

Management of Submandibular Abscess in Pregnant Woman: A Case Report

Fachrul Razi¹, Abel Tasman Y², Seto Adiantoro S³

¹Oral and Maxillofacial Surgery Residency Program, Faculty of Dentistry, Padjadjaran University, RSUP Dr. Hasan Sadikin, Bandung, Indonesia

^{2,3}Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Padjadjaran University, RSUP Dr. Hasan Sadikin, Bandung, Indonesia

Abstract: *Submandibular abscess may be caused by odontogenic infection spread in immunocompromised patients. However, occasionally pregnant women with bad oral hygiene may develop tooth infection that leads to submandibular abscess. This article aims to describe and discuss submandibular abscess management using surgery intervention in pregnant woman. A 28 years old woman, pregnant, reported to ER at Dr. Hasan Sadikin general hospital with chief complaint swelling and pain on left cheek with difficulty to open her jaw. She was diagnosed with left submandibular abscess. Management of this case included consultation to Obstetric and gynecologist department and drainage incision through local anesthesia. Drainage incision is a mandatory in abscess management to prevent a further spread infection. Surgery intervention in pregnant woman need a holistic and accurate emergency treatment by considering well established clinical guidelines in managing odontogenic infection.*

Keywords: submandibular abscess, pregnancy, drainage incision

1. Introduction

Abscess is a localized pathologic cavity filled with pus and limited by fibrotic tissue. Abscess is an infection response product to maintain body homeostasis stable and balance using vascular and cellular response. Abscess pathogenesis can be classified into odontogenic and nonodontogenic infection. Odontogenic infection derives from tooth hard tissue, marked by *port de entre* from pulp exproation. Nonodontogenic infection derives from tooth margin or periodontal tissue.^{1,2}

Abscess of submandibular is a chronic suppurative odontogenic or nonodontogenic infection that spread into submandibular space. Commonly caused by lower premolar or molar teeth. Clinical signs showed extra oral swelling at submandibular region with redness at lower jaw angle. No intra oral swelling shown except at a later stage.^{1,2}

Pregnancy has been shown to be associated with compromised oral health due to hormonal changes and altered immunological activity aggravating response to dental infection resulting in serious life threatening condition. Odontogenic infections are the most prevalent disease worldwide that presenting initially as localized and could spread causing facial cellulitis and if not treated will develop into more serious facial spaces infections. Health practitioners may be reluctant to treat orofacial infections aggressively in pregnancy due to the potential risks of imaging modalities and medications such as antibiotics^{1,2,3}

This article report a management of odontogenic infections in pregnancy, and present a case of a pregnant patient who underwent successful surgical management of a submandibular abscess

A 28 years old second-trimester pregnancy woman was reported to Emergency Department of Dr. Hasan Sadikin general hospital with swelling on left cheek. History take revealed a toothache of posterior left lower tooth one month before admission and there was no treatment performed. Two weeks later the left cheek became swollen then she visited a dentist and was only prescribed analgesia and antibiotic. Due to unsubsided complaint, she was then presented to Dr. Hasan Sadikin general hospital emergency department with worsening pain, enlarged swelling and limitation in mouth opening.

Clinical examination showed there was no other compromised systemic condition, no evidence of difficulty in swallowing or voice change. Patient was fully alert with stabil vital signs and no fever. On presentation there was asymmetrical face with swelling at left lower jaw extended to left cheek. The swelling was 10 x 7 x 5 cm in size, localized, redness in colour, warm, fluctuant, tenderness and pain on palpation was noticed. Mouth opening around 4 mm. (Fig. 1 and 2).



Figure 1: Pre-treatment facial profile

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Figure 2: Intra oral picture. Noticed the severe trismus (with inter incisalspace about 4 mm)

Blood examination and consultation to obstetric and gynecologist department was completed at emergency room. Prior to surgery intervention, pus aspiration was performed to ensure the location of pus and for the purpose of antibacterial resistance and sensitivity cultures(Fig.3). The source control was done by forming incisionat the extraoral of submandibular region for pus drainage and silicone drain placement for pus access (Fig.4).Extraction of the tooth as the source of infection was unable to perform due to difficult access caused by limited mouth opening.The extraction was postponed until next visit through outpatient department.After surgical intervention, the patient was observed to see if there was any systemic compromised as the side effect of infection and treatment. The patient was discharged with stabil vital signs. During home treatment, she was encouraged to maintain her oral hygiene, practicing mouth opening using wooden popsiclesticks, and reported back three days after.



Figure 3: Pus aspiration



Figure 4: Drainage incision and silicone drain placement



Figure 5: Inter incisal space widened into 1 cm after incision and drainage

Three days follow up after incision, the improvement was significant, swelling at left cheek decreased and mouth opening also widened (Fig. 6).



Figure 6: Facial profile of three days follow up after incision

3. Discussion

Submandibular space is located beneath mylohyoid muscle that separates it from sublingual space. It lies inferior and medial to posterior mandible, limited by hyoglossus muscle, digastricus muscle, and posterior external pterygoid muscle. The submandibular space is the most common location of odontogenic abscesses. Extension of the infection to adjacent fascial spaces develop in more than 50% of cases. Without proper and adequate treatment, the infection can spread along fascial planes caudally to the skull base, and in a rostral direction down to the mediastinum. Infection related with this space may be caused by dentoalveolar abscess, periodontal abscess, and pericoronitis affecting lower premolar or molar tooth.^{1,2}

Incision and drainage as a part of infection control should be performed properly.⁴ Drain flow observed to evaluate drain efficacy and pus production. If the pus production is minimal, drain needs to be remove to prevent further infection and enhance recovery.

Extraction of infectious tooth has to be executed immediately, since itsbecoming a comprehensive therapy to cease infection. Following tooth extraction, curettage on tooth socket carried out to eliminate necrotic tissue and optimize pus evacuation intraorally. ⁴It is also important to educate the patient to maintain their oral health and mouth opening exercise using wooden popsicle stick to optimize pus evacuation through muscle contraction. The exercise is useful to prevent mastication muscle atrophy hence prevent trismus.

Broad-spectrum antibiotics should be empirically administered per oral or intravenously before the results of cultures obtained. Antibiotic therapy will be change according to culture results and clinical response of the patient. Drug of choice depends to microorganism pattern and sensitivity test. Antibiotics often used in the setting of odontogenic infections are penicillin, amoxicillin and cephalosporins.^{5,5,6}

The definitive management of odontogenic abscesses is surgical exploration and drainage in need of decompression. In the setting of pregnancy this does not change, and early and aggressive surgical management is likely to be less harmful than prolonged antibiotics, which is commonly associated with progression of disease to sepsis and multi-organ dysfunction syndrome, compromising both the patient and the baby. In basic, there is no absolute contraindication in pregnant woman, as in abscess patient surgery intervention is necessary to prevent further infection, however, there are particular consideration needed related to management and drug options.^{5,6}

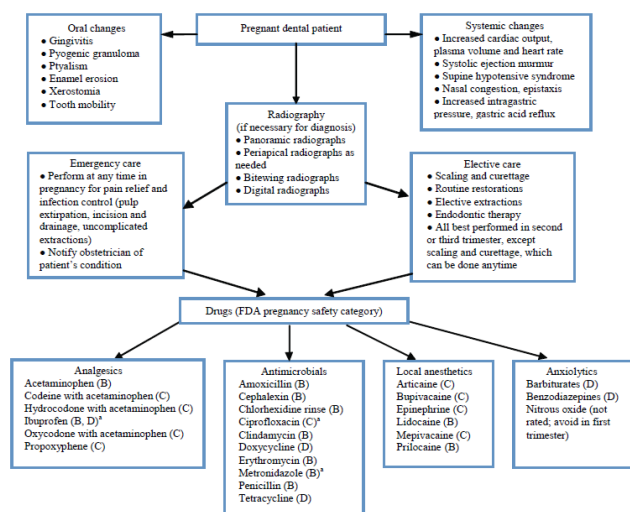


Figure 7: Management scheme related to pregnancy, diagnostic, and medicine options in pregnant woman⁶

Table 1: Pregnancy drug risk category, published by U.S. Food and Drug⁷

Category	Evidence
A	Adequate, well-controlled studies in pregnant women have not shown an increased risk of fetal abnormalities.
B	Animal studies have revealed no evidence of harm to the fetus, however, there are no adequate and well-controlled studies in pregnant women. or Animal studies have shown an adverse effect, but adequate and well-controlled studies in pregnant women have failed to demonstrate a risk to the fetus
C	Animal studies have shown an adverse effect and there are no adequate and well-controlled studies in pregnant women. or No animal studies have been conducted and there are no adequate and well-controlled studies in pregnant women.
D	Studies, adequate well-controlled or observational, in pregnant women have demonstrated a risk to the fetus. However, the benefits of therapy may outweigh the potential risk.
X	Studies, adequate well-controlled or observational, in animals or pregnant women have demonstrated positive evidence of fetal abnormalities. The use of the product is contraindicated in women who are or may become pregnant.

Odontogenic infection needs immediate treatment any time during pregnancy. Pregnant woman mostly not in immunocompromised state, however immune system is suppressed as a response due to fetus presence. Consequently,

Natural Killer (NK) cell activity and cellular immunity is decreased and as a result, odontogenic infection may developed to deep infection readily and disrupt oro-pharynx airway. Abscess formed requires drainage whereas the infected pulp involves extirpation or extraction to control the infection. Consultation to obstetrician related to patient status is made prior to patient therapy plan discussion.^{6,7}

General consideration concerns about prescribing and drug administration as the drug may get through placenta barrier and induce teratogenic effect towards the fetus. U.S. Food and Drug Administration (FDA) defines pregnancy risk category for various kind of drug (Table 2).^{6,7}

Nearly every antibiotic prescribed by dentist included in B category, except tetracycline and derivatives (e.g. doxycycline) in D category that affect growing teeth and bone. Ciprofloxacin, a broad spectrum antibiotic used for periodontal disease related to *Actinobacillus actinomycetecomitans*, included in C category. Ciprofloxacin utilization for pregnant woman is limited due to atrophy effect and affecting cartilage development in immature animals. No sufficient data related to human safety found. Metronidazole is included in B category. Some researchers recommended careful usage in the first trimester as it may harm the fetus, however recent study showed no definitive teratogenic effect. Risk to benefit ratio metronidazole administration involves obstetrician consultation. Eritromycinestolate form has to be avoided as it harms hepar in pregnant woman. Chlorhexidine gluconate, antimicrobial mouthwash, is included in B category.^{6,7,8}

Analgesic categorization is based on short term usage (2-3 days) to treat a specific disease. Acetaminophen in B category pregnancy risk is the safest analgesic to use during pregnancy. Most of the other analgesic prescribed for pregnancy is included in C category. Consider that despite C category is safe in general, it is not tested in human study. Therefore, drug prescription in this category should be given in precise therapeutic dose in the shortest period of time. Ibuprofen is analgesic B category in first and second trimester however it becomes D category in third trimester, associated with low amniotic fluid, arteriosus duct closure prematurely, and birth inhibition.^{6,7,8}

4. Conclusion

Optimal dental and oral health is principal for pregnant woman and may be carried out safe and effective. Surgery intervention in pregnant woman need a holistic and accurate emergency treatment by considering well established clinical guidelines in managing odontogenic infection. Follow up and evaluation post operatively is important to avoid further complication. Periodontal disease may affect pregnancy, therefore dentist has an important role in maintain and early detection of infection.

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