



Damage Control Management of Iatrogenic Esophageal Tear in a Challenging Case of a Re-Do Tracheostomy

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Abstract

Introduction: Esophageal tear is a surgical emergency as it is associated with high morbidity and mortality. This condition is a rare but catastrophic complication and usually secondary to esophageal instrumentation.

Case Presentation: Here, we would like to present a case of a 12-year-old non-Malaysian with an iatrogenic tear of the esophagus which occurred during tracheostomy under general anesthesia after difficult endotracheal intubation. A damage control management, which involves the surgical team on the table to repair the esophagus via primary closure to close up the perforation and passive drain for drainage of the mediastinum, followed by tracheostomy.

The patient underwent successful surgical repair immediately intra-operatively at the same setting.

Conclusion: This case report is to raise awareness of this complication, to emphasize the importance, and to advocate the possible management responsible for this unusual disease entity.

Keywords: Damage control surgery; Esophageal perforation; Adverse effects; Tracheostomy; Tracheal intubation

Introduction

The tear of the cervical esophagus is an infrequent severe situation. It is rare but can be life-threatening if untreated or misdiagnosed. However, tear of the cervical esophagus has a better prognosis than those involving other levels of the esophagus [1]. Iatrogenic action is the main cause of cervical esophageal tear [2].

Causes of the iatrogenic esophageal tear are nasogastric tube insertion, difficult endotracheal intubation, percutaneous tracheostomy, surgery of the mediastinal organs including resection of lung cancer, operations on the cervical spine, endoscopic procedures, thyroidectomy, and palliative intubation, stenting, or laser treatment of esophageal tumors [3]. Other causes of perforation include foreign body ingestion, penetrating trauma, and corrosive injury [4].

A treated esophageal tear within 24 h of perforation shown mortality reported to be 10% to 25% whereas it doubled to two-fold (40% to 60%) when the treatment is delayed [5,6]. The increase in mortality is due to the location of the esophagus where bacteria and digestive enzymes easily access the mediastinum thus leading to the development of empyema, severe mediastinitis, sepsis, and multiple organ dysfunction syndromes [7].

Case Presentation

A 12-years old boy non-Malaysian who was just recently decannulated from tracheostomy came with complained of shortness of breath for 2 days. This condition was aggravated by an Upper Respiratory Tract Infection (URTI) 3 days ago. Otherwise, there is no history of trauma. He has a history of tracheostomy done 6 months ago due to prolonged ventilation where the patient self-decannulated as the patient feels he has improved and no longer needed the tracheostomy for the airway unfortunately, he came back with complained of worsening symptoms. Clinical examination upon arrival to the emergency department showed that he was tachypneic with an oxygen saturation of 90% requiring re-intubation. However, the anesthetist had difficulty in inserting the Endotracheal

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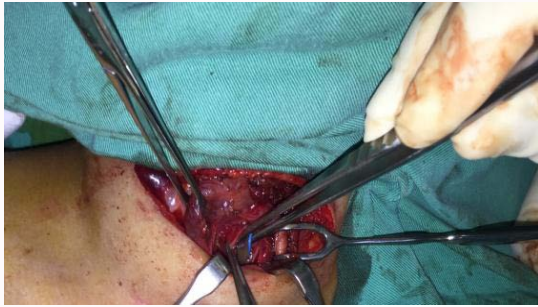


Figure 1: A tear over the cervical esophagus, about 0.5cm in length, confirmed with visibility of nasogastric tube seen at the tear.



Figure 2: Definitive closure where, the esophagus was primarily repaired with 3/0 silk, shown in a white arrow.

Tube (ETT) for his appropriate size. The anesthetist managed to insert ETT size 3 which is not accurate for his age. The patient was then pushed into the operation theatre for a controlled setting of re-do tracheostomy. An incision was made over the previous tracheostomy incision site but, we have difficulty in identifying the trachea at this point due to the adhesion. Unfortunately, on retraction and also diathermizing of the tissues surrounding the trachea, we noticed a tear over the cervical esophagus at the level of the 2nd and 3rd tracheal ring anteriorly, about 0.5 cm in length, confirmed with visibility of nasogastric tube seen at the tear (Figure 1). The surgical team was called in on the table, to repair the esophageal tear without delay. Definitive closure and drainage were carried out as soon as possible and the esophagus was primarily repaired with 3/0 silk (Figure 2) and subsequently the tracheostomy tube size 6 was inserted. Direct laryngoscopy was performed after the airway is secured, unfortunately, we were unable to proceed further as the bilateral vocal cord was in laryngospasm where both vocal cords were tightly adducted (Figure 3) as a protective reflex due to result from direct inhalational anesthesia earlier on. Further procedures were then aborted. A nasogastric tube was kept in situ during the operation and a drainage tube was executed subcutaneously. Antibiotic coverage and enteral nutritional support were given to improve the whole body condition. On a postoperative day 10, the patient was well and discharged for reassessment later as an outpatient. On follow-up assessment in the outpatient clinic, the patient was not able to attend the fluoroscopy investigation to look for anastomotic leakage due to financial constraints, subsequently; the nasogastric tube was removed by assessment with the Functional Endoscopic Evaluation of Swallowing (FEES) technique. The patient was well after the removal of the nasogastric tube. During a short

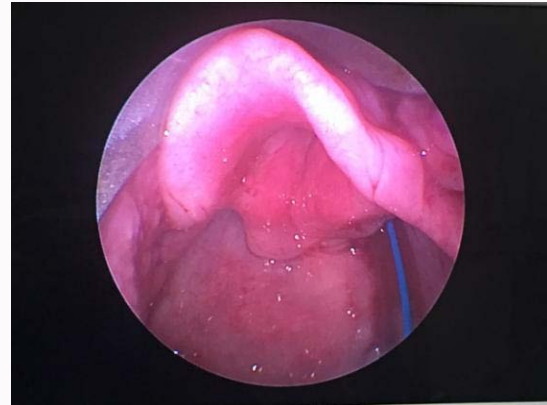


Figure 3: Direct laryngoscopy showed bilateral vocal cord was in laryngospasm where both vocal cords were tightly adducted.

term review in the clinic within 6 months, the patient was seen a few times with no complication of esophageal injury. Tracheostomy tube change was done monthly. He was planned for airway assessment prior to decannulation but the patient defaulted the treatment after that.

Discussion

Tracheostomy is usually performed as a routine life-saving procedure in a patient coming with airway obstruction. However, fatal complications may occur in some cases especially in cases of the difficult airway. To date, there is no case report on iatrogenic esophageal perforation following tracheostomy.

Our case report highlights that catastrophic complications following urgent tracheostomy are always possible although uncommon. Lesson learned a prompt diagnosis and early identification with reconstruction improve the prognosis.

The esophageal tear is a surgical emergency as it is life-threatening especially in children [2,3]. Early surgical treatment by suturing the tear in two layers with buttressing as much as possible, favors the healing in excellent condition like mentioned in our case report [8].

The rarity of this case report presenting an iatrogenic esophageal tear secondary to tracheostomy posed to us that complications as such are possible. We also agree with the conclusion that early identification and immediate surgical operation of repair and drainage is almost always with the successful outcome when the esophageal tear is at cervical region [7,8].

Catastrophic complications following tracheostomy are always possible and that a multidisciplinary consults and help, with a prompt diagnosis and reconstructive surgery, will improve prognosis. Keeping in mind, although precautions and measures to be taken care of in a difficult tracheostomy, sometimes this event is unpredictable.

Several tracheostomy technique mastery should be sought especially when encountering unexpected difficulty and written consent of such a concern should always be counseled to the patient and parents [9].

Conclusion

Recognition of potentially difficult intubation can prevent these complications. Rapid diagnosis and early surgical treatment will provide a good outcome.

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