Submandibular abscess in a pregnant patient with multiple antibiotic allergies: A case report

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Abstract

Objective: This article describes and discusses the management of submandibular abscesses in pregnant women with allergies to several antibiotics.

Case Report: A 34-year-old pregnant female patient came to the dental clinic with complaints of swelling and pain in her left cheek and difficulty in opening her jaw. The patient was diagnosed with a left submandibular abscess.

Results: The doctor performed an odontectomy and extracted the remaining roots, which were suspected to be the cause of the abscess. The patient was also advised to visit the emergency room at Brawijaya University Hospital for further treatment after coamoxiclav failed to alleviate the symptoms.

Conclusion: This case reports a dramatic course of treatment in a pregnant patient with a submandibular abscess accompanied by allergies to several antibiotics. Surgical intervention in pregnant women requires appropriate clinical considerations and guidelines to prevent complications.

Keywords: Submandibular abscess, pregnant patient, antibiotics, allergies.

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Introduction

A submandibular abscess is defined as the formation of an abscess resulting from the spread of odontogenic or non-odontogenic infections that are not treated immediately or that management is inadequate. This abscess is caused by aerobic and anaerobic bacteria, where the formation occurs in the space between the deep neck fascia. Symptoms that can occur include fever and pain in the neck, accompanied by swelling under the mandible or the tongue with or without fluctuation, trismus, and erythema. The management consists of clearing the airway, eliminating the source of infection, antibiotic therapy, and surgical procedures (incision and drainage).1-3

Hormonal and non-hormonal alterations in the oral environment can have adverse effects on oral health, including the highly prevalent gingivitis that affects pregnant women.4,5,6 Additionally, numerous alterations in hemodynamics and the immune system occur during pregnancy. The occurrence of complications linked to various adverse pregnancy outcomes is a perilous consequence of odontogenic infections for expectant mothers.3,4

When oral surgery procedures, such as extractions, necessitate comprehensive information on systemic changes occurring during pregnancy, it is imperative to promote safer management for both the mother and the embryo.3,4

The ideal action is prevention, where patients who are planning a pregnancy program must check-ups first with the dentist and receive appropriate treatment before pregnancy. Patients should have regular check-ups with the dentist during pregnancy to prevent unwanted problems from occurring.4 Minor routine treatments can be held in the second trimester and should be avoided in the first and third trimesters. However, if emergency treatment is needed, it can be given in any trimester because action must be taken immediately to avoid delays and causing the spread of odontogenic infections to get worse. As a dentist, it is essential to know about pregnancy because pregnant women are different physiologically and psychologically from non-pregnant women.5,7

Pregnancy is an invaluable experience for women; however, the mother must ensure that she is in excellent health before planning this. In addition to affecting the buccal cavity, the condition of the mother’s health is intrinsically linked to that of the embryo. Oral health services are critical in such situations, particularly for pregnant women. Nonetheless, numerous dentists and pregnant women continue to disregard this fact, with some even exhibiting hesitancy towards administering treatment to expectant mothers due to the potential side effects that may ensue.7 When expectant women develop allergies to multiple antibiotics, the author will discuss the management of submandibular abscess cases.
A CASE REPORT

Case Report
On December 2, a 34-year-old woman who was approximately two months pregnant visited a private dental clinic. The patient presented with symptoms, including left facial edema, tenderness, and dyspepsia. The dentist conducted a recollection examination. The patient acknowledged that he had undergone an examination and received a prescription for amoxicillin and paracetamol at the Public Health Center. However, the patient’s grievances persisted, prompting the patient to elect for an additional examination. The patient has not presented with any pregnancy-related complications or systemic diseases. The general and clinical examinations revealed normal findings: profound cavities, palpation, and percussion indicate impaction on tooth 38, and trismus restricts oral movement to a maximum of one finger. The patient is referred for a panoramic photograph before the procedure figure 1.

The dentist diagnosed a submandibular abscess emanating from tooth 38 and the residual root of tooth 37, as determined by the imaging and clinical examination findings. After the odontization of the tooth was conducted under local anesthesia, co-amoxiclav, an antibiotic, was prescribed to the patient. Following an online control the following day, the patient reported that her condition had not improved; consequently, the dentist advised her to seek medical attention at the emergency room.

The patient presented to the emergency room of Brawijaya University Hospital (RSUB) on December 5, 2022. Upon examination, the patient exhibited the following vital signs: heart rate 89 beats per minute, blood pressure 136/86 mmHg, temperature 36.7 °C, respiratory rate 20 breaths per minute, and oxygen saturation (SpO2) 78% in ambient air. A complete blood count (PDL), current blood sugar (GDS), urea (Ur), creatinine (Cr), electrolytes, and a COVID-19 antigen test are among the laboratory evaluations that the patient is required to perform after an appointment with an Oral Surgeon and Obgyn Specialist.

Nurses hospitalized and monitored the patients for their general condition and vital signs. The doctor also gave instructions to give a nasal cannula of 3 liters per minute if the patient feels short of breath. Therapy carried out during hospitalization: Intravenous Fluid Drops (IVFD) Ringer lactate (RL) 500cc per 12 hours, ampicillin sulbactam injection 4x1.5 grams, metronidazole inf 3x500 mg, paracetamol inf 3x1 gram intravenously (IV), and ranitidine injection 2 x 50 mg. After treatment, the patient did not improve, so the doctor recommended a skin patch test, and the results were positive for allergies to ampicillin sulbactam. Then the doctor replaced it with ceftriaxone, and also allergic. The medication was changed to gentamicin, and the results were positive for allergies. The last use is cefazoline, and the patient is negative for allergies to the drug. So, the patient was given cefazoline, but it had not improved. Finally, on December 6, 2022, the doctor performed an incision and injected 400 mg of vitamin C. The next day, the doctor checked the patient, but his condition did not improve, and he still could not open his mouth. The next day, on December 8, 2022, the doctor gave an injection of dexamethasone, and then the patient could open his mouth. Then, after the patient’s condition improved slightly, on December 10, 2022, the swelling began to decrease, and the patient was outpatient and given the oral drug metronidazole. The patient control at the private clinic she previously visited, her condition has improved, and her pus is gradually coming out figure 2.

Discussion
When the risks and benefits of each action are substantial, treatment and actions for pregnant patients with submandibular abscesses must be meticulously considered to arrive at the most optimal decisions. Immediate dental intervention and procedures are necessary to address urgent matters such as infections and acute pain. According to the American Academy of Periodontology (AAP), the dentist should take immediate action in acute periodontal infection, remove the focus of infection regardless of the stage of pregnancy, and still consult with the patient’s obstetrician before further procedures are carried out prompt dental intervention and procedures are required to attend to critical conditions such as acute pain and infections. The American Academy of Periodontology (AAP) advises that...
in the event of an acute periodontal infection, the dentist must remove the source of the infection without regard to the stage of pregnancy. However, before proceeding with additional procedures, the dentist should still consult with the patient’s obstetrician. In this patient, the doctor performed an odontectomy to remove the focus of infection using local anesthesia, which is also considered safe. Giving local anesthetics such as lidocaine is included in category B and is considered to have almost no effect on pregnant women and the fetus. Local anesthesia is classified as safe, but you need to pay attention to the dose and type of local anesthetic that will be given. The vasoconstrictor content in local anesthetics can delay the absorption and slow transfer of anesthetic drugs to the fetus.6-8

After carrying out the procedure, the dentist prescribed medication for pregnant women according to categories classified by the Food and Drug Administration (FDA) based on existing scientific evidence and the cost ratio or benefit:

Category A: Adequate and well-controlled studies fail to show any risk to the fetus in the first trimester of pregnancy (and no evidence of any risk in the next trimesters); Category B: Animal reproduction studies have failed to demonstrate any risk to the fetus, and there are no adequate and well-controlled studies in pregnant women; Category C: Animal reproduction studies have shown harmful effects on the fetus, and there have been no adequate and well-controlled studies in humans, but the potential benefit may require the use of drugs in pregnant women despite potential risks; Category D: There is positive evidence of risk to the fetus based on adverse reaction data from investigative or marketing experience, and the risks of using the drug in pregnant women are more significant than the potential benefit.

The treating dentist changed the antibiotics amoxicillin and paracetamol to amoxicillin with clavulanic acid (co-amoxiclav). Amoxicillin belongs to the penicillin class of antibiotics, which works against gram-negative and positive bacteria and is considered the first line of treatment in non-allergic patients. Amoxicillin belongs to FDA category B.8,11 Paracetamol is also given as an analgesic and antipyretic drug as the first choice of treatment during pregnancy. Co-amoxiclav is a broad-spectrum antibiotic as a second-line antibiotic that dentists prescribe. This antibiotic is the right choice in cases of severe odontogenic infections such as abscesses and pulpitis. Co-amoxiclav is included in FDA category B.11,13 However, after giving the drug, there is no improvement in the response of the patient’s condition to the therapy provided, increased blood pressure, pain, trismus, and swelling.

The dentist subsequently referred the patient to RSUB and administered treatment. The antibiotics prescribed to him were ampicillin and metronidazole, both of which are in FDA category B. Bactericidal in nature, amoxicillin is a beta-lactam antibiotic with broad-spectrum activity. Simultaneous prescription of amoxicillin and metronidazole can enhance the efficacy of antibiotic treatment against anaerobic bacteria in odontogenic infections. Metronidazole exhibits bactericidal properties and functions against anaerobic microorganisms through its ability to inhibit nucleic acid synthesis and counteract protozoal activity. Furthermore, it does not disrupt the beneficial aerobic microbiota.11 However, there was no response or relief in the drug’s effects following administration of antibiotics; therefore, they decided to perform a patch test, which confirmed an amoxicillin hypersensitivity. The dentist encountered challenges in this particular instance due to the patient’s previously unknown antibiotic allergies; despite administering the antibiotics, the patient exhibited no symptoms of an allergic reaction, including but not limited to rashes, pruritus, or respiratory distress.

The dentist changed the antibiotic again by giving Ceftriaxone (FDA category B). Ceftriaxone is a third-generation cephalosporin B-lactam antibiotic and is a broad-spectrum antibiotic.14 However, after giving antibiotics, there was no response or improvement in the drug’s results, so they decided to do a patch test, and the results were positive for ceftriaxone allergy. Then, the doctor changed the antibiotic to gentamicin, an aminoglycoside antibi-

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**Figure 2. The patient control after three months of incision**
treatment, despite the potential risk; Category potential benefits may require the use of drugs in adverse reaction data from investigative or marketing experience, and the risks of severe odontogenic infections such as abscesses in pregnant women necessitates adherence to surgical intervention.

Animal reproduction studies have shown harmful effects in pregnant women does not disrupt the beneficial aerobic microbiota. Metronidazole exhibits bactericidal properties and can enhance the efficacy of antibiotic treatment against anaerobic bacteria in odontogenic infections. Gentamicin is included in FDA category D, where the drug is estimated to cause fetal deformities or permanent damage. However, the fact that during pregnancy, suspected ototoxicity in the fetus has rarely been described, and several studies involving population studies or randomized trials have shown that the use of gentamicin during pregnancy does not show such signs. Australian medical professionals who treat pregnant women say that gentamicin is safe to use during pregnancy but must be used correctly. Unfortunately, after using gentamicin, the patient showed positive results for an allergy to the drug, so the doctor changed antibiotic therapy to use Cefazolin.

Cefazolin is the first generation of cephalosporin that dentists often prescribe. Cefazolin is also recommended for patients who are allergic to penicillin and cannot take the drug orally. Besides that, some researchers do not recommend cephalosporins for patients who are allergic to penicillin because the results show cross-reactivity and double allergies to the two b-lactam antibiotics. However, some results suggest that most patients with a history of penicillin allergy can still receive cefazolin. Hence, researchers suggest exceptions may occur in patients with confirmed penicillin allergies or a history of severe reactions requiring additional treatment. As was the case with our patient, who did not show an allergic reaction, and the patch test results were negative. So, the patient was treated using antibiotic drug therapy cefazolin, metronidazole, vitamin C, and dexamethasone.

The treating dentist gave an additional prescription for dexamethasone, considering the patient's condition was not improving, pain, edema, and trismus. After being injected with dexamethasone, the patient showed changes in his condition for the better: reduced pain, the ability to open his mouth, and a rapid reduction in edema. Giving corticosteroids such as dexamethasone provides anti-inflammatory and anti-edema effects, which can inhibit the transcription of pro-inflammatory mediators in human respiratory endothelial cells, which cause pharyngeal inflammation and pain symptoms. Research by Lakim and Portt (2006) reported a remarkable effect of antibiotics and steroids in treating various head and neck infections. Some may argue that systemic corticosteroids can suppress the body's natural immune response, potentially worsening the symptoms of an existing infection. However, short-term giving corticosteroids will not suppress the immune response.

The treatment trajectory for mandibular abscesses in pregnant women allergic to multiple antibiotics is detailed in the preceding section. Conducting and maintaining effective dental and oral hygiene practices is critical, especially in pregnant women, where hormonal fluctuations (estrogen and progesterone) can contribute to increased plaque bacteria and gingival disease. Pregnant women may develop miscarriages, low-birth-weight infants, pre eclampsia, ulceration of gingival tissue, pregnancy granuloma, gingivitis, epulis gravidarum, unstable teeth, parched mouth, and tooth erosion due to inadequate dental and oral health during pregnancy. They will avert unintended complications by exercising caution. It is advisable to undergo a comprehensive examination before pregnancy to attain optimal oral and dental health. Preventive care entails maintaining regular check-ups at the dentist and acting in private during pregnancy. It is permissible to perform dental procedures such as extractions, root canal therapy, scaling, and root planning during the second trimester. Although it is possible to perform dental procedures during the first trimester, except in cases of emergency, the third trimester can be more challenging due to the patient’s increased body size, which can make it difficult to remain in the dental chair. The physician must adhere to FDA recommendations and use only safe medications if treatment is required.

Conclusion
Achieving optimal health for both the mother and embryo during pregnancy requires preventative measures and proper care of the dentition and mouth. Occasionally challenging to manage, severe odontogenic infections frequently entail the potential for adverse complications. Surgical intervention in pregnant women necessitates adherence to established clinical guidelines and considerations. According to this case report, successful clinical outcomes are possible with the referral to a tertiary center that offers adequate services. Evaluation and management following surgery are crucial for preventing complications. This case is of the utmost importance for medical professionals when weighing the potential benefits and hazards of a particular course of action.

Acknowledgment
None.

Conflict of Interest
The authors report no conflict of interest.
References


