

Complete traumatic laryngo-tracheal separation.

AUTHOR(S)

James Paul O'Neill, Neville Shine, Conrad Timon

CITATION

O'Neill, James Paul; Shine, Neville; Timon, Conrad (2009): Complete traumatic laryngo-tracheal separation.. Royal College of Surgeons in Ireland. Journal contribution. <https://hdl.handle.net/10779/rcsi.10788566.v2>

HANDLE

[10779/rcsi.10788566.v2](https://hdl.handle.net/10779/rcsi.10788566.v2)

LICENCE

CC BY-NC-SA 4.0

This work is made available under the above open licence by RCSI and has been printed from <https://repository.rcsi.com>. For more information please contact repository@rcsi.com

URL

https://repository.rcsi.com/articles/journal_contribution/Complete_traumatic_laryngo-tracheal_separation_/10788566/2

Complete Traumatic Laryngo-Tracheal Separation

Ir Med J. 2009 Oct;102(9):291-2.

JP O'Neill, N Shine, C Timon

Department of Otolaryngology, Head and Neck Surgery, St James's Hospital, James's St, Dublin 8

Abstract

Laryngotracheal separation injuries are rare and potentially fatal. Immediate respiratory signs may include dysphonia, aphonia, hemoptysis, subcutaneous emphysema and a sucking wound. Patients with this injury usually die at the site of the trauma. The absolute life saving intervention for patients with laryngotracheal injury is airway control via routine intubation or emergency tracheostomy. We present an extremely rare case of complete laryngotracheal separation in a teenager driving a quad bike in a 'clothes line' type injury with chicken wire. This case highlights the need for prompt airway evaluation, radiological imaging required, surgical management and long term injury sequelae.

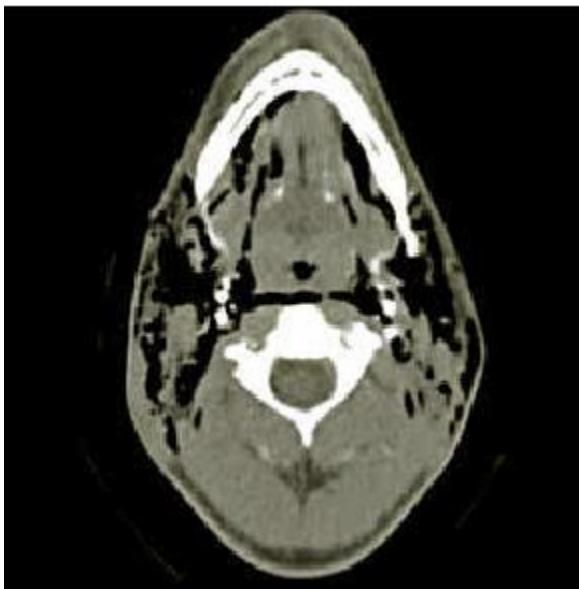
Introduction

Laryngotracheal separation is a rare variant of laryngeal trauma. Laryngotracheal injuries in particular may present with subtle initial symptoms that, if undiagnosed, may rapidly progress to loss of airway and respiratory collapse. The spectrum of injuries within the laryngotracheal region has an estimated mortality of 26.8%¹. A complete laryngotracheal separation is associated with a high mortality immediately as patients succumb to their injuries at the site of the accident².

Case Report

We present a case of a 17 year old male who while driving a quad bike was involved in a 'clothes line' type injury with chicken wire. He received a blunt injury to his anterior neck with minimal skin excoriation. On arrival to the emergency department he was anxious but stable with marked biphasic stridor, mild tachypnoea, complete aphonia and marked subcutaneous emphysema. A small skin abrasion with ecchymosis was noted at the level of his cricothyroid membrane. His condition did however deteriorate rapidly with marked tachypnoea, the onset of haemoptysis and progressive oxygen desaturation. An emergent intubation was attempted however was unsuccessful. Augmented with a gum elastic bougie and a 6.5mm endotracheal tube, intubation appeared to be successful however oxygen saturations were by now 50% and dropping. An emergency tracheostomy was performed. The anatomy was noted to be distorted and the distal end of the endotracheal tube found in the proximal tracheal portion. A complete tracheal separation was diagnosed and a cuffed shiley size 8 inserted into the distal portion. The patients' respiratory status immediately stabilised. Flexible laryngoscopy revealed blood and clot filling the hypopharynx and larynx.

Figure 1: Ct Scan revealing marked subcutaneous emphysema through the anatomical planes of the neck secondary to blunt force trauma



CT Angiography reported emphysema in the soft tissues of the neck and chest extending into the mediastinum. Extensive soft tissue swelling in the region of the larynx was noted and the absence of normal trachea over approximately 3cm above the insertion of the tracheostomy. No vascular or bony injuries were found. A primary repair in theatre was performed. A complete cricotracheal separation was identified and the oesophagus and recurrent laryngeal nerves intact. Immediate reconstruction with restoration of the laryngotracheal framework and mucosal integrity was performed. The patient's submental region was sutured to his anterior chest wall which was released after seven days. Nutrition was maintained with nasogastric tube insertion. The tracheostomy tube was left in situ for a three month period and gradually reduced in tube calibre. Decannulation was performed following rigid bronchoscopy which outlined the surgical repair and minimal airway impingement approximately 2cm distal to the rima glottis. The left vocal cord was however found to be paralysed and the patient is now receiving speech and language rehabilitation.

Figure 2: Intra-operative photo of a complete tracheal separation from blunt force trauma to the neck

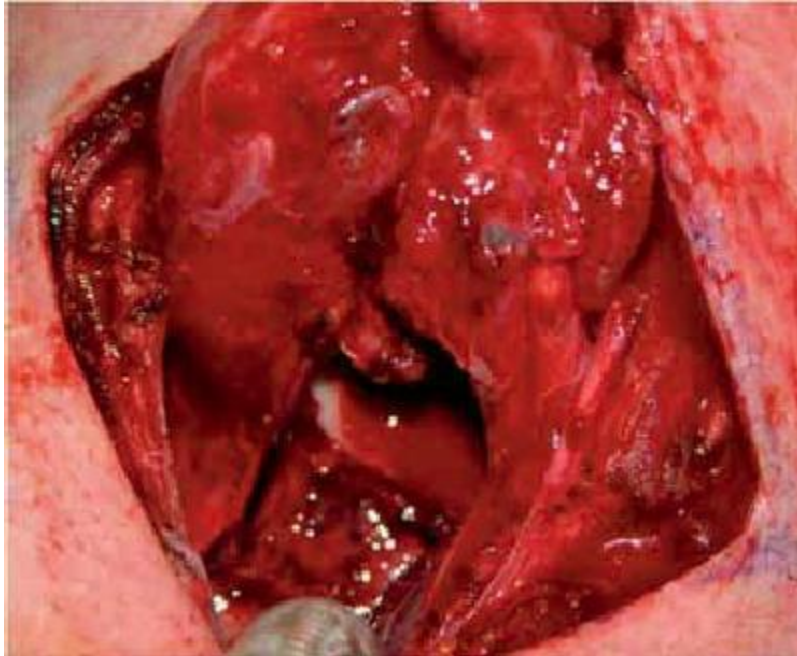


Figure 3: Endoscopic image at 12/52 post trauma. The vocal cords are visible with the now healed operative segment visible in the subglottic region



Discussion

Laryngotracheal injury accounts for less than 1% of all trauma injuries however 75% of immediate mortality. Direct blunt trauma at the site of the cervical trachea may cause fracture, dislocation and partial or complete separation². Traumatic airway injuries, especially in children and teenagers, are rare because of the relative anatomical safety and protection afforded to the laryngotracheal region. Correct management of the airway in laryngotracheal injuries has a direct impact on morbidity and mortality³. Appropriate flexible and rigid endoscopy and radiographic studies confirm the diagnosis of injury to the larynx, trachea, or bronchi. CT scanning is helpful in determining the extent of injury. Digital subtraction angiography (DSA) was considered the 'gold standard' for diagnosing blunt cerebral vascular injury. Recent advances in multidetector computed tomographic angiography (CTA) may have led to improved accuracy compared with DSA^{4,5}.

The treatment we advocate for laryngotracheal separation is airway stabilization followed by formal repair of the transected trachea. The decision to observe or repair injuries is primarily based on respiratory distress and associated injuries. Laryngotracheal injuries are broken up into cervical trachea in 45% of cases, 35% above the cricoid, 15% at cricoid and 5% others⁶. Successful reconstruction requires appropriate airway management and surgical restoration of laryngeal integrity enabling the patient to recover airway patency, functional voice, and swallow mechanism. This report describes the emergent and surgical management required to treat laryngotracheal trauma. This involves prompt clinical recognition and surgical approximation and closure. An article in 1976 highlighted the dangers of minibikes as a new factor in laryngotracheal trauma⁷. It would now appear quad bikes are also developing an equally ominous profile.

Correspondence: JP O'Neill

Department of Otolaryngology, Head and Neck Surgery, St James's Hospital, James's St, Dublin 8

Email: joneill@rcsi.ie

References

1. Bhojani RA, Rosenbaum DH, Dikmen E, Paul M, Atkins BZ, Zonies D, et al. Contemporary assessment of laryngotracheal trauma. *J Thorac Cardiovasc Surg* 2005; 130: 426-32
2. Aouad R, Moutran H, Rassi S. Laryngotracheal disruption after blunt neck trauma. *Am J Emerg Med* 2007; 25: 1084.e1-2
3. Granholm T, Farmer DL. The Surgical Airway. *Respir Care Clin Am* 2001; 7: 13-23
4. Malhotra AK, Camacho M, Ivatury RR, Davis IC, Komorowski DJ, Leung DA, et al. Computed tomographic angiography for the diagnosis of blunt carotid/vertebral artery injury: a note a caution. *Ann Surg* 2007; 246: 632-3
5. Berne JD, Reuland KS, Villarreal DH, McGovern TM, Rowe SA, Norwood SH, et al. Sixteen-slice multidetector computed tomographic angiography improves the accuracy of screening for blunt cerebrovascular injury. *J Trauma* 2006; 60: 1209-10
6. Cicala RS, Kudsk KA, Butts A, Nguyen H, Fabian TC. Initial evaluation and management of upper airway injuries in trauma patients. *J Clin Anesth* 1991; 3: 91-8
7. Alonso WA, Caruso VG, Ronace EA. Minibikes, a new factor in laryngotracheal trauma. *Ann Otol Rhinol Laryngol* 1973; 82: 800-4