



Tracheal Rupture Post Trauma Aggravated by Intubation - A Rare Complication of a Life Saving Procedure

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Study

ABSTRACT

Tracheal rupture is a rare but serious complication of both trauma and intubation. Clinical manifestation includes widespread subcutaneous emphysema and respiratory distress. The management is either a surgical repair or conservative. Here we present a rare case of tracheal rupture secondary to trauma that required surgical intervention in a tertiary centre with no in-house thoracic surgeons. To our best of knowledge, this is the first reported case in South East Asia.

Keywords: Tracheal rupture; trauma intubation; thoracic surgery.

1. INTRODUCTION

Tracheal rupture due to trauma & endotracheal intubation has been reported at a rate of 2 &

0.005% respectively [1,2]. Many proposed theories of the possible cause are there but none are conclusive. We present a case of tracheal rupture post trauma aggravated by intubation

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that was managed surgically. Our objective is mainly to highlight on the importance of a vigilant mind to detect and treat it early for the best outcome.

2. PRESENTATION OF CASE

Mr. A a, 36 -year -old gentleman, congenital heart disease as well as childhood bronchial asthma was involved in a motor vehicle accident. He was a motorbike rider involved in a collision with a car however the mechanism was unknown. Post trauma he sustained loss of consciousness, swelling over anterior neck, as well as ENT bleed.

His GCS on arrival to Emergency Department was E1V1M2 with persistent tachycardia. He was intubated for respiratory distress with endotracheal tube (ETT) size 7.5cm and anchored at 20cm. During intubation noted pooling of blood at oral cavity however no obvious source.

Post intubation he had worsening subcutaneous emphysema up to bilateral knee. Urgent CT done showed bilateral pneumothorax with the ETT traversing the trachea at T1 level, extensive pneumomediastinum and subcutaneous emphysema involving neck, thorax, abdomen and pelvis. He also suffered traumatic brain

injury with multiple intracranial bleeds and cerebral edema.

He was brought to the operation theatre and underwent emergency neck exploration. Intra-operatively noted tracheal tear involving the whole anterior portion of tracheal cartilage with intact membranous trachea. ETT was penetrating through the torn tracheal segment and ventilating cervical and pre-tracheal space. He was discharged 1 month later under room air with a GCS of E4VTM6.

3. DISCUSSION

As described above, tracheal injury post trauma and intubation is rare. Increased risk of rupture is associated with female gender, short stature, difficult air way anatomy, steroid use, chronic obstructive pulmonary disease and underlying connective tissue disease [6].

The above described patient likely sustained a tear due to the trauma. It was then aggravated by intubation leading to the rupture of trachea. He had multiple intravenous cannula inserted subcutaneously (Image 1), however our advice is to insert bilateral chest tube to manage the emphysema rather than the above.



Image 1. Multiple IV cannula inserted subcutaneously to release the subcutaneous emphysema

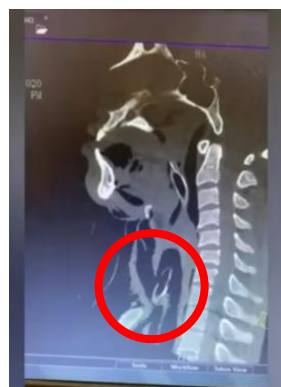


Image 2. CT images depicting the tracheal tear anteriorly with the ETT traversing the perforation

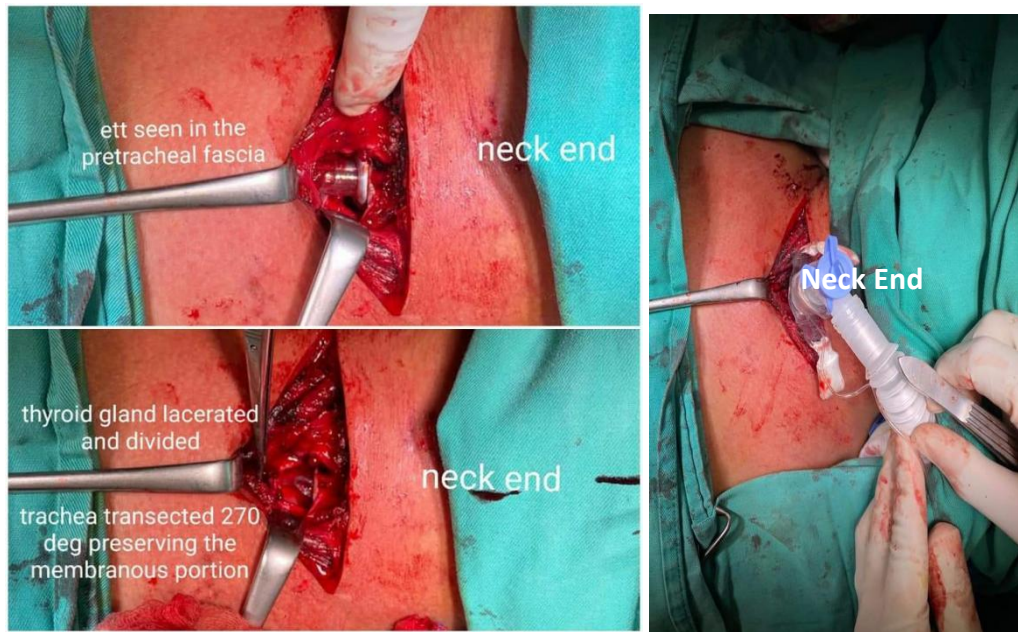


Image 3. Intra-operative findings as described

He had spontaneous breathing and was able to saturate before the surgery despite endotracheal tube not in-situ. This is likely due to intact pre-tracheal fascia allowing passage of oxygen. However carbon dioxide retention which worked against his cerebral protection prompted emergency surgical repair.

Pre-tracheal fascia also known as the middle layer of deep cervical fascia, extends from the hyoid bone before blending with the fibrous pericardium. It houses the trachea and carotid vessels as it assist in formation of the carotid sheath. It is this fibrous layer that remained intact in our patient keeping him alive till the surgery.

There have been reported cases managed both conservatively and by surgical measures [3-4]. The excellent outcome of this mishap would be an early detection (i.e.: worsening emphysema or difficulty in ventilation) and prompt management. Techniques of bridging by passing a single lumen ETT beyond the rupture is also advocated if feasible[4,8].

Early surgical consult if failed conservative management is warranted. Surgical intervention is reserved if non-invasive ventilation (NIV) or bridging is not feasible [8].

Our advise is to have a vigilant mind and be prompted on the possibility of a tracheal rupture especially in the event of a trauma. Red flag signs of a neck swelling, extensive subcutaneous

emphysema, and stridor post-trauma should alert one of the possibility of a tracheal injury. These subset of patients if deemed necessary for an intubation, our advise is to be done under endoscopic guidance ensuring no further trauma is caused.

4. CONCLUSION

In general, surgical interventions done over the years have shown to yield a better outcome in managing this unexpected complication. Bilateral chest tube drainage is advised for initial stabilization of patient.

Surgical consult is to be sought early, preferably from a thoracic surgical centre.

CONSENT AND ETHICAL APPROVAL

As per university standard guideline, participant consent and ethical approval have been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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