



CASE STUDY

PERIODONTITIS SUSPECTED CAUSED BY FUNGAL INFECTION

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ABSTRACT

Background: Invasive fungal infections (IFI) are uncommon, but when they occur, they are devastating to patients. These infections are opportunistic, they occur when the organism to which are frequently exposed gain entry to the body due to a decrease in host defenses. Periodontitis usually caused by bacteria infection. The aim of this study is to introduce a rare case of periodontitis suspected caused by fungal infection.

Case: The focus case is 59 year-old immunocompromised patient with left maxillary canine teeth had a caries, vital pulp but there was already swelling on her left cheek, very sharp pain, the patient had a headache, no fever and normal gingiva.

Result: The patient was treated with antibiotic, no effect but with antifungal had a good outcome and the left maxillary canine teeth had an endodontic treatment

Conclusion: It is suspected that this periodontitis was caused by fungal infection because this patient had a history identification of fungal infection which was cultured from her right ear and the skin swab of ass right.

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INTRODUCTION

Fungal infections, also called mycoses, are important causes of morbidity and mortality in humans. Some fungal infection are endemic, and these infection usually caused by fungi that are present in the environment and whose spores enter human. Other fungal infections are said to be opportunistic because the causative agents cause mild or no disease in healthy individuals but may infect and cause severe disease in immunodeficiency persons. The human airway is continuously open to the non sterile environment where fungal spores have the potential to reach lung tissue and produce disease. In the immunocompromised host, many fungi, including species of fungi typically considered non pathogenic, have the potential to cause serious morbidity and mortality (Puebla, 2012). In the USA, the incidence of sepsis caused by fungi has increased by more than 200% since 1991, whereas cases of bacterial sepsis have only increased moderate (Martin *et al*, 2003). The outcome of an infection with a human-pathogenic fungus often depends on immune status of the host organism. In recent decades, the frequency of invasive fungal infections has increased steadily, resulting in considerable morbidity and mortality (Hom *et al.*, 2012).

The pathogenesis of fungal infections involves several virulence factors that allow fungal survival and persistence in the host, eventually leading to tissue damage. Examples of the latter are dimorphic fungi, which transform from saprobic filamentous molds to unicellular yeasts in the host. Also, some species of *Candida* can grow in different forms, such as yeasts, blastospores, pseudohyphae and hyphae, depending on infection sites. *Cryptococcus neoformans* yeasts become coated with a capsule, and the filamentous fungi (for example, *Aspergillus spp.*, *Fusarium spp.*, and *Zygomycota*) which are inhaled as unicellular conidia, can transform into branching hyphae in the lungs (Romani, 2004). However, epidemiological data for fungal infections are notoriously poor because fungal infections are often misdiagnosed. Consequently, the calculations may significantly underestimate the true burden of invasive fungal disease (Brown *et al*, 2012). Infections by *Aspergillus* or *Mucor* usually develop by inhalation of spores. Common features of rhinocerebral, pulmonary and disseminated diseases include blood vessel invasion, hemorrhagic, necrosis, thrombosis and a rapid fatal outcome (Morace and Borghi, 2011) Periodontitis is a set of inflammatory diseases affecting the periodontium, which are the tissues that surround and support the teeth (Frascolino, 2014). Periodontitis means "inflammation around the tooth". It is a serious gum infection that damaged the soft tissue and bone that supports the tooth.

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All periodontal diseases, including periodontitis, are infections which affect the periodontium. Microorganisms, such as bacteria, stick to the surface of the tooth and multiply – an overactive immune system reacts with inflammation. Gingivitis refers to gum inflammation occurs before periodontitis (Nordqvist, 2015). Of all diseases affecting the periodontium, the most prevalent and clinically important are those cause by oral bacteria that colonize in dental gingival crevice, gingivitis and periodontitis, in acute and chronic form. Acute periodontal diseases develop rapidly, often are aggressively destructive, and cause considerable pain and disability. Their management is based on the same principle applicable to any acute infection – suppression of the causative organism – and most respond standard antiinfective measure (Trumel and Behnia, 2002). Fungi are widespread in the environment and diverse array of fungi can be found on mucous membranes of humans (Rickerts and Fredricks, 2012). In immunocompromised patients the portal entry of fungal infection has been suggested by researcher to be the gingival sulcus or the marginal gingiva. Painful gingival ulcerations are initially noted and peripherally the mucosa and soft tissue develops diffuse swelling with a grey or violaceous hue (Neville *et al.*, 2009)



Figure 1. Intra oral image



Figure 2. Microscopic image before endodontic treatment

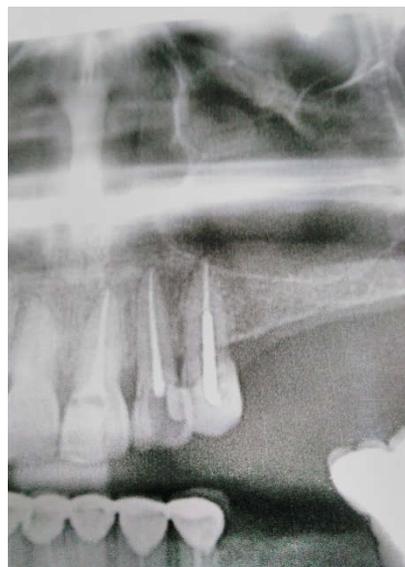


Figure 3. Microscopic image post endodontic treatment



Figure 4. Culture of ass right

The Case Report

A female patient, 59 years old an immunocompromised with nasopharynx carcinoma stage 3 since 1996 post radiotherapy came to dental clinic in Naval Hospital dr Ramelan Surabaya to have a treatment of left maxillary canine. She was diagnosed 3 years ago as an invasive fungal infection (IFI), opportunistic and was identified as *Aspergillus terreus*, cultured from fluid of her right ear. *Aspergillus* species showed from the skin swab of ass right (Figure 4). Since 1 week before, she feel very painful on her left maxillary canine teeth and after that there was a swelling on the buccal mucous of left maxillary teeth to the left cheek, very painful, had a headache, no fever and normal gingiva. In dental clinic, the dentist found that the left maxillary canine teeth had a caries, vital pulp, and the swelling of buccal mucous and left cheek. The left maxillary lateral incisor teeth diagnosed as hyperemic pulp and the left central incisor of maxillae already had a filling since 2 years ago, was diagnosed as hyperemic pulp. She had treatment for left maxillary canine teeth and after that, she also complain about the pain in the central incisor teeth of maxillae and later in the left maxillary lateral incisor teeth (Figure 2)

The Case Management

The swelling appeared on buccal mucous of left maxillary canine to the left cheek and the consistency was rather hard and very painful.

There was no sign of redness as usual in inflammation, gingiva in normal condition but very painful, percussion positive. She had a head ache for 3 days but no fever. The dentist opened the pulp of canine and found that the pulp was still vital, so it was injected and exiled. The patient was treated with antibiotic ciprofloxacin 500 mg, 3 times daily and analgesic, mefenamic acid 500 mg, 3 times daily for 3 days. Because still very painful and abscess, she was given cefadroxil 500mg, for 4 days, 2 times daily and diclofenac sodium 50 mg, 3 times daily for 4 days, it help to ease the pain but not reduce the swelling. The dentist decided to give itraconazole 400mg, 2 times a daily for the patient because of the history of IFI before. Surprisingly, it was make a very good response for the patient. The swelling, the pain and the headache disappeared within 3 days and then she received endodontic treatment. Culture swab was taken from the mucosa of the maxillary canine teeth, but there was no sign of fungal growth. The left maxillary central incisor teeth, percussion positive, but when the dentist opened the pulp, it was already died and there was no reaction of gas that usually will release the pain in bacterial infection. The left maxillary lateral incisor teeth with hyperemic pulp the cavity was filled with composite, but after that the patient felt very painful, percussion positive so the dentist decided to lift the pulp and was given an endodontic treatment. The 3 anterior teeth on the left maxillae then given endodontic treatment (Figure 3).

DISCUSSION

Of all diseases affecting the periodontium, the most prevalent and clinically important are those cause by oral bacteria that colonize the dental gingival crevice, gingivitis and periodontitis in acute and chronic form. The periodontal tissues also maybe involve secondary by abscesses arising from an acute or long-standing pulpal-periapical infection. From a diagnostic and treatment standpoint the most complicated periodontal abscess is one in which both periodontitis and an infected pulp or periapical lesion are present before abscess formation. Swelling may affect only limited area of gingiva or may extend into the alveolar mucosa and vestibule and maybe visible or palpable extraorally. The status of the pulp must be determined to rule out pulpal and associated with periapical lesions as the source of infection. The presence of deep carious lesions should be considered, although such findings alone are not indicative of pulpal-periapical disease (Trumel and Behnia, 2002). The patient in the case above was patient with low immunity due to suffering from nasopharyngeal cancer stage 3 and had been diagnosed with invasive/opportunistic fungal infection. Cultures of the fluid contained in the right ear is *Aspergillus terreus* and cultures from ass right looks like an image of *Aspergillus* species. Although inflammatory periodontal disease of bacterial origin are diverse, they can be classified as acute or chronic. A periodontal abscess often presents all or most of the signs of acute local inflammation and infection: abrupt onset, gingival or mucosal swelling or both, intense erythema of the affected tissue, and pain (Trumel and Behnia, 2002). This was not happen in our case because although this case belongs to the category of acute but not all visible signs of inflammation. There was gingival and mucosal swelling, very sharp pain, no redness in gingiva, no heat. In Trumel and Behnia (2002): The affected tissues in bacteria infection of periodontal are deep blue to bright red but in this case the gingiva was normal, no redness. The nature of pain experience often is helpful in distinguishing between a pulpal-periapical and periodontal abscess. Acute pulpal-periapical

infections typically manifest in severe, sharp pain of an intermittent and spontaneous nature. In contrast pain associated with a periodontal abscess usually is not severe or spontaneous and is dull and throbbing (Trumel and Behnia, 2002). The patient in this case felt a very sharp pain during 1 week. In histopathological terms a periodontal abscess elsewhere in the body: pyogenic bacteria locally invade the gingival connective tissue adjacent to the pocket wall. The ensuing accumulation of pus ultimately seeks drainage through the pocket orifice or by formation of a fistulous tract through the pocket wall into the gingiva or mucosa (Trumel and Behnia, 2002). In this case there was no accumulation of pus but there was swelling with rather hard consistency. The pulp tissue in this case report was vital and according to Trumel and Behnia (2002) that If the tooth has either an intact (i.e vital) pulp or a filled root canal and no evidence of periapical disease, then a diagnosis of periodontal abscess is rational. Systemic antibacterial therapy currently is reserved for specific situation and adjunctive microbes in patients with systemic conditions may reduce the resistance to infection (Trumel and Behnia, 2002). Antifungal, itraconazole was given to the patient and had a good result after received antibiotic ciprofloxacin and cefadroxil. The result of culture swab of mucosa gingiva, showed no sign of fungal growth, maybe because the swab was taken after the patient already consumed antifungal drugs (itraconazole).

Conclusion

This periodontitis is suspected caused by fungal infection because the patient was an immunocompromised with IFI history, different symptoms and clinical sign in oral cavity compare to periodontitis cause by oral bacteria. There was no response to antibiotic therapy but was respond to administration of antifungal drugs that ensured this periodontitis is a result of the fungal infection.

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