

## Poor Dental Hygiene in Pregnancy Leading to Submandibular Cellulitis and Intrauterine Fetal Demise: Case Report and Literature Review

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### ABSTRACT

Ludwig's angina is an infectious process involving submandibular, sublingual, and submental spaces that can rapidly progress to hemodynamic instability and airway obstruction. A 38-year-old unbooked multipara of low socioeconomic status with a poor oral and dental hygiene presented with bilateral submandibular cellulitis and intrauterine fetal demise. She delivered vaginally, and subsequently drainage was done for cellulitis. The report highlights the importance of dental hygiene during pregnancy, lest life-threatening complications like Ludwig's angina occur, complicating the course of pregnancy.

**Keywords:** Cellulitis in pregnancy, intrauterine fetal demise, periodontal disease

### INTRODUCTION

Submandibular cellulitis was described by von Ludwig in 1836 as a "gangrenous induration of the connective tissues of the neck which advances to involve the tissues which cover the small muscles between the larynx and the floor of the mouth."<sup>[1]</sup> The risk of maternal and fetal infection include both septicemia and asphyxia. We present a case of submandibular cellulitis in a pregnant patient and review aspects of dental hygiene.

### CASE REPORT

A 38-year-old multipara presented with a complaint of swelling over the cheek and neck region with difficulty in chewing solids and lying down since 15 days, excoriation and blisters over the abdomen and neck since eight days, purulent discharge from a tooth since five days, and loss of fetal movements since one day. Her general condition was poor, pulse 48/minute, blood pressure 90/60 mm of Hg. She had poor oral hygiene and swelling present over the right cheek and submandibular region with cellulitis and necrosis with blisters extending up to the chest [Figure 1], and petechiae present on both legs. Obstetric examination revealed a singleton pregnancy, with cephalic presentation, uterus corresponding to 34 weeks, relaxed, and fetal heart sound (FHS) not localized. Systemic examination revealed no abnormality.



**Figure 1:** Picture of the patient at presentation

Hemoglobin was 6 g%, blood group B positive, total count 16900/cmm, and differential count showed increased polymorphs. Blood sugar was 76 mg/dL, urea 104 mg/dL, serum creatinine 2.68, prothrombin time (PT) 14 seconds, and urine routine normal. Ultrasound revealed intrauterine fetal demise. On local examination, vulval edema was present and per vaginal examination showed cervical opening one finger loose, not effaced, no show. Under antibiotic coverage, cerviprime instillation was performed, and the patient delivered a 2.6 kg female stillborn baby after 6.5 hours. The postpartum period was uneventful.

After delivery, an incision was made at the submental and bilateral submandibular areas, and blunt dissection to the lingual inferior border of the mandible was carried out. Through the submental incision, the blunt dissection continued through the mylohyoid muscle to the sublingual areas to access all abscesses and upper part of the chest, and debridement was done three to four times till healthy granulation tissue was seen from below. She was given crystalline penicillin, gentamycin, metrogyl, and daily dressings. The follow-up was uneventful.

## DISCUSSION

The unique anatomy of the floor of the mouth plays an important role in the development and extension of intraoral infections. The usual course begins with a periapical dental abscess of the second or third mandibular molar. The roots of these teeth extend inferior to the insertion of

the mylohyoid muscle; so, if left untreated, the infection may continue from primary spaces to penetrate the thin inner cortex of the mandible and involve the posterior margin of the mylohyoid muscle to the submandibular space.<sup>[2]</sup> Because the mandible, hyoid bone, and superficial layer of the deep cervical fascia limit the expansion of tissue associated with the developing edema, the floor of the mouth and the base of the tongue become displaced superiorly and posteriorly, resulting in severe airway compromise.<sup>[2]</sup> Further extension of the infection may spread into the mediastinum and the carotid sheath resulting in severe thoracic infection. Rupture of abscesses along the way may cause aspiration of pus into the lungs and/or even pericarditis. Left untreated, mortality is close to 100%, both from the acute sepsis and from airway obstruction.<sup>[1]</sup> The patient with Ludwig's angina has extraoral swellings involving the bilateral submandibular, submental, and sublingual spaces. Common presentation is elevation and displacement of the tongue, trismus, drooling of saliva, airway obstruction, dysphagia and/or dyspnea, and a hoarse ('hot potato') voice. With the extensive use of antibiotics, most facial infections improve before they have a chance to progress to Ludwig's angina. The mortality rate from Ludwig's angina, when diagnosed, has decreased from 50 to 5%.<sup>[1]</sup> Therapy also includes early surgical removal of the source of infection (which is often grossly carious dentition) via extraction, aggressive and vigorous incision, and drainage procedures with appropriate placement of drains, along with intense and prolonged antibiotic therapy and maintenance of a patient airway.<sup>[1]</sup>

Each year, it is estimated that about 50,000 women undergo anesthesia and a surgical intervention at some time during gestation for indications unrelated to the pregnancy.<sup>[3]</sup> When medical and surgical treatments for pregnant women are considered, both the physiologic changes of pregnancy and the perinatal effects of the treatment must be considered.<sup>[4,5]</sup> Pregnancy is accompanied by many physiological changes which place the mother at a higher risk of infection or of doing worse, once infected. The immune response is greatly diminished during pregnancy, resulting in potential faster progression of an infection. In addition, there is decreased neutrophil chemotaxis, cell-mediated immunity, and natural

killer cell activity.<sup>[6,7]</sup> From an oral perspective, pregnancy-associated hormonal changes also affect the gingival tissues. They become much more sensitive and susceptible to irritation from soft plaque. Plaque accumulates, becomes hard calculus deposits on the teeth, and harbors bacteria in large numbers resulting in a constant, low-grade intraoral infection. An exaggerated local inflammatory response can then begin and may result in erythematous and edematous swelling of the gingiva between the teeth, also known as pregnancy gingivitis. Approximately 70% pregnant women have this condition, even with routine oral care.<sup>[8]</sup> This condition may be slightly painful and bleed easily upon routine tooth brushing. Maternal infective processes sustained especially by Gram-negative anaerobic bacteria, such as those leading to Ludwig's angina, have been demonstrated to cause physiologic imbalance through inflammatory cytokine production, sometimes resulting in preterm labour, preterm premature rupture membranes, and low birth weight.<sup>[9,10]</sup> During pregnancy, women tend to have frequent meals and snacks, which cause further accumulation of plaque, as well as an increase in decay or rapid progression of previously present decay. Because a pregnant patient has increased demands on her organs, there is increased potential for poor oxygenation. On the other hand, poor oxygenation is compromising to the fetus. An infection in itself can at times infect the placenta, uterus, and possibly the fetus, causing fetal septicemia. Treatments such as prolonged intubation and certain intravenous medications can also harm the fetus. During a life-threatening infectious situation such as the one described, the risk of maternal and fetal morbidity may overshadow potential teratogenic side effects.<sup>[11]</sup>

To prevent a similar life-threatening emergency, health-care providers should not neglect even minimal complaints of dental pain. If a problem is identified during the early stages of pregnancy, routine dental care can be planned to control active disease or eliminate potential problems that could increase in severity later in the pregnancy. An appropriate time for dental care from a medical standpoint is the second trimester and pregnant women usually experience the greatest sense of well-being during that time.<sup>[7]</sup> Dental treatments including routine cleanings, fillings,

crowns, extractions, treatment of the gums, and continuation of orthodontic treatment can all be provided. Dental anesthetics such as lidocaine can penetrate the placenta, but in general, do not reach it because they are used locally and in small dosages during routine dental procedures.<sup>[7]</sup> Antibiotics that are acceptable include penicillin, amoxicillin, and clindamycin. Tetracycline should be avoided as it tends to cause permanent discoloration of primary and temporary dentition of the unborn child.<sup>[7]</sup> To decrease dental pain, narcotics should be avoided as well as over-the-counter medications such as aspirin, ibuprofen, and related products because of the potential to affect bleeding.<sup>[8]</sup> Acetaminophen, which is in pregnancy risk category B, is the safest analgesic for use during pregnancy. However, because various strengths and preparations are available and because there is a potential for liver toxicity, patients should be instructed on how to take the drug and the maximum recommended daily dose (no more than 4 g/day for adults).<sup>[11]</sup> Morphine appears to be a safe analgesic when administered for short periods of time.<sup>[8]</sup>

Our report highlights the importance of small things like good dental hygiene which should be maintained during pregnancy especially in the low socioeconomic population, lest life-threatening complications like Ludwig's angina occur, complicating the course of pregnancy.

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