Case Report: An Airway Challenge
Laryngotracheal transection

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The purpose of this report is to bring the diagnosis to the attention of people involved in the immediate care of patients after major accidents. To improve the dismal outcome of these patients, practitioners must focus on early diagnosis, appropriate management of the airway, identification and treatment of associated trauma, and prompt repair of the injury.
A<sub>x</sub>
- At risk / unprotected
- Blood in airway
- Stridor
- Hoarse voice
- Resisted C<sub>x</sub> collar

B<sub>x</sub>
- Rhonchi
- Bilaterally decreased AE
- Shallow/Rapid/laboured
- SpO<sub>2</sub> - 84%

C<sub>x</sub>
- Palpable radial pulse
- No external neck wounds
- No external haemorrhage

D<sub>x</sub>
- GCS 15 at scene

24 ♂ had 1 ton glass pallet fall on his chest.

Time to scene 6.5 min
At scene 5 min
Time to ED 12 min

Government of Western Australia
Department of Health
Armadale Health Service

smacc GOLD
Out of Hospital

- Deterioration en route
- Attempted intubation failed
- BVM- no chest rise, but swelling of neck
- LMA inserted but unable to ventilate
- ↑surgical emphysema
- ↓Consciousness
- ↓SpO₂
- Bradycardic PEA prior to arrival in ED

In the Emergency Department

- RSI performed and the larynx was intubated uneventfully
- Transient ROSC
- SpO₂ ↑ 92%
- Difficult to ventilate
- ↑Surgical emphysema
- Rt ICC- no blood
- Lt Thoracotomy
- Slight hiss on thoracotomy
- No evidence of tension pneumothorax
- No cardiac contractility
- Suprasternal neck incision
- Unable to locate distal end of trachea.
- RIP
Tracheobronchial rupture occurs in 0.3% of closed chest injuries.

In 80% of cases the injury is within 2.5 cm of the carina.

The cervical trachea is injured less commonly than the thoracic trachea following blunt trauma.

Blind intubations often fail to achieve an adequate airway, necessitating emergency tracheostomy.

Patients with partial tracheal disruption have a normally positioned trachea and may form a false passage through the traumatized soft tissues, thereby maintaining a low level of ventilation.

Tracheobronchial rupture may present acutely or after a considerable delay. This arbitrary division emphasises that such an injury is not always immediately fatal.

In patients with partial tracheal rupture, orotracheal intubation may aggravate the damage and lead to massive haemorrhage, causing worsening of dyspnoea.
High index of suspicion

Respiratory distress
Hemoptysis
Chest pain
Odontophagia
Dysphonia

Skin in the anterior part of the neck moves in and out with respiration
Gap within the tracheal rings may be felt beneath the moving skin

Cyanosis
Subcutaneous emphysema
Emphysema worsens with ventilation

Clinical deterioration out of proportion to x-ray appearance
Mediastinal emphysema
Multiple upper rib fractures

Persistent pneumothoraces despite ICC, continuous bubbling in Water-seal
Persistent aspiration of blood from trachea

The most fundamental intervention for patients with laryngotracheal injury is airway control
Controversy regarding a secure airway

Schaefer et al avoided intubation in these patients and recommended a tracheostomy.

Gussack et al argued that endotracheal intubation can safely manage the airway if performed by experienced personnel under direct visualisation with a small endotracheal tube.

Dong et al advocate not using either tracheotomy or blind oral or nasal intubation if the diagnosis has not been confirmed.

Fuhrman et al reported that a tracheostomy should be the only method of airway control used in laryngotracheal trauma [LTT].

Application of cricoid pressure may lead to its dislocation or total airway occlusion in patients with undiagnosed cricoid fracture.

Alfille et al suggest Rapid-sequence induction may theoretically result in airway collapse and distortion from profound muscle relaxation.

Dong et al advocate not using either tracheotomy or blind oral or nasal intubation if the diagnosis has not been confirmed.
A relatively stable situation can deteriorate suddenly to respiratory arrest.

Intubating the larynx doesn’t always mean a secure airway.

Blind oral or nasal intubation in patients with tracheal injury can lead to false extratracheal intubation and irreversible damage to the airway and the distal end of the disrupted trachea may retract into the thoracic cavity, causing airway obstruction and death.

Ideal initial emergency management is to cautiously pass a bronchoscope into the trachea under direct vision rather than to attempt blind intubation failing which cervical incision for tracheostomy.

Dr Weingart’s CricCon 3/2 preparedness!! for RSI.
References


Lee et al. Acute external laryngotracheal trauma: Diagnosis and management. *Ear, Nose & Throat Journal; Mar* 2006; 85, 3; 179-184


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**Table 1. Classification of laryngotracheal trauma according to the degree of the injury**

<table>
<thead>
<tr>
<th>Type</th>
<th>Degree</th>
<th>Symptoms</th>
<th>Signs (in order of their incidence)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mild</td>
<td>Mild voice change, mild dyspnea, cough</td>
<td>Minor hematomas, small lacerations, no fractures or dislocations</td>
</tr>
<tr>
<td>2</td>
<td>Moderate</td>
<td>Compromised airway, hemoptysis</td>
<td>Obstructing hematoma, edema, minor mucosal disruption, nondisplaced fractures</td>
</tr>
<tr>
<td>3</td>
<td>Severe</td>
<td>Severe airway compromise, stridor</td>
<td>Massive edema and hematoma, deep mucosal tears, exposed cartilage, aspiration, displaced fractures, unilateral vocal fold immobility</td>
</tr>
<tr>
<td>4</td>
<td>Profound</td>
<td>Impending airway obstruction</td>
<td>Massive edema, mucosal avulsion, fragmented cartilage, aspiration, displaced arytenoids, bilateral vocal fold immobility</td>
</tr>
<tr>
<td>5</td>
<td>Critical</td>
<td>Complete airway obstruction</td>
<td>Skeletal collapse, structural disruption and breakdown complete laryngotracheal separation</td>
</tr>
</tbody>
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**Post-mortem:**

- Complete transection of trachea & oesophagus.
- Fractures of C7, T1 with haemorrhage and disruption of the spinal cord at T6.