

Anaesthetic Management Of A Patient With Necrotising Fascitis Of Neck And Ches-Wall

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Citation

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Abstract

The anesthetic management of a patient with Necrotising Fascitis involving chest wall & neck is presented. Necrotising Fascitis causes necrosis and gas formation in the fascial planes. The edema, compressing the chest wall associated with respiratory distress and neck tissue caused deviation of the trachea. Thorough pre-op evaluation including IDL, CT chest neck was done. Anesthesia was induced with Inj. Ketamine induction 1.5 mg/kg and after confirmation of ventilation Inj. Scoline was given. DL scopy followed by bougie guided intubation was done. Post-op. patient was electively kept on ventilator support.

INTRODUCTION

Necrotising fascitis is rapidly spreading infection of the subcutaneous tissue and fascial planes due to mixed aerobic, anaerobic bacteria. As the edema increases it will cause increase in the compartment pressure. Due to compression of the neck structures including trachea and veins anesthesiologist must be very much vigilant during managing these patients.

CASE REPORT

A 35 year old male, driver by occupation, came with a history of swelling over the left chest wall, face and neck since 24 hrs. The patient was well before when he noticed a small erythematous patch over his left chest wall which rapidly increased and spread to the neck region till angle of mouth anteriorly and mastoid posteriorly. During this period patient developed dyspena, pain in the region of the swelling, so he was brought to hospital where he was admitted in the emergency medical services. The clinical diagnosis was Necrotising fascitis. The patient was posted for emergency release incisions and debridement of the necrosed and inflamed tissue which was compressing chest wall and soft tissue of the neck on left side. The patient was conscious, oriented but febrile with temp of 38°C. He was comfortable in right lateral decubitus position.

The patient was having tachypnea RR 24/min and tachycardia HR 110/min. The blood pressure was 110/68 mmHg. Central line canulation was done through Right sided Cephalic vein CVP was 6-8 cm H20. There was

marked edema and erythema with few blebs from left chest wall extending to neck up to mastoid posteriorly and submandibular region, floor of mouth anteriorly. There was exquisite tenderness on palpation of this region. Mouth opening was 4 cm. and Modified Mallampatti's grade was three with slight restriction of neck movements because of pain. Air entry was reduced in the left lower zone without added sounds. Heart sounds were normal.

To know the extent of lesion a CT scan was done which revealed the extensive stranding of subcutaneous fat in left hemithorax, axilla, and left shoulder extending to neck muscles around it. The scapula appeared bulky, hypo dense. The impression was that of a cellulites invading the left chest wall to superior mediastinum. Along with these findings the patient had left sided minimal pleural effusion and mild pericardial effusion. The X-ray chest showed minimal blunting of the costophrenic angle. Cardiac silhouette was within normal limit. X-ray neck lateral view showed marked shift of trachea to the right side. There was no compression of trachea seen on lateral view of x-ray neck. On investigation, hemoglobin was 7gm% , Hct 24%, CBC 7000/cmm BUN 19 & Sr. Creatinine 1.8 mg%. Sr. Na 123 & K 4.2 meq/li. Liver function tests were within normal range. Arterial blood gas analysis was within normal limits. EKG was normal. The edema inside the oral cavity and shift of trachea made visualization of vocal cords difficult, IDL was done. It revealed no edema in side the oral cavity and the epiglottis was seen. Vocal cords were not visualized.

High risk consent was taken and risk of post-op ventilatory support was explained to the patient and relatives. He was NPO since 24 hrs. The patient was trolleyed to the OT. Monitors including manual BP cuff, cardioscope, pulse oximeter were attached and basal readings noted. Inj Glycopyrrolate 4mcg/kg was given. The patient was given oxygen through Hudson's mask in the EMS as well as in the OT without any interruption. Difficult intubation cart including Rusch tubes of different sizes, LMAs, Bougie, Maccoy's blade, stubby handle, was kept. Emergency tracheostomy back up was confirmed & consent for the same was taken. Ryle's tube aspiration was done. The patient was preoxygenated for 5 mins. Then inj. Ketamine 1.5 mg/kg was given and during his spontaneous breathing efforts, the ability to ventilate was checked by assisting his breath. Once the ventilation was confirmed, the Ketamine was given to complete the total dose of 2mg/kg and Inj. Scoline in the dose of 1mg/kg was given. The direct laryngoscopy was done by senior anaesthesiologist with 4 no Macintosh blade. The posterior commissure was seen with great effort after giving external pressure on neck from right side to push trachea to left. A bougie was passed through cords and 8 no. PVC cuffed ETT was passed over it. The bougie was removed and endo- tracheal intubation was confirmed clinically. Then the patient was given Inj. Atracurium 5mg/kg, Inj. midazolam 0.03 mg/kg, Inj. Fentanyl 2mcg/kg. maintained on 100% oxygen. Surgery lasted for 60 mins. Patient did not require any relaxant top up after loading dose. He maintained the blood pressure around 100-110/60-70 mm Hg., CVP 6-8 cm H₂O. During the procedure Inj. Mannitol 1 gm/kg was given over 30 mins. Urine output was 400cc. At the end of surgery the patient was electively kept on Mechanical Ventilator A/c mode. The patient was extubated after 24 hrs. when he fulfilled weaning criteria.

Figure 1

Figure 1: X-ray neck P.A. View : Showing severe acute deviation of trachea to Rt. side



Figure 2

Figure 2: X-ray chest P.A. View : Showing edema of chest wall & fascial Planes on Lt. side.



DISCUSSION

The patient developed the swelling followed by edema, tenderness, redness of the skin which turned into red dark induration and bullae during course of the disease which is highly suggestive of Necrotizing Fascitis.¹ Necrotizing Fascitis is associated with thrombosis of the blood vessels of the dermal papillae. The edema spreads rapidly along the fascial planes. Starting with nonspecific pain and fever patient lands up into shock and multi organ failure.^{1,2}

Aggressive surgical exploration is the essential part of the management. It helps by decreasing the compartment pressure, visualization of extension, removing necrosed tissue. Antibiotic coverage including Clindamycin, Gentamycin or Ampicillin and Sulbactam is further required.³

For an anesthetist the problems regarding Necrotising Fascitis in this case includes to stabilize the patient hemodynamically preoperatively. These patients may be hemodynamically unstable because of severe toxemia and sepsis. During surgery difficult airway, sepsis and renal protection for myoglobinuria are the important issues to be handled.

There is cervical fascia in the neck. It is divided into Superficial & Deep cervical fascia. Deep cervical fascia is again divided into Superficial, Middle, Deep layers. Middle layer is most important. It invests major vessels and trachea. These fascial layers form 11 spaces in the neck. Infection of these spaces can lead to mediastinitis.^{4,5}

For an anesthetist a condition which leads to a compromised airway is a worrisome problem. Condition like can't intubate and can't ventilate is a frightening nightmare for us. Such condition can be encountered due to extensive edema of the chest wall and neck. Edema of chest wall make ventilation difficult and edema of the neck tissue lead to deviation of the trachea which makes intubation difficult.

If severe, the fascitis may cause compression of the deep cervical fascia causing compression of the tracheal lumen, veins in the neck.^{4,5} So in this case right sided cephalic vein was cannulated. The leg veins can be preferred. Preop IDL was done to know edema of the upper airway and possibility to visualize the vocal cords. Xray neck PA view gives idea about lateral deviation and Lat. view about ant-post compression. The CT scan of the chest and neck is very useful in knowing extension of the edema in fascial planes, compression of major structures in the neck including trachea and veins, tracheal deviation, mediastinal extension.

In view of the compromised airway due to tracheal shift, edema of the neck region, chest wall and surgical debridement around this area, the case was planned to be conducted under general anesthesia with endo-tracheal tube in situ and elective post op ventilatory support. A Difficult Intubation Cart was kept ready. Emergency Tracheostomy consent was taken. Due to tracheal deviation, edema of neck fascia, and chest wall the ability to ventilate the patient under anesthesia was questionable. So it was decided to keep patient on spontaneous ventilation till the ability to ventilate was confirmed. These circumstances made Ketamine as the agent of choice due to its ability to maintain spontaneous respiration till deeper plane of anesthesia is achieved.^{6,7} Ketamine has minimal effects on central respiratory drive as reflected by unaltered response to CO₂. In doses upto 2 mg/kg IV transient decrease I tidal volume is seen. Apnea is seen in unusual high doses.⁸ Propofol affects respiratory centre in a manner quantitatively in the same manner as barbiturates. Apnea seen after induction doses. Incidence & duration of apnea is dependant upon dose, speed of injection, and concomitant premedication. In 30% cases during propofol induction apnea is seen lasting for 30sec or more.⁹

If inhalational agents were available, especially Sevoflurane, then it would have been an agent of choice. All inhalation agents decrease the tidal volume, Isoflurane & Halothane decrease the RR and Minute Ventilation. Newer agents like Sevoflurane, Desflurane also exhibit dose related decrease in tidal volume but decrease in RR is seen only in high concentration eg. > 1.6 MAC Desflurane.¹⁰

Due to unavailability of Sevoflurane vaporizers in Emergency medical services especially in developing countries like India, Ketamine remains the agent of choice. With the dose of 1-1.5 mg/kg Ketamine causes dissociation and maintain spontaneous respiration and ability to ventilate can be judged by assisting spontaneous breaths. In these doses the chances of rigidity caused by Ketamine are low which is seen if dose exceeds 2.5 mg/kg at a time.⁸ Secretions caused by Ketamine was a minor problem, taken care by Inj. Glycopyrrolate premedication. Obviously the anticipated difficult intubation made Scoline as a muscle relaxant of choice for intubation. On direct laryngoscopy the view of the larynx was Cormack Lehane grade III and Crooke's score III-B only after external pressure from right side of the neck. So bougie guided intubation was decided and done by a senior Anaesthesiologist in first attempt.

Intra op. hydration was maintained, maintaining CVP of 6-8 cm H₂O. Inj. Mannitol was given 1gm/kg to flush kidneys as myoglobinuria is seen in these patients. One must be vigilant about urine output as myoglobinuria and nephrotoxic drugs like Gentamycin can precipitate renal failure.

Awake Fiber-optic intubation would have been the ideal management for this patient to intubate the trachea because

under anesthesia there are high chances that patient may obstruct and ventilation may not be possible. But due its cost it is not available in many of the secondary health care centers in India and the same is true of the inhalational agents. These problems made us to manage this case with Ketamine and bougie guided intubation. Thus in emergency cases, places where the Fiberoptic bronchoscope and inhalational agents not available such cases can be managed in this line of management.

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