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ORIGINAL ARTICLE

Aspergillus in endodontic infection near the maxillary sinus☆,☆☆

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KEYWORDS
Aspergillus;
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Abstract
Introduction: Diseases of the maxillary sinus have been associated with dental roots near the maxillary sinus that have undergone endodontic treatment.
Objective: To investigate the presence of filamentous fungi in patients with dental roots near the maxillary sinus who had apical periodontitis treated endodontically, and to alert practitioners that this could be a possible avenue of contamination of the sinus in patients who develop maxillary sinus infection.
Methods: Cross-sectional study in 60 palatal roots of the first maxillary molars near the maxillary sinus, that underwent endodontic treatment for apical periodontitis. After removal of the filling material, dentin shavings were collected and placed in test tubes containing Sabouraud dextrose agar and chloramphenicol. The phenotype was determined by macroscopic and microscopic examination of the colonies. For polymerase chain reaction, the primers ITS-5 and ITS-4 were used. The sequences obtained were compared with those deposited at GenBank using the Basic Local Alignment Search Tool program.

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Results: Filamentous fungi were isolated from 6 of 60 canals (10%): *Aspergillus niger* (6.7%), *Aspergillus versicolor* (1.6%), and *Aspergillus fumigatus* (1.6%).
Conclusion: Root canals near the maxillary sinus with endodontic treatment and apical periodontitis may exhibit positive cultures for filamentous fungi. Interested professionals should be alert, because these microorganisms have pathogenic characteristics that can cause disease of odontogenic origin in the maxillary sinus.

PALAVRAS-CHAVE
Aspergillus;
Endodontia;
Infecção;
Seio maxilar

Aspergillus em infecções endodônticas próximas ao seio maxilar

Resumo
Introdução: Doenças do seio maxilar têm sido associadas à raízes com tratamento endodôntico próximas ao seio maxilar.
Objetivo: Investigar a presença de fungos filamentosos em raízes com tratamento endodôntico e lesão periapical, próximas ao seio maxilar, alertando para uma possível contaminação do seio maxilar por via odontogênica.
Método: Estudo transversal em sessenta raízes palatinas de primeiros molares superiores próximas ao seio maxilar, com tratamento endodôntico e lesão periapical. Após remoção do material obturador, raspas de dentina foram coletadas e inseridas em tubos de ensaio contendo Agar *Sabouraud Dextrose* e Clorafenicol. O fenótipo foi determinado pela análise macroscópica e microscópica das colônias. Para o PCR utilizou-se iniciadores ITS-5 e ITS-4. As sequencias obtidas foram comparadas as disponíveis no *GenBank* utilizando *Basic Local Alignment Search Tool*.
Resultados: Fungos filamentosos foram isolados de 6 dos 60 canais (10%): *Aspergillus niger* (6,7%), *Aspergillus versicolor* (1,6%) e *Aspergillus fumigatus* (1,6%).
Conclusão: Raízes próximas ao seio maxilar com tratamento endodôntico e lesão periapical, podem apresentar cultura positiva para fungos filamentosos. Profissionais afins devem estar alerta, pois este micro-organismo possuem características de patogenicidade podendo causar doenças no seio maxilar de origem odontogênica.

Introduction

Approximately 10–12% of cases of maxillary sinusitis are caused by odontogenic infection, due to the proximity of the roots of posterior maxillary teeth with the maxillary sinus cavities.[1] Apical and marginal periodontitis constitute 83% of odontogenic factors that may cause signs in maxillary sinuses.[2,3] Lu et al.[3] showed a direct relationship between presence of apical periodontitis and maxillary sinus membrane thickening, at a rate of 100%. The authors believe that microorganisms and toxins present in endodontic infections can seep into the maxillary sinus directly or through their countless vascular anastomoses, alveolar bone marrow, and lymph vessels.

Although bacteria are the most extensively studied etiological agents in endodontic infections, fungi also can be isolated from root canals.[4–9] The presence of filamentous fungi in root channels of teeth with pulp necrosis and apical periodontitis was first detected by Gomes et al. in 2010.[10]

There are several articles published in the medical literature that link the presence of filamentous fungi in the maxillary sinus with endodontically treated root canals in close contact with the maxillary sinus.[11–16] Recent studies have reported that endodontic treatment in posterior maxillary teeth is a strong risk factor for onset of a fungus ball within the maxillary sinus.[12,13]

However, the role of endodontic infections in maxillary sinuses is not very clear. Based on these reports, the aim of this study was to investigate the presence of filamentous fungi in endodontically treated root canals with apical periodontitis, located near the maxillary sinus.

Methods

This research was approved by the Research Ethics Committee (CEP CMM/HUAP 134/08 CAAE 0101.0.258.000-08). All participants completed a health questionnaire and signed an informed consent. For this study, 60 (24 female and 36 male) patients aged 18–65 years were selected; these patients were under treatment at the School of Dentistry.

Study design

This was a cross-sectional study of a contemporary cohort.