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ORIGINAL ARTICLE

Fungus Ball of the Paranasal Sinuses: Analysis of Our Serie of Patients☆

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KEYWORDS
Sinusitis;
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Abstract
Introduction and objectives: The fungus ball is the most frequent type of fungal rhino-sinusitis. The objective of this study is to analyse the clinical and surgical features of our patients.
Methods: Retrospective analysis of 35 patients with fungus ball treated in our centre between 2006 and 2014.
Results: Mean age was 55 years old. 49% were men and 51% women. 75% involved the maxillary sinus, whereas 25% involved the sphenoid. 69% of our patients showed microcalcifications in the CT study. All the patients were surgically treated, with no cases of recurrence.
Conclusions: Clinical manifestations of fungus ball are non-specific, therefore endoscopy and image study are mandatory. The definitive diagnosis is made by histopathological study of the lesion. Endoscopic sinus surgery is the treatment of choice, with opening of the diseased sinus and complete removal of the fungus ball. The frequency of complications is very low. No oral or topical antimycotic treatments are necessary.
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PALABRAS CLAVE
Sinusitis;
Enfermedades fúngicas;
Micetoma

Bola fúngica sinusal: análisis de nuestra casuística

Resumen
Introducción y objetivos: La bola fúngica es la forma más frecuente de rinosinusitis fúngica. El objetivo de nuestro estudio es analizar las características clínicas y los resultados de la cirugía en nuestra serie de pacientes.

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Métodos: Se analizaron retrospectivamente 35 pacientes con bola fúngica tratados en nuestro centro entre 2006 y 2014.
Resultados: La edad media fue de 55 años. El 49% de los pacientes fueron varones y el 51% mujeres. El 75% se localizaron en el seno maxilar y el 25% restante en el seno esfenoidal. La clínica más frecuente fue obstrucción nasal, rinorrea y algias craneofaciales. El 69% de pacientes mostró microcalcificaciones intrasinusales en la tomografía computerizada. Todos los pacientes fueron intervenidos quirúrgicamente, sin registrarse recidivas.
Conclusiones: Las manifestaciones clínicas de la bola fúngica son muy inespecíficas, por lo que el diagnóstico de sospecha se hace mediante endoscopia y estudio de imagen. El estudio histopatológico confirma el diagnóstico. La cirugía endoscópica nasosinusal es la base del tratamiento de la bola fúngica, limitándose a la apertura del seno (o senos) afecto, y exéresis completa de la lesión. La tasa de complicaciones postoperatorias es muy baja, y no es necesario tratamiento antifúngico oral o tópico concomitante.
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Introduction

Fungi are micro-organisms which, apart from yeasts, reproduce by producing spores. These spores are ubiquitous and are considered saprophytes of the mucosa of the entire upper aerodigestive tract.[1] Despite the enormous diversity of species, only a few cause disease in human beings. The species most commonly involved in sinonasal disease are: *Aspergillus*, *Alternari*, *Pseudallescheria*, *Bipolaris* and *Rhizopus*. Fungal rhino-sinusitis (FRS) is classified into two large categories; invasive and non-invasive (NIFRS). The former is determined by histological evidence of invasion of the mucosa, submucosa, blood vessels or underlying bone, and occurs in immunosuppressed patients. By contrast, with NIFRS there is no evidence of tissue invasion and it is typical in immunocompetent patients. The fungus ball (FB) is a form of NIFRS which is defined as an agglomeration of detritus and hyphae inside a paranasal sinus. This is the most common form of FRS, and in most cases is located in the maxillary sinus, followed by the sphenoid sinus. The pathogenesis of the FB remains a matter of debate. Treatment of this disorder is surgical with a view to resecting the entire lesion and ventilating the affected sinus, without the need for adjuvant antifungal therapy. The objective of our study is to describe our experience in the surgical treatment of the FB, analysing the main epidemiological and clinical characteristics, and the outcomes of surgery in our patients.

Methods

A retrospective study was made of 35 cases of FB-type NIFRS diagnosed and treated in our centre between 2006 and 2014. The diagnosis was confirmed by the presence of hyphae in histological analysis of the intrasinusal mass. All the patients presented intact immunological function. The clinical features and semiology of the disease, associated pathology, distribution per age and sex, and location were analysed. The mean age was compared between the males and females using the Student's *t*-test. All the patients were studied preoperatively with computerised tomography (CT scan) to assess the location and extension of the disease, and the existence of microcalcifications. The study was complemented with magnetic resonance (MRI) in cases where the location was the sphenoid sinus. The type of surgical approach and its complications were also studied, and recurrence of the disease. Mean follow-up was 10 months.

Results

Forty-nine percent of the patients were male (17/35) and 51% females (18/35). The mean age at the time of diagnosis was 55, with a range of between 22 and 79 years of age. The mean age was analysed per age subgroups; 48 being the mean for the female group and 62 for the male (P=.003). All the cases were unilateral, except for one patient (3%) who presented a bilateral maxillary sinus FB. Seventy-five percent of the FB (27/36) were located in the maxillary sinus, whereas the remaining 25% (9/36) were located in the sinus. The most frequent clinical symptom of maxillary sinus FB was nasal obstruction (76.9%), followed by purulent rhinorrhoea (61.5%) and facial or cranial algias (46.1%). In the cases of sphenoid sinus FB the most common symptoms were cranial or facial algias (77.8%) followed by purulent rhinorrhoea (66.7%) and cacosmia, only 11.1% of the patients presented a sensation of nasal obstruction (Table 1). Oedema of the mucosa or the presence of purulent exudate in the middle meatus or sphenoethmoidal recess was found in 69% of the FB (25/36). The proportion of pathological findings on endoscopy, according to the location, was 75% in the maxillary sinus FB and 66% in the sphenoid sinus FB.

CT scan showed intrasinusal microcalcifications in 69% of cases (25/36). In the case of sphenoidal FB, the proportion of microcalcifications was 33%, less than the 83% found in the maxillary sinus FB. All the cases were operated using an endoscopic endonasal approach, with wide opening of the

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