

Anaesthetic Management of Massive Necrotizing Fasciitis of Neck with Ludwig's Angina

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Abstract

Anesthetic management of necrotizing fasciitis of neck associated with Ludwig's angina is presented. This case was challenging as all the major vessels and tracheal rings were visible from outside. Also because of massive blood loss patient was in hypovolemic shock. Necrotizing fasciitis is a rare, rapidly progressive, life threatening infection process primarily involving the subcutaneous tissue and fascia with thrombosis of the subcutaneous blood vessels. While Ludwig's angina is a serious, potentially life-threatening infection of floor of the mouth and neck. This condition is notorious for its aggressiveness, rapid progression to airway compromise and high mortality when not treated promptly. These conditions cause severe threat to the patient's life.

Keywords: Necrotizing fasciitis; Ludwig's angina; Hypovolemic shock.

Introduction

Necrotizing fasciitis of neck and Ludwig's angina is a grave emergency due to severe airway compromise and respiratory distress. We report, a rare case of combination of these life threatening conditions for anesthetic management. This case becomes unique as patient was bleeding very profusely through eroded vessels of neck. It is diagnosed by exclusion and has good prognosis with earlier diagnosis.

Case History

65 years old grossly obese female (BMI=38.7kg/m²) with height of 150 cms weighing 87kgs non diabetic non alcoholic was admitted to the casualty department due to the profuse bleeding through right sided neck vessels with pus draining through site. On examination patient was semiconscious, disoriented and obeying

commands intermittently. Her skin was cold clammy, femoral pulse was 140 beats per minute, respiratory rate of 24/minute and blood pressure was 64/40 mmHg. Mouth opening was 2 cms and Modified Mallampatti's grade was three with restriction of neck movements because of pain. Air entry was reduced in the right lower zone without added sounds. Heart sounds were normal.

Previous history revealed that she was hypertensive since 10 years and was not taking any medications. She had history of left sided hemiplegia 3 years back and currently was not

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able to walk with the same leg. Recent history revealed extraction of teeth 15 days back followed by appearance of swelling in submandibular region. On admission in casualty department, there was rupture of abscess with drainage of approximately 1400 ml of pus mixed with blood.

Patients both cephalic veins were cannulated at antecubital fossa with 18G cannulae as internal jugular or subclavian vein catheterization was not possible because of infection. 350 ml of whole blood and 300 ml of 3% Hydroxyl Ethyl Starch solution infused within 20 minutes. Amoxicillin plus clavulanic acid antibiotic dose was administered IV. Ryle's tube aspiration was done. Urethral catheterization was done with No. 16 Foley's catheter.

On investigation, hemoglobin was 7gm%, Hct 24%, CBC 16000/cmm BUN 29 & Sr. Creatinine 2.2 mg/dl. Sr. Na 143 & K 4.2 meq/li. Liver function tests were within normal range. EKG was normal. On X ray neck AP view there was no tracheal shift. X-ray chest showed right sided minimal pleural effusion. Cardiac silhouette was within normal limit

Patient was immediately trolleyed to OT anticipating difficult airway and resuscitation. 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. The patient was preoxygenated for 3 minutes. Then Inj. Glycopyrrolate 0.2mg, inj. Ketamine 60 mg and inj. Midazolam 1mg was given IV during her spontaneous breathing efforts, the ability to ventilate was checked by assisting her breaths.

After the gentle laryngoscopy with no. 3 McIntosh blade, Patient was intubated with no.6 RAE [North Pole] cuffed tube through right nostril. Blind nasal intubation was not tried because of distortion of anatomy. Patient's throat packing was done with wet roller gauze. By the time patients pulse rate was 110/min, BP 90/50 mmHg, SPO2 99% and EtCO2=30mmHg. She was maintained on O2, Nitrous oxide (33:66%) & sevoflurane 1% with inj. Vecuronium 4 mg as muscle relaxant. Patient was ventilated on Volume control mode with TV= 350ml & RR=12/min. Resuscitation continued with ringer lactate through one cannula and whole blood through other. Urine output throughout the procedure was 200 ml. Total 700ml of whole blood, 300ml of 3% HydroxyEthyl Starch and 1000ml of ringer lactate was infused.

Thorough debridement done for 2 hours and all the bleeding vessels were cauterized. During debridement approximately 700 ml of blood mixed with pus was drained. Patient shifted to the ICU with endotracheal tube in situ with pulse rate of 92/min, BP =108/68mmHg and SPO2=99% with T-piece. Patient was extubated after 24 hours as she fulfilled the weaning criteria. During the ICU stay patient condition were closely monitored. Oxygen supplementation with mask continued. After 6 days of ICU stay patient was shifted to oral surgery ward.

Discussion

While described as far back as the writings of Hippocrates and Galen, the necrotizing fasciitis Ludwig's angina was first detailed by the German surgeon Wilhelm Friedrich von Ludwig in 1836.[1] Necrotizing fasciitis (NF), commonly known as flesh-eating disease or Flesh-eating bacteria syndrome, is a rare infection of the deeper layers of skin and subcutaneous tissues, easily spreading across the facial planes.[2] Necrotizing fasciitis is a quickly progressing and severe disease of sudden onset. It has to be treated immediately with doses of broad spectrum intravenous antibiotics and by surgical treatment.

Type I describes a polymicrobial infection, whereas Type II describes a monomicrobial infection. Many types of bacteria can cause necrotizing fasciitis (e.g., Group A streptococcus (*Streptococcus pyogenes*), *Staphylococcus aureus*, *Vibrio vulnificus*, *Clostridium perfringens*, *Bacteroides fragilis*). Such infections are more likely to occur in people with compromised immune conditions like diabetes, immunosuppression, alcoholism/drug abuse, malignancies, and chronic diseases.[3] Most affected patients are in age group of 20 to 60 years, although age range from 12 to 84 has been reported. There is a male predominance (3:1 to 4:1) for these disorders.[4] It occasionally occurs in people with an apparently normal general condition

For an anesthetist the problems regarding Necrotising Fasciitis 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. In view of semiconscious

patient with fistula in floor of the mouth risk of aspiration is very high. Condition which lead 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 necrosis of the neck structures. Edema of the neck tissue leads to deviation of the trachea which makes ventilation and intubation difficult.

In view of the compromised airway due to tracheal shift, edema of the neck region and surgical debridement around this area, the case was planned to be conducted under general anesthesia with endotracheal tube in situ. A difficult intubation cart was kept ready. Emergency Tracheostomy consent was taken. Due to tracheal deviation, edema of neck fascia, and 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. Ketamine has minimal effects on central respiratory drive as reflected by unaltered response to CO₂. In doses up to 2 mg/kg IV transient decrease in tidal volume is seen.[6] Apnea is seen in unusual high doses. Propofol affects respiratory Centre in a manner quantitatively in the same manner as barbiturates. Apnea seen after induction doses.[7] Patient was maintained with sevoflurane 1%, nitrous oxide and oxygen in the ratio of 60:40 on controlled ventilation.[8]

In our case, there were multiple discharging sinuses and one large fistula was present at the floor of mouth. Her oral cavity was flooded with blood and pus. Airway was thoroughly suctioned

before and at the time of laryngoscopy. Blind nasal intubation is not a good option in these cases because of the distortion of the airway and fragile tissues of the nasopharyngeal airway. 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 as there was bleeding and pus pouring out from multiple discharging sinuses at the floor of mouth which would have obstructed the view of fiberoptic bronchoscope. As mouth opening was adequate, we decided to perform direct laryngoscopy and intubation was done.

Differential Diagnosis of these conditions includes:

1. Peritonsillar abscess
2. Parotid space infection
3. Mumps
4. Parapharyngeal or retropharyngeal space infection
5. Paravertebral space infection
6. Suppurative jugular thrombophlebitis.[9]

Mortality rates have been noted as high as 73 percent if left untreated. Without surgery and medical assistance, the infection will rapidly progress and will eventually lead to death.[10]

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