Volume : 12; Issue1; pp 33-36
DOI: http://doi.org/10.4038/cjo.v12i1.5348

Laryngotracheal injuries: case series and review of literature

Widanage W.H.U.P.[1]

[1-] Consultant ENT surgeon, Base Hospital , Wathupitiwala , Sri Lanka

Abstract

Laryngotracheal injuries are rare presentation to the emergency room which can potentially carry high mortality and morbidity rate if not identified and managed appropriately. Here we present a series of three patients presented with laryngotracheal injuries and managed successfully at a base hospital in Sri Lanka between march 2021 and august 2022.

Key words: laryngotracheal injuries , tracheostomy , laryngotracheal repair

Funding: None

Competing interest: None

Correspondence: Dr. W.H.U.P.Widanage (widanageupeksha@yahoo.com)

Accepted Date: 19.01.2023 Published Date: 19.03.2023

p-ISSN : 2012 - 855x, e-ISSN: 2576-2040
Ceylon Journal of Otolaryngology

Introduction

laryngotracheal injuries can happen due to penetrating trauma or blunt trauma. 3-6 % of penetrating neck injuries can be associated with tracheal injuries[1] which carry high mortality rates noted as 14 % [2]. Blunt trauma leading cervical tracheal and laryngeal injuries are relatively rare as it is protected by the mandible and cervical spine. It's elastic and mobile nature further protects it from trauma.

Case series

Case 1

A56 years old male was brought from the local hospital with a history of self-inflicted neck injury. Endotracheal tube had been inserted via the neck wound. His vital signs were stable on admission though significant amount of bleeding was noted over the dressing. Clinical examination did not reveal involvement of the nervous system, chest or the abdomen. Basic blood investigations were arranged, and the patient was prepared for neck exploration. Fiberoptic assessment of the larynx did not show injuries in the supraglottis or the glottis. Bleeding was found to be from the thyroid gland and its related blood vessels which were controlled. There were two full thickness transverse cuts over the thyroid lamina distorting it, which were sutured with 3/0 polyglactin. Cricoid was damaged anteriorly and the endotracheal tube was inserted though the damaged cricoid (fig 1). Tracheostomy was performed and the cricoid defect was sutured. neck was kept flexed post operative period while managing him with intravenous antibiotics, steroids, anti-reflux medication and tracheostomy care. Fiberoptic laryngoscopy was done in one week after post-surgery showed normal larynx and subglottis. Tracheostomy was removed in 14 days and he is found to have normal voice , swallowing function up to now (fig 2).

Figure 1: Endotracheal tube is passed via the damaged cricoid.

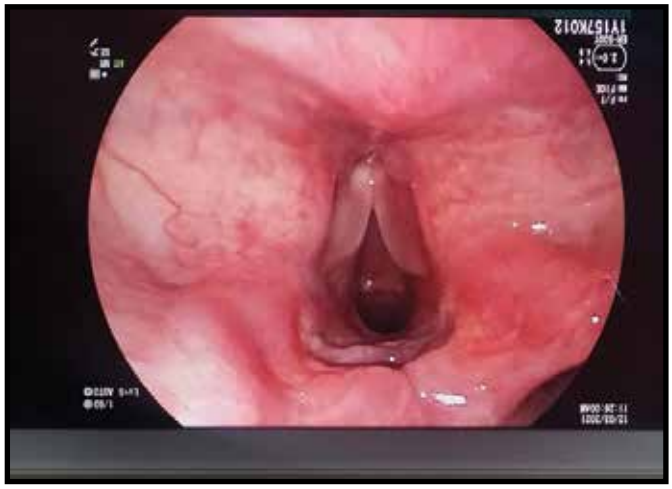

Figure 2: Healed subglottis

Figuer 3: The frame used to stabilize the head and neck (the head lies between the tall vertical parts whereas the neck is placed between the two short segments

Case 2

A23 years old male. addicted to opioids, presented with self-inflicted neck injury was found to have progressive surgical emphysema in the neck. He had stable haemodynamics and no neurological findings. Neck exploration was done after securing the airway with an endotracheal tube passed under the fiberoptic vision. Cricothyroid membrane and the thyroid lamina were found to have full thickness cuts exposing the airway. They were sutured and tracheostomy was done. Post operative period was uneventful and he was decannulated successfully in second week.

Case 3

A48 yrs old male was transferred from a local hospital with a neck injury acquired while using a locally made firearm. There was a piece of wooden stick which passed through the neck, entering the trachea. He had progressively expanded surgical emphysema, and later developed stridor while the operating theatre was arranged. Fiberoptic assisted intubation was done while pulling the stick outward facilitating passing of the endotracheal tube. Left lateral half of the cricoid cartilage and the thyroid lamina were found to be damaged which were sutured. Tracheostomy was done and the patient remained stable throughout the post operative period.

Discussion.

Laryngotracheal injuries are relatively rare entity in poly trauma patients. But early identification and timely intervention is imperative in preventing mortality and morbidity. Penetrating neck injuries are mostly associated with carotid of digestive tract injuries than with airway injuries according to the literature[1] though all our patients had only airway involvement.

Presentation can vary from minor laceration or haematoma in airway to a complete transection of the trachea[5].

Small tracheal cracks originally well opposed and not having others tissue damage, can be left to heal spontaneously [2,7]. But all our patients had significant wound gapping, air leak or bleeding, warranting surgical exploration.

Managing our three patients were mainly based on clinical findings. They all were having obvious signs of airway involvement such as stridor, open wound with air leak. Inserting an endotracheal tube via the traumatized cricoid cartilage could have caused disastrous consequence like dislocating fractured segments[1]. But on a patient with life threatening injury at a Centre with limited resources, this could be a reasonable option. Patients with compromised airway is preferably to be intubated as an awake fiberoptic guided procedure. Facilities should be available for emergency tracheostomy in case of a failure. Rigid esophagoscopy done at the time of neck exploration excluded major oesophagial tear. There was no clinical evidence of pneumothorax. If there is strong suspicion of injuries in major vessels, glottis, supraglottis , imaging modalities such as carotid duplex, HRCT scan of neck , CT angiogram need to be arranged pre operatively.

Repairing laryngeal framework cartilages are best to be done using miniplates as it ensures cartilaginous reunion, whereas suturing or wiring induces healing by fibrous union. But none of our patients had airway narrowing. Airway stents were not available for any of these patients. However, we could achieve anatomical approximation and the repair seemed stable. Proper positioning of these patients during post operative period is utmost important to ensure proper healing of the approximated tissue segments. We used a locally made frame which keeps the patient's neck flexed while avoiding lateral movements too (Fig.3). Patients who had complete tracheal anastomosis are kept with neck flexed by placing chin to neck sutures for 7 to 15 days [2,6,7].

How to manage the airway post operatively on these patients is a matter of controversy. Some suggest immediate extubation of endotracheal tube while others perform immediate tracheostomy on patients having severe tracheal injuries. Immediate tracheostomy associates with less mortality rates while having more incidence of surgical site infections[4]. Our patients did not develop surgical site infection. Only one patient was admitted to intensive care unit immediately after the surgery for observation while the other two were safely managed at the ward.

All our patients had been operated within 3-4 hours after being admitted to hospital. They did not develop late complications such as air way stenosis , granulation tissue formation and voice impairment. Late complications are common when treatment delays more than 24hour after admission[1].

References

1. *Hurford, W.E., Peralta, R., (2003). Management of tracheal trauma. Canadian journal of anaesthesia. 50 (6), pp.1–6.*

2. *Moonsamy, P., Sachdeva, U.M., Morse, C.R.,(2018) Management of laryngotracheal trauma. Ann Cardiothorac Surgery.7(2), pp.210-216.*

3. *Grewal, H.S., Dangayach, N. S., Ahmad, U., Gildea, G. S.T., Mehta, A. C. T.(2019). Treatment of Tracheobronchial Injuries A Contemporary Review. CHEST. 155(3), pp.595-604.*

4. *John, A H., Ethan, A.E., Bryan, A. C., Jason, B., Deborah, M. S., Evren,D. (2016). Airway management following repair of cervical tracheal injuries. Journal of Trauma and Acute Care Surgery.80, pp.366-371.*

5. *Paik, J. H.,Choi. J.,Han, S. B., Jung.H. M., Kim, H., (2014). Complete cervical tracheal transection caused by blunt neck trauma. Ulus Travma Acil Cerrahi Derg.20 (6), pp. 459-462.*

6. *Siciliani, A., Rendina, E. A.,Ibrahim, M., (2018) State of the art in tracheal surgery. Multidisciplinary Respiratory Medicine. 13:34.*

7. *Zhao, Z., Zhang, T., Yin, X., Zhao, J., Li, X., Zhou. Y., (2017). Update on the diagnosis and treatment of tracheal and bronchial injury. J Thoracic Diseaeses. 9(1), pp50-56.*