Oral Candidiasis in Grave's Disease after Dental Surgery

Fanny Margaretha Laihad[1], Lita Agustia[2], Eddy Hermanto[1], Kristanti Parisihni[3], Syamsulina Revianti[3], Widyasri Prananingrum[4], Linda Rochyani[5], Meinar Nur Ashrin[6], Noengki Prameswari[7]

1. Department of Oral Surgery, Naval Hospital, Surabaya, Indonesia.
2. Faculty Hang Tuah University, Surabaya, Indonesia.
3. Department of Oral Biology, Faculty of Dentistry, Hang Tuah University, Surabaya, Indonesia.
4. Department of Dental Material, Faculty of Dentistry, Hang Tuah University, Surabaya, Indonesia.
5. Department of Conservative, Faculty of Dentistry, Hang Tuah University, Surabaya, Indonesia.
6. Department of Prosthodontic,Faculty of Dentistry, Hang Tuah University, Surabaya, Indonesia.
7. Department of Orthodontic, Faculty of Dentistry, Hang Tuah University, Surabaya, Indonesia.

Abstract

Candida usually considered as a normal flora in the oral mucosa and Grave's disease is an autoimmune thyroid disorder that have a very noticeable sign like exophthalmos and can occur at any age. The aim of this study is to analyze a case of oral candidiasis in a patient with Grave's disease after dental surgery. There was a 40-years-old-female with hyperthyroid (Grave's disease) under controlled which carried out of dental surgery in the lower left third molar with local anesthetic and suffered swelling two days after surgery performed. She was hospitalized for 3 days, and treated by internist and oral surgeon. Candida tropicalis was found from fungal culture on the gingival mucosa 38. The swelling was reduced after treatment and the patient was in a good condition. The act of surgery in oral cavity may lead to the emergence of fungal infection (Candidiasis) in immunocompromised patient as in Grave's disease.

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Introduction

Fungal infection can be transmitted by the inhalation of spores, percutaneous inoculation in cutaneous and subcutaneous infections, penetration into the mucosa by commensal organism and the ingestion of a toxin in contaminated food or drink.[1] Invasive fungal infections (mycoses) are uncommon, but when they occur, they are devastating to patients. These infections are opportunistic, they occur when organisms to which we are frequently exposed gain entry to the body due to a reduction in the host defenses, or through an invasive portal, such as a dental extraction.[2] Candida is any of several yeast like fungi that may cause thrush, vaginitis and other condition. Candida is naturally present in human body, but their presence is well regulated.[3] Historically, *Candida albicans* has been the major species responsible for causing candidiasis in immunocompromised and immunocompetent patients. *Candida albicans* infections have increseased dramatically during the last two decade.[4] *Candida tropicalis* has been identified as the most prevalent pathogenic yeast species of Candida Non Albicans group.[5]

Hyperthyroidism is a condition caused by unregulated production of thyroid hormones[6] and occurs when the thyroid gland release too much of its hormones over a short (acute) or long (chronic) period of time.[7] Thyrotoxicosis is a serious sequela of hyperthyroidism that corresponds to an overt tissue exposure to excess circulating thyroid hormones. It is characterized by tremor, emotional instability, intolerance to heat, sinus tachycardia, marked chronotropic and inotropic effects, increase cardiac output, systolic heart murmur, hypertension, increased appetite and weight loss.[6] Grave's disease is an autoimmune thyroid disorder that have a very noticeable sign like exophthalmos / protruding eye balls.[8] Grave's disease is a pathological complex produced by hyperthyroidism with diffuse goiter, ophthalmopathy and dermopathy but not all of

Corresponding author:
Noengki Prameswari
Department of Orthodontic, Faculty of Dentistry,
Hang Tuah University
Surabaya, Indonesia
E-mail: noengki.prameswari@hangtuah.ac.id

these signs appear together during the course of the disease and can occur at any age.[6]

The oral manifestation of thyrotoxicosis are increased susceptibility to caries, periodontal disease, enlargement of extra-granular thyroid tissue, maxillary or mandibular osteoporosis, accelerated eruption of teeth, development of connective-tissue diseases and burning mouth syndrome.[9]The oral health care professional should be familiar with the oral and systemic manifestations of thyroid disease so he or she can identify any complication and assess the level to which condition is controlled.[6] Dental extraction of the third molar is related with a variety of complications and the most frequently encountered procedure in oral and maxillofacial. It is often challenging to dental surgeons because of related postoperative complication. Extracting the impacted mandibular third molar, however, is often challenging to dental surgeons because of related postoperative complication.[10]

The aim of this study is to analyze a case of oral candidiasis in patient with Grave's disease after dental surgery.

Case

A 40-years-old-female patient came to the oral surgery clinic at Naval Hospital dr. Ramelan Surabaya for odontectomy 38 referred from the internist. From anamnesis found that the patient routinely control every month in the clinic of internal medicine for hyperthyroid. One month earlier, she had odontectomy on the tooth of 48 and suffered swelling after surgery performed. At that time antibiotics cefadroxyl 500 mg, 2 times daily and mefenamic acid 500 mg, 3 times daily were given as a premedication and also continued after odontectomy to cope with the swelling that occurred. On extra oral examination there was a noticeable sign of protruding eyeballs (exophthalmos). She was scheduled in the early November 2016 and previously given premedication of antibiotics and analgesics as usual. Odontectomy run smoothly with no significant inhibitors and the impacted teeth can be removed in approximately 15 minutes. Two days later, the patient returns to the oral surgery clinic with swelling complaints on the neck and pain of swallowing. On extra oral examination seen the swelling in the neck, mandibular area with no redness, no fever but pain at the time of swallowing. On intra oral seen no swelling in the oral gingiva 38, normal mucosa, no redness (Figure 1). We performed swab on the gingival mucosa 38 for fungus culture in the oral cavity. Because of the patient's uncertain condition and the swelling are widespread, finally she has been hospitalized.

Case Management

She was hospitalized for 3 days, two days after surgery and was treated by internist and oral surgeon. At night after hospitalization, the patient complained about the pain of swallowing and difficulty of breathing. The patient tension is slightly increase and somewhat stressed by her condition. From internist, are given medications to reduce the symptoms of *thyrotoxicosis* such as increased tension, unstable emotion and other conditions of the illness. Whereas from oral surgeon, the patient gets infus ringer lactate (RL) and drugs like anti-inflamatory, metronidazole infusion 500 mg, 2 times daily, mouthwashes and continuing antibiotics used given. On the first day after hospitalization, the progress of the patient was very good and she feels more comfortable. On the second day, the swelling has decreased as well as the pain and at the third day the patient has been out of hospital (Figure 2). From microbiological examination, *Candida tropicalis* was found from fungal culture on the gingival mucosa 38. The swelling was reduced after treatment and the patient was in a good condition. The patient had been informed of a fungal infection but after that the patient do not appear in the oral surgery clinic and do not want to be given anti-fungal drugs.

Discussion

Candida is the most common fungal of oral cavity in human. It exist as a commensal inhabitant of mucosal surfaces in most healthy individual. Superficial infections are caused most often by several species of Candida, which are the second numerous agents of fungal infection in the worldwide.[12] Oral Candidal infection usually involves a compromised host and the compromise maybe systemic or local.

Figure 1. Extra Oral Image Before Treatment

Figure 2. Extra Oral Image After Treatment

Oral candidiasis is generally a localized infection and rarely appears as a systemic fungal disease whereas oral non-candidal fungal infections are usually signs of disseminated disease.[13] Candida species are ubiquitous fungi that represent the most common fungal pathogens that affect humans, caused severe diseases in immunocompromised individu.[14]

The growing problem of mucosal and systemic candidiasis reflects the enormous increase in the number of patients at risk. The increased opportunity that exists for *candida* species which are true opportunistic pathogens exploit recent technological advances to gain access to the circulation and deep tissue.[12] The clinical manifestation of the disease caused by a given fungal agent can be highly variable and related to host immunity and physiological condition. For example, the species of Candida can invade a local side (mucocutaneous or cutaneous candidiasis) or cause systemic infections in renal, liver etc.[1] Linear gingival erythema (LGE) in HIV infection significant correlation with candida infection in oral cavity[15] and cigarettes also increase candidiasis in the oral cavity.[16] Candida is any of several yeast like fungi that may cause thrush, vaginitis and other condition. Candida is naturally present in human body, but their presence is well regulated.[3] Species of the genus Candida, predominantly with *Candida albicans* which is a normal microflora in the oral cavity but also can be isolated from the root canal.[17] *Candida tropicalis* has been identified the most prevalent pathogenic yeast species of CNA (Candida Non Albicans group). Infections due to *Candida tropicalis* have increased dramatically on global scale thus proclaiming this organism to be emerging pathogenic yeast. In India, *Candida tropicalis* is the most cause of nosocomial candidiasis and the data showed that 67%-90% of nosocomial candidaemia causes were due to CNA species of which *C. tropicalis* was the most dominant.[5]

Recognition of the signs and symptoms of hyperthyroidism is very important in dentistry. The elevated levels of thyroid hormones in these patients make them sensitive to sympathomimetic drugs such as epinephrine, which is used in dentistry in local anesthesia. It can cause the patient to experience a hypertensive crisis, tachycardia and/or dysrhythmia.[8] Patients who have hyperthyroidism have increased level of anxiety, stress or dental surgery can trigger a thyrotoxic crisis. Stress management is vital for hyperthyroidism.[18] Anti-thyroid drugs namely propylthiouracil (PTU) has anti-vitamin K activity and can cause hypoprothrombinemia and bleeding that poses a risk for hemorrhage so patients taking PTU must be carefully evaluated before surgery or invasive dental treatment.[19] Some drugs like aspirin, oral contraceptives, estrogen and NSAIDs (nonsteroidal anti-inflamatory drugs) can lead to thyrotoxicosis.[18]

One of the most common causes of yeast overgrowth is the overuse of antibiotics. The reason for this is because the healthy bacteria that is part of the gut flora help to keep the yeast in check. Antibiotics not only kill the harmful bacteria, but also the healthy bacteria. People with Grave's disease are susceptible to getting candida infections and this yeast infection will in turn affect the health of immune system. For someone who has a genetic marker for Grave's disease, this can very well act as a trigger for this condition. Similarly, if someone already has Grave's disease, then this potentially can lead to the development of a candida infections. Grave's disease is an autoimmune hyperthyroid condition and so the compromised immune system can make someone more susceptible to a candida infection.[20]

Dental surgery of lower third molar is one of the most common minor oral surgical procedures practiced in oral and maxillofacial surgery on day to day basis.[21] Extracting the impacted mandibular third molar is often challenging to dental surgeons because of related postoperative complication.[10] The odontectomy of impacted mandibular third molars produce a great degree of injury to the soft tissues as well as to the bony structures of the oral cavity, which significantly results in a potential inflammatory reaction.[22] The latter produces the usual postoperative surgical consequences of pain, edema, and limited mouth opening that is trismus due to muscle spam.[23]

Dentist are seeing a growing number of medically compromised patient in their practices.[2] Often there is a history of extraction in fungal infection.[24] There are also 3 (three) cases that were suspended in dental surgery due to suspected infection of the fungus.[25] Usually the infection make progress with the angioinvasive hyphae which entering into the vascular channels.[24] The ability to identify patients whose overall health status may not allow them to tolerate surgical or dental manipulation very well is important to avoid the clinical outcome.[2]

In the above case when viewed from its characteristic features, the patient is a hyperthyroid, especially Grave's disease, that is the patient whose immune system is decreased or immunocompromised. Increased blood pressure is likely due to the use of epinephrine on local anesthesia. Epinephrine is administered on the basis of a controlled patient condition, no cardiac abnormality and there was no information that stating about using epinephrine from the internist. An increase of blood pressure can also cause by the patient's stress because of the situation so that her emotion become unstable. Although there is no cardiac abnormality and hyperthyroid condition is controlled, many expert advice against taking epinephrine or need to be carefully considered.[6-9]

Patient did not experience bleeding after extraction but swelling. Swelling occurs with a rather hard consistency where the mucosa is normal, no redness, no fever. In the case of periodontitis suspected caused by fungal infection has the same symptoms like the swelling with a rather hard consistency, no redness, no fever but very painful.[26] The cause of the infection may come from bacteria or fungi and more likely the fungus after there is a result of culture as *Candida tropicalis*. Beside the patient still taking antibiotics and the result of blood test, normal leukocytes, 7,37 $10^{>3}$/ul. In addition to the condition of immunocompromised which can trigger fungal infections, the patient also has a history of antibiotic use in the previous surgery. The problem is that this infection does not give a complete inflammation mark (five Cardinal symptoms), normal leukocytes despite extensive swelling. By looking at the various reviews above, the swelling that occurs more leads to a fungal infection that gives such signs of inflammation. In the future, things like this need further investigation.

The antifungal agents usually used for fungal infections are Amphotericin B (AmB), Azole and Echinocandins. The combination therapy of azole and Amphotericin B is often used.[27] There was a study of flaxseed extract, a natural product with a wide array have an antifungal activity[28] Other studies have evaluated the management of antifungal drugs, but few studies of antifungal therapy have been conducted and it was shown that some cases of oral candidiasis went untreated.[29] It takes about two (2) weeks to make sure that the patient is infected with *Candida tropicalis,* so the patient did not get given anti fungus although in the case like this needed immediate treatment. The given drugs can relieve infections such as metronidazole that do have an impact to microbial infection and anaerobic bacteria in oral.[30] It is also reported that hyperbaric oxygen therapy has an effect on fungal infection like mucormycosis,[31] which may also have an effect on candidiasis. It is required further research.

Conclusions

The act of surgery in oral cavity may lead to the emergence of fungal infection (Candidiasis) in an immune compromised patient as in Grave's disease. Dentist should be vigilant and have a detailed knowledge of the clinical and oral manifestations of hyperthyroidism that will affect dental care. Need further investigation about the signs of inflammation of fungal infection in the oral cavity.

Declaration of Interest

The author report no conflict of interest for this article

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