

Cervicofacial Necrotizing Fasciitis - Airway Management

Ankit Kedia¹, Saikat Sengupta¹, Gaurab Maitra¹, Shantanu Panja²

Abstract

Introduction: Anaesthetic management of cervicofacial necrotizing fasciitis is challenging in view of the difficult airway and existing comorbidities. The airway should be managed by experienced anaesthesiologist with readiness of difficult airway cart. In the case report presented, we note that airway management should be done early, as the rapid progression of the swelling around the neck can make the task more difficult and thereby increase the morbidity and mortality.

Keywords: Cervicofacial necrotizing fasciitis, Difficult airway, Awake fiberoptic intubation.

Key Messages: Cervicofacial necrotising fasciitis is associated with rapid deterioration of airway, and airway should be secured as early as possible to prevent the hazard of complete airway obstruction.

Introduction

Cervicofacial necrotizing fasciitis is a rare but aggressive infection of the soft tissues and fascial planes of the neck causing local necrosis and systemic toxicity. The diagnosis is a clinical one supported by laboratory investigations and imaging. The mainstay of treatment is immediate hemodynamic resuscitation of the patient, along with airway management and aggressive surgical debridement. Additional surgeries may be necessary before soft tissue coverage is undertaken [1]. It is usually polymicrobial in nature and is associated with dental infections [2]. Airway management is challenging and timely airway intervention is crucial as the disease process involves rapid airway deterioration. The American Society of Anaesthesiologists difficult airway algorithm [3] lays down logical sequence of decision making, which significantly reduces the incidence of airway associated complications.

Case report

A 53 year old gentleman was admitted to our hospital with a history of painful swelling of cheeks, chin and neck for 7 days. It started about a month ago with pain in the left lower jaw followed by localised swelling in the left cheek. He was undergoing treatment for dental caries in the left lower premolar tooth. The patient received oral third generation cephalosporins for the same, but the swelling increased in size spreading in submandibular region and to the right side. The patient attended the otorhinolaryngology out-patient department of our hospital where he was advised urgent admission for surgical drainage. The patient was diabetic and hypertensive for last 5 years and was taking glimepiride, metformin, amlodipine and bisoprolol.

Preliminary examination revealed signs of sepsis with a temperature of 101 F, and a heart rate of 114/min. There was no hypotension. His blood glucose was found to be 480mg/dl. However, there was no evidence of ketoacidosis on urine dipstick.

emphysema. Systemic examination did not reveal any abnormality of cardiovascular, respiratory and central nervous system. Initial assessment of the airway revealed an interincisor distance of 4cm (Figure 1). Computed tomography scan of the neck revealed unobstructed airway with pockets of air in subcutaneous tissue of neck. There was no evidence mediastinal extension in the CT scan images (Figure 1). Over the next four hours, the swelling increased in size, inter-incisor distance decreased to 2cm with appearance of blisters, bluish discoloration and increased subcutaneous emphysema over the neck (Figure 2). His neck movement was restricted by pain. With a working diagnosis of cervicofacial necrotizing fasciitis, the patient was started on intravenous meropenem empirically along with variable rate intravenous insulin infusion under the supervision of the endocrinologist, and posted for surgery. Plan of airway management included awake fiberoptic nasotracheal intubation as there was no obvious focus of infection in the pharynx and the computed tomography scan of neck showed a patent airway. The otolaryngologist was requested to be prepared for emergency tracheostomy as a backup plan during the intubation. The patient was counseled about the procedure of awake fiberoptic nasal intubation and the need to maintain the endotracheal tube postoperatively till the oedema subsides. The patient's nasal cavity was prepared with

oxymetazoline drops and lignocaine spray. After thorough preoxygenation



Dr. Ankit Kedia

¹Department of Anaesthesiology, Apollo Gleneagles Hospital, Kolkata India.

²Department of Otorhinolaryngology, Apollo Gleneagles Hospital, Kolkata India.

Address of Correspondence

Dr. Ankit Kedia

Department of Anaesthesiology, Apollo Gleneagles Hospital, Kolkata, India.

Email: kediaster@gmail.com

© 2016 by Journal of Anaesthesia and Critical Care Case Reports | Available on www.jaccr.com |

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License

(<http://creativecommons.org/licenses/by-nc/3.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.



Figure 1: (Left) During preanesthetic evaluation (Interincisor distance 4cm). (Right) Sagittal cut on computed tomography showing subcutaneous emphysema. No mediastina extension.



Figure 2: (Left) Bluish discoloration of skin and blisters appearing in left side of the neck. (Right) Interincisor distance of 2cm immediately before the surgery.

and providing continuous oxygen delivery through nasal prongs placed in mouth, the fiberoptic endoscope was inserted and the airway was anaesthetised using spray as you go technique. A 7.5mm internal diameter cuffed, reinforced, Murphy Eye Mallinckrodt Lo-Contour™ Oral/Nasaltracheal tube was inserted after examination of the pharynx and the position of the tip of the tube was confirmed visually. The patient was then anaesthetised using intravenous propofol 2mg/kg and neuromuscular paralysis achieved with atracurium 0.5mg/kg. The surgical anaesthesia was maintained using desflurane and intermittent boluses of atracurium. Fentanyl was used to provide analgesia along with intravenous paracetamol. The pus collection was drained and necrotic tissue was debrided by the otolaryngologist. The samples collected were sent for microbiological evaluation. At the end of the surgery, the patient was shifted to intensive care unit with the nasotracheal tube in place. Enteral nutrition was initiated via nasogastric tube. On the first postoperative day, the patient was extubated over an airway exchange catheter after confirming the presence of air leak air around the deflated cuff of the endotracheal tube in the presence of difficult airway cart. The patient was shifted out of intensive care unit on the second postoperative day. The pus sample grew *Klebsiella pneumoniae*, while the lymph node samples were positive for acid fast bacilli. The antibiotic therapy was modified based on culture and sensitivity report, and anti tubercular treatment was initiated. After repeated debridements and adequate pain control,

the patient was discharged on the sixth postoperative day with the instruction of regular outpatient follow up and dressing changes.

Discussion

Cervicofacial necrotizing fasciitis is a rapidly spreading infection of the soft tissues of the neck and fascial planes. It is usually polymicrobial in nature. Group A *Streptococcus* is the most common mono microbial cause of the infection [4]. It is associated with high mortality and early diagnosis and multi-disciplinary care is critical. The most commonly accepted treatment involves rapid surgical intervention and broad spectrum antibiotics [5]. Further explorations may be necessary before soft tissue coverage is undertaken [1]. It is most common in patients with an underlying systemic disease, such as diabetes, but can also be seen in healthy individuals [6]. The initial source of infection is commonly of dental origin, but it can propagate from other regions in the head and neck [7]. It is mainly a clinical diagnosis, and is often wrongly diagnosed in its early stages as cellulitis. One of the most important factors determining the patient outcome is the time to initiation and completion of therapy [4]. An early diagnosis can be made by meticulous clinical examination and computed tomographic scans revealing pockets of air in the planes of cervical region [8]. A normal computed tomography does not rule out necrotising fasciitis and a bedside cut down procedure with fascial biopsy maybe needed to expedite the diagnosis [9]. The infection can also track down along the

great vessels to the mediastinum [10]. The disease poses challenges with regards to the airway management in the perioperative period. Early intervention to secure the airway is easier and can obviate the need for emergency or surgical airway management. Based on the rapid nature of disease progression seen in the photographs taken upon admission and four hours later in the preoperative room, it may be speculated that any further delay in intervention could have resulted in the disastrous consequence of complete airway obstruction. Other important anaesthetic concerns include hemodynamic management and glycemic control as the patients commonly present in a state of sepsis, severe sepsis or even septic shock [11].

In the case presented, mask ventilation, supraglottic airway devices and laryngoscopy were not viable options, and the clinical scenario demanded the need to secure the airway with the patient awake [12]. Hence, the decision to perform awake fiberoptic nasal intubation was made with surgical tracheostomy as a backup plan. No procedural sedation was used during intubation. The major drawbacks of a surgical airway were the altered anatomy and the potential to spread the infection along the airway leading to life threatening pulmonary infections [13]. Potter et al, in a retrospective study of 85 patients with deep neck infections, suggested that use of tracheostomy allowed earlier movement out of the intensive care unit and was associated with lower cost of hospitalization [14]. While there have been case reports of securing the airway under direct laryngoscopy under anaesthesia with

ketamine without use of neuromuscular blockers, the author clearly mentions that fiberoptic awake intubation is a better alternative when available [15]. The process of extubation should be as cautious as that of intubation. The disadvantage of immediate postoperative extubation in the operating room is the potential loss of airway patency and failure to secure it back in a planned manner. The extubation in the intensive care unit should

be performed in the presence of difficult airway cart, over an airway exchange catheter, preferably after checking for the presence of air leak around the deflated cuff of the endotracheal tube.

Conclusion

The management of cervicofacial necrotizing fasciitis revolves around the pillars of hemodynamic management and airway control. We recommend early

intervention to secure the airway in view of the rapidly progressive nature of the disease, as a delay of few hours can make the airway even more difficult. Preoperative counselling about the need to maintain endotracheal tube in situ with judicious use of analgesia and sedation in the postoperative period is essential followed by careful and planned extubation.

References

1. Hasham S, Matteucci P, Stanley PR, Hart N B. Necrotizing fasciitis. *BMJ* 2005;330:830-3.
2. Shaikh N, Ummunissa F, Hanssen Y, Al Makki H, Shokr HM. Hospital epidemiology of emergent cervical necrotizing fasciitis. *J Emerg Trauma Shock* 2010;3:123-5
3. Practice Guidelines for Management of the Difficult Airway: An Updated Report by the American Society of Anesthesiologists Task Force on Management of the Difficult Airway, *Anesthesiology* 02 2013, Vol.118, 251-270.
4. Jamal N, Teach SJ. Necrotizing fasciitis. *Pediatr Emerg Care.* 2011 Dec;27(12):1195-9
5. Medeiros R Jr, Catunda Ide S, Queiroz IV, de Moraes HH, Leao JC, Gueiros LA. Cervicofacial necrotizing fasciitis following periodontal abscess. *Gen Dent.* 2012 Jul-Aug;60(4):316-21)
6. Ord, R. and Coletti, D. (2009), Cervico-facial necrotizing fasciitis. *Oral Diseases*, 15: 133–141.
7. Bilodeau E, Parashar VP, Yeung A, Potluri A. Acute cervicofacial necrotizing fasciitis: three clinical cases and a review of the current literature. *Gen Dent.* 2012 Jan-Feb;60(1):70-4.)
8. Zhang WJ, Cai XY, Yang C, Zhou LN, Cai M, Lu XF, Zheng LY, Jiang B. Cervical necrotizing fasciitis due to methicillin-resistant *Staphylococcus aureus*: a case report. *Int J Oral Maxillofac Surg.* 2010 Aug;39(8):830-4. 22.)
9. Lee JW, Immerman SB, Morris LG. Techniques for early diagnosis and management of cervicofacial necrotising fasciitis. *J Laryngol Otol.* 2010 Jul;124(7):759-64.)
10. Qureshy FA, Baskin J, Barbu AM, Zechel MA. Report of a case of cervicothoracic necrotizing fasciitis along with a current review of reported cases. *J Oral Maxillofac Surg.* 2009 Feb;67(2):419-23.)
11. Durrani MA, Mansfield JF. Anesthetic implications of cervicofacial necrotizing fasciitis. *Journal of Clinical Anaesthesia*, August 2003, Volume 15, Issue 5, Pages 378–381.
12. Linkov G, Soliman AMS. Infections and Edema. *Anesthesiology Clin* 2015, 33: 329–346
13. Standards for the Care of Adult Patients with Temporary Tracheostomy. Standards and Guidelines. The Intensive Care Society, July 2008
14. Potter, JK, Herford, AS, Ellis, E. 3rd. Tracheotomy versus endotracheal intubation for airway management in deep neck space infections. *J Oral Maxillofac Surg.* 2002;60:349–355.
15. Shabadi R, Shetty, A. Anaesthetic Management Of A Patient With Necrotizing Fasciitis Of Neck And Chest Wall. *The Internet Journal of Anesthesiology.* 2006 Volume 12 Number 1.

Conflict of Interest: Nil
Source of Support: None

How to Cite this Article

Kedia A, Sengupta S, Maitra G, Panja S. Cervicofacial Necrotizing Fasciitis - Airway Management. *Journal of Anaesthesia and Critical Care Case Reports* Jan-Apr 2016; 2(1):12-14.