

Major tracheobronchial injuries: Management of two rare cases

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SUMMARY

Tracheobronchial injuries are uncommon and a high level of suspicion is needed for immediate diagnosis and prompt treatment. In this case series, two rare cases of tracheobronchial injuries is described showing variable clinical presentations with different levels of injury. Our first case was seen in a 20 years old male whom had a direct impact on the neck and presented with upper tracheal injury. On arrival, this patient was in respiratory distress and had bilateral pneumothorax. Bilateral chest tube was inserted with subsequent neck exploration. During the neck exploration, anastomosis of the injured trachea was performed. The second case was represented by a 35 years old man with right main bronchial injury. Upon initial presentation, this patient appeared well and was comfortable under room air. However he gradually deteriorated one week after the trauma requiring surgical intervention. Eventually a thoracotomy with primary anastomosis of the bronchial tear was performed. Details of both cases including clinical presentation, imaging and procedures done will be discussed in this article.

INTRODUCTION

Tracheobronchial injuries (TBIs) are uncommon but potentially life-threatening. A high index of suspicion is required for early detection and successful treatment. The immediate sequelae can include death from asphyxiation. Lack of recognition and incorrect management may result in life threatening or disabling airway stricture and recurrent pulmonary infections. In this article, two cases of TBI which we encountered recently are described.

CASE 1

A 20-year-old Indonesian man was brought in to the emergency department with shortness of breath after sustaining a blunt trauma to the neck from a motor vehicle accident. He was a rider of a motorcycle that lost control and crashed into a lorry. He was tachypneic with a respiratory rate of 44 breaths per minute. His blood pressure was 150/78mmHg with pulse rate of 81bpm. Physical examination revealed bruises and massive subcutaneous emphysema with palpable crepitus over the neck and upper chest. There was a reduced air entry and chest expansion with hyper-resonant note over the right chest. Plain chest radiograph showed right sided pneumothorax and subcutaneous emphysema. (Figure 1) He was intubated in the emergency department with right chest drain inserted.

Post intubation chest x-ray revealed left sided pneumothorax, which required a second chest tube insertion on the left side. He was nursed in intensive care unit, subsequent reviews showed no progression of subcutaneous emphysema and no difficulty in maintaining his ventilation. On post trauma day-2, computed tomography (CT) cervical was performed to look for cervical injury. The CT cervical revealed an irregularity of trachea at C6 vertebra level and subcutaneous emphysema indicating an upper tracheal injury. (Figure 1) Oesophagogastrosocopy excluded an associated oesophageal injury. An emergency neck exploration performed on day-4 post trauma revealed disruption of the two third circumference of the cervical trachea 4cm below the vocal cord with surrounding muscle necrosis and pus collection. (Figure 1) The devitalized tracheal edge was resected and primary anastomosis of the trachea performed. (Figure 1) Post operatively this patient developed complication of anastomotic leak that required a tracheostomy. Follow up one month with a repeat flexible bronchoscopy revealed a subglottic tracheal stenosis. Multiple attempts at tracheal dilatation were unsuccessful due to thick granulation tissue with near total luminal occlusion and he was kept on a permanent tracheostomy.

CASE 2

A 35-year-old male presented with loss of consciousness, retrograde amnesia and chest pain after an alleged motor vehicle accident. Physical examination revealed multiple anterior chest wall bruising. An erect chest radiograph showed pneumo-mediastinum. The CT thorax revealed features of a right main bronchus tear. (Figure 2) Despite the dismal CT findings, this patient did not require oxygen supplementation and the vital parameters were within normal limits. Therefore, this patient was managed conservatively. After a week, he developed shortness of breath and a repeat CT Thorax revealed a total 'cut off' of the right main bronchus at its origin causing obstruction and right lung collapse. (Figure 2) Bronchoscopy was performed which supported a complete obstruction of the right main bronchus by a granulation tissue. We proceeded with a right thoracotomy via a posterolateral approach. Intraoperative findings were a partially transected right main bronchus near to the origin held up by peribronchial tissue. The proximal and distal ends of the affected right main bronchus was mobilised and a primary bronchial anastomosis was performed. Postoperatively, the patient recovered well and was discharged after one week. On the subsequent clinic visit three months post-operatively, he developed

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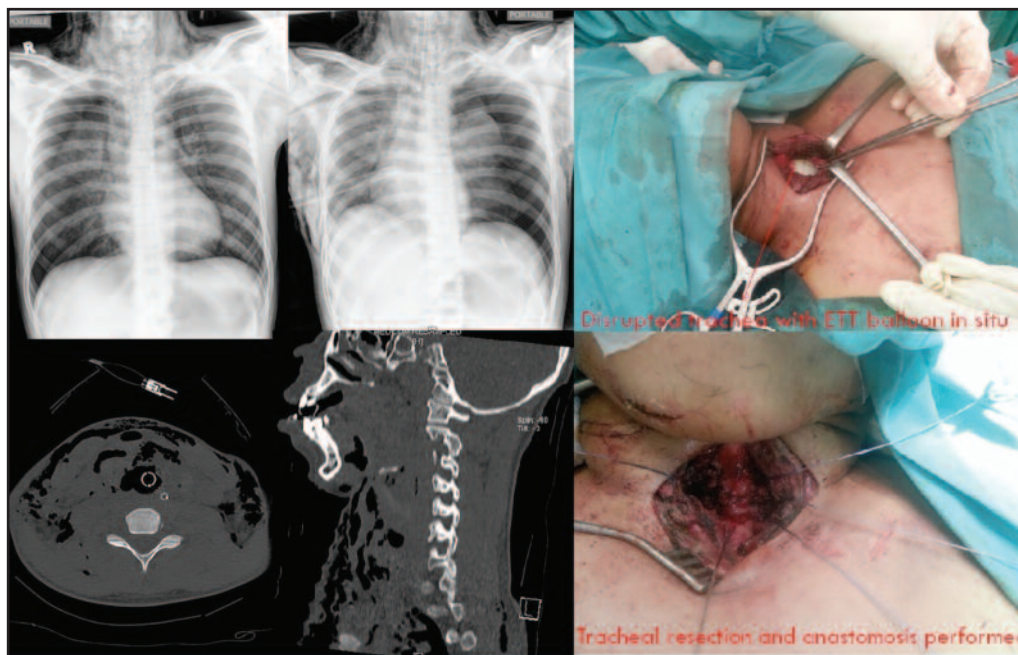


Fig. 1: Chest radiograph^a, CT cervical^b and Operative procedure^c performed in the first case.

^a Chest radiograph (left upper image) with initial right pneumothorax and subsequent left pneumothorax

^b CT cervical (left lower image) showing subcutaneous emphysema with tracheal irregularity

^c Operative procedure (right side) showing disrupted trachea with endotracheal tube balloon, tracheal anastomosis was done after debridement of devitalised tissue as shown.



Fig. 2: Chest radiograph^a, CT Thorax^b done in second case.

progressive wheezing. A repeat bronchoscopy revealed a right main bronchus stenosis. A silicon stent was inserted over right main bronchus after failed twice bronchoscopic dilatation. Following silicon stenting, he remains asymptomatic on the subsequent clinic visit one year later.

DISCUSSION

Incidences of TBI cases reported in most studies are small. The numbers reported for each type of TBI varies from centre to centre.¹⁻³ Currently, the incidences of TBI among trauma patients with chest and neck injuries, including those that died immediately is estimated to be at 0.5-2%. Patients with blunt and penetrating injuries is reported to have an incidence of 0.4% and 4.5% respectively.⁴

Treatment options of TBI's may vary from case to case and depends on the anatomical location and the duration from time of trauma to surgery. There is a wide array of treatment which is from a conservative watchful waiting, primary repair of the injury to a primary resection with anastomosis or reconstruction of the primary injury.^{2,5}

For the first case, the diagnosis of tracheal injury was diagnosed after post trauma day-2 and confirmed following a CT Cervical. The delayed diagnosis led to a difficult repair due to formation of devitalised tracheal tissue which requires debridement before anastomosis. From this case, the learning point encountered is to have a high index of suspicion towards a tracheal injury if there was trauma to the neck with progressively worsening dyspnoea, pneumothorax or subcutaneous emphysema. The presence of subcutaneous emphysema is always a clue towards TBI as it was seen in 87% of reported cases.⁴ Whenever in doubt, CT imaging and liberal use of bronchoscopy can identify majority of TBI.⁴ In our case, it was possible to avoid a permanent tracheostomy if repair was performed early within 24 hours of trauma. As a delay in diagnosis is shown to be the most important factor affecting the outcomes in management of TBI cases.⁵

The second case was treated conservatively for a week due to the relatively stable condition despite the bronchial tear. Only after a week post trauma he developed shortness of breath due to an obstructed right bronchus caused by granulation tissue and fibrosis. Surgery was performed to resect the stenosed bronchus which caused collapse of the right lung. In this case we would like to highlight the importance of early bronchoscopy to characterize the injury in preparation for further treatment.⁴

CONCLUSION

Liberal use of bronchoscopy is advocated whenever there is a suspicion of tracheobronchial injury for early diagnosis and management. An early surgical repair prior to the onset of tissue necrosis is the key for better patient outcome.

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