

Case of the month: Complete transection of the trachea and oesophagus in a 10 year old child: a difficult airway problem

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Tracheal transection from blunt trauma is an uncommon occurrence and presents a difficult challenge even to physicians with experience in managing difficult airway problems. This is a case report of a child who sustained a complete cervical tracheal transection from blunt trauma and presented to an outer metropolitan hospital where definitive care for his injuries was unavailable.

A 10 year old boy presented to the emergency department (ED) of an outer metropolitan hospital with a severe neck injury. He had driven a farm bike into a wire fence, which had resulted in a neck high wire lacerating his neck: a process known as being "clothes lined".

He had walked 500 m back to his house and his father had driven him by car to the nearest ED, which was 20 minutes away. As this incident occurred out of hours, the ED to which he was brought to had an on-site emergency physician who was immediately available, with an on-call service for anaesthesia, and the average response time being 30 minutes.

On initial assessment, there was an obvious large wound in the anterior neck with some haemorrhage into the wound. It was not possible to immediately ascertain the anatomy of the injury. There was noted to be some air bubbling through the blood in the wound. The patient was moving all four limbs, with no clinical evidence of a cervical spine injury.

The patient was breathing spontaneously, with saturations of 98% on air and had a blood pressure of 110/70, with a pulse rate of 146/minute.

He was alert and orientated, but was aphonic.

A provisional diagnosis of laceration of the trachea, with no major vascular injury was made. The nearest tertiary centre was one hour away by road, so it was decided to intubate the child to secure the airway prior to transfer. The preferred options of a gaseous induction and/or an endoscopically guided intubation were not immediately available, so the decision was made to perform a rapid sequence intubation.

After sedation and paralysis, laryngoscopy was performed. This provided a good view of the cords and intubation was performed. The endotracheal tube was visualised going through the cords, but the distal end then projected out of the anterior neck wound. A repeat attempt at oral intubation gave the same result. The patients saturations began to fall, and he became impossible to oxygenate by bag mask ventilation.

A diagnosis of a complete transection of the trachea was then made, and an attempt to find the distal end of the trachea in the neck failed.

A finger sweep of the anterior mediastinum below the clavicles was made, locating the distal end of the trachea at 5–6 cm below the sternal notch, 2–3 cm from the midline on the left hand side.

With a little finger in the lumen of the trachea acting as a guide, a size six and a half cuffed endotracheal tube was

inserted into the trachea, and pushed down the right main bronchus, and the cuff was then inflated.

On commencement of bag ventilation, the patient's saturations recovered to 98% with a good waveform.

The patient was then transferred to the tertiary children's hospital where investigations revealed that he had a complete subcricoid transection of the trachea with a lacerated oesophagus, but no major vascular injury. The recurrent laryngeal nerve was intact, but had been severely traumatised.

The tracheal and oesophageal injuries were repaired in theatre, with a good result. A tracheostomy was left in place, and it is expected that this will be closed at a later date. Recovery of the recurrent laryngeal nerve, and thus vocal function, is unpredictable, but recovery should be gradual over 12–24 months.

DISCUSSION

Complete transection of the cervical trachea through blunt trauma is a rare injury, the true incidence of which is unknown. Although it is possible that the initial intubation attempt in this patient converted a partial tracheal transection to a complete one, as has previously been reported,¹ this is unlikely to be the case because of the ease of passage of the endotracheal tube through the vocal cords combined with no palpable distal obstruction found during the attempt. The mortality rate for blunt laryngotracheal trauma has been estimated at 40%.² An autopsy study on blunt trauma deaths estimated that 2.8% of these cases had tracheobronchial injuries.³

One case series of 10 patients with blunt tracheobronchial injuries identified only one complete tracheal transection⁴

Survival from these injuries is dependant on adequate management of the airway.⁵

There have been several reports of patients surviving for several hours with a complete tracheal transection,^{6,7} resulting in the recommendation that recognition of the injury and urgent referral to the operation room for definitive airway management is the key to successful management.⁸ However, several reports have also documented patient demise because of an inability to control the airway when the distal trachea retracts into the mediastinum.⁹

Thus, these cases create an additional dilemma for the practitioner in a rural or regional area where definitive surgical or anaesthetic care may not be immediately available. Should they transport a patient such as that described above and run the risk of losing the airway in less than optimal conditions, or should they attempt to gain a definitive airway prior to transport?

Abbreviation: ED, emergency department

The answer to this must be that where there is sufficient capability to manage a complex airway in the base hospital, the airway should be controlled prior to transfer. Where this capability is not available, expedient transfer to a centre with this capability should occur.

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Failure of NIV in acute asthma: case report and a word of caution

▶ Noninvasive ventilation (NIV) is the provision of ventilatory support without the need for an invasive airway, and has revolutionised the management of patients with diverse forms of respiratory failure. The advantages of NIV include improved patient comfort, reduced need for sedation, whilst avoiding the complications of endotracheal intubation, including upper airway trauma, sinusitis, otitis, and nosocomial pneumonia. In selected patients NIV has also been shown to improve survival. The role of NIV in acute severe asthma is at best controversial. In this case report we describe a patient with acute severe asthma who was initially managed with NIV, and who failed a trial of NIV, and was successfully managed with invasive ventilation. We also review the pathophysiological mechanisms of benefit of NIV in acute severe asthma, and the current literature on the use of NIV in acute asthma.

In conclusion, a trial of NIV in acute asthma may be justified in carefully selected and monitored patients who do not respond to initial medical therapy. However, since its role is not clear and as the condition of an asthmatic patient may deteriorate abruptly, extreme caution is advisable to recognise failure of NIV as in the case presented here. Facilities for immediate endotracheal intubation and next level of treatment should be readily available.

▲ Agarwal R, Malhotra P, Gupta D. Failure of NIV in acute asthma: case report and a word of caution. *Emerg Med J* 2006;**23**:e9. <http://emjonline.com/cgi/content/full/23/2/e9>. doi:10.1136/emj.2004.020438

Do we intervene inappropriately for ST elevation?

▶ Targets for reperfusion have altered drastically the assessment of a patient with chest pain. In our emergency department the standard is 10 minutes from presentation to ECG review for these patients. ST elevation on a 12 lead ECG is one of the cardinal features of acute myocardial infarction (AMI). There are, however, other causes of ST elevation in addition to AMI. Intracerebral bleed, aortic dissection, tension pneumothorax, Brugada syndrome and pericarditis have all been reported to cause these changes.

Three cases are presented, all of whom had chest pain and ST elevation. All had pneumothoraces yet only one had an AMI. In these 3 cases the ECG changes seen early in the assessment process prompted the doctors to consider thrombolysis.

There is no doubt that early coronary reperfusion is beneficial for cases of AMI. Chest pain with ST elevation is not always synonymous with an AMI. In the rush to meet government targets clinicians must avoid making a hasty but wrong diagnosis.

▲ Sanders A, Froude A, Probst F. Do we intervene inappropriately for ST elevation? *Emerg Med J* 2006;**23**:e10. <http://emjonline.com/cgi/content/full/23/2/e10>. doi: 10.1136/emj.2004.020537

A left MCA territory infarction during intravenous recombinant tissue plasminogen activator therapy for right MCA territory ischemic stroke

▶ An 81 year old man with a history of hypertension received intravenous tPA under the impression of right MCA territory infarction, which presented acute onset of left hemiplegia, left side facial palsy, and drowsy consciousness. He had neither a stroke nor a cardiac arrhythmia