

The use of fractional CO₂ laser therapy for the treatment of an *in situ* squamous cell carcinoma in the glans penis of a patient with hypospadias

Laser fracionado de CO₂ para o tratamento de carcinoma espinocelular in situ da glândula em paciente com hipospádia

ABSTRACT

Erythroplasia of Queyrat is an *in situ* squamous cell carcinoma of the glans penis. Due to its unusual location, surgical treatment can cause mutilation. CO₂ laser-assisted vaporization is a treatment option with excellent aesthetic and functional results, but it requires strict follow up owing to its high recurrence rates. The authors describe a case of erythroplasia of Queyrat treated with fractional CO₂ laser, with an absence of recurrence during a one-year follow up

Keywords: carcinoma, squamous cell; carcinoma *in situ*; foreskin; laser coagulation; lasers; lasers; gas; penis; penile neoplasms

RESUMO

A eritroplasia de Queyrat é o carcinoma in situ da glândula. Devido a sua localização peculiar, o tratamento cirúrgico pode ser mutilante. A vaporização com laser de CO₂ é uma opção de tratamento com ótimos resultados cosméticos e funcionais, mas que exige acompanhamento regular devido à alta taxa de recorrência. Apresentamos um caso de eritroplasia de Queyrat tratada com laser fracionado de CO₂, sem recidiva após acompanhamento de um ano.

Palavras-chave: carcinoma de células escamosas; carcinoma *in situ*; coagulação por laser; doenças do pênis; lasers; lasers de gás; pênis; prepúcio do pênis

INTRODUCTION

The traditional treatment for squamous cell carcinoma of the penis is resection with a 2 cm safety margin.¹ This procedure, however, is considered mutilating, and conservative treatments are accepted for *in situ* lesions.² Treatments with imiquimod, 5-fluorouracil, and laser are described in the literature.²

CO₂ laser is absorbed by water and produces deep, predictable cutaneous vaporizing regardless of the color of the tissue.³ The authors report a case of a patient with erythroplasia of Queyrat treated with CO₂ fractional laser.

CASE REPORT

An 80-year-old man with hypospadias complained of a reddish lesion, progressive in growth that had appeared in the periurethral region one year earlier. On examination it was possible to observe an erythematous plaque in the ventral portions of the glans and foreskin (Figure 1). Biopsies were performed on four specimens, each obtained from one of four quadrants of the lesion, in addition to the exeresis of its most elevated part. The histological examination revealed a squamous cell carcinoma (SCC)

Case Reports

Authors:

Daniel Holanda Barroso¹
Clárrissa Marques Maranhão¹
Araken Almeida de Araújo²
Eliane Ruth Barbosa Alencar³
Emmanuel Rodrigues de França⁴
Silvana Maria de Moraes Cavalcanti²

¹ Resident Physician in dermatology at the Universidade de Pernambuco - Recife (PE), Brazil

² Associate Professor, Universidade de Pernambuco

³ Dermatology Preceptor, Universidade de Pernambuco

⁴ Assistant Professor, Head of the Dermatology Service, Universidade de Pernambuco

Correspondence:

Daniel Holanda Barroso
R. Arnóbio Marques, 310, Santo Amaro
Cep: 50100-130 - Recife (PE), Brazil
E-mail: danielhbarroso@gmail.com

Received on: 25 January 2015
Approved on: 11 March 2015

This study was carried out at the Universidade de Pernambuco - Recife (PE), Brazil.

Financial support: none
Conflict of interest: none

in situ: erythroplasia of Queyrat (Figure 2). The patient refused to undergo excision of the lesion, preferring the treatment with CO₂ fractional laser (eCO₂[®], Lutronic, Sowon-Ro, South Korea). The procedure was performed monthly under topical anesthesia with 4% lidocaine cream (Dermomax[®], Laboratório Aché, São Paulo, Brazil). During each procedure the coagulation of all the spongy area was carried out with a 5 mm margin. The parameters used were: 300μm tip, 100mtz/cm² density, and 60 to 80J/cm² fluence. Five sessions were performed (Figures 3 and 4). There were no complications between sessions. By the time this



FIGURA 1: Placa eritematosa discretamente elevada nas regiões ventrais de glande e de prepúcio

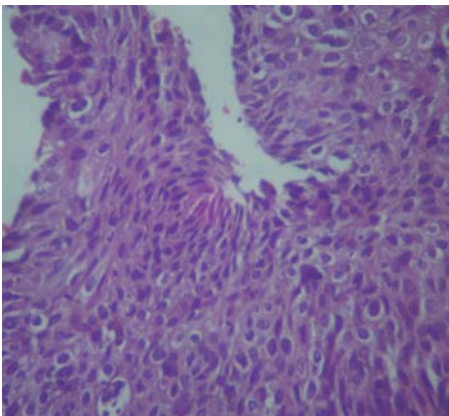


FIGURA 2: Exame histopatológico mostrou ceratinócitos atípicos em toda a extensão do epitélio, CEC *in situ*



FIGURA 3: Tratamento com laser fracionado de CO₂



FIGURA 4: Remissão clínica persistente oito meses após última sessão de tratamento

paper was approved for publication, the patient had not presented recurrences for a period of one year and would be followed up with for five years after the end of the treatment.

DISCUSSION

The erythroplasia of Queyrat (EQ) is an SCC *in situ* that develops in the glans or foreskin.⁴ Its extension up to the distal urethra – where the pseudostratified urethral epithelium becomes squamous stratified – has already been described.⁵ The EQ usually arises in the glans and inner foreskin as a single plaque or multiple plaques that are slightly elevated and erythematous.⁴ When compared to SCC *in situ* of the epidermis, the EQ has a high rate of progression into invasive neoplasia (10–33%).^{4,6}

Conventional treatment of penile carcinoma involves full or partial amputation with good oncologic control of the lesion,⁷ however aesthetic and functional alterations may affect psychosexual function in important ways. Conservative therapy is an option for *in situ* lesions,² and although survival is seldom affected, it has a higher recurrence rate when compared to the surgical treatment described.⁷

Mohs micrographic surgery is a conservative treatment option, however it has a relatively high recurrence rate (21%) when compared to partial penectomy (0–7%).⁸ Due to the extent of the lesion, even undergoing Mohs micrographic surgery would be unacceptable to the patient because of the great loss of tissue.

Of the topical alternatives, 5-fluorouracil is the most studied,^{4,2} even though it causes great discomfort and a local inflammatory process during different treatment cycles.⁴ When the urethra is affected, however, this treatment is not recommended by some authors,⁴ since there is no guarantee that it will be possible to perform applications along the entire length of the intraurethral lesion.⁹

According to the last U.S. directive,² CO₂ or ND:YAG laser therapy are among the options for penile SCC *in situ*, and some consider this as the first choice due to the favorable aesthetic and functional outcomes.¹ On the other hand, local recurrence rates are high, reaching 26%;¹ therefore, patients should be

followed up with more often than those who underwent amputation – every three months for the first two years and every six months up until five years after the treatment.⁶ Recurrences can be treated with the same procedure.¹

Nd:YAG laser produces tissular coagulation at least 3–4mm¹ deep, a very useful benefit in cases of histologically aggressive and invasive tumors.¹⁰ On the other hand, it tends to result in unsightly scars.¹ In contrast, CO₂ laser is absorbed by water and has a superficial vaporization effect with predictable depth (0.1 – 0.23 mm),³ and is considered the best laser for the

treatment of non-invasive lesions.¹ Its use was reported in the involvement of the proximal urethra, with good results.⁵ In these cases, the possibility of stenosis⁵ and intraurethral recurrence of the lesion requires a multidisciplinary approach with urology.

Another peculiarity of the case is the association with hypospadias. A search on the PubMed database with the keywords Queyrat, hypospadias, carcinoma and penis yielded only one case report of association between hypospadias and penile SCC.¹●

REFERENCES

1. van Bezooijen BP, Horenblas S, Meinhardt W, Newling DW. Laser therapy for carcinoma in situ of the penis. *J Urol*. 2001;166(5):1670-1.
2. Clark PE, Spiess PE, Agarwal N, Biagioli MC, Eisenberger MA, Greenberg RE, et al. Penile cancer: Clinical Practice Guidelines in Oncology. *J Natl Compr Canc Netw*. 2013;11(5):594-615.
3. Shokrollahi K, Raymond E, Murison MSC. Lasers: principles and surgical applications. *The Journal of Surgery*. 2004;2(1):28-34.
4. Graham JH, Helwig EB. Erythroplasia of Queyrat. A clinicopathologic and histochemical study. *Cancer*. 1973;32(6):1396-414.
5. Del Losada JP, Ferré A, San Román B, Vieira V, Fonseca E. Erythroplasia of Queyrat with urethral involvement: treatment with carbon dioxide laser vaporization. *Dermatol Surg*. 2005;31(11 Pt 1):1454-7.
6. Mikhail GR. Cancers, precancers, and pseudocancers on the male genitalia. A review of clinical appearances, histopathology, and management. *J Dermatol Surg Oncol*. 1980;6(12):1027-35.
7. Leijte JA, Kirrander P, Antonini N, Windahl T, Horenblas S. Recurrence patterns of squamous cell carcinoma of the penis: recommendations for follow-up based on a two-centre analysis of 700 patients. *Eur Urol*. 2008;54(1):161-8.
8. Shindel AW, Mann MW, Lev RY, Sengelmann R, Petersen J, Hruza GJ, et al. Mohs micrographic surgery for penile cancer: management and long-term followup. *J Urol*. 2007;178(5):1980-5.
9. Bernstein G, Forgaard DM, Miller JE. Carcinoma in situ of the glans penis and distal urethra. *J Dermatol Surg Oncol*. 1986;12(5):450-5.
10. Frimberger D, Hungerhuber E, Zaak D, Waidelich R, Hofstetter A, Schneede P. Penile carcinoma. Is Nd:YAG laser therapy radical enough? *J Urol*. 2002;168(6):2418-21.