

***Drainage of Ludwig' Angina under Superficial Cervical Plexus Block
in Pediatric Patient***

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ABSTRACT

Ludwig's angina is a rapidly spreading cellulitis that may produce upper airway obstruction which can be potentially lethal and often leading to death. However, this disorder can develop in children, in whom it can cause serious airway compromise. Treatment included incision and drainage of associated spaces, teeth extraction, and antibiotic therapy. There is no consensus in the literature regarding airway management. We report a patient with Ludwig angina with airway compromise who presented at a remote rural hospital. We successfully relieved airway obstruction by surgical decompression alone, using a cervical plexus block.

Keywords: Ludwig's angina; superficial, cervical plexus block

INTRODUCTION

Ludwig angina is defined as a potentially lethal, rapidly spreading cellulitis, involving the sublingual and submandibular spaces, and is manifested by a brawny suprahyoid induration, tender swelling in the floor of the mouth, and elevation and posterior displacement of the tongue.¹

The most common cause of Ludwig's angina is an odontogenic infection, from one or more grossly decayed, infected teeth, and is usually as a result of native oral streptococci or a mixed aerobic-anaerobic oral flora.² Prompt airway management is critical, but the presence of swelling of the neck, glottic edema, elevation of the tongue, trismus, or pharyngeal edema create formidable problems.³

The approach for incision and drainage in patients presenting with abscesses of deep facial and cervical spaces with or without marked trismus is more difficult and requires a general anesthetic experienced in fiberoptic guided nasal intubation.⁴

A recent study suggest that with superficial cervical plexus block, local anaesthetic crosses the deep cervical fascia and blocks the cervical nerves at their roots, that is, the superficial cervical plexus innervates the skin of the anterolateral neck.⁵

The published recommendations for the airway management in Ludwig's angina vary and are based on each author's personal experience and available resources.

CASE REPORT

An 11-year old male child was presented to hospital complaining of facial swelling ([Figure 1](#)).



Figure 1: General view of the face. Note severe submandibular swelling.

Patients give a seven-day history of lower left quadrant tooth pain, and a three-day history of fever and chills. On presentation, his vital signs were the following: temperature 38.7°C, blood pressure 110/54, pulse 136/min, oxygen saturation on room air 96%, and white cell count of 20000/ μ L. His clinical presentation included large soft tissue swelling under his mandible. The diagnosis of Ludwig's angina was made. It was difficult to perform an adequate oral exam secondary to pain, swelling, and severe trismus. ([Figure 2](#))

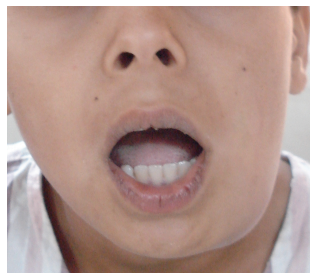


Figure 2: Trismus: this is the maximal mouth opening.

The patient was having difficulty maintaining his own salivary secretions because of dysphagia but denied dyspnea. Since in similar situations patients can desaturate very quickly, even though his oxygen saturation was recorded to be 96% on room air, he was given supplemental oxygen and a pulse oximeter was placed on his right index finger because of possible impending quick respiratory difficulties.

Of note, although not used, an emergent cricothyrotomy kit was available at the patient's bedside at all times. Securing an airway via an awake fiberoptic nasal intubation was risky; a fiberoptic tube inserted into the pharynx might puncture an abscess and cause pus aspiration or swallowing. It was thus decided to attempt a trial of decompression under superficial cervical plexus block. Complete preparations for an emergency tracheostomy were also made.

All standard monitors were placed. The patient was placed in a supine position, with his head turned to the right side. Under aseptic technique, after local infiltration with lidocaine 1% at the midpoint of the line connecting the mastoid process with Chassaignac's tubercle of C6 transverse process, local anesthetic inj.bupivacaine 0.5% 6ml was injected after negative aspiration using a fan technique with superior-inferior needle redirections alongside the posterior border of sternocleidomastoid muscle which reduced the pain and enabled the patient to open mouth more widely. An inferior alveolar nerve block was given by

maxillofacial surgeon intra orally i.e. intraoral mandibular nerve block. Conscious sedation was maintained by fractionated doses of midazolam at dose of 0.025 mg/kg.

Dense anesthesia was established in about 7 min. A rapid decompression of the left submandibular region was done and the mylohyoid transected with resultant lowering of the floor of mouth, the blunt dissection continued through the mylohyoid muscle to the sublingual areas to access all abscesses. Carious teeth were the primary sources for the infection so were removed. Upon removal, purulence was expressed through the extraction socket. There was little discharge from the wound, which was lightly packed and dressed.

DISCUSSION

The unique anatomy of the floor of the mouth plays an important role in the development and extension of intraoral infections. The usual infectious 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 that if untreated, the infection may continue from primary spaces to penetrate the thin inner cortex of the mandible and will involve the posterior margin of the mylohyoid muscle to the submandibular space. At this time, the infection may

develop and progress at such an alarming rate that special precautions regarding airway maintenance must be taken.⁶

In an exhaustive review of the literature, from 1945 to 1979, 75 cases of Ludwig angina were found, and the authors strongly advocate elective tracheostomy under local anaesthesia.⁷ However, there may be good reason to avoid tracheostomy. Cellulitis of the neck with involvement of the tracheostomy site makes it a more difficult procedure. Moreover, surgical dissection of the fascial planes in the neck may actually open and contaminate the pathways, leading to life-threatening mediastinal invasion.⁸

Other options for airway management may include orotracheal, blind nasotracheal, and fiber optic intubation or cricothyroidotomy with jet insufflation. We chose to employ a cervical plexus block as anesthesia for surgical decompression. The block permitted a thorough incision and drainage, including transection of mylohyoid with lowering of the floor of mouth and rapid relief of respiratory obstruction. Ling et al also recommended the consideration of superficial cervical plexus block, and if necessary an auriculotemporal nerve block, for the management of selected patients with difficult airways who present for drainage of dental abscesses.⁹

Shteif et al also concluded that superficial cervical plexus block with concomitant mandibular nerve block has a high success rate, low complication rate and high

patient acceptance rate for the drainage of submandibular and submental abscesses.⁴

Regional anaesthesia also lowers costs of patient care because of the shorter duration of recovery and procedure.

It is important to mention the limitations of this technique. Complications include infection, hematoma, phrenic nerve blockade, local anaesthetic toxicity, nerve injury and spinal anaesthesia. Thus patients with significant respiratory disease may be considered contraindicated for superficial cervical plexus block, as well as highly stressed patients.

CONCLUSION

It is a case of Ludwig's angina in which abscess drainage was done under superficial cervical plexus block and mandibular nerve block. More sophisticated airway management methods may be available, but superficial cervical plexus block permits the surgical decompression in this case. In a rural hospital with limited resources it should be considered as an option.

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