

Ludwig's Angina: A Challenge for Anaesthesiologist.

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ABSTRACT

Ludwig's angina is an aggressive, rapidly spreading cellulitis of the floor of mouth and neck. It is less frequently seen in children as compared to adults. Successful management of Ludwig's angina requires proper understanding of the anatomy, appropriate antibiotic therapy and surgical drainage whenever needed. Airway management is of prime concern and should be done with prior planning and cooperation of surgeon and anaesthesiologist. We hereby describe the successful management of Ludwig's angina in a 3 year old child.

Keywords: Ludwig's angina, airway management, inhalational induction, team approach.

INTRODUCTION

Ludwig's angina is an aggressive, rapidly spreading cellulitis without lymphadenopathy of the submandibular space bilaterally in the floor of the mouth. Submandibular space consists of the sublingual space and the submylohyoid space. It was first described by the German physician, Wilhelm Frederick von Ludwig's in 1836. It spreads rapidly, consistency changes from soft to hard, becomes inflexible and has a huge potential for airway obstruction.^[1] So, requires careful monitoring and rapid intervention for prevention of asphyxia and aspiration pneumonia.

CASE REPORT

A 3 year old male child presented in the emergency department with chief complaints of pain and difficulty in swallowing with progressive swelling in submandibular region since 3 days. It was also associated with high grade fever. Parents also gave history of running nose in the last week. On physical examination, Pulse rate was 90 beats per minute, respiratory rate 24 per minute, blood pressure 110/70 mmHg and temperature 39°C. Trismus was present with a mouth opening of 2 fingers and tongue was swollen and elevated. The submandibular swelling was hard, tender, woody



Figure 1 (i) & (ii): Severe swelling of the bilateral submandibular secondary to Ludwig's angina in a 3 year-old child- lateral view

1(iii) ; Restricted mouth opening in the patient

1 (iv); Anterior view of gross submandibular swelling.

and immobile. The patient was posted for emergency surgical intervention under general anaesthesia. After preliminary examination and preoperative investigations (hemogram, X-ray soft tissue neck), patient was taken up for surgical drainage. An intravenous assess was secured and standard monitoring: Electrocardiography (ECG), noninvasive blood pressure, pulse oximetry, end-

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tidal carbon dioxide and axillary temperature were applied in the operating room. In premedication, injection glycopyrrolate 5µg/Kg and dexamethasone 2mg was administered. Inhalational induction without muscle relaxation was planned. ENT surgeons were standby in case need for emergency tracheostomy arises. Adequate Preoxygenation was done. Continuous oxygen insufflation was done through nasal cannula. An inhalational induction with spontaneous breathing was achieved using sevoflurane (2-4%) and Check laryngoscopy was done with macintosh blade under deep inhalation anaesthesia. Once the vocal cords were visualized (Cormack lehane grade 2) intravenous succinylcholine 1.5mg/kg was administered. Trachea was intubated successfully with cuffed endotracheal tube of 3.5mm ID. Anesthesia was maintained with inhalational agent, fentanyl and atracurium. At the end of surgery, patient was shifted to intensive care unit for elective ventilation in view of gross airway edema. Child was extubated after 48 hours on subsidence of the edema. Rest of the postoperative period was uneventful.

DISCUSSION

Ludwig's angina is an aggressive, rapidly spreading cellulitis of the floor of mouth and neck. Early use of antibiotics and prompt management can reduce the incidence of acute airway obstruction.^[1] Mostly seen in middle aged adults with an incidence of 25-30% in children.^[2] In adults, it most commonly arises from an infected second or third mandibular molar tooth, where as in children mostly occurs subsequent to upper respiratory tract infection (URI). In around one third cases, dental infection most commonly of first molar is the cause while etiology remains unknown in the remaining cases.

While managing such cases, there was a trend towards elective tracheostomy under local anaesthesia to secure the airway in earlier days. But recently, starting broad spectrum antibiotics soon and carefully observing the patient for signs of impending respiratory failure, in a safe environment like intensive care unit is the norm.^[3] An artificial airway is required less frequently in children (only one third of cases) than in adults. Approximately 80% of adults with Ludwig's Angina require incision and drainage.^[4]

Various techniques for airway management are elective tracheostomy under local anesthesia, awake fiberoptic or blind nasal intubation, direct laryngoscopy and intubation under intravenous, or inhalational anesthesia with or without muscle relaxant. Awake fiberoptic intubation is good technique and is mostly the first option in conscious and cooperative adult patients with deep neck infection.^[5] However it is not possible in uncooperative children. surgical tracheostomy under local anesthesia is oldest and safest technique in

adults if fiberoptic intubation fails.^[5] In children the safest technique is inhalational induction with maintenance of spontaneous respiration and performing laryngoscopy and intubation under deep plane of inhalational anesthesia without muscle relaxation. The other option is to administer rapid and short acting muscle relaxant, once the vocal cord is visualized on direct laryngoscopy under inhalational anesthesia. Care should be taken to prevent abscess rupture which if occurs can lead to catastrophic airway sequelae. Anaesthesia with Ketamine without securing airway has been used in past times but it should be highly discouraged to avoid complications due to intraoral abscess rupture during the surgical procedure.^[6] One should always be ready for the need of an emergency surgical airway which is very rare. So, Most anaesthetists rarely encounter this situation, especially in children. Currently, needle cricothyroidotomy with the use of 14, 16, or 18 gauge angiocatheters for needle remains the fastest technique in the 'cannot intubate, cannot oxygenate' situation in children. This technique has been shown to provide effective oxygenation for at least 15 minutes. But the cricothyroid membrane is difficult to identify in this age group, also there is a higher risk of perforation of the posterior tracheal wall.^[4] So with the improvement in the technique and availability of better equipment for the management of difficult airway in children the outcome has improved but still there are problems associated with significant risks and complications.

CONCLUSION

Antibiotic usage has reduced the incidence of Ludwig's Angina with life threatening respiratory obstruction but the clinician must be familiar with its presentation. With this case report we want to highlight the difficulties related to the paediatric Ludwig's angina with respiratory compromise and the role of advanced planning, anticipation of complications, back up plans and good communication between surgeon and the anaesthetist for successful management of these cases.

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