

## Awake Fiberoptic Intubation for the Drainage of Ludwig's Angina in a Pregnant Patient; A Case Report

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### Abstract

Ludwig's angina is a potentially lethal, rapidly spreading cellulitis involving the sublingual and submandibular spaces leading to difficult airway. Associated pregnancy makes airway management and choice of anesthesia further difficult. There are previously reported cases of drainage of Ludwig's angina in pregnant woman managed with superficial cervical plexus block and other regional techniques. We report a case of drainage of Ludwig's angina in a pregnant woman, conducted under general anesthesia with awake fiberoptic intubation. The options of regional anesthesia vs. general anesthesia for management of Ludwig's angina in pregnant patient are discussed.

**Keywords:** Ludwig's angina; Pregnancy; Difficult airway

### Introduction

Ludwig's angina is a potentially lethal, rapidly spreading cellulitis involving the sublingual and submandibular spaces and is manifested by a brawny induration, tender swelling in the floor of the mouth with the elevation and posterior displacement of the tongue. The treatment of Ludwig's angina consists of airway maintenance, surgical drainage and broad-spectrum parenteral antibiotics. Even though Ludwig's angina in pregnancy is common occurrence, anesthetic management for the same is not very clear. The published data about anesthetic management for Ludwig's angina mainly suggests regional anesthesia namely superficial cervical plexus block and local anesthesia for the drainage [1-3]. We report a case of drainage of Ludwig's angina in a pregnant woman, conducted general anesthesia with awake fiberoptic intubation.

### Case

A 28 year old lady who was 28 weeks pregnant weighing 68 Kg, presented with four days history of tooth ache, swelling in front of the neck, fever, difficulty in swallowing and slight difficulty in breathing. Her heart rate was 130/min, blood pressure was 120/70 mmHg, respiratory rate was 32 breaths/min and temperature was 38°C. On examination there was diffuse tender swelling with brawny edema in submental and submandibular areas bilaterally extending up to lower border of thyroid cartilage. Floor of the mouth had brawny induration with tongue pushed up. She had restricted mouth opening with inter-incisor distance of 2 cm, unable to protrude her tongue, modified Mallampati score of IV and limited neck extension because of pain. She was diagnosed to have Ludwig's angina and was planned for incision and drainage of the abscess. Obstetrician confirmed that single live fetus was present with fetal heart rate of 140/min and there were no uterine contractions.

Patient was explained about the awake fiberoptic nasal intubation and the risk of preterm labor and informed consent was obtained. Premedication was given with intravenous ranitidine 50 mg and

glycopyrrolate 0.2 mg. Monitoring consisted of ECG, pulse oximetry, capnography, non-invasive blood pressure and intermittent fetal cardiac activity monitoring. Preoperatively she was given nebulization of 2.5 ml of 4% lignocaine. Oxymetazoline nasal drops were instilled and nasal passage was dilated with nasopharyngeal airway soaked in lignocaine gel. Midazolam 1.5 mg and fentanyl 100mcg were given intravenously. Bilateral superior laryngeal nerve block and transtracheal injection was performed with 4 ml of 2% lignocaine. Awake fiberoptic nasal intubation was carried out with 7.0 mm cuffed endotracheal tube. After securing the airway, anesthesia was maintained with propofol, vecuronium, isoflurane. Haemodynamic parameters were maintained during anesthesia and end tidal CO<sub>2</sub> was maintained between 35-40 mmHg. Incision and drainage of the abscess was carried out and purulent material was evacuated by blunt dissection of mylohyoid. In view of airway narrowing and edema preoperatively, decision was made to keep the endotracheal tube in situ. Patient was extubated in the intensive care unit few hours later when she was fully awake. Cardiocotography at the end of surgery confirmed the fetal cardiac activity and absence of uterine activity. Her pregnancy continued normally and 10 weeks later she had normal vaginal delivery at 38 weeks of gestation. Baby did not have any anomalies, weighed 2.8 kg and had normal activity at birth.

### Discussion

Ludwig's angina is known to have high mortality varying from 8-25%, mostly due to airway related complications rather than overwhelming sepsis [3,4]. Pregnancy with its anatomic and physiological changes is expected to make the airway management further difficult in these cases. Because of these difficulties, previously similar cases of Ludwig's angina in pregnant woman have been operated under superficial cervical plexus block along with inferior alveolar nerve block or under local anesthesia [1-3]. They report that block relieved the pain, trismus and permitted a thorough incision and drainage, including transection of mylohyoid with lowering of the floor of mouth. In unpublished data of few cases of Ludwig's angina in our institute, it was noted that superficial cervical plexus block along with mandibular nerve block was inadequate, leading to significant

pain, hence conversion to general anesthesia with securing airway under emergent condition. Even in specialized center performing these blocks, no one can guarantee high success rate for regional anesthesia in presence of local infection. Therefore in cases of anticipated difficult airway with difficult mask ventilation and intubation, safe option may be to secure the airway with a tracheal tube while the patient remains awake rather than trying unfamiliar regional anesthesia technique. Furthermore laryngospasm leading to asphyxia and death have been reported following incision and drainage of Ludwig's angina under local anesthesia [4]. Similar events have been reported following inhalational induction for general anesthesia, before securing the airway [5]. Direct laryngoscopy and endotracheal intubation under general anesthesia will be difficult due to altered airway anatomy. Hence awake fiberoptic intubation is considered first line approach in airway management in Ludwig's angina. In cases where mouth opening is limited and swelling is confined to the oral cavity, there should be a low threshold for the use of awake nasal fiberoptic intubation. In the recently published NAP 4 report, failure to consider awake fiberoptic intubation as the primary airway technique led to direct harm in a proportion of reported patients [6]. When patient is awake natural airway will be better preserved, adequate muscle tone is maintained to keep the relevant upper airway structures (base of tongue, vallecula, epiglottis, larynx, esophagus, and posterior pharyngeal wall) separated from one another and much easier to identify. Awake fiberoptic nasal intubation has been safely performed in pregnant women keeping following consideration in mind: 1 Possibility of nasal engorgement and bleed may more in pregnant woman 2: pregnant women may be more sensitive to local anesthetic drugs used for anesthetizing the airway.

Both general and regional anesthetic techniques have been successfully used for non-obstetric surgery in pregnant patients. No research to date has shown a definitive superiority of one technique over the other in fetal outcome [7]. Regional anesthesia does avoid the potential risk of failed intubation and aspiration in non-airway surgeries. But in airway surgeries, chances of failed regional anesthesia and need for general anesthesia may make emergent securing airway much more difficult.

Pregnant woman undergoing non obstetrics surgeries are at higher risk of preterm labor, but in a study involving 116 pregnant women for non-obstetric surgeries, the incidence of preterm labor was not related

with type of anesthesia either general or regional [8]. Although most general anesthetic drugs like midazolam, fentanyl are known teratogens in certain species, most agents are safe in humans, especially in 3<sup>rd</sup> trimester. The fetus is at more risk from hypoxia than the adverse teratogenic effect of anesthetic drugs. This must be avoided by maintaining maternal oxygenation and hemodynamic stability. Hence it is important to maintain adequate depth of anesthesia either regional or general anesthesia, to avoid the catecholamine surge, which adversely affects the utero-placental circulation and increase the risk of preterm labor, intrauterine growth retardation.

Thus we successfully managed a case of difficult airway due to Ludwig's angina in a pregnant woman by awake fiberoptic intubation with general anesthesia. We feel it is safer to secure airway electively in such anticipated difficult airway cases in pregnant women for airway related surgeries.

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