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## Case Report

# Traumatic airway injury, sinking Trachea: An unusual presentation

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### ABSTRACT

**Introduction:** Airway injuries are one of the less commonly encountered types of cases in the emergency department. Neck lacerations can involve the superficial layers of skin, superficial fascia, deep structures including the airway and less commonly the structures encased in carotid sheath. Airway injuries are potentially life threatening. In this case report we present a cut throat case presented to the emergency services at our institute in an unusual way. And it was challenging case to treat as the trachea has got transected and sunk into thorax.

**Case Report:** A 35-year-old male, laborer by profession, had sustained multiple injuries while lowering granite slab from a truck. He presented with a cut over his throat, and injury to his leg. He complained of pain in chest while breathing, difficulty in phonation, difficulty and pain while walking. He had a contused lacerated wound over the lower half of his neck. Deeper examination of the wound revealed that the trachea had been transected in half of its circumference. The lower tracheal segment was sinking in thorax due to complete transaction of trachea. Tracheostomy tube was placed in the lower segment. Patient was taken up for emergency airway assessment under general anesthesia and immediately resection and anastomosis surgery of trachea was performed in the same emergency operation theatre on the same day. Patient was taken up for emergency airway assessment under general anesthesia and immediately resection and anastomosis surgery of trachea was performed in the same emergency operation theatre on the same day. The challenge was to search the lower intrathoracic segment of trachea & to pull it in the neck to perform resection anastomosis surgery.

**Conclusion:** Although airway injuries may not always be present in a case of lacerations of the neck, careful assessment is necessary to evaluate airway integrity even when the patient has no respiratory issues. A carefully done & accurately placed tracheostomy helps not only to secure the airway but also makes any possible future airway surgery have a better outcome and thus reduce postoperative morbidity. Timely decision making, careful patient selection and aseptic & meticulous surgical technique reduces intraoperative complications, postoperative morbidity and also makes earlier functional recovery possible.

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## 1. Introduction

Airway injuries are one of the less commonly encountered types of cases in the emergency department.<sup>1-3</sup> Being a tertiary care center, our institute has seen many airway injuries associated with neck lacerations. Neck lacerations

may be hiding a more dangerous underlying condition and require a careful assessment.<sup>2,3</sup> Traumatic airway injuries can be classified as those caused by blunt trauma or sharp injuries based on the mechanism of injury.<sup>4,5</sup> Neck lacerations can involve the superficial layers of skin, superficial fascia, deep structures including the airway and less commonly the structures encased in carotid sheath.<sup>3-5</sup> Although neck lacerations with concomitant airway injuries

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are potentially life threatening, they may not present as such and can go undetected until they become one.<sup>1,2,4</sup> In this case report we present a cut throat case presented to the emergency services at our institute in an unusual way where the Trachea had got completely transected. And it was challenging case to treat as the lower segment of trachea has got transected and sunk into thorax. The challenge was to search the lower intrathoracic segment of trachea & to pull it in the neck to perform resection anastomosis surgery.

## 2. Case Report

A 35-year-old male, laborer by profession, had sustained multiple injuries while lowering granite slab from a truck. He presented with a cut over his throat, and injury to his leg. He complained of pain in chest while breathing, difficulty in phonation, difficulty and pain while walking. He was taken to a private hospital where he received primary care for his wounds and was referred to our institute for definitive management.

Primary assessment revealed that the patient was conscious, oriented and had no respiratory distress at the time of presentation. Patient had difficulty vocalizing. He had also sustained a fractured rib with pneumothorax for which an intercostal drain was inserted, and a minimally displaced fracture of tibia for which a splint was applied.

He had a contused lacerated wound over the lower half of his neck, measuring 4cm long \* 1cm deep, with surrounding subcutaneous emphysema. Deeper examination of the wound revealed that the trachea had been transected in half of its circumference. There was no evidence of soiling of the tracheal wound with foreign material or bleeding from around the trachea or in the tracheal lumen. Laryngoscopic examination using rigid Hopkin's 70-degree telescope revealed a right vocal cord paresis with compensation from the opposite cord and pooling of saliva but no aspiration.

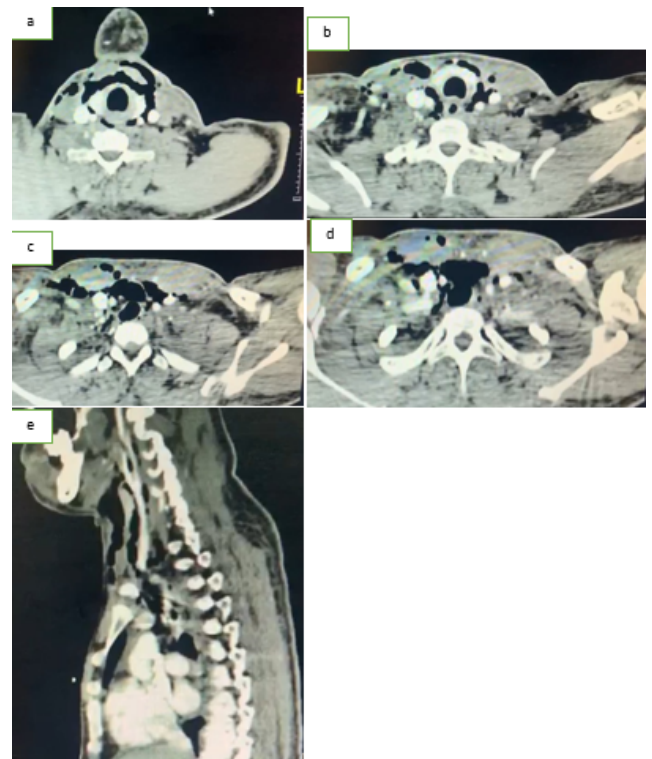
There was a tracheal tear at the junction of 2<sup>nd</sup>-3<sup>rd</sup> tracheal rings. The lower tracheal segment was sinking in thorax due to complete transection of trachea. Tracheostomy tube was placed in the lower segment the emergency department itself by palpating the tracheal rings in the suprasternal notch area and pulling the lower tracheal rings in the neck with forceps. The lower end of trachea was stabilized by taking tracheal stay sutures and airway was secured till a definitive tracheal anastomosis surgery was planned. During the tracheostomy it was found that the carotid sheath was intact and the rent in the trachea was wide enough that a tracheostomy tube could be inserted through it.

CT scan of the neck revealed that there was no other injury to the airway apart from this, and that the contents of carotid sheath were undamaged.

Patient was taken up for emergency airway assessment under general anesthesia and immediately resection and



**Fig. 1:** Tracheostomy done through the neck laceration itself and no additional incision taken (image taken after anesthesia)



**Fig. 2:** (Left to Right then down) (2-5 axial cuts, 6 coronal). CT scan images showing subcutaneous emphysema extending in parapharyngeal spaces, around and beyond carotid spaces, inferiorly extending into the mediastinum

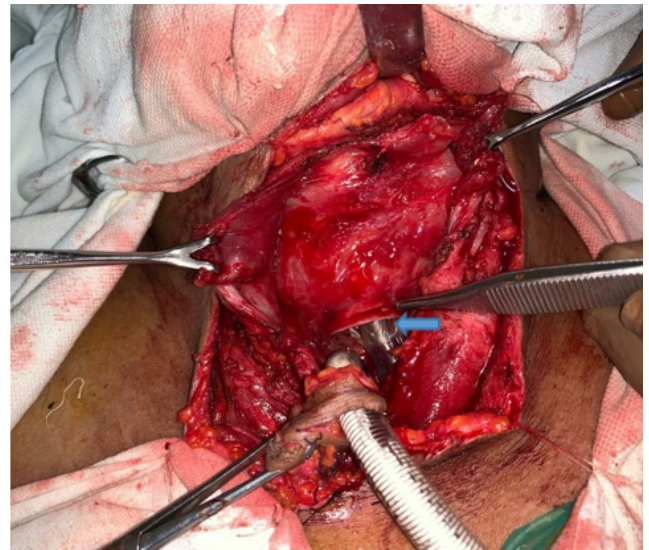
anastomosis surgery of trachea was performed in the same emergency operation theatre on the same day. It was revealed during the procedure that, there was a tracheal tear and complete transaction at the junction of 2<sup>nd</sup> - 3<sup>rd</sup> tracheal rings and that the mucosa at the ends of the damaged trachea was not completely vital and the ends needed to be freshened. Patient was taken up for emergency airway assessment under general anesthesia and immediately resection and anastomosis surgery of trachea was performed in the same emergency operation theatre on the same day. The challenge was to search the lower intrathoracic segment of trachea & to pull it in the neck to perform resection anastomosis surgery. After searching the lower segment of trachea stay sutures were taken in the lower segment of trachea & it was gently pulled in the neck.



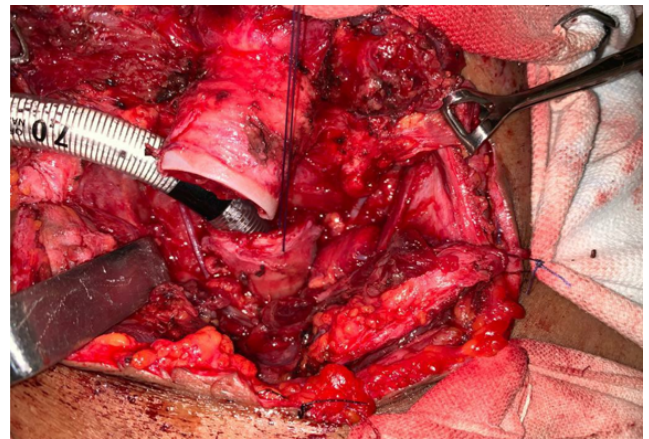
**Fig. 3:** Intraoperative image showing, neck incision taken in such a way as to leave a cuff of skin surrounding the neck laceration, also seen is site of tracheostomy

After freshening of the ends of the tracheal stumps the ends were primarily sutured with submucosal sutures using 2-0 vicryl round body taking care that the sutures are not at the same level to prevent pressure from the suture accumulating at the same tracheal level. Airtight seal was confirmed and a suction drain was inserted in the surgical field making sure that the drain is inserted through a separate puncture site. Skin flaps were sutured in layers. Patient was extubated on table, and observed for any signs of deterioration. Patient had an uneventful immediate postoperative period in the operating room and later in the ICU.

Postoperatively patient was observed to have persistent hoarse voice and right vocal cord paresis similar to initial airway assessment. After 7 days of observation patient was transferred to orthopedic services for definitive management of tibial fracture and it was advised to avoid tracheal intubation to allow healing of the tracheal repair to occur unimpeded.



**Fig. 4:** Skeletonizing the trachea, showing endotracheal tube at the upper stump, inserted after induction via tracheostomy tube.



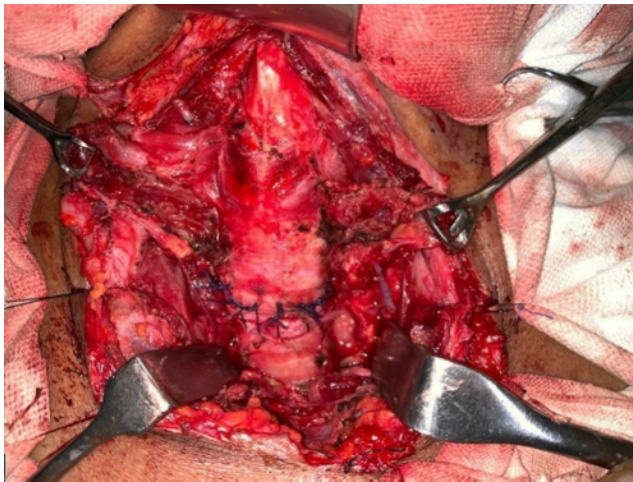
**Fig. 5:** After freshening of tracheal stumps and first tracheal suture is being placed.

Prior to discharge patient was assessed for vocal cord mobility and pooling or aspiration of saliva. Patient had persistent vocal cord paresis, but there was no evidence of pooling of saliva or aspiration. Nasogastric tube that had been put initially was removed and patient started on oral feeding.

Airway assessment done after 2 months of being discharged showed a healthy anastomotic site with minimal to no narrowing at the site of anastomosis. Patient still had right vocal cord paresis which improved over the course of next few months.

### 3. Discussion

Airway insults associated with neck lacerations range from minimal blunt trauma to the structure to significant blunt



**Fig. 6:** Sutured trachea (ventilation achieved via orotracheal tube in image 8 achieved).

force being applied to the airway leading to fracture of the laryngeal cartilages, hematoma in the laryngeal membranes to crico-tracheal disassociation & tracheal tears.<sup>1,2,4,6</sup> Careful assessment is necessary to triage cases according to the zone involved, their severity, damage to vital structures such as the airway, great vessels, esophagus etc.<sup>4,7-9</sup> Cases with only lacerations of the skin, and fascial layers without damage to these vital structures can be managed conservatively although a keen observation is needed to identify any early signs of deterioration.<sup>4,10,11</sup> Cases with injuries to the above mentioned vital structures are better managed at a higher center as these cases may require multidisciplinary management and intensive care.<sup>3,7,8</sup> Careful primary assessment is important along with imaging of the neck to devise a sound treatment strategy.<sup>1,2,6</sup> Cases with minimal tissue loss, minimal loss of vitality of remnant structures such as mucosa, fascial layers etc., and where the patient is vitally stable, can be taken up for corrective surgery early as it can help improve the outcome, prevent postoperative morbidity and can have a better postoperative functional prognosis.<sup>11,12</sup> Delay in surgical management due to any reason increases the chances of infection of the airway with associated tracheal mucositis which further increases the chances of postoperative stenosis at the anastomotic site apart from the chances of lower respiratory tract infection.<sup>7,8,11</sup>

#### 4. Conclusion

Although airway injuries may not always be present in a case of lacerations of the neck, careful assessment is necessary to evaluate airway integrity even when the patient has no respiratory issues.<sup>1,4,6,12</sup> Surgical emphysema over the neck is a tell-tale sign of airway insult and should alert the treating surgeon or physician.<sup>2,9,12</sup>

Once confirmed, the site and severity of the insult along with trauma to the surrounding vital structure should be checked for and whenever possible a laryngoscopic evaluation either using a rigid or a flexible laryngoscope should be carried out.<sup>2,6,8</sup>

Imaging helps in pointing out the site & extent of trauma and should be carried out along with imaging being done to evaluate other bodily injuries in emergency department.<sup>4,8,10</sup>

A carefully done & accurately placed tracheostomy helps not only to secure the airway but also makes any possible future airway surgery have a better outcome and thus reduce postoperative morbidity.

Timely decision making, careful patient selection and aseptic & meticulous surgical technique reduces intraoperative complications, postoperative morbidity and also makes earlier functional recovery possible.<sup>8,9,11</sup>

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#### 6. Conflict of Interest

The authors declare no potential conflicts of interest concerning the authorship and publication of this article.

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