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Giant Mycetoma of the Scalp: A Reconstructive Challenge Regarding a Clinical Case

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Abstract

Mycetoma is a fungal soft tissue lesion that is mainly diagnosed in tropical countries [1] and affects mostly the feet, limbs and periocular regions [1,2]. The scalp is rarely affected. It´s characterized by chronic induration, draining sinuses, and discharge of granules. A 15-year-old male was transferred to Hospital Dona Estefânia in Lisbon from São Tomé e Principe due to large exophytic granulomatous lesions with gradual increase over the course of three years, spanning the whole scalp and involving the upper left eyelid. Past medical history revealed a trauma 3 years before after a fall. The patient had no other known co-morbilities. He was submitted to long term antibacterial therapy with cephalosporin in his primary hospital without any sign of regression. The initial diagnosis workup excluded HIV, HBV, HCV, Tuberculosis, Lymphoma and connective tissue disease. Initial biopsy studies revealed no spores or evidence of fungi. Broad-spectrum antibacterial and antifungal agents were initiated and serial excision and reconstruction with advancement rotation flaps was performed. Surgical intervention allowed for the exposure of deeper pockets of tissue where fungi were identified. Mycetoma is still a rare diagnosis in developed countries, requiring both surgical and medical treatment and a multidisciplinary effort in order to properly diagnose and treat.

Keywords: Mycetoma; Scalp Reconstruction; Pediatric Plastic Surgery

Introduction

Mycetoma is a fungal soft tissue lesion that is mainly diagnosed in tropical countries [1]. It's a neoplastic or quasi-neoplastic mesenchymal lesion with fibroblastic and histiocytic differentiation, more commonly located in the dermis [1,2]. It is characterized by chronic induration, draining sinuses and discharge of granules, however this typical triad may not always be present. It's either actinomycotic, if caused by bacteria, or eumycotic, if caused by fungi [1]. It originates from microorganisms from sole and stale waters. Following contamination and trauma, a colonization is proceeded with proliferation to deeper layers of the skin. Therefore, the most commonly affected regions are those most exposed such as the feet, eyelids, paranasal sinuses, mandible, perineum and testis [1,2]. The affection of the scalp is rare and presents an ablative and reconstructive challenge.

Current diagnosis workup starts with exclusion of other exophytic granulomatous lesions namely soft tissue sarcoma and lymphocytic neoplasms. Secondly, all efforts should be made to access the extension of infection and identification of the agent as well as its susceptibility to antimicrobial therapy regimens. Differential diagnosis with other fungal infection such as aspergillosis, botryomycosis, chromoblastomycosis and sporotrichosis is paramount.

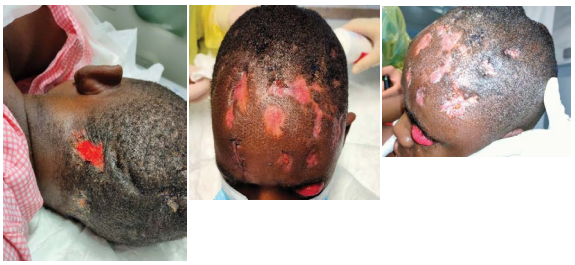
Treatment regimens vary widely due to local fungal species. In most cases of mycetoma, the mainstay treatment is medical with pulse and cyclic antibiotic therapy [1-3]. However, in the case of Eumycetoma, due the nature of quiescent spores and hyphae structure, surgical debridement is generally necessary alongside the cycling antimicrobial therapy [1-3].

Clinical Case

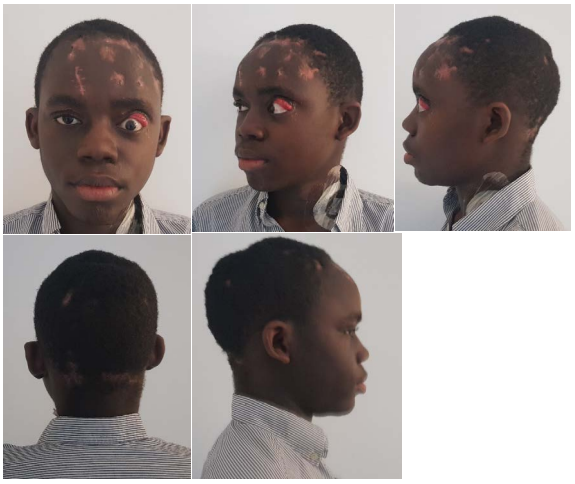
A 15 years old male, without any known medical history, was transferred to Hospital Dona Estefania in Lisbon from São Tomé e Principe in August 2020 due to chronic, destructive, granulomatous lesions of the scalp and upper left eyelid, with three years of evolution.

Initial evaluation excluded tuberculosis, connective soft tissue disease, granulomatous diseases, HIV, HCV and HBV and lymphoproliferative disease. No abnormalities were identified by chest radiography nor abdominal and renal ultrasounds. CT Scan and MRI imaging identified a soft tissue mass with sclerosing alteration of the sphenoid, frontal and occipital bone, without invasion of the cortical plates. The soft tissue mass of scalp was in continuity from the occipital pole to the glabella promoting multiple breaks in the scalp skin with protruding exophytic lesions. The upper left eyelid mass invaded the

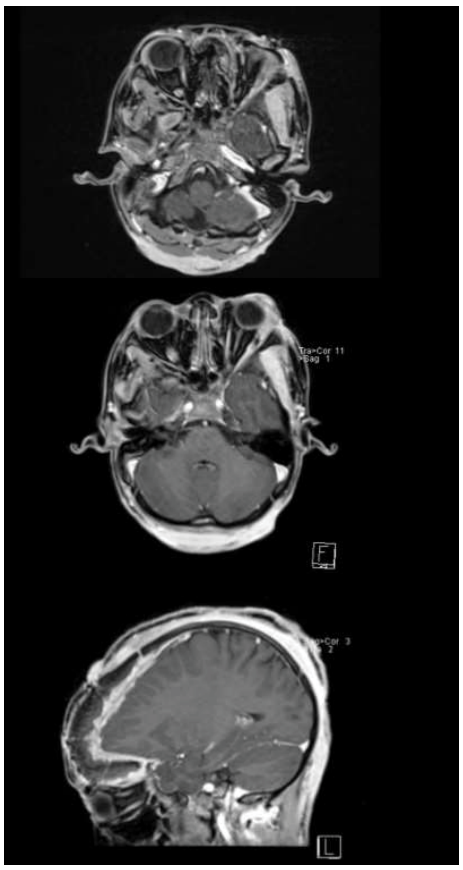
Figures 1-3: Patient at admission.



Figures 4-6: Patient after serial debridement and advancement rotation flap.



Figures 7-11: 1 Month post Op.



Figures 12-14: Admission MRI Op.

intraconical space leading to a mass effect on the intraocular muscles and protrusion into the epineural space.

Initial biopsies revealed no spores of mycelia. Broad-spectrum antibiotics and antifungal therapy were started empirically with continuous local worsening over the course of two weeks. In an effort to obtain tissue samples and to ease the mass evolution, serial debridement was undertaken, leading to local reconstruction of the scalp by demand and necessity. After several session of debridement, it was evident that the scalp was enveloped in itself, allowing for the creation of safe havens for fungi proliferation that were not reached by systemic or topical antibacterial and antifungal therapy. Deep Foci of *Providencia Retgerri, Enterococcus Faecalis, Pseudomonas Aeruginosa, Klebsiella Pneumoniae* were then isolated but no spores were diagnosed. The release of the entire scalp with discharge incisions and rotation advancement flaps allowed for the complete debridement of the granulation tissue and primary closure of the scalp wounds with systemic improvement of the laboratory inflammatory parameters.

Follow Up and Outcomes

After several debridement sessions, a prolonged course of antimicrobacterial therapy and hyperbaric chamber treatments allowed for the complete epithelization of the scalp. The Antibiotic Regimen was 154 days of Itraconazol, 150 days of sulfamethoxazole and Trimethoprim, 30 days of Endovenous amicacine followed by 4 cycles of 15 days. 25 days of Meropenem and 24 days of Penicilin.

Although the scalp had a favorable evolution, the eyelid lesion with expansion into the intraconical space did not respond well. Debridement and upper eyelid ectropion correction with supraclavicular skin was performed. At 3 months follow up, CT Scan imagining revealed the presence of a intracranial expansion with involvement of the frontal sinusoidal space. Currently, the patient is proposed for a final endovenous antimicrobacterial course.

Treatment for mycetoma is medical and surgical. Actinomycetoma has a good response to medical therapy with pulsed and cycling antimicrobial therapy. However, eumycetoma, due to the quiescent nature of fungal spores generally requires surgical debridement.

Currently, surgical treatment of mycetoma is restricted to either isolated lesions that can be excised completely without morbidity or to large lesions, in order to increase the efficacy of the antifungal and antimicrobial therapy. In selected cases there is evidence of usefulness of external beam radiotherapy.

Conclusion

Eumicetoma of the scalp is a common infection in tropical countries [1-3]. The current clinical case presented a diagnostic challenge due to the abnormal anatomical area, the uncharacteristic exophytic lesions, the absence of the typical abscess formation or any mycobacteriology results in the most superficial swabs and early biopsies. The primary differential diagnosis were hematologic malignancies, granulomatous soft tissue disease and sexual transmitted infections.

Surgical treatment was of upmost importance in order to destroy the quiescent spores and to allow for the correct realignment of the scalp.

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