CASE REPORT

Cricotracheal Separation: A Case of Delayed Diagnosis and Treatment

A R Nur Hashima, MBBS, M B Marina, MS ORL-HNS, A Sani, MS ORL-HNS

Department of Otorhinolaryngology- Head and Neck Surgery, Universiti Kebangsaan Malaysia Medical Centre, Kuala Lumpur.

SUMMARY

A motorcyclist was involved in a motor vehicle accident and presented with respiratory distress and neck swelling with surgical emphysema. He sustained gross tracheal injury, severe pneumothoraces and lung contusions. As intubation was successful, the tracheal injury was not addressed immediately in view of the other severe respiratory problems. Evidence of aspiration lead to further investigations which confirmed the diagnosis 22 days post trauma. Thyrotracheal anastomosis was carried out without stenting. A complete cricotracheal separation is a rare event and can be easily overlooked in the emergency department.

KEY WORDS:
Cricotracheal separation, Laryngeal trauma

INTRODUCTION

Severe blunt laryngotracheal trauma is generally rarely seen resulting in limited experience with this injury and hence may be associated with delay in its diagnosis and treatment. Complete cricotracheal separation is a well documented variant of laryngeal trauma in the medical literature. This type of injury is usually diagnosed within the first few hours of injury[1,2].

CASE REPORT

A 20 year-old male motorcyclist was seriously injured in a motor vehicle accident and presented to the district emergency department with respiratory distress and neck swelling with extensive surgical emphysema extending down to the scrotum. He was intubated for a deteriorating Glasgow Coma Scale score and an urgent computed tomography was done for suspicion of thoracic injuries. This showed gross tracheal injury with severe bilateral pneumothoraces and multiple lung contusions. As the patient was successfully intubated, the tracheal injury was not addressed at this time due to the patient's other respiratory problems. Further assessment of the upper airway was not carried out as there was no otolaryngologist in the hospital but a tracheostomy was performed one week later by the surgical team for extensive surgical emphysema. The patient improved, weaned off ventilation and was progressed from nasogastric tube feeding to oral feeding. However, it was immediately apparent that water that he swallowed leaked from around the tracheostomy tube. He was transferred to another hospital with an otolaryngology department where a diagnosis of cricotracheal separation was made, 22 days post trauma. The patient was quickly referred to our centre for further management.

On examination, the patient was comfortable on a non cuffed tracheostomy tube without oxygen support and tolerated feeding from a nasogastric tube. Flexible laryngoscopy showed gross edema of the arytenoids and pooling of saliva. There was a small hematoma seen on the laryngeal surface of the epiglottis. Both vocal cords were at the paramedian position and immobile. The subglottis could not be visualized. Computed tomography of the neck showed an interrupted radiolucency of the trachea above the tracheostomy level (Figure 1). The patient was subsequently put under general anesthesia for further assessment and neck exploration. He was ventilated via a fleximetallic tube through the tracheostoma. On direct laryngoscopy, the trachea was not seen below the vocal cords. Esophagoscopy revealed normal findings. A U-shaped incision was made over the anterior neck and exploration revealed a complete cricotracheal separation. The distal trachea had retracted 3cm (Figure 2). The recurrent laryngeal nerves were not found. The distal trachea was mobilized with blunt dissection of the surrounding tissue and approximated to the thyroid cartilage. Thyrotracheal anastomosis was done using interrupted 3.0 nonabsorbable sutures and it was not stented. The whole operation took about 3 hours. The patient went on to have a feeding jejunostomy in view of evidence of aspiration.

Postoperatively the patient recuperated well and was discharged home on tracheostomy and feeding jejunostomy. At 3 months follow-up, a flexible laryngoscopy revealed immobile vocal cords at the cadaveric position with adequate airway so the patient was successfully decanulated. On follow-up at 6 months, the position of the vocal cords was unchanged. Surprisingly, a functional endoscopic evaluation of swallowing showed no aspiration therefore the jejunostomy was removed and the patient was allowed to feed orally. At his 1 year follow-up, the patient remains well with no stridorous breathing and he is able to talk although with a weak voice.

DISCUSSION

Incidences of complete cricotracheal separation range from 1 in 14000 to 1 in 42000 emergency department presentations although the true incidence remains unknown as many victims die of airway obstruction before reaching hospital[1,3]. Usual symptoms are respiratory distress and dysphonia while common signs include surgical emphysema, tenderness,

This article was accepted: 20 May 2011
Corresponding Author: Nur Hashima Abdul Rashid, Department of Otorhinolaryngology and Head and Neck Surgery, Universiti Kebangsaan Malaysia Medical Centre, Jalan Yaacob Latif, 56000 Cheras, Kuala Lumpur, Malaysia Email: nurhashima@gmail.com

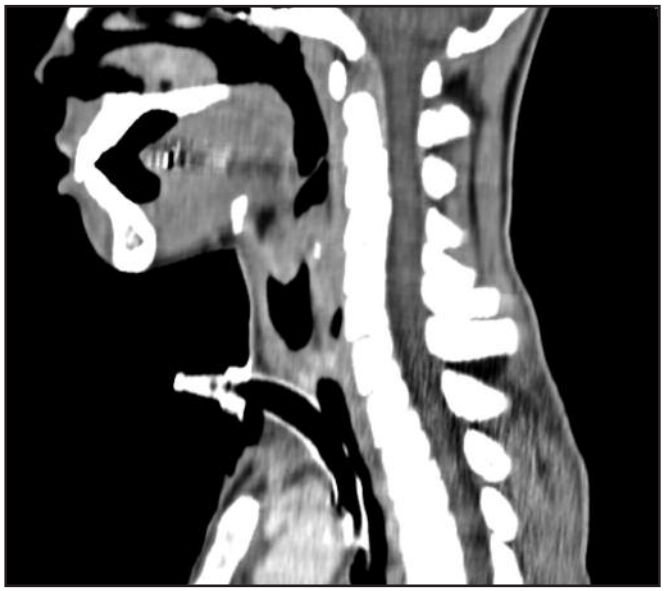

Fig. 1: Computed tomography scan, sagittal section. An interrupted radiolucency of the trachea superior to the level of the tracheostomy.

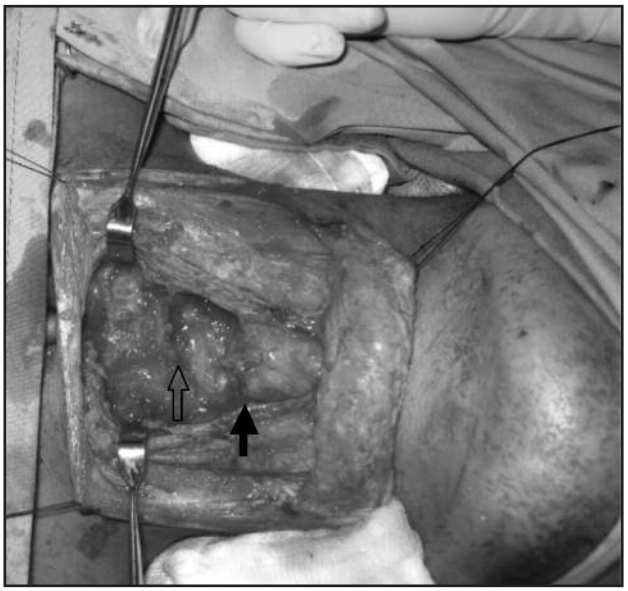

Fig. 2: Intra-operative picture. A complete tracheal separation was seen where the distal trachea (open arrow) was found to be retracted 3cm from the larynx (black arrow).

hematoma and distortion of laryngeal landmarks[2]. Complete cricotracheal separation also poses significant diagnostic and therapeutic challenges across many medical specialties such as emergency medicine, otolaryngology, radiology, anesthesia and intensive care[1]. Our patient presented with significant signs and symptoms to suggest severe laryngeal trauma. The authors believe that inexperience coupled with the lack of the otolaryngology specialty were the factors responsible for the delay of the diagnosis initially.

Orotracheal intubation for respiratory distress may be attempted if the larynx looks normal, an experienced clinician is available to perform the intubation and no resistance to the passage of the tube is encountered[3]. Tracheostomy under local anesthesia is considered to be the safest alternative[4]. Although our patient had extensive cervical surgical emphysema and no upper airway assessment was done, intubation was uneventful. The tracheostomy that was done was not for airway management but it did lead to issues that highlighted the diagnosis of a laryngotracheal separation.

Computed tomography is a valuable radiological tool in the diagnosis of laryngotracheal separation. A high resolution helical CT can provide important complementary information regarding laryngotracheal skeleton and soft tissue integrity, particularly when adequate endoscopic assessment of the airway is impeded by significant oedema4. On the other hand, some authors argue that it is unwarranted if surgery is clearly indicated on clinical grounds[3]. In our patient, it was on the repeat scan that he was thought to need surgical exploration and referral to a tertiary center.

Surgical reconstruction within 24 to 48 hours is associated with a much lower incidence of subglottic stenosis and significantly improved outcomes with respect to airway and voice3. Techniques of surgical repair must be tailored to the individual pathology encountered[5]. Our patient underwent a thyrotracheal anastomosis without endolaryngeal stenting, done 25 days post trauma. The patient also underwent a feeding jejunostomy to address his aspiration. As it is associated with a high risk of complications, endolaryngeal stenting is reserved for wounds involving disruption of the anterior commisure, comminuted laryngeal skeletal fractures and massive mucosal injuries3 which were not present in our patient.

In conclusion, a complete cricotracheal separation is a rare event and associated with a high mortality and morbidity and can be easily overlooked in the emergency department. In order to prevent this, any patient who present with signs such as hoarseness, surgical emphysema or hemoptysis with a recent history of trauma to the anterior neck, must be considered as having sustained a laryngeal injury. Absolute priority must be given to securing the airway. From our experience, death is not inevitable if there is a delay in diagnosis and treatment as long as airway is established. However close follow up is crucial so as not to miss any complications that may arise.

REFERENCES

1. Hermon A, Segal K, Har-El G, Abraham A, Sidi J. Complete cricotracheal separation following blunt trauma to the neck. J Trauma 1987; 27: 1365-7.
2. Lee WT, Eliashar R, Eliashar I. Acute external laryngotracheal trauma: diagnosis and management. Ear Nose Throat J 2006; 85: 179-84.
3. Schaefer SD. The Treatment of Acute External Laryngeal Injuries: 'State of the Art'. Arch Otolaryngol Head Neck Surg 1991; 117: 35-9.
4. Fuhrman GM, Stieg FH III, Buerk CA. Blunt laryngeal trauma: classification and management protocol. J Trauma 1990; 30: 87-92.
5. Mazita A, Sani A. Sequelae of traumatic laryngotracheal separation: the need for individualized long term treatment plan. Auris Nasus Larynx 2005; 32: 421-5.