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## **MANAGEMENT OF DIFFICULT AIRWAY DUE TO CHOP WOUND IN POSTERIOR NECK**

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### **ABSTRACT**

*A 35 years old male patient presented with a chop wound in posterior neck between C2 and C3 interspace. After initial resuscitation this patient was put for surgery and general anesthesia was induced in left lateral position. Our experience suggested that a proper size ILMA (intubating laryngeal mask airway) is useful in managing difficult airway in left lateral position. Blind intubation attempt via ILMA is generally successful. We recommend routine use of ILMA as a backup plan in managing anticipated difficult intubation in nonconventional position.*

**Keywords:** Difficult airway, Chop wound, Penetrating neck injury, Lateral position, ILMA.

### **Contribution/ Originality**

A systemic approach with appropriate alternatives is the key behind successful management of anticipated difficult airway. Often this scenario is further complicated by emergence nature of surgery and nonconventional positioning. This paper documents successful use of ILMA in these cases as a suitable alternative.

### **1. INTRODUCTION**

Neck injuries are broadly classified into penetrating and non-penetrating injuries. Penetrating injuries are further divided into stab wound, incised wound, chop wound and missile wound. It is the third most common cause of spinal injuries in adults [1]. In most cases, non-missile penetrating spinal injuries (NMPSI) are inflicted by assailants from the back and the inflicting object is often deflected by bones away from the spinal cord. As a result, spinal cord

injury is mostly incomplete and half of the patients present with Brown-Sequard syndrome with ipsilateral motor deficit and contralateral dissociated sensory loss [2].

Most of the penetrating neck injuries are caused by firearms and stab wounds [3]. Chop wounds are rare entity. It deserves special attention due to gravity of the injury, associated massive bleeding and usual involvement of deeper viscera.

It is best considered as a combination of blunt and sharp force injury produced by a blow with the sharp cutting edge of a fairly heavy weapon with a tremendous amount of force [4]. Almost always these injuries are homicidal in nature.

An unusual case of chop wound in posterior neck presented to us in the emergency department (ED). The challenges to be taken by the anesthesiologist were emergency nature of surgery, full stomach of the patient, suspected spinal cord injury, associated blood loss, nonconventional positioning during intubation and an anticipated difficult intubation.

## 2. CASE REPORT

A 35 years old male patient was brought to the ED by his fellow colleagues. He had sustained a chop wound in back of neck. The assailant tried to decapitate him by a blow of machete but missed. The victim was able to escape the scenario and later called his colleagues.

On examination, the patient was in recumbent position in bed supported by attendants. He was conscious, alert and in distress due to severe pain aggravated by neck movement. He was unable to lie down either supine or prone position.

There was oozing of blood with slightest movement of the neck. Since the injury was in back of neck, immobilization by cervical collar was not possible.

The patient was immediately stabilized in left lateral position with cotton rolls and a pillow. His pulse rate was 120/minute, blood pressure was 106/70 mm of Hg and he was maintaining oxygen saturation of 95% in room air.

He had moderate pallor and respiration was regular. The wound was 7.5 cm in length and 4 cm deep at its highest point. Neurological examination did not reveal any sensory or motor deficit at that time.

There was no obvious injury in thorax, abdomen, long bones or other part of the body. X-ray soft tissue neck showed potential soft tissue injury between the spinous processes of C2 and C3 vertebra (Figure 1). There was no bony injury.

There was no associated pneumothorax or subcutaneous emphysema and chest x-ray was normal. Angiography and color Doppler ultrasonography were not available in the ED, so these could not be done. Routine investigation revealed hemoglobin of 7.5 gm/dl and total leukocyte count, urea, creatinine, random blood sugar were within normal limit.

After initial volume resuscitation with crystalloid, the patient was put for operation on an emergency basis. Four units of blood were kept in hand. Lateral immobilization of neck was maintained throughout the period of examination, investigation and transportation.

During preoperative examination, it was found that the patient was in full stomach. He could not tell his past medical history properly. He had normal dentition, three finger breath mouth opening and Mallampati score was II. Since supine position was not possible, we decided to intubate the patient in left lateral position.

The patient already had two wide bore intravenous lines. As potential intraoperative blood loss was contemplated, intra-arterial line was done to monitor invasive blood pressure (IBP). Routine monitors like ECG (electrocardiogram), pulse oximeter, NIBP (noninvasive blood pressure), temperature probe were attached.

Difficult airway cart was kept ready. Direct laryngoscopy and intubation with minimal stress was our first priority. Placement of ILMA (intubating laryngeal mask airway) followed by blind Fastrach endotracheal tube (FETT) insertion was kept as a backup plan. We did not have provision of fiberoptic bronchoscope in the emergency department.

The patient was premedicated with injection glycopyrrolate 0.2 mg and fentanyl 2 µg/Kg body weight intravenously (IV). Rapid sequence induction (RSI) was planned. After preoxygenation for 3 minutes, patient was induced with injection etomidate in titrating dose till loss of eyelash reflex. Ventilation was confirmed, manual in-line stabilization and cricoids pressure were maintained by assistants.

Rocuronium bromide was given in intubating dose (0.9 mg/Kg body weight). After adequate relaxation, direct laryngoscopy was done using Macintosh laryngoscope blade size 4 and it revealed Cormack and Lehane's grade IIIa glottic view. First attempt of intubation was failed. A second optimum attempt with OELM (optimal external laryngeal manipulation), gum elastic bougie and moderate amount of lifting pressure was failed again. Then the patent was reverted back to bag mask ventilation and cricoids pressure released.

ILMA (size 4) was inserted and cricoids pressure was applied again. Patient was ventilated again. Then blind FETT (internal diameter 8.0 mm) insertion through the ILMA was attempted with and it was successful this time.

After confirming proper placement and position of FETT, ILMA was removed. Anesthesia was maintained with isoflurane (1-2%) with nitrous oxide (66%) in oxygen. Top up doses of vecuronium used for muscle relaxation. Patient was turned to prone position for surgical exposure (Figure 2). Intraoperative course was uneventful. After completion of surgery, neuromuscular blockade was antagonized with injection of neostigmine 0.05 mg/kg and glycopyrrolate 0.02 mg/kg IV and patient was extubated in left lateral position.

**Figure-1.**X-ray neck lateral view showing soft tissue injury at C2-C3 interspace



**Figure-2.**Showing chop wound in posterior neck



### 3. DISCUSSION

Airway management in trauma patients during surgical emergency are compounded by several factors like presence of full stomach, associated comorbidities, intoxication, airway trauma, difficulties in obtaining past medical history, suspected spinal cord injury (SCI), hemodynamic instability, atypical positioning during intubation, susceptibility of patients to narcotics and sedative agents etc. The main choice for the anesthesiologist is between awake fiberoptic intubation (gold standard) and intubation by direct laryngoscopy with manual in-line stabilization (MILS). For emergency airway, RSI with direct laryngoscopy is more preferable [5].

In our patient, main challenges for airway management were presence of full stomach, suspected SCI and left lateral positioning during intubation. For SCI, MILS was done. The goal of MILS is to apply adequate opposite forces to prevent head and neck movement during airway interventions. Cricoid pressure was applied to prevent regurgitation of gastric contents. It is also found helpful after placement of LMA (laryngeal mask airway). Cricoid pressure does not cause dislodgement of LMA, prevents gastric insufflations but it may hinder ventilation especially when neck is not supported [6]. Left lateral position has been found to be associated with deterioration of laryngoscopic view [7]. This was the reason behind failures of intubation following direct laryngoscopy. LMA more rapidly and reliably establishes airway control in this position [7]. Again, ILMA is more suitable than classical LMA in patients with recognized difficult airways [8]. Blind intubation through an ILMA in lateral position is generally successful with a reasonable intubation time (<1 minute) [8]. Rabiu and Fadare had suggested 'suspended' supine

position during intubation in case of posterior neck injury [9]. Here patient was positioned supine on foam mattresses so that neck lay free. This method quiet effectively bypassed the laryngoscopic difficulties and altered physiological responses associated with lateral position. Recently, rigid indirect videolaryngoscopy has been shown to be a useful alternative to conventional direct laryngoscopy in difficult airway management [10]. There are several studies using Glide Scope® and Airtraq® with conflicting results and definite conclusion is yet to be drawn.

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