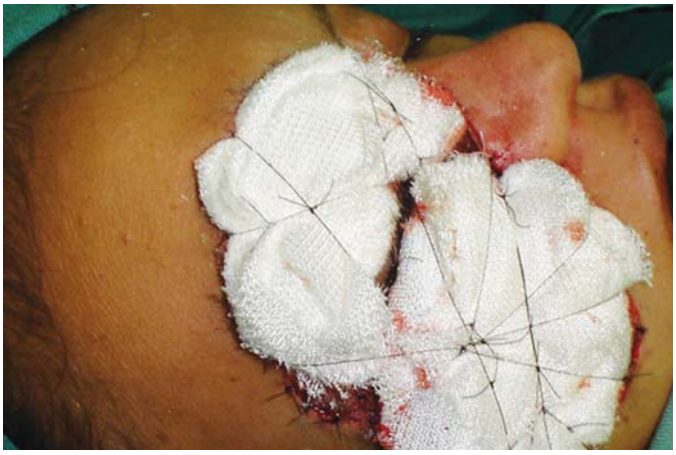

Figure 4 – Brown's dressing

and periorbital lesions using full thickness expanded grafts from the supraclavicular region as the first choice for larger nevi and reconstruction of adjacent tissue after six months, in order to avoid the distortion of the palpebral canthi and cicatricial ectropion due to the retraction of the grafts.[5] In their surgical algorithm for complex facial nevi, Gur and Zuker used z-plasty in two cases and serial reconstruction (including tissular expansion, flaps, grafts and serial excisions) in 11 cases. The larger periorbital lesions were grafted with total thickness retroauricular skin.[3] In addition to the combination of tissular expansion and graft, Warner and others used cultivated autologous cutaneous cells, which provides cosmetic results, malleability and durability comparable to those of grafts, reducing the donor area's morbidity.[1]

Flaps and cutaneous grafts are the main surgical procedures for tissular repair. Flaps can be defined as transfers of tissues connected to a vascular pedicle, and can be local (to cover an area close to that of the tissular loss) or from a distance (to cover non-adjacent areas, transferred in a free or indirect manner, with tubular flaps). Local flaps have the advantage of presenting practically the same characteristics as the defective skin; they are not always accepted in the face, however, due to the physiognomic alterations that they can cause.[7] Grafts are skin sections that are completely detached from the original area, without a pedicle, and transferred to the area to be repaired. They are classified as partial or total grafts according to the thickness of the dermis, and can be thin (0.15-0.30 mm), intermediate (0.30-0.45 mm) or thick (0.45-0.60 mm). Those of total thickness are thicker than 0.60 mm.[7] Intermediate grafts are recommended for facial lesions more than 3 cm in diameter. The lateral and medial face of the thigh, the forearm and gluteus are donor sites.

The grafts are removed with Blair's blades or electric or pneumatic dermatomes. After the fixation of the graft, the application of a compression bandage is recommended to promote direct contact with the bed's vasculature, and to almost completely immobilize the area.[7] The graft's integration process takes between five and seven days, when the vascularization is complete; the retraction and subsequent distention takes one to two

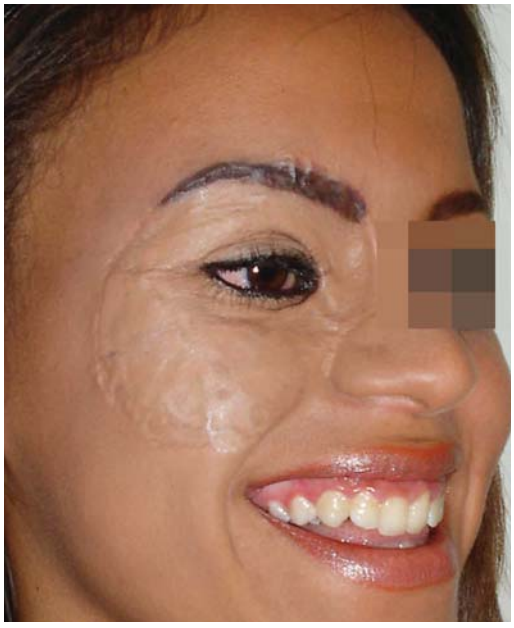

Figure 6 – Seven months after the procedure

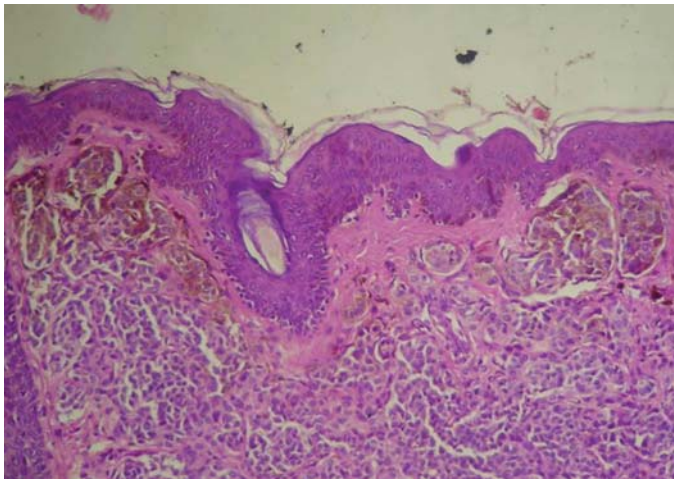

Figure 7 - histological samples of skin showing agglomerations of nevus cells in the dermis without atypias

months. Reinnervation, as well as color modifications, take place in the final phase.[7] Late complications described are ectropion (in 6% of cases) and unattractive scars (in 16.7% of cases).[3]

In conclusion, the surgical treatment of periorbital region congenital melanocytic nevi reduces the probability of malignization and reverses the stigma associated with the aesthetic deformity. Skin grafts constitute an excellent reconstructive method following the resection of the GMN. ●

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Case Report

Vulvar granular cell tumor (Abrikossoff's tumor) – Case report

Tumor de células granulosas (tumor de Abrikossoff) vulvar – Relato de caso

Autores:
Jefferson Alfredo de Barros[1]
Daniela Presente Taniguchi[2]
Marcos Antônio Rodrigues Martinez[3]
Carlos D' Apparecida Santos M. Filho[4]
Mônica Chmeliauskas Moya[5]
Antônio José Tebcherani[6]
Julizia Foloni Silva[7]

[1] Teaching Assistant, Dermatology, Faculdade de Medicina do ABC (FMABC)
[2] Regent, Dermatology Department, Faculdade de Medicina do ABC (FMABC)
[3] Resident Physician, Dermatology, Faculdade de Medicina do ABC (FMABC)
[4] Instructor, Pathology, Faculdade de Medicina do ABC (FMABC)
[5] Resident Physician, Pathology, Faculdade de Medicina do ABC (FMABC)

Correspondence:
Dr. Jefferson Alfredo of Barros
Rua das Figueiras, 1601 – Campestre
09080 371 - Santo André – SP, Brazil
Tel / Fax: +55 (11) 4991 5858
E-mail: jeffersonderma@uol.com.br

ABSTRACT

Introduction: The granular cell tumor was first described by Abrikossoff in 1926. It is a benign, uncommon neoplasia, most frequently found on the tongue. It occurs in the vulva in 5 to 6% of cases. Its histogenesis is not known for sure, but is probably linked to Schawann cells. It is treated surgically, with a good prognosis. The tumors may recur, and some may become malignant according to the literature. The authors describe a case of a vulvar nodule with a histopathologic diagnosis of granular cell tumor, which was successfully treated with surgery.

Keywords: vulva; vulvar diseases; vulvar neoplasms, granular cell tumor.

RESUMO

Introdução: *O tumor de células granulosas foi descrito por Abrikossoff em 1926. Trata-se de neoplasia benigna, incomum, observada mais frequentemente na língua e, em percentual de cinco a 6% dos casos, na vulva. Sua histogênese é incerta, provavelmente ligada às células de Schwann. O tratamento é cirúrgico, com bom prognóstico. Podem ocorrer recidivas, e existem descrições na literatura de malignidade. Os autores relatam caso de paciente com nódulo na vulva com diagnóstico histopatológico de tumor de células granulosas, tratado cirurgicamente com sucesso.*

Palavras-chave: *vulva; doenças da vulva; neoplasias vulvares, tumor de células granulares.*

INTRODUCTION

A granular cell tumor was first described by Abrikossoff in 1926, in a patient with a lesion on the tongue.[1] It is a neoplasia of uncertain histogenesis, probably linked to Schwann cells, with a typical histological appearance, presenting polygonal cells with the characteristic granular cytoplasm.[2,3] The most frequent site is the tongue, but they can occur in the oral mucous membrane, gastrointestinal tract, biliary tract, musculoskeletal system, salivary glands, breasts, prostate, pituitary gland and, with lower frequency, in the vulvar 4 and clitoridian 2 region. Granular cell tumors affect more blacks, prevailing in women aged 20 to 50.[3,4]

They usually appear as a single, asymptomatic or painful nodule, with a color that varies from brownish to red, or covered by normal skin. Cases with multiple lesions have been reported.[4]

The recommended treatment is the surgical exeresis of the lesion. The prognosis is usually good, with cases of recurrence probably correlated to the incomplete removal of the tumor. These tumors rarely become malignant.[2] The authors report a case of Abrikossoff tumor (granular cell tumor) with uncommon features in the vulva, which was treated surgically without

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reincidence after 36 months.

CASE REPORT

A 48-year-old black female patient, originally from Santo André, São Paulo, Brazil was referred to the Gynaecology Service presenting a brownish, painless nodule approximately 2 cm in diameter. The nodule was movable in relation to deeper planes, as it was located in the left labium majus, close to the clitoris (Figure 1). A biopsy was carried out using a 3 mm dermatologic punch, with a histopathologic diagnosis of granular cell tumor (Abrikossoff tumor).

The excision and suture of the lesion was carried out under infiltrative local anesthesia (lidocaine chlorhydrate with norepinephrine 1:50,000). The macroscopic analysis of the excised tissue showed a whitish proliferation of poorly defined margins (Figure 2). The histopathologic examination, carried out using hematoxylin-eosin (HE) staining, revealed an epidermis with pseudoepitheliomatous hyperplasia, both in the superficial and deep dermis, and cellular proliferation with the appearance of small blocks, permeated by thin bands of dense conjunctive tissue (Figure 3). The proliferated cells present wide cytoplasm containing thin, PAS-positive granulation. The nuclei were centered and without atypias. The immunohistochemistry was positive for S-100 and enolase, both with a cytoplasmic pattern. Results were negative for CEA and HMB-45. There was no recurrence in the follow-up period of 36 months after surgery (Figure 4).

DISCUSSION

Granular cell tumors, also known as Abrikossoff tumors or granular cell myoblastomas, are uncommon and are found in several sites, most frequently on the tongue. They can occur on the vulva, mainly in the labia majora.[5] Only 5-6% of the cases reviewed in the medical literature occurred in the vulvar region.[6]

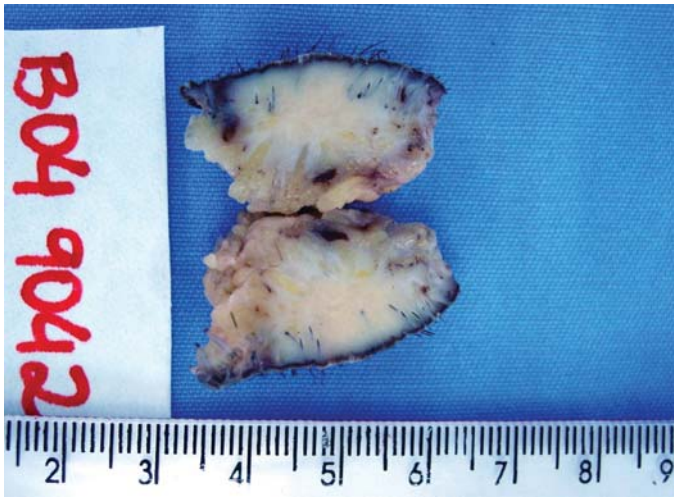

Figure 2 - Macroscopic examination showing a whitish tumor with a poorly defined margin

The histogenesis of granular cell tumors is uncertain. It is believed that the tumors are caused by alterations in the cellular metabolism of Schwann cells – a hypothesis that is reinforced by the constant presence of the S-100 protein in the immunohistochemistry, which appears with cytoplasmic pattern positivity, 3 which has also occurred in the present case.

Microscopically, polygonal cells with small nuclei and cytoplasms are observed, which contain abundant eosinophilic granular substance. Other neoplasias, such as angiosarcoma, leiomyoma, dermatofibrosarcoma protuberans and basal cell carcinoma, can also present granular cytoplasm, however they present other histological and immunohistochemical characteristics that distinguish them from Abrikossoff tumors.[2]

Granular cell tumors clinically present as an asymptomatic nodule, painful or slightly pruriginous, normochromic, brownish or erythematous hyperchromic, varying from 0.5-3.0 cm in

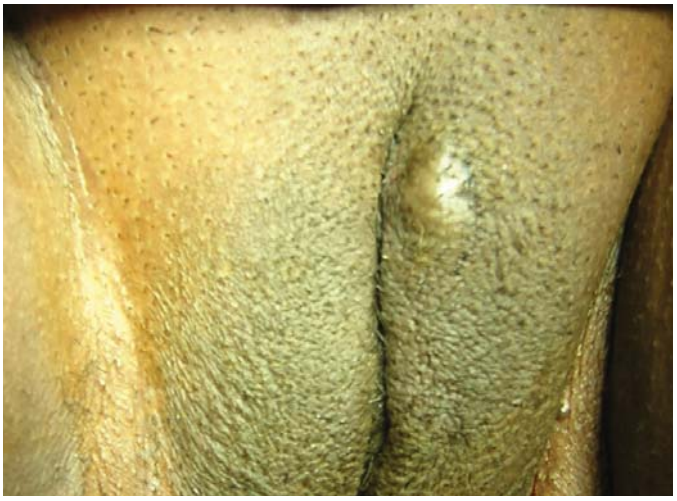

Figure 1 - Left labium majus: presence of brownish nodule approximately 2 cm in diameter

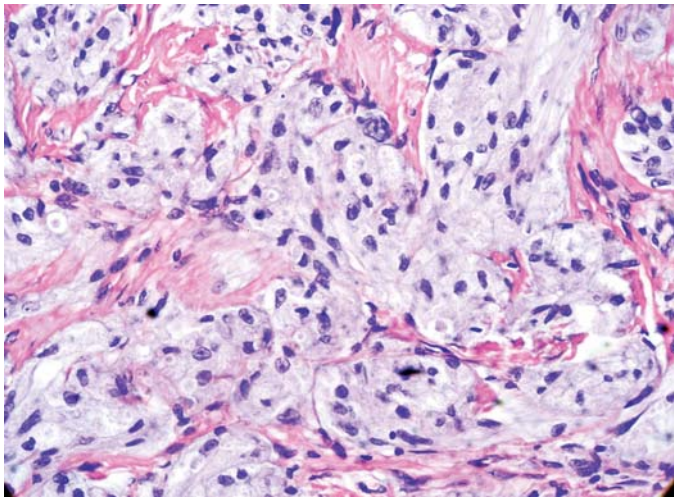

Figure 3 - Hematoxylin-eosin staining: cell proliferation, with granular cytoplasm arranged in blocks, permeated by collagen bars (200x)

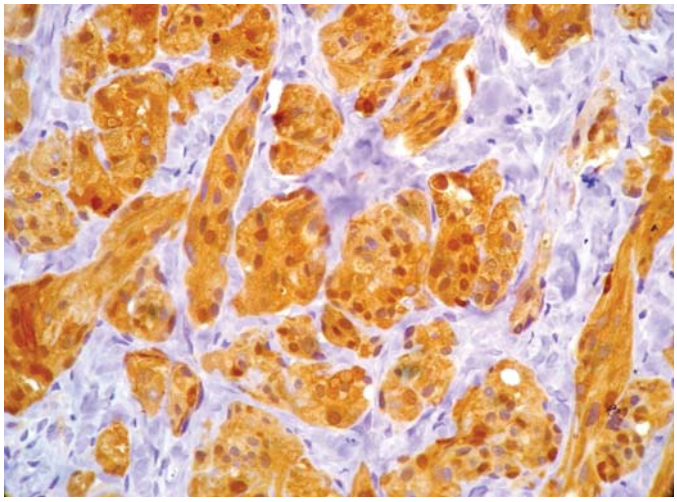

Figure 4 - S-100 immunoperoxidase. Positive reaction (brown), cytoplasmic pattern

diameter.[7] The differential diagnosis in the vulvar case includes Bartholin gland cysts, lipoma, papilloma, hidradenoma and fibroma.[8] Malignant transformation can occur in 1-2% of cases.[9]

Clinical diagnosis is very difficult, especially in the vulvar region, due to the rarity of this lesion and its capacity to mimic other pathologies that are more frequently found in that location; in general, it requires a histological diagnosis.

The recommended treatment is the surgical exeresis of the lesion. Local recurrence of the lesion can occur in 15% of cases if the excision is incomplete.[10] In the present case, the lesion was completely removed, without recurrence after 36 months of follow-up.●

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New techniques

Correction of transverse overcurvature of the nail using autologous dermal graft

Correção de hipercurvatura transversa da unha utilizando enxerto de derme autóloga

Autores:
Glaysson Tassara Tavares[1]
Nilton Di Chiacchio[2]
Walter Refkalefsky Loureiro[3]
Nilton Gioia Di Chiacchio[4]
Diego Leonardo Bet[4]

[1] Permanent Assistant Physician, Dermatology Clinic, Santa Casa de Misericórdia de Belo Horizonte – Belo Horizonte (MG), Brazil; and Instructor, Faculdade de Ciências Médicas de Minas Gerais (FCMMG) – Belo Horizonte (MG), Brazil
[2] Head, Dermatology Department, Hospital do Servidor Público Municipal de São Paulo – São Paulo (SP), Brazil
[3] Volunteer Physician, Dermatology Department, Hospital do Servidor Público Municipal de São Paulo
[4] Resident Physician, Dermatology Department, Universidade de Taubaté (UNITAU) – Taubaté(SP), Brazil

ABSTRACT

Introduction: Transverse overcurvature is a common inaesthetic and painful deformity of the nail plate. There are several conservative and surgical techniques for treating this condition. We describe a simple and cost effective technique using autologous dermal grafts.

Keywords: nail diseases; nails; nails, malformed; nails, ingrown; ambulatory surgical procedures.

RESUMO

Introdução: *A curvatura transversa é uma deformidade inestética comum da lâmina ungueal. Existem várias técnicas, conservadoras e cirúrgicas, empregadas no tratamento dessa condição. O presente estudo descreve uma técnica simples e de baixo custo, que emprega enxertos dérmicos autólogos.*

Palavras-chave: *doenças da unha; unhas; unhas mal formadas; unhas encravadas; procedimentos cirúrgicos ambulatoriais.*

Correspondence:
Dr. Glaysson Tassara Tavares
Av. do Contorno, 9636, 1208
30110 068 - B. Horizonte – MG, Brazil
E-mail: gtassara@terra.com.br

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INTRODUCTION

Transverse over-curvature of the nail can be classified into 3 types: pincer nail, tile nail and folded nail.[1,2] Although the etiology is uncertain, it has been attributed to conditions such as tumors, psoriasis, exostosis and others.[3,4] Although the big toe is frequently affected, this deformity can occur in other digits.[5] The curvature increases distally, pinching the soft tissue beneath the nail plate, causing severe pain and sometimes secondary infection. Treatment is recommended if the patient has pain, inflammation, difficulty wearing shoes or cosmetic complaints. This condition usually affects a patient's daily activities and quality of life.[4]

Several surgical treatments have been reported, but until now there has not been a universally accepted technique.[4] Zook suggested placing dermal grafts under the lateral nail beds between the paronychial fold and the phalanx to flatten the nail bed. Removal of hypertrophy of lateral and distal nail folds using Howard-Dubois s technique or U shape techniques[6] are described as a surgical correction, especially when an osteophyte of the distal phalanx is removed and the nail bed must be flattened. This article describes a procedure that combines both of these techniques to flatten and widen the nail bed and correct

the dense adherence of the nail bed to the periosteum, in order to prevent a reattachment of the nail bed to the distal phalanx and preserve the nail matrix.

METHODS

The nail plate is removed after a distal block anesthesia and the placement of a tourniquet (Figures 1 and 2). An elliptical wedge of soft tissue, approximately 5 mm wide, is excised within the distal lateral wall and removed down to the bone, as in Howard-Dubois s technique. The dermal graft is performed after the epidermis and fat tissues have been removed using scissors. The graft is then divided into two fragments of about 15 mm each (Figure 3). The lateral paronychial attachments to the bone are longitudinally freed with a blunt spatula, creating a tunnel from the open wound to the matrix on both sides (Figure 4). The dermal grafts are placed inside these tunnels to flatten the nail bed, as in Zook's technique. Finally the incision is closed with mononylon 4-0 (Figure 5). After the procedure, analgesics are prescribed and the suture stitches are removed after 7 to 14 days.

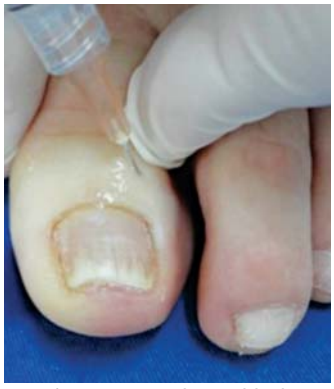

Figure 1 - Distal wing block anesthesia

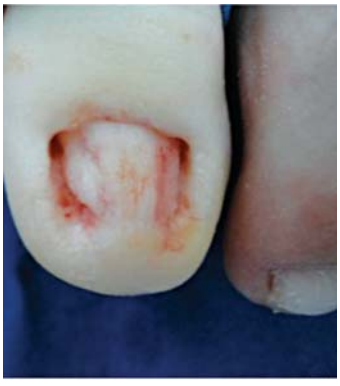

Figure 2 - Exposed nail bed

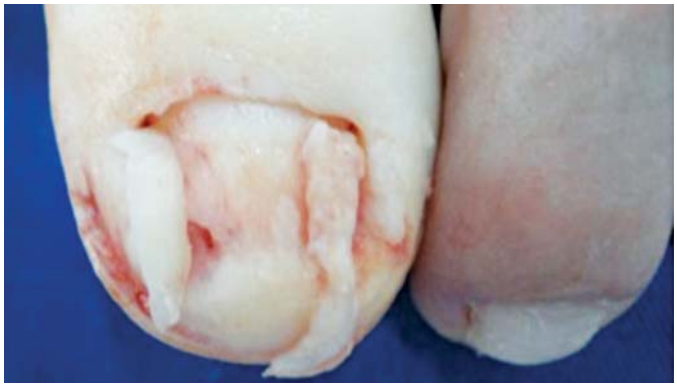

Figure 3 - Dermal grafts

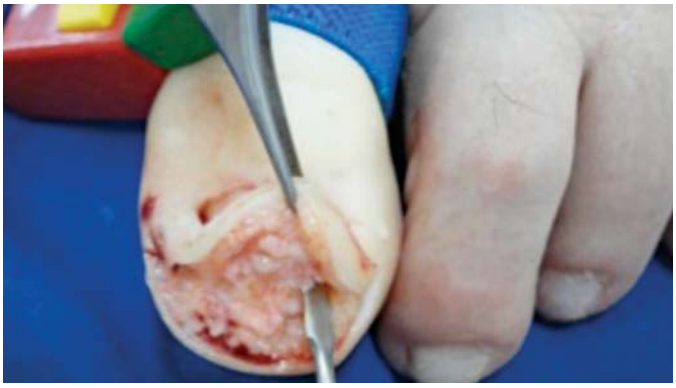

Figure 4 - Creation of the tunnels

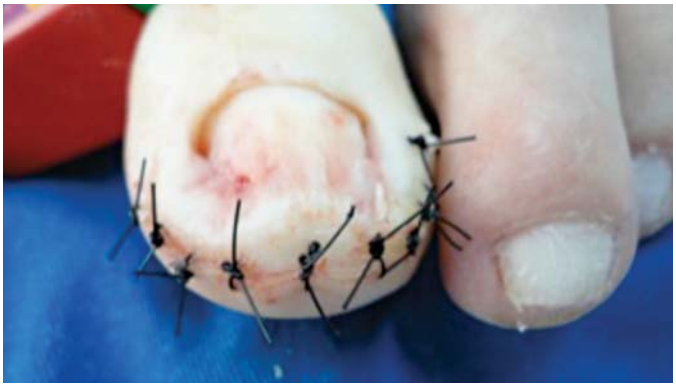

Figure 5 - Closure after graft insertion

RESULTS

Immediately after the procedure it is possible to note the flattened nail bed due to the elevation of the nail matrix in the places where the grafts were placed. The pain is light to moderate in the first days, being more intense when there is necessity of osseous rectification. The use of closed shoes is allowed after approximately 4 weeks, with clear improvement of the pain when walking, as compared to the period before the procedure. The new nail grows with a flattened plate and an elongated bed, with excellent esthetical and functional results. (Figures 6 and 7).

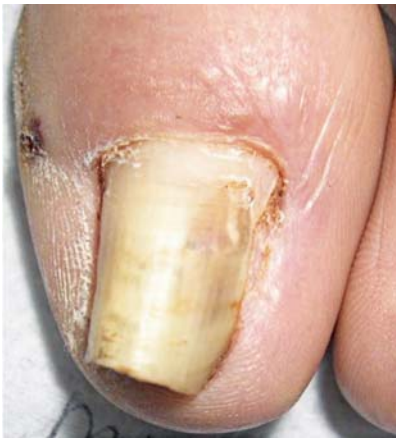

Figure 6 - Transverse over-curvature of the nail before the procedure

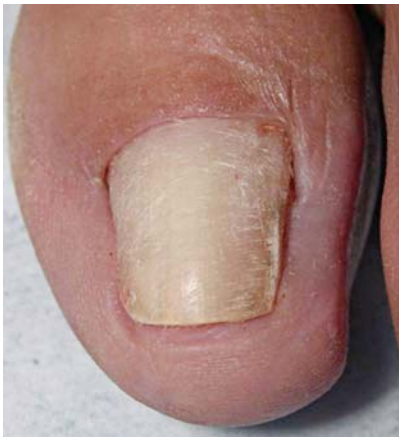

Figure 7 - Same patient after correction with dermal grafts

DISCUSSION/CONCLUSION

The transverse over-curvature of the nail is a nail apparatus alteration considerable prevalent in the population, leading to esthetical and functional problems. A number of correction techniques are described in the literature. The present method is aimed at combining two diverse techniques by excising the hallux's hypertrophy (according to the Howard-Dubois technique), using that material as a dermal graft (according to the Zook's technique), rather than discarding it. With the synergy generated from the combined techniques, this procedure takes less time, less anesthesia and avoids an unattractive scar in the donor area for the dermal graft. ●

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Reconstruction of the ear using silicone fiber

Reconstrução de defeito condrocutâneo auricular usando fibra de silicone

Authors:
Ivander Bastazini Júnior[1]
Ana Luiza Grizzo Peres Martins[2]

[1] Head Preceptor, Dermatologic Surgery, Instituto Lauro de Souza Lima – São Paulo (SP), Brazil
[2] Resident Physician, Instituto Lauro de Souza Lima

Correspondence:
Dr. Ivander Bastazini Júnior
R. Guilherme of Almeida, 649 – Bauru
17044-430 – São Paulo, SP, Brazil
E-mail: bastazinijr@hotmail.com

ABSTRACT

Reconstructions of the auricular pavilion are complex, especially when there is a loss of cartilaginous support. A case of chondrocutaneous defect reconstruction, after the exeresis of a basal cell carcinoma in the upper third of the auricular pavilion, is reported. Silicone fiber was used to model and provide support for the ear. The technique of using cartilage or compound grafts in the auricular pavilion is described.

Keywords: ear cartilage; surgery, plastic; ear derformities, acquired; ear; prostheses and implants.

RESUMO

Reconstruções do pavilhão auricular são complexas, principalmente quando há perda do suporte cartilaginoso. Relata-se caso de correção de defeito condrocutâneo após exérese de carcinoma basocelular no terço superior do pavilhão auricular, utilizando fibra de silicone com o objetivo de moldagem e sustentação da orelha. Demonstra-se opção do uso de enxertos de cartilagem ou compostos no pavilhão auricular.

Palavras-chave: *cartilagem da orelha; cirurgia plástica; deformidades adquiridas da orelha; orelha; próteses e implantes.*

INTRODUCTION

Auricular pavilion reconstructions are complex due to the anatomic peculiarity of the region. Congenital and acquired deformations have stimulated the development of new techniques for centuries. Due to the risks and complexity of performing cartilaginous grafts, auricular molds made of synthetic materials (silicone, polyethylene, nylon mesh and Teflon, among others) were used in the 1960s and 1970s.[1] We report a case in which silicone fiber, often used in orthopedic surgeries, was used to mold and temporarily support the upper third of the ear.

METHODS

A 68-year-old healthy female patient presented with a 1.5 cm lesion, infiltrated and adhered to the cartilaginous plan in the upper third of the left helix, which was diagnosed as a basal cell carcinoma (Figure 1). The exeresis of the lesion and corresponding cartilaginous structure was able to preserve only the posterior face of the auricular pavilion (Figure 2) – which lost its support completely. Due to the size of the defect, and with the goal of preserving the original curvature and creating support for the reconstruction, a decision was made to use the type of flexible silicone fiber that is used in orthopedic surgeries. (Oval tendon spacer, Medicone, Cachoeirinha – RS, Brazil) (Figure 3). After implanting the silicone fiber up to the edge of

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Financial support: none

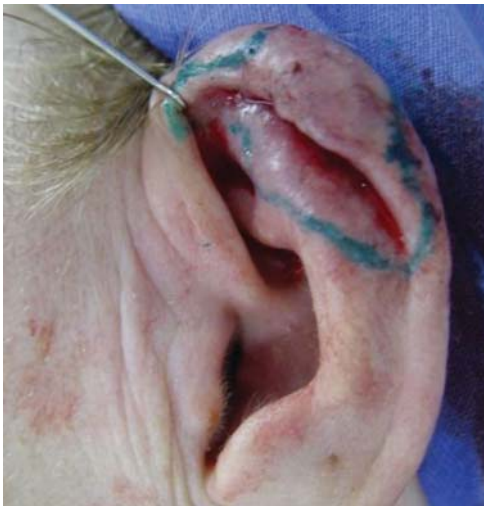

Figure 1 - Before the procedure

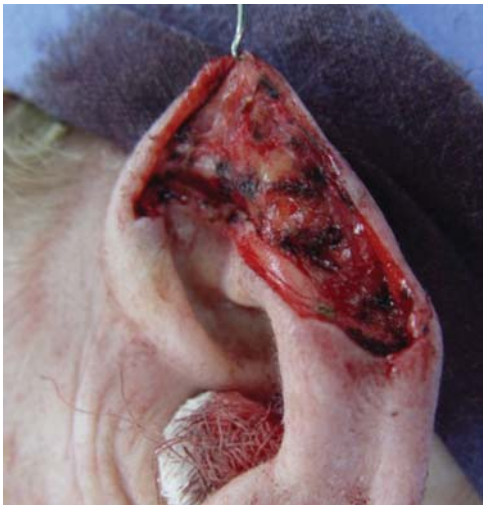

Figure 2 - Intraoperative period after the removal of the cartilage of the upper third of the ear

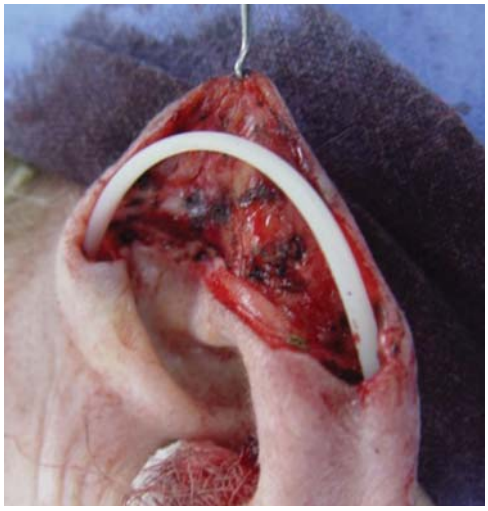

Figure 3 - Adaptation of the silicone fiber

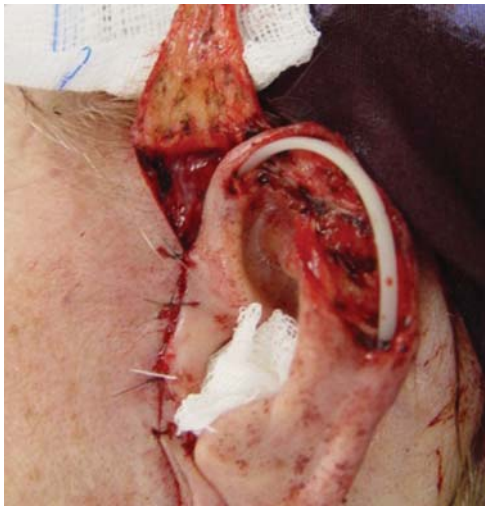

Figure 4 - Preauricular transposition flap

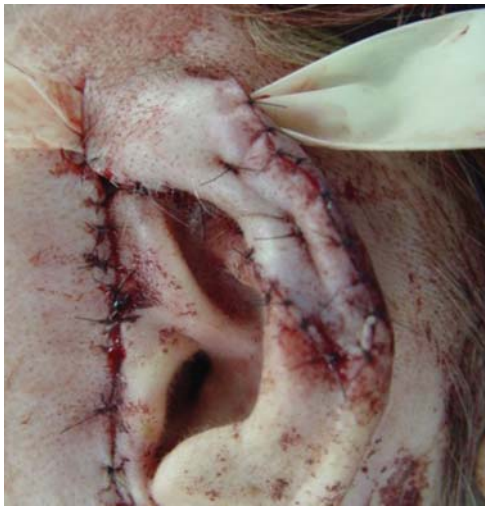

Figure 5 - Before the second surgery and dehiscence with exposure of the implant

the surgical defect, the area was covered again with a wide transposition flap originating from the preauricular region (Figures 4 and 5). The separation of the flap took place in a second surgery, four weeks later, when the wound opened and the implant became visible (Figures 6 and 7). An infection developed at the site of the dehiscence, which did not respond to topical or systemic antibiotic therapy. The proximal portion of the fiber extruded and was removed after eight weeks; the infection healed and the aesthetic results were satisfactory (Figure 8).

DISCUSSION

Defects in the auricular pavilion can be classified according to their location (upper, middle and lower third) and thickness: total (loss of the cartilage) or partial (only the skin).[1] A great number of reconstruction techniques have been described in the literature, with appropriate grafts or flaps for each area, which yield good aesthetic results.[1,2]

Small chondrocutaneous defects can be resolved with direct suture,[1,3] however large total thickness defects are difficult to repair due to a lack of cartilaginous support. When the pavilion's contour is not affected, healing by second intention for small lesions or a simple graft for larger lesions ensure excellent reconstruction results.[2] In cases where the outer support is affected, complex techniques involving compound or cartilage grafts (costal, ipsi or contralateral auricular pavilion covered by

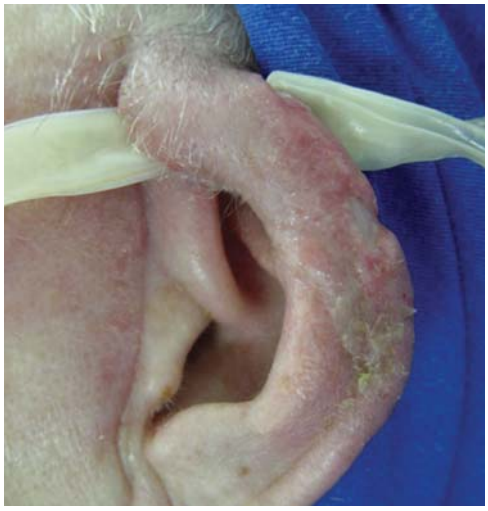

Figure 6 - Immediately after surgery

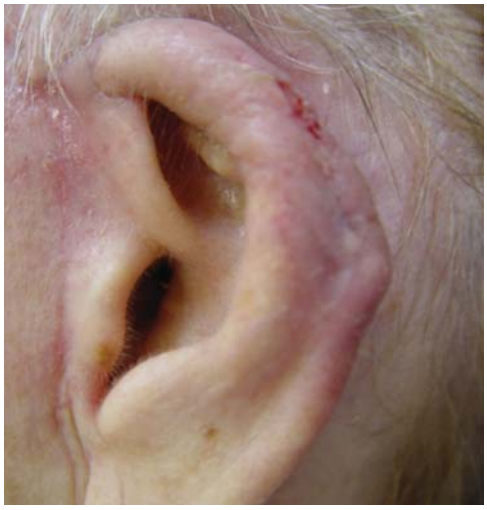

Figure 7 - Late post-operative period with infection

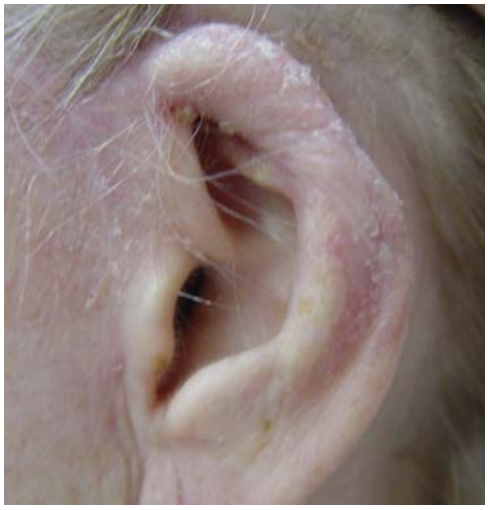

Figure 8 - Late post-operative period after removing the fiber, with the resolution of the infection

local flaps, are necessary. Compound grafts taken from the opposite ear are useful for defects of up to 1.5 cm. However, the risks of necrosis of the graft and sequela in the donor ear reduce their acceptance and applicability.[1,2] The costal cartilage was initially used for the reconstruction of congenital deformations of the auricular pavilion,[1] supplying cartilage pieces that must be molded as required. The techniques for obtaining it demand experience on the part of the surgeon, and complications, such as chronic residual pain and pneumothorax, can occur.[1,3]

Auricular cartilage from the opposite ear is currently the most frequently used in reconstructions of acquired lesions of total thickness, for it allows a more delicate and flexible support, in addition to a more straightforward removal and a minor residual scar.[1,2]

In an attempt to avoid wide incisions in both ears, and based on recent reports in the literature,[3] a decision was made to use the thin and flexible silicone fiber that is used in tendon reconstructions in hand surgeries.[4] That material generates little inflammatory response and helped support and maintain the auricular pavilion's shape, making it possible to cover the whole defect and the fiber with a preauricular transposition flap, resulting in a very satisfactory aesthetic result.

The main risks associated with the use of synthetic materials are infection and the extrusion of the product [1,2] – which have historically discouraged their use.[1] In this case, these events occurred two months after the procedure, probably due to the dehiscence that occurred in the flap's suture. After that period, even with the removal of the implant, the fibrosis generated in the healing site of the flap on the posterior face of the ear was enough to maintain the support and shape of the auricular pavilion. This technique is a viable alternative to the use of cartilage or compound grafts in the auricular pavilion. ●

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New techniques

Correction of unaesthetic hair transplantation

Correção de transplante capilar inestético

Authors:
Renata Indelicato Zac[1]
José Rogério Régis[2]
Patrícia Jannuzzi Vieira e Oliveira[3]
Daniela Rezende Neves[4]
Kleber de Sousa Silveira[5]

[1] Dermatologist Physician, Belo Horizonte (MG), Brazil
[2] Dermatology Preceptor, Santa Casa de Belo Horizonte - Belo Horizonte (MG), Brazil
[3] Dermatologist Physician, Belo Horizonte (MG), Brazil.
[4] Dermatologist Physician, Belo Horizonte (MG), Brazil.
[5] Dermatologist Physician, Belo Horizonte (MG), Brazil.

Correspondence:
Dra. Renata Indelicato Zac
Av. Brasil 673 / Sala 207 – Funcionários
30310-010 – Belo Horizonte, MG, Brazil
E-mail: dra.renatazac@gmail.com

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ABSTRACT

When outdated techniques and large skin grafts are used in hair transplants, the results are unattractive and disfiguring. More recently, natural looking results have been achieved by transplanting follicular units. The correct shape and implantation level in the hairline contribute to a natural appearance. Correction methods include: camouflage with follicular units, removal of transplanted hairs and suture, reduction of the scalp, correction of scars, and laser therapy. In this article, the combination of different surgical techniques and laser epilation are described with satisfactory results in the correction of hair transplants.
Keywords: hair; transplantation; lasers.

RESUMO

Transplantes capilares utilizando técnicas ultrapassadas e enxertos grandes resultam em aparência inestética e desfigurante. A naturalidade dos resultados foi conseguida mais recentemente com o transplante de unidades foliculares (UF). Contribuem para a naturalidade o desenho correto e o nível de implantação da linha frontal. Os métodos de correção incluem: camuflagem com unidades foliculares; remoção de cabelos transplantados e sutura; redução do couro cabeludo, correção da cicatriz e laserterapia. Descreve-se associação de técnicas cirúrgicas diversas e epilação por laser com resultados satisfatórios para correção de transplantes capilares.
Palavras-chave: *cabelo; transplante; lasers.*

INTRODUCTION

Hair transplants attempt to restore the natural look of the hair. An important aspect of hair restoration involves the correction of previous transplants that were carried out using outdated methods, which led to disfiguring results.[1] In the past, transplants were carried out using 3-4 mm grafts containing up to 25 hairs, which created an artificial appearance.

In the 1990s, a new method that transplanted follicular units (FU) was developed.[2] Since then, several advances in the technique have contributed to ever more natural results. FUs correspond to the anatomical clustering of hairs and contain

from one to four terminal hairs, in addition to vellus hairs, the erector muscle of the hair, and a sebaceous gland.

In addition to the use of FUs, another decisive factor for natural results is the correct demarcation of the transplant's hairline which must be compatible with the patient's gender, ethnicity and age. Rather than adhering to rigid rules, creating the new hairline requires the surgeon to have an artistic sensibility.

In men, the implantation level of hairs in the hairline varies according to the individual, usually located in the transition of the vertical forehead to the horizontal scalp. The frontotemporal recessions must remain positioned in the sagittal line passing through the outer corner of the eyes. The FUs of a thread of hair are positioned more anteriorly with similar angulation, however they are intentionally distributed irregularly in order to recreate the natural pattern.

Unfavorable transplant results are classified into three categories: technical mistakes, poor planning and complications.3,4 Correction methods include: 1) anterior camouflage with FUs; 2) removal with or without redistribution of transplanted hairs and suture of the defect; 3) reduction of the scalp; and 4) correction of the scar. In special situations, the removal of hairs can be carried out using laser, which can also improve the scar's appearance.[1,4,5]

CASE REPORT

A 35-year-old male patient had two sessions of hair transplant at another medical service in January and July 2005. Grafts of six to 12 threads each had been implanted, in diverse directions (some inverted causing inclusion cysts); and almost all in low hairline. Unsatisfied with the result (Figure 1), the patient sought the medical service where the authors work. He was using 1 mg/day finasteride and 5% minoxidil, denying comorbidities.

METHODS

The first corrective surgery was conducted in November 2005, when the larger and poorly positioned grafts were removed with punches of 2-3 mm, followed by sutures with mono nylon 6-0 thread. Among the fragments removed with the punches, the FUs were reimplanted in the same surgery more posteriorly in the front region and were separated with the assistance of a stereomicroscope. The inclusion cysts were extirpated.

The epilation was started one month later with 800 nm diode laser in areas that had smaller grafts with varied angulation and transfixed follicles. Four sessions at one-month intervals were carried out (Figure 2).

In March 2006, a transplant of about 1,450 FUs was carried out in the frontal region. The 25 x 1 cm donor area at the back of the head included the old scar (Figure 3). A second transplant was conducted in July 2007, using approximately

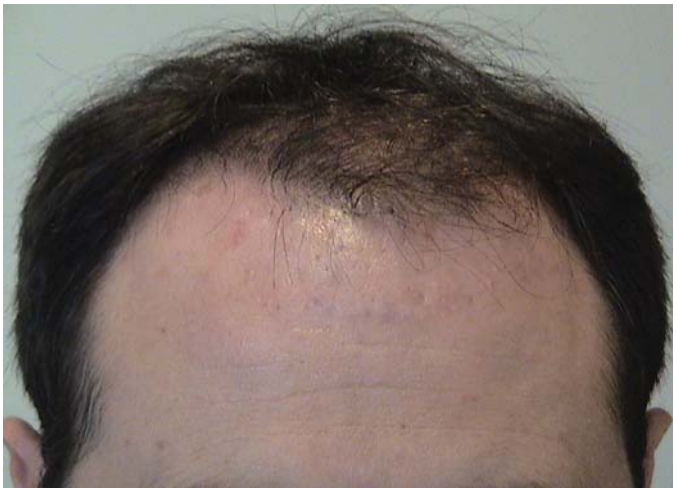

Figure 2: Frontal view after exeresis of poorly positioned frontal punches and 4 laser sessions

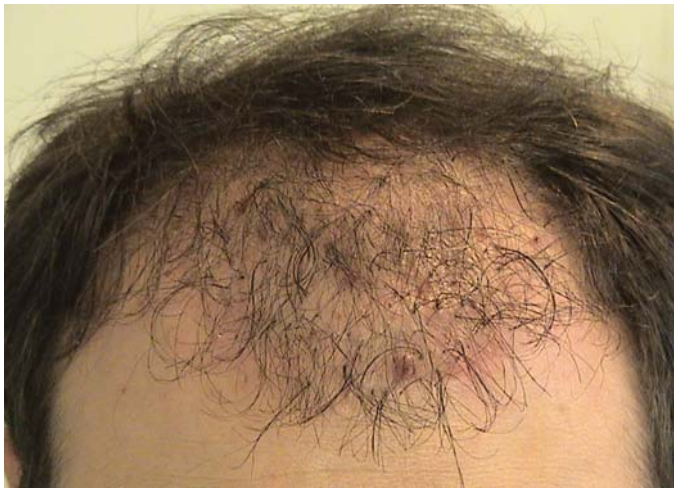

Figure 1: Frontal view in the initial consultation

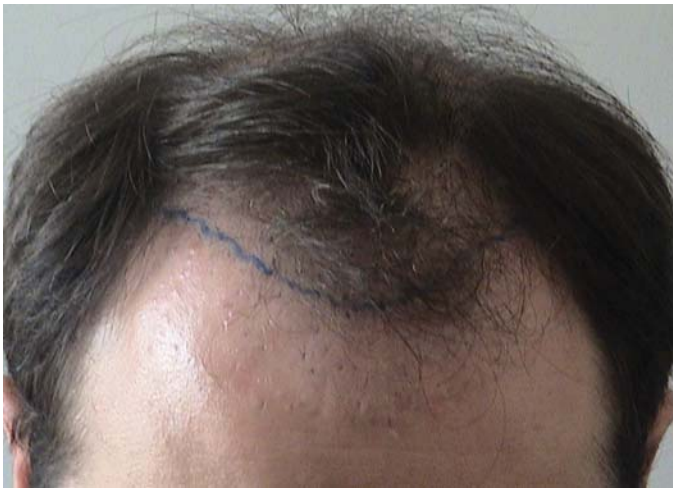

Figure 3: Frontal view before FU transplant

1,300 FUs harvested from the back of the head, in the upper parietal region and anterior periphery of the vertex (Figures 4 and 5).

RESULTS

The treatment was concluded with periodic 800 nm diode laser epilation sessions (four sessions with monthly intervals), when a progressive improvement of the dilated pores and scars resulting from the initial corrective surgery were observed (Figure 6).

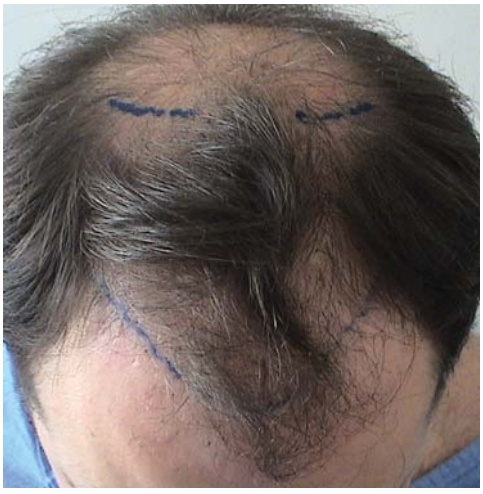

Figure 4: Superior view before FU transplant

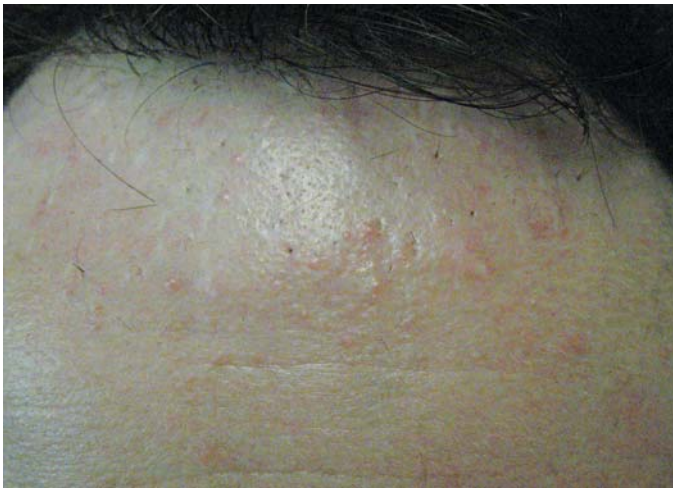

Figure 5: Frontal view after FU transplant and 4 laser sessions (note the improvement of the dilated pores in the frontal region)

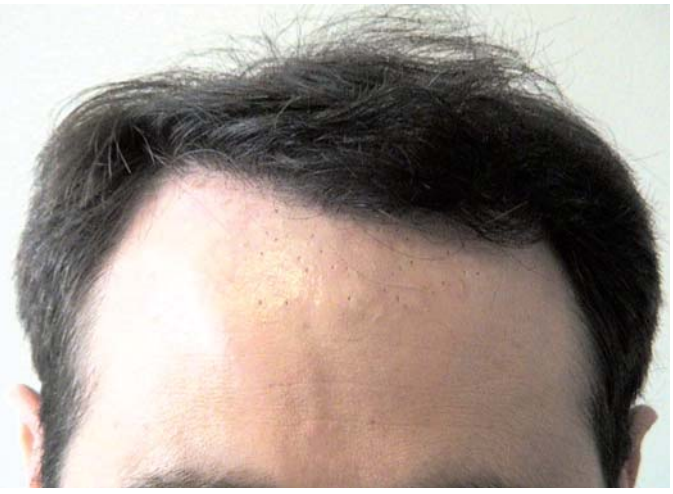

Figure 6: Frontal view after FU transplant (note dilated pores of grafts were removed in the frontal region)

DISCUSSION / CONCLUSION

Hair transplants with larger grafts frequently result in an artificial appearance, contributing to the stigmatization of both patients and hair transplant surgery. Combined techniques for correcting hair transplants can improve patients' appearance and quality of life. ●

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Queratose seborreica simuladora de melanoma

Seborrheic keratosis that resemble melanoma

ABSTRACT

Seborrheic keratosis are benign epithelial tumors that are usually easily diagnosed through clinical and dermatoscopic examination. They can sometimes resemble malignant lesions, especially melanoma. This article illustrates two such cases, highlighting the detailed dermatoscopic observations that help distinguish these lesions, to help increase the accuracy of diagnoses.

Keywords: keratosis, seborrheic; melanoma; dermoscopy.

RESUMO

Queratoses seborreicas são tumores epiteliais benignos de diagnóstico usualmente fácil pelo exame clínico e dermatoscópico. Em algumas situações podem simular lesões malignas, em especial o melanoma. O presente artigo tem como objetivo ilustrar dois desses casos e enfatizar a observação dermatoscópica cuidadosa na busca de aspectos menos comuns dessas lesões que podem ser determinantes para o aumento da acurácia diagnóstica.

Palavras-chave: *ceratose seborreica; melanoma; dermoscopia*

Authors:
Alessandra Yoradjian[1]
Natalia Cymrot Cymbalista[2]
Francisco Macedo Paschoal[3]

[1] Collaborator Physician, Dermatoscopy Ambulatory, Dermatology Department, Faculdade de Medicina do ABC (FMABC) – Santo André – (SP), Brazil
[2] Master in Dermatology, Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo (USP) – São Paulo (SP), Brazil
[3] Assistant Professor, Dermatology, Faculdade de Medicina do ABC (FMABC)

Correspondence:
Dra. Alessandra Yoradijan
R. Sampaio Viana, 580 – Paraíso
04004-002 – São Paulo, SP, Brazil
E-mail: alessandraderma@terra.com.br

Seborrheic keratosis is a benign epithelial tumor that is formed by epidermal proliferation at the expense of basaloid cells, which can be pigmented. It is more common from the age of 50 and in Caucasians.[1] Its etiology is unknown, but it may run in families and be influenced by growth factors.[1]

Clinically, it manifests as a plaque or papule with a waxy appearance, usually brownish and well delimited, which can manifest in any area of the skin especially in photoexposed areas, excluding the palmoplantar region.

During dermatoscopy, it is mainly characterized by milia-like cysts (round and yellowish intraepidermal formations filled with keratin) and comedo-like openings (chestnut brown-black invaginations, filled with keratin and with well defined borders).[2, 3] Although those characteristics can also be observed in papillomatous melanocytic nevi, they are very common in seborrheic keratoses. Other verifiable traits are moth-eaten or jelly borders in plane lesions, and a cerebriform aspect in more papulous ones.

Its diagnosis does not usually present difficulties, although in some situations it can simulate melanoma in the clinical and dermatoscopic examinations.[2] Therefore a histological study is required to confirm the diagnosis in such cases. The article discusses cases that characterize seborrheic keratoses resembling melanoma.

Case 1:

A 69-year-old female Asian patient presented an irregular pigmented lesion in the lumbar region, with no other similar lesions on the skin. She could not specify for how long she had had it and' did not have a history of melanoma. In the dermato-

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scopic examination, the lesion appeared asymmetric, with pigmentation varying from light to dark brown, forming an amorphous area, with a delicate pigmentary network in most of the lesion and an area of eccentric hyperpigmentation where the pigmentary network was thicker and there were blotches. Due to the possibility of melanoma, an excisional biopsy was performed, with the histopathologic examination results determining that it was a pigmented seborrheic keratosis (Figures 1 and 2).

Case 2:

A 63-year-old white female patient presented with a blackened irregular lesion on the back that she noticed three months previously. She described a family history of skin cancer, without specifying the type. In the dermatoscopic examination, the asymmetry of the lesion was clear not only regarding the shape, but also the variability of colors (light brown, dark brown, black, grayish and bluish white). Irregular points, blotches and a bluish-white veil were observed. Due to a strong suspicion of melanoma, a decision was made to carry out an excisional biopsy of the lesion. The histological diagnosis was that the lesion was a seborrheic keratosis (Figures 3 and 4).

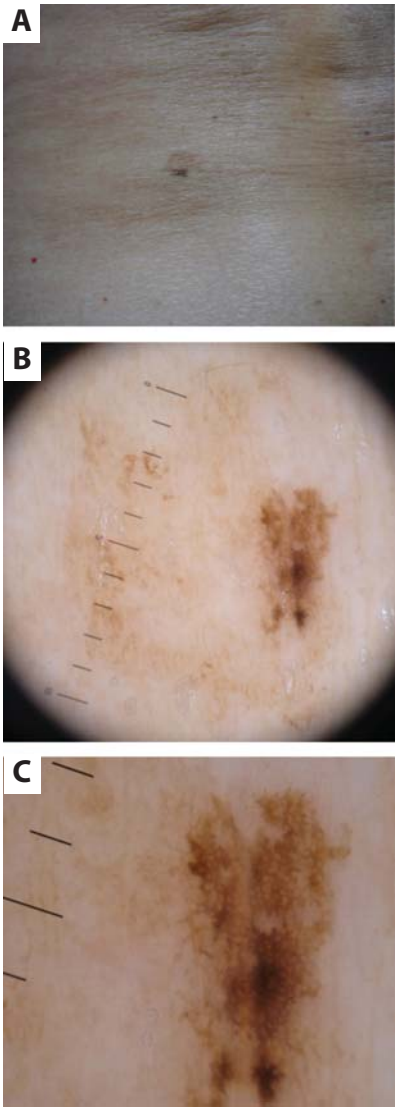

Figure 1-
A. Clinical appearance;
B. Dermatoscopic appearance;
C. Dermatoscopic appearance – details of the eccentric hyperpigmentation area

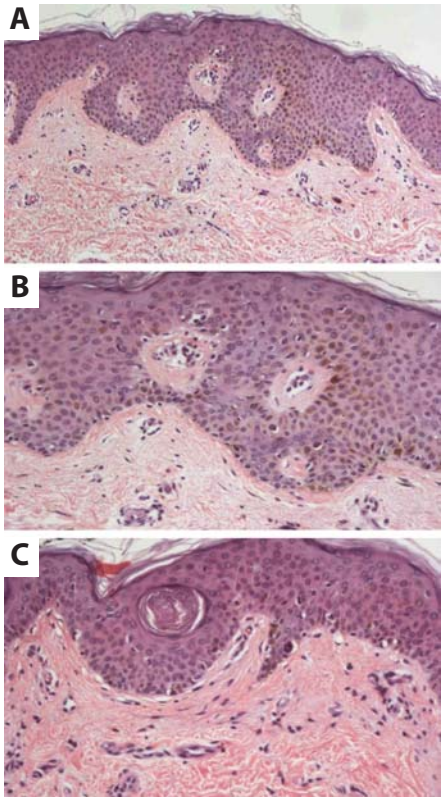

Figure 2-
A. Histologic appearance – panoramic view;
B. Histologic appearance – details of the proliferation of basaloid cells area;
C. Histologic appearance – pseudo-horn cysts

COMMENTS

Dermatoscopy, or microscopy epiluminescence, is a non-invasive and practical examination that emerged a few decades ago as an important subsidiary tool in diagnosing pigmented lesions. This method helps differentiate non-melanocytic and

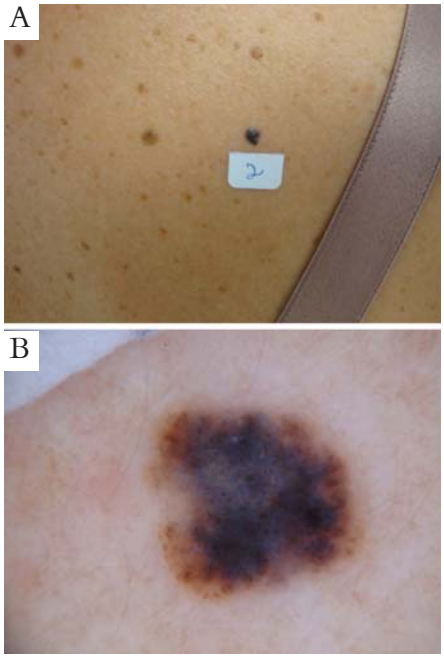

Figure 3-
A. Clinical appearance;
B. Dermatoscopic appearance

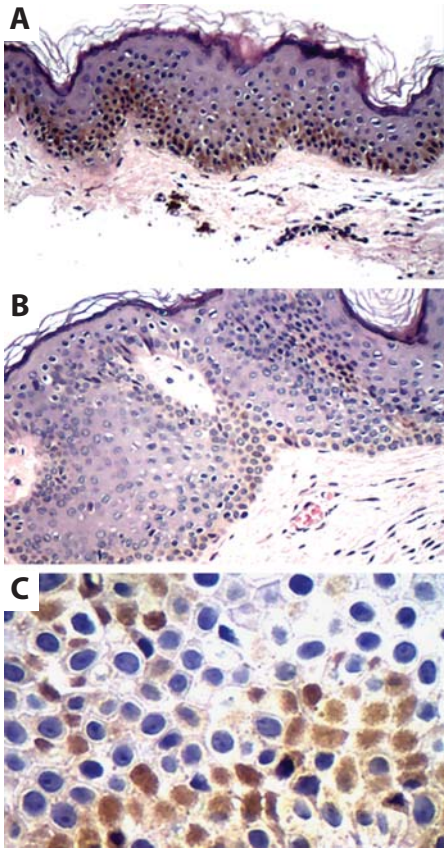

Figure 4-
A. Histologic appearance – panoramic view; **B.** Histologic appearance – proliferation of basaloid cells and pseudo-horn cysts; **C.** Histologic appearance –pigmented basaloid cells (detail)

melanocytic lesions (first-level analysis), and can gauge the malignant potential of the latter (second-level analysis). It can increase the accuracy of a diagnosis by 5-30%, [2] compared to a clinical examination alone. However, in certain situations there are difficulties in interpreting the results due to features that get mixed and the subjective nature of the analysis, which could lead to false-positive or false-negative results for malignancy – especially in the case of melanoma.[4]

This article is aimed at illustrating some of those situations, describing seborrheic keratosis cases that resemble melanoma, both clinically and dermoscopically.

First-level analysis is the most important in identifying seborrheic keratosis. If the lesion is mistakenly found to be melanocytic, there is a high risk of misinterpretation in the second-level analysis, which can often lead to an erroneous classification of malignancy.[2]

The main dermatoscopic features observed in seborrheic keratoses are milia-like cysts and comedo-like openings (initial algorithm proposed by Stolz and colleagues), with well defined moth-eaten or jelly borders. Nonetheless, other features, such as hairpin vessels, pigmentary network-like structures (usually more prominent, thicker and heterogeneous than the classic pigmentary network of melanocytic lesions), blotches, points, crusts, fissures (cerebriform aspect), fingerprint-like, whitish veil, in addition to a possible variation in colors (yellow, black, dark brown, light brown, grayish-blue), have been already identified.[3,5] The observation of those additional features can reduce diagnostic mistakes considerably, further improving the accuracy of this valuable dermatologic resource.[2] ●

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Pigmented basal cell carcinoma mimicking a malignant lentigo melanoma in black female patient

Carcinoma basocelular pigmentado simulando lentigo maligno melanoma em paciente negra

Authors:
Marcela Duarte Villela Benez[1]
Ana Luiza Furtado da Silva[2]
Gustavo Costa Veradino[3]
Solange Cardoso Maciel Costa Silva[4]

[1] Dermatologist Physician, Rio de Janeiro (RJ), Brazil
[2] Post-graduate Candidate, Hospital Universitário Pedro Ernesto da Universidade Estadual do Rio de Janeiro (UERJ) – Rio de Janeiro (RJ)
[3] Post-graduate Candidate, Hospital Universitário Pedro Ernesto da Universidade Estadual do Rio de Janeiro (UERJ) – Rio de Janeiro (RJ)
[4] Associate Professor and Head of Dermatology, Hospital Universitário Pedro Ernesto (UERJ)

ABSTRACT

A case of pigmented basocellular carcinoma clinically mimicking a malignant lentigo melanoma in the temporal region of a black female patient is reported. Basal cell carcinoma rarely occurs in black patients. When present, however, it is the second most common malignant skin neoplasia, and is usually pigmented. When the face is affected in such patients, it is difficult to differentiate between malignant lentigo melanoma and basal cell carcinoma. Dermatoscopy is a very helpful diagnostic tool in these cases.
Keywords: neoplasms, basal cell; melanoma; dermoscopy.

RESUMO

Relata-se caso de paciente negra com carcinoma basocelular pigmentado na região temporal que clinicamente mimetizava lentigo maligno melanoma. O carcinoma basocelular é raro em negros, porém, quando presente, torna-se a segunda neoplasia maligna de pele mais comum, sendo habitualmente pigmentado. Quando esses indivíduos têm a face acometida, o diagnóstico diferencial com o lentigo maligno melanoma é difícil. Nesses casos a dermatoscopia é grande aliada.
Palavras-chave: *carcinoma basocelular; melanoma; dermoscopia.*

Correspondence:
Dra.Marcela Duarte Villela Benez
Rua Bom Pastor 551/401 – Tijuca
20521-060 – Rio de Janeiro – RJ, Brazil
E-mail: mabenez@hotmail.com

Basal cell carcinoma (BCC) is a malignant neoplasia derived from non-keratinized cells that originate in the epidermis' basal layer. If not treated, local invasion can occur, resulting in substantial tissular destruction, which can damage the skin's function and appearance. Metastases are extremely rare and occur more frequently in men over 40 with fair skin.[1] It is uncommon in black people, however the pigmented subtype is the most common type found in those patients, which hinders its clinical and differential diagnosis regarding other tumors. Dermatoscopy is a useful resource in such cases.[2-5]

We report the case of a 77-year-old black female who presented with a lesion in the right temporal region that appeared approximately ten years before, which had grown progressively during the previous year. In the clinical examination, it appeared as a darkened macule, with different colors and irregular shape, measuring approximately 4 x 3 cm (Figure 1).

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Financial support: none

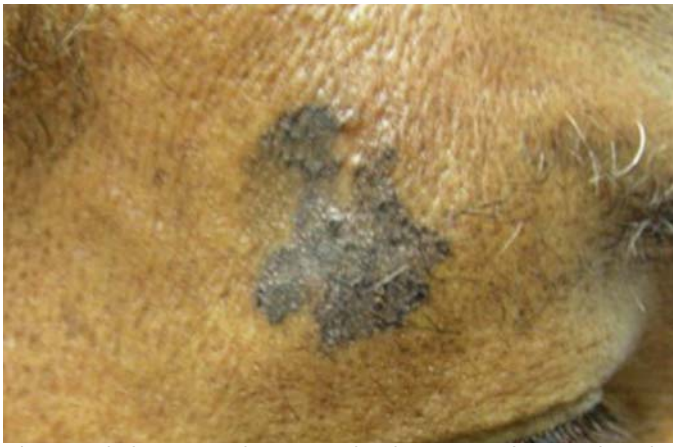

Figure 1: Black patient with pigmented and asymmetric lesion in the right temporal region

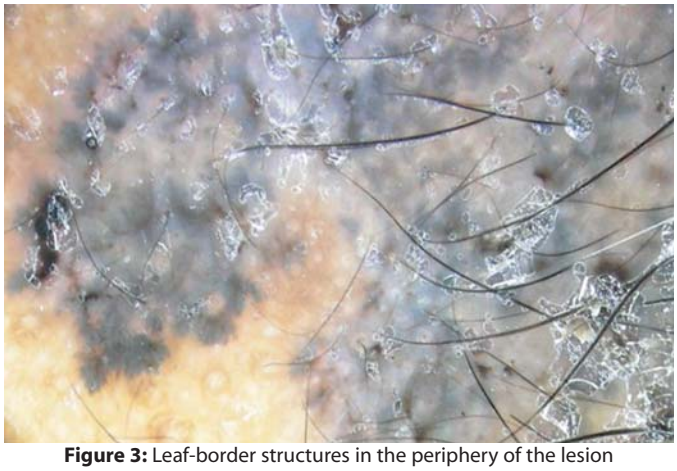

Figure 3: Leaf-border structures in the periphery of the lesion

Figure 2: Lesion with darkened pigment with absence of criteria for melanocytic lesion

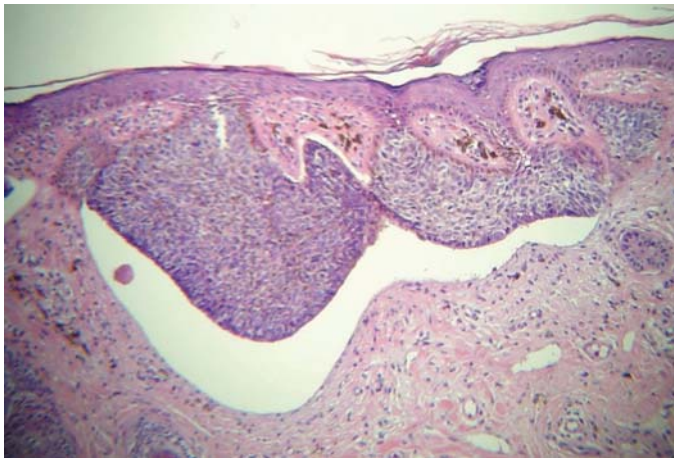

Figure 4: Basaloid tumorous cells with peripheral palisading and retraction of the collagen and melanin

Due to the suspicion that the lesion was a BCC or lentigo maligna melanoma, dermatoscopy was carried out, which revealed a darkened lesion with leaf-like border in its periphery (Figures 1 and 2). The histologic examination found basaloid tumorous cells, with peripheral palisading and retraction of the collagen extending over the epidermis. Melanin was seen inside the tumor, which helped confirm a superficial pigmented BCC diagnosis (Figure 4).

Only 1.8% of BCCs occur in black people; their higher levels of epidermal melanin provide a degree of photoprotection.2-4 BCCs are the second most frequent type of skin cancers affecting blacks.[2-4] Nonetheless, when affected by some type of skin cancer, black individuals are more likely to present advanced stages of the disorder and have a greater mortality than whites. This disparity is probably due to a tendency for late diagnosis or a higher biological aggressiveness of tumors.[2-4]

Most BCC lesions are asymptomatic at the time of diagnosis; clinical features are similar for all ethnicities. Since exposure to the sun is the most frequently involved etiologic factor, photoexposed areas are usually the most affected, with rare occurrences in photoprotected areas. In general, a lesion occurs as a solitary translucent nodule that can ulcerate.[1-4] In blacks, pigmentation is present in more than 50% of tumors, which hinders diagnosis and potentially generates confusion with pigmented seborrheic keratosis, melanoma or melanocytic nevus.[2-4] The patient presented a darkened and asymmetric macule – clinical signs that suggest melanoma. Dermatoscopy is a valuable complementary method in such cases. As is characteristic in pigmented BCCs, the patient's macule presented structures such as leaf-like border and ovoid globules; telangiectasias and arboriform vessels were more difficult to verify.[5] The diagnosis was confirmed by a histologic examination.

In Brazil, where the ethnicities are very mixed, knowledge of the clinical features of cutaneous tumors in black patients is extremely important for correctly diagnosing and planning treatment for lesions.●

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