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Management of External Laryngeal Trauma- Case Report

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Abstract

*Laryngeal trauma is a less common but life threatening emergency and should be dealt with seriously and on priority basis. The sternum and lower jaw usually protect larynx from blunt trauma **[1]**. Laryngeal trauma is usually caused by endo-laryngeal surgical procedures and less commonly by external blunt trauma or penetrating injuries by sharp objects and gunshots **[2]**. Vitally important structures of phonation, swallowing and ventilation are present in a compact space in the neck. Furthermore, these are not protected by any bony covering **[3]**.*

*Two types of injuries may occur, blunt & penetrating. Blunt injuries range from mild mucosal damage and edema to cartilage fractures and displacements. While penetrating injuries may cause gross tissue loss or external opening of airway **[2]**. CT scan in combination with direct flexible endoscopy provide reliable information about the extent of injury and avoids unnecessary exploration when indication of surgery is in doubt **[2]**. A CT scan can help to decide between conservative or operative management. Therefore, one should have very low threshold to go for high resolution CT scan or neck ultrasound in these cases. Due to the presence of vitally important structures in the neck, a multidisciplinary team consisting of ENT, anesthesia, thoracic surgeon and intensive care unit physicians is needed. We present a case of blunt laryngeal trauma and its management by a multidisciplinary team in the ED (emergency department) & operating room.*

Case Report

A 29 years old young patient was admitted in the emergency department (ED) with a 3 hour history of neck pain and mild swelling after he fell from a ladder, hitting the side rail on the Left side of the neck. The patient complained of difficulty in breathing that started within half an hour of injury, associated with voice change as well. The patient also had a bout of hemoptysis after the injury. There was hoarseness of voice and stridor but no loss of consciousness or seizures. Immediate CT scan was done and showed left sided extensive soft tissue emphysema. It was causing mass effect on trachea, displacing it to the right and extending to the mediastinum. There were no motor or sensory symptoms. He had free neck movement but CT scan showed a C6 Left transverse process fracture. The ENT surgeon did first naso-laryngoscopy which showed decreased mobility of the left vocal cord. A decision was made to do urgent endotracheal intubation in operation room by the anesthesia team, accompanied by the ENT surgeon to do tracheostomy in case of airway collapse. Awake fiber-optic intubation was done by spraying 10% lignocaine on tongue, lateral and posterior pharyngeal wall and advised the patient to gargle. The fiber-optic laryngoscopy showed decreased movement of the left vocal cord and a traumatic lesion distal to it on the same side **[**fig 1**]**. Lignocaine spray was done on the vocal cords through fibre-optic bronchoscope and distal to it. Patient coughed which helped in spread of local anesthetic in the trachea. There was minimal mucosal injury on the posterior wall distal to the one mentioned earlier **[**fig 2**]**. Once the airway was secured with ETT # 6, patient was sedated with bolus doses of fentanyl (100 mcg) and propofol (100 mg). Patient was shifted to surgical ICU for further management and monitoring.

Fig 1: Vocal cords having lesion (fiberoptic bronchoscopic view).

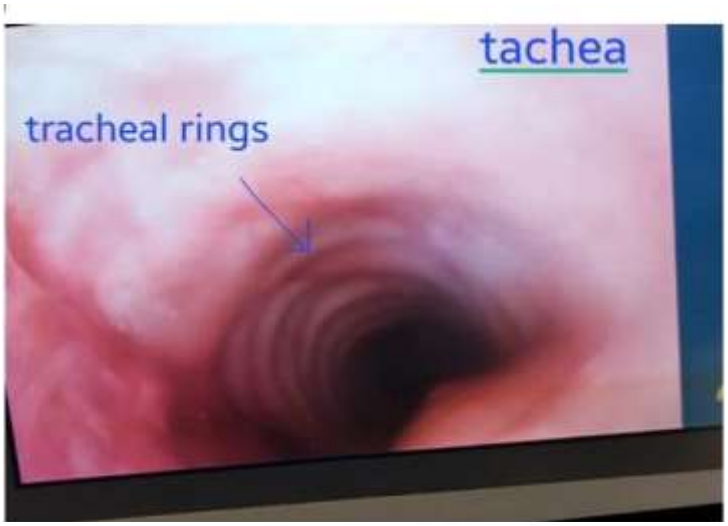

Fig 2: Tracheal view having lesion on the posterior wall of trachea (fiberoptic bronchoscopic view).

Figure 3: CT scan of neck showing air leak into soft tissues of neck and tracheal shift to Right side.

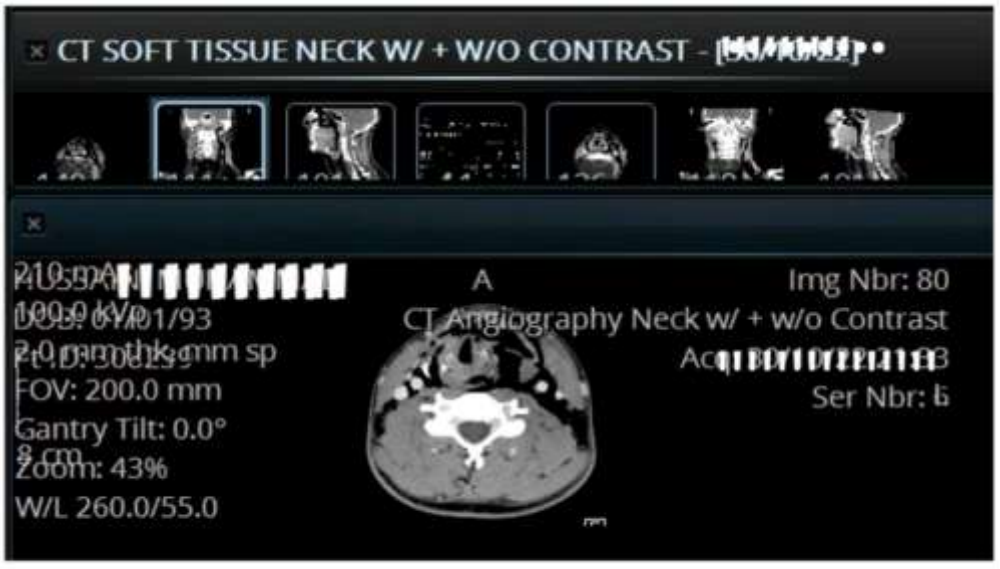

Figure 4: CT scan of neck showing air leak into soft tissues of neck.

In surgical ICU, neurosurgeon visited the patient and advised conservative treatment for non-displaced C6 transverse process fracture. On the 3rd day, flexible bronchoscopy was done in ICU which showed left vocal cord hematoma and a small laceration between cricoid and the first tracheal ring. An X-ray chest on the 4th day showed resolution of mediastinal emphysema and a gross decrease in the supraclavicular emphysema. Patient was extubated on the fifth day and remained comfortable without any respiratory symptoms. On the next day, fiber-optic bronchoscopy was done under general anesthesia in operation room by thoracic surgeon which showed decreased left vocal cord movement with resolving vocal cord hematoma and normal trachea. The next day, patient was shifted to general surgical ward from ICU. Referral to speech therapist was done who started therapy right away. There were no issues of swallowing and regurgitation of food. On the 10th day, patient was discharged from the hospital with future outpatient appointments of neurosurgery and ENT.

Discussion

Laryngeal trauma is rare but serious and potentially deadly injury. The prompt diagnosis and management of acute laryngeal trauma is necessary because clinical presentation is variable depending on the location, severity and mechanism of injury **[**5**]**. Usual signs are hoarseness, dysphagia, odynophagia, anterior neck discomfort, dyspnea, stridor, coughing and hemoptysis and surgical emphysema **[**6**]**.

The most important initial decision is whether patient can maintain the airway for CT scan and diagnostic laryngoscopy. It is recommended that if there is any doubt, first secure airway and only then proceed for investigations to check and assess any laryngeal damage **[**8**]**. Extreme vigilance is required in anterior neck injuries and one should have low threshold to secure airway surgically by an emergency tracheostomy or cricothyrotomy **[**7**]**.

Laryngeal trauma is quite infrequent in pediatric population due to its high position in neck relative to adults and more pliable nature of the laryngeal cartilages. Furthermore, larynx is well protected by mandible **[**4**]**.

It is vitally important to restore mucosal integrity as well as proper alignment of the cartilaginous framework for phonation and sphincter function of larynx. Muscles and ligaments repair is also important **[**2**]**. Due to anatomical defects, airway blockage may develop immediately, or it may take time for patients to experience symptoms resulting from delayed airway obstruction. Therefore, hospital admission and close monitoring of airway patency is required. Flexible fibre-optic laryngoscopy can show mucosal injuries of proximal larynx and upper aero-digestive tracts as well as

any lacerations, hematoma or other structural abnormalities. For concealed laryngeal-tracheal damage-new developing vocal fold paresis/paralysis is concerning. Serious delayed complications might happen even if the patient is currently asymptomatic **[**3**]**.

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