

Surgical treatment and long-term follow-up of subcutaneous mycoses caused by dematiaceous fungi: chromoblastomycosis, phaeohyphomycosis and eumicetoma

Tratamento cirúrgico e seguimento a longo prazo das micoses subcutâneas causadas por fungos demáceos: cromoblastomicose, feoifomicose e eumicetoma

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ABSTRACT

Introduction: Subcutaneous mycoses caused by dematiaceous fungi are classified according to their characteristics in the tissue: chromoblastomycosis (with the presence of fumagoid corpuscles), phaeohyphomycosis (with dematiaceous septate hyphae) and eumicetoma (with grains composed of septate hyphae). Several treatments are proposed, among them, surgical excision. Surgical treatment is more indicated in cases where there is localized infection and where excision is possible, yielding good therapeutic outcomes and low recurrence rates.

Objective: To describe the experience of a dermatological service in the surgical treatment of subcutaneous mycosis cases caused by dematiaceous fungi, discussing the surgical approach and its results.

Methods: A retrospective study was carried out with the descriptive analysis of cases treated from April 2014 to December 2016, at a dermatological clinic in the Brazilian Southeast city of São Paulo. All cases diagnosed with subcutaneous mycoses caused by dematiaceous fungi were included and surgically treated with total exeresis of the lesion.

Results: A total of 7 cases were analyzed – 2 eumicetomas, 1 chromoblastomycosis and 4 phaeohyphomycoses. Only one on the cases was not treated at an ambulatory surgical center. All cases progressed without sequelae or recurrences during the clinical follow-up.

Conclusions: When surgical treatment is possible, the exeresis of the lesion is a good therapeutic option in cases of subcutaneous mycoses caused by dematiaceous fungi.

Keywords: chromoblastomycosis; phaeohyphomycosis; bacterial infections and mycoses; mycosis; mycetoma; ambulatory surgical procedures; bloodless medical and surgical procedures; histology; therapeutics

RESUMO

Introdução: As micoses subcutâneas provocadas por fungos demáceos (MSCFD) são classificadas conforme sua apresentação no tecido: cromoblastomicose com presença de corpúsculos fumagoides, feoifomicose com hifas septadas demáceas e eumicetoma com grãos compostos por hifas septadas demáceas. Diversos tratamentos são propostos, entre eles a exérese cirúrgica. O tratamento cirúrgico é mais indicado nos casos em que há infecção localizada e passível de exérese, com bons resultados terapêuticos e baixa taxa de recidiva.

Objetivo: Apresentar a experiência de um serviço dermatológico no tratamento cirúrgico dos casos de MSCFD, discutindo as abordagens cirúrgicas e seus resultados.

Métodos: Estudo retrospectivo com análise descritiva dos casos atendidos no período de abril de 2014 a dezembro de 2016 em clínica dermatológica da cidade de São Paulo. Foram incluídos todos os casos com diagnóstico de MSCFD que foram submetidos à terapêutica cirúrgica com exérese total da lesão.

Resultados: Foram totalizados sete casos: dois de eumicetoma, um de cromoblastomicose e quatro de feoifomicose. De todos os casos apenas um não foi abordado em regime de centro cirúrgico ambulatorial. Todos evoluíram sem sequelas e sem recidivas no seguimento clínico.

Conclusões: A remoção da lesão cutânea é um boa opção terapêutica nos casos de MSCFD em que o procedimento cirúrgico for viável.

Palavras-chave: cromoblastomicose; feoifomicose; infecções bacterianas e micoses; micoses; micetoma; procedimentos cirúrgicos ambulatoriais; procedimentos médicos e cirúrgicos de sangue; histologia; terapêutica

Original Articles

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INTRODUCTION

Subcutaneous mycoses are fungal infections located in the deep layers of the skin. They can be caused by both hyaline fungi, with no pigment in their structure, and by dematiaceous fungi that present melanin in their cellular wall.^{1,2} Dematiaceous fungi are found throughout the planet, with a predilection for tropical areas, inhabiting the soil and vegetables (geophilic fungi).³⁻⁵

Subcutaneous mycoses caused by dematiaceous fungi (SMCDF) are classified according to their appearance in the tissue: chromoblastomycosis with presence of fumagoid corpuscles, phaeohyphomycosis with dematiaceous septate hyphae and eumycetoma with grains composed of dematiaceous septate hyphae.^{1,6} These structures can be visualized in the direct mycological examination of the material harvested from the lesion or in the tissue biopsy histological analysis. Fungus culture is required to determine the agent's species.^{2,3,6,7}

Several treatments are proposed in these cases, from the use of antifungals to thermotherapy and surgical excision. The choice between these therapies is made based on the analysis of several factors, such as manifestation of the lesion, clinical conditions and the patient's comorbidities, in addition to the availability of treatment when medical advice is sought.^{2,4,8-10}

The present study is aimed at describing the experience of a dermatological clinic in the city of São Paulo (SP) - Brazil, in the surgical treatment of SMCDF cases, discussing surgical approaches and results.

METHODS

A retrospective study was conducted with the descriptive analysis of cases treated from April 2014 to December 2016, at a tertiary dermatologic clinic in the city of São Paulo, Brazil. All cases diagnosed with SMCDF that underwent surgical treatment with total lesion excision were included.

DESCRIPTION OF CASES

Case 1 consisted of a eumycetoma initially treated with antifungals for 24 months, without success. After having been treated surgically by the plastic surgery team, it progressed with healing (Figure 1). Case 2 consisted of a nodular lesion that was promptly removed after eumycetoma diagnosis (Figure 2). Case 3 involved a chromomycosis located in the patient's knee, that was not treated in a single surgical time due to the possibility of dehiscence: three sessions were performed, with an excellent final outcome (Figure 3).

Cases 4, 5 and 6 had lesions similar to each other, easily removed with surgical technique. Cases 4 and 5 showed cystic lesions on the feet – a classic symptom of phaeohyphomycosis (Figures 4 and 5). In case 4, there was an attempt of using drug therapy prior to the procedure, without any response. Case 6 presented a solid tumor near the knee (Figure 6) that was approached with total lesion excision (fusiform excisional biopsy). This patient had other cystic phaeohyphomycosis lesions in the limbs that were not surgically accessible, having been treated with antifungal after biopsy, which explains the prolonged medication time after the approach.

Case 7 had multiple phaeohyphomycosis lesions on the dorsum of the hand, for the patient used plants' thorns to puncture lesions, inoculating new dematiaceous hyphae with this habit. Several excisional sessions were carried out with a sterile needle up until healing was achieved (Figure 7).

RESULTS

There were seven cases in total: 2 eumycetomas, 1 chromoblastomycosis and 4 phaeohyphomycosis. Only one of these cases was not treated in ambulatorial surgical center setting. None presented recurrence after the surgical treatment. The characteristics of the seven cases are detailed in Table 1. The diagnoses were defined based on the association of the clinical appearances, isolation of the etiological agents and the morphology observed in the histology of the tissues.

All cases progressed without sequelae and absence of recurrences in the clinical follow-up.

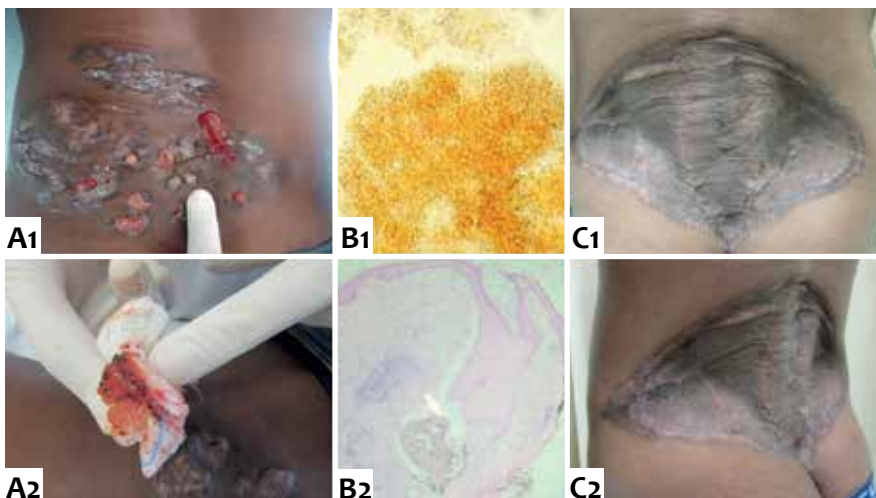


FIGURE 1: Eumycetoma, in the lower back region. Clinical appearance with increased volume, fistulas and discharge of purulent secretion, and grains to the expression (A1 and A2). Identification of the grain by direct mycological examination (B1) and histology (B2). Clinical appearance after surgical excision (C1 and C2)

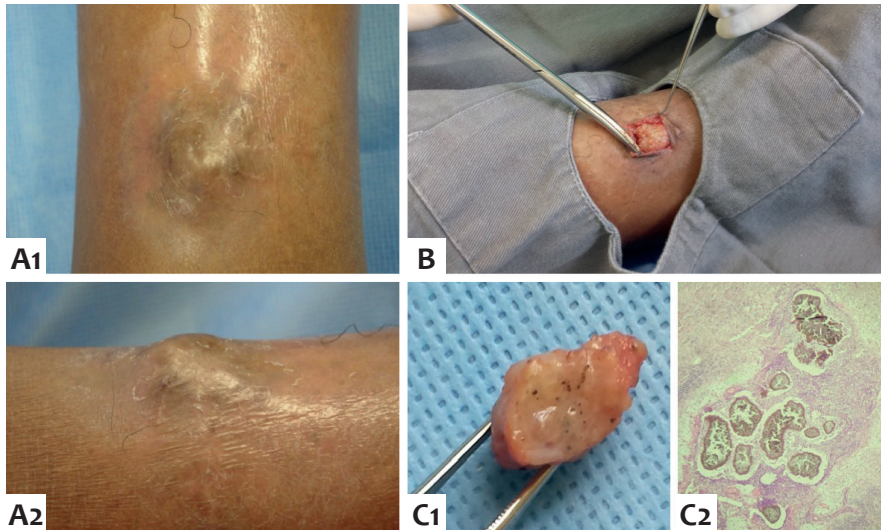


FIGURE 2: Eumycetoma located in the leg. Clinical aspect (A1 and A2). Surgery with lesion excision (B). Histology's macroscopic (C1) and microscopic (C2) aspects of the lesion; identifying the grains (C2)

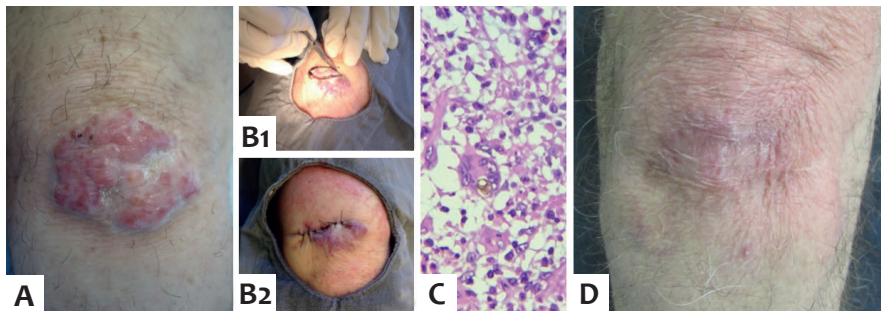


FIGURE 3: Chromomycosis located in the knee. Tumoral clinical appearance (A). First surgery (B1 and B2). Histology identifying fungoid corpuscles (C). Post-treatment appearance at the end of the total removal (D).

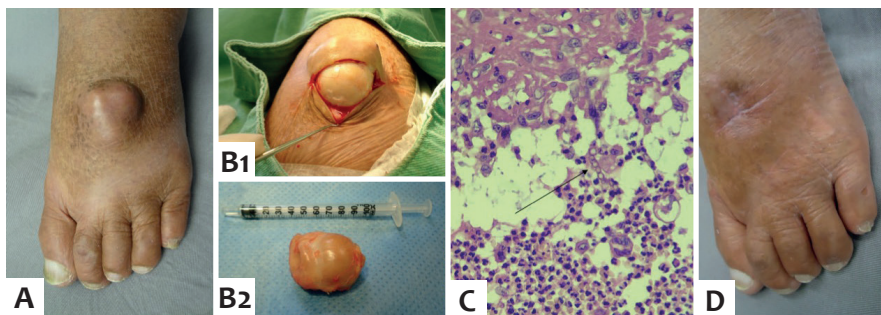


FIGURE 4: Phaeohyphomycosis located in the foot. Intact cystic clinical aspect (A). Surgery (B1) with macroscopic aspect of the removed lesion (B2). Histology with arrow identifying dematiaceous hyphae in the tissue (C). Clinical aspect after surgical excision (D).

DISCUSSION

Currently, SMCDF treatment can be divided into medicament and / or surgical based. Surgical treatment is more indicated in cases where there is localized infection and exeresis is feasible.^{1,10} Although widely used, medicament based treatment should be introduced with caution, since it is protracted, and patients with SMCDF frequently are elderly and have conditions that alone require their own daily doses of medication.^{3,8}

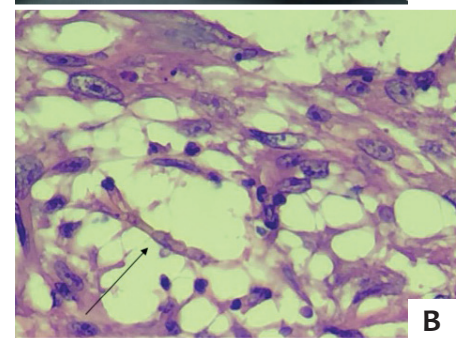


FIGURE 5: Phaeohyphomycosis located in the foot. Ruptured cystic clinical aspect (A1 and A2). Histology with arrow identifying dematiaceous hyphae in the tissue (B). Clinical aspect after surgical excision (C)

In the cases presented in this paper, surgical removal was proven a safe option. The authors did not observe any perioperative complications, such as infection, dehiscence or collections formation. In addition, despite the advanced age or immunosuppression associated with most cases, it was not possible to observe any clinical complication resulting from the operative event. Except for Case 1 (Figure 1), all patients were operated in an ambulatorial basis under local anesthesia, which simplified

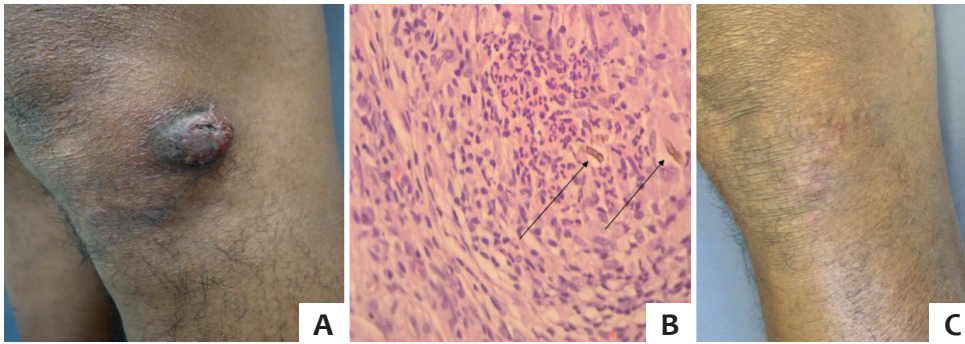


FIGURE 5: Phaeohyphomycosis located in the knee. Intact clinical aspect (A). Histology with arrows identifying septate dematiaceous hyphae in the tissue (B). Clinical aspect after surgical excision (C).

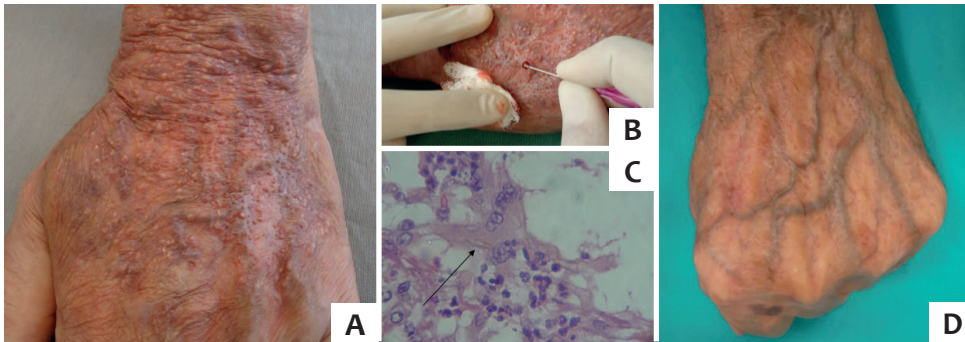


FIGURE 7: Phaeohyphomycosis located in the hand. Clinical aspect of milia (A). Excision of small lesions performed one by one with a needle (B). Histology with arrow identifying septate dematiaceous hyphae in the tissue (C). Clinical appearance after all surgical excision sessions (D).

TABLE 1: Characteristics of the case series: patients' clinical aspects, identification of agents by complementary exams and therapeutic approaches

		CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	CASE 7
Patient data	Gender	Male	Male	Male	Male	Male	Male	Male
	Age	16	62	76	79	44	45	79
	Comorbidity	n.a.	SAH	COPD	SAH / CHF	Kidney transplantation	Kidney transplantation	Lymphoma
Characteristics of the lesion	Previous trauma	Yes	No	No	No	No	No	Yes
	Clinical aspect	Classic Triad	Nodule	Tumor	Cyst	Cyst	Tumor	Milia
	Time of development	12 months	24 months	12 months	24 months	8 months	1 week	2 months
	Location	lower back	leg	knee	foot	foot	knee	hand
Diagnosis	Direct examination	grains	negative	negative	hyphae	hyphae	hyphae	hyphae
	Culture	<i>M. pseudomycetomatis</i>	Negative	<i>Fonseceaea pedrosoi</i>	<i>Exophiala sp</i>	<i>Phialophora sp</i>	<i>Exophiala sp</i>	<i>Phialemonium sp</i>
	Histology	Eumycetoma	Eumycetoma	Chromomycosis	Phaeohyphomycosis	Phaeohyphomycosis	Phaeohyphomycosis	Phaeohyphomycosis
Surgical treatment	N° of procedures	2	1	3	1	1	1	1
	Disease free	14 months	25 months	17 months	41 months	70 months	40 months	62 months
Antifungal	Which	ITRA + TERB	n.a.	n.a.	ITRA + SMX-TMP	n.a.	TERB + ITRA	ITRA + TERB
	When	pre	n.a.	n.a.	pre	n.a.	oost	TERB pre / ITRA
Post	How long	24 months	n.a.	n.a.	1 month	n.a.	11 months	TERB 9 months / ITRA 3 months
Recurrence		no	no	no	no	no	no	no

*SAH: Systemic arterial hypertension, COPD: Chronic obstructive pulmonary disease, CHF: Congestive heart failure, ITRA: Itraconazole, TERB: Terbinafine, SMX-TMP: Sulfamethoxazole-trimethoprim

the treatment and considerably reduced the morbidity and risk of procedure.

Surgical treatment of SMCDF, regardless of whether or not it was associated with systemic antifungal therapy, did not predispose to the dissemination or implantation of the infectious agent. In the period of clinical follow-up ranging from 14 to 70 months (mean = 38.4 months), no new lesions were observed at

the site of surgical treatment.

Due to the multiplicity of clinical presentations, the surgical techniques employed varied according to the specificities of each case. Cases characterized by subcutaneous nodules or cysts (Cases 2, 4 and 5) were well delimited, which facilitated dissection and the complete removal of the lesion. Tumor-like cases (Cases 3 and 6) were removed using fusiform excision and

direct closure. Due to the size and anatomical location of the lesion in Case 3, a decision was made for a three-stage excision. This approach did not trigger the cutaneous implantation of the agent or any other postoperative complication.

CONCLUSION

In the authors' experience, surgical treatment was proven effective, simple and safe in cases where the infection is anatomically delimited. The antifungal agents' toxicity associated with the usually affected patient's clinical / immunological profile, makes surgery an optimal therapeutic option, which should be regarded as the first-choice treatment whenever surgical removal is feasible. ●

REFERENCES

1. Hoffmann CC, Danucalov IP, Purim KSM, Queiroz-Telles F. Infecções causadas por fungos demácios e suas correlações anátomo-clínicas. *An Bras Dermatol*. 2011;86(1):138-41.
2. Revankar SG. Phaeohyphomycosis. *Infect Dis Clin North Am*. 2006;20(3):609-20.
3. Nenoff P, van de Sande WW, Fahal AH, Reinel D, Schöfer H. Eumycetoma and actinomycetoma - an update on causative agents, epidemiology, pathogenesis, diagnostics and therapy. *J Eur Acad Dermatol Venereol*. 2015;29(10):1873-83.
4. Correia RTM, Valente NYS, Criado PR, Martins JEC. Cromoblastomycose: relato de 27 casos e revisão da literatura. *An Bras Dermatol*. 2010;85(4):448-54.
5. Zijlstra EE, van de Sande WW, Welsh O, Mahgoub ES, Goodfellow M, Fahal AH. Mycetoma: a unique neglected tropical disease. *Lancet Infect Dis*. 2016;16(1):100-12.
6. Wong EH, Revankar SG. Dematiaceous molds. *Infect Dis Clin North Am*. 2016;30(1):165-78.
7. Revankar SG, Sutton DA. Melanized fungi in human disease. *Clin Microbiol Rev*. 2010;23(4):884-928.
8. Oliveira WRP, Borsato MFL, Dabronzo MLD, Festa Neto C, Rocha LA, Nunes RS. Feoifomicose em transplante renal: relato de dois casos. *An Bras Dermatol*. 2016;91(1):93-6.
9. Welsh O, Al-Abdely HM, Salinas-Carmona MC, Fahal AH. Mycetoma medical therapy. *PLOS Negl Trop Dis* 2014;8(10):e3218
10. Silveira F, Nucci M. Emergence of black moulds in fungal disease: epidemiology and therapy. *Curr Opin Infect Dis*. 2001;14(6):679-84.