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Right Main Bronchus Transection Post Blunt Trauma: A Case Report

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Abstract **Case Report**

Tracheobronchial Injury is a relatively uncommon condition which is associated with high mortality. Majority occurring from blunt chest trauma sustained from deceleration injury in road traffic accidents. We present a case of a 17-year-old young male who presented in the acute setting of post motorcycle accident with respiratory distress, subcutaneous emphysema, right pneumothorax and fracture of posterior right 8^{th}-9^{th} ribs. CT shows right main bronchus anterior wall tear, with extensive subcutaneous emphysema, pneumomediastinum, bilateral pneumothorax and pneumoperitoneum. Thoracotomy confirmed the findings. Lacerated segment of right lower lobe bronchus was resected and (end-to-end) anastomosis was performed. Post-surgery was complicated with empyema thoracis which required decortication. Early detection and prompt surgical repair is fundamental and carries a high success rate in tracheobronchial injuries, however post-surgery complications need to be entertained and managed adequately to ensure safe outcome.

Keywords: Main Bronchus Transection Post Blunt Trauma.

INTRODUCTION

Tracheobronchial Injuries are a relatively rare condition which could be life threatening and fatal. Depending on the nature if the injury, a patient could present acutely or in a chronic manner. It may present with unspecific signs and symptoms, which poses a challenge to clinicians as it requires a high index of suspicion. Proper diagnosis could be made by a spectrum of investigations ranging from a simple chest x-ray to performing a CT scan or Bronchoscopy. Prompt treatment yields good prognosis where a patient could return to normal daily activities. Complications could also be found in these patients, especially in those which treatments are delayed. Even though these could be managed, it contributes to the increasing morbidity for the patient.

CASE REPORT

A 17-year-old man with alleged road traffic accident. He presented to emergency department 12 hours later when he developed respiratory distress and haemoptysis. Patient condition was stable on arrival, however he later deteriorated. Chest X-Ray showed bilateral pneumothorax with a right 'Fallen Lung' sign (Figure 1). Despite bilateral chest drain insertions; there was still persistent air leak with extensive subcutaneous emphysema, extending from his face to bilateral lower limbs, and worsening respiratory distress, requiring intubation. Urgent Contrast Enhanced Computed Topography (CECT) Thorax and Abdomen confirmed a complete anterior tear at the right main bronchus with extensive subcutaneous emphysema, pneumomediastinum, bilateral pneumothorax and pneumoperitoneum. Patient was then referred to our centre, and we proceeded to a combined emergency thoracotomy and laparotomy. Intraoperative findings were consistent with a transected right main bronchus. Resection of lacerated right main bronchus with bronchial anastomosis was performed. Laparotomy revealed negative intraabdominal finding.

Fig-1: Immediate Anterior-Posterior Chest X-Ray at time of admission immediately post chest drain insertion. There is displacement of the mediastinum away from the affected side with a "fallen lung" sign.

DISCUSSION

Although blunt thoracic trauma is relatively common, main bronchus tears are rare and uncommon, being found in 1% of these patients [1]. It occurs mostly due to road traffic accidents and is associated with a high morbidity and mortality, which has been reported to be 36% and 15.5% respectively [2, 3]. Immediate detection and intervention reduces mortality. Pneumothorax is the most common sign found in patients with tracheobronhial injuries. A "fallen lung" sign as has been demonstrated by this patient is a rare but very specific sign seen on chest x-ray [4, 5]. Patients usually present with respiratory distress requiring airway intervention, therefore airway management plays an important role in these patients. Lung isolation e.g. double-lumen tubes or bronchial blockers are useful adjunct in management of tracheobronchial injuries as they provide differential ventilation hence reducing barotraumas to the affected lung. Urgent surgical intervention is rarely required in minor transections. One centre reports only 0.4% of patients required emergency thoracotomy, most of which were performed to deal with bleeding or major airway laceration [6]. Minimal sign and symptoms were usually treated conservatively. Currently, a review of the literatures reveals there is no equivocal consensus on indications for surgical management in tracheobronchial injuries [7]. However, one literature proposes a surgical approach in patients fulfilling these criterias [7]:

- lesion 2 cm or more than one-third of the circumference
- full wall thickness
- injury involving the carina or paracarinal region
- failure of the chest tube and residual pneumothorax
- prolapse of oesophageal wall or associated oesophageal injury

Perioperative Bronchoscopy is the most essential and diagnostic study as it enables visualization of the location and extent of injury [3]. The most common location of injury occurs in the right bronchus, which in a study is demonstrated to be 47% of all tracheobronchial injuries [5]. This is attributed to the shorter length of the right main bronchus, the right bronchus is less protected than the trachea or the left bronchus, which are encircled by the aorta as well as other mediastinal tissues, and the heavier right lung on the shorter right main bronchus[5]. Delay in detection and repair of the bronchial tear results in a myriad of complications such as formation of granulation tissue, scar, and stenosis at the injured site, and associated atelectasis and/or bronchiectasis destroys the underlying lung, leading to lung resection [2].

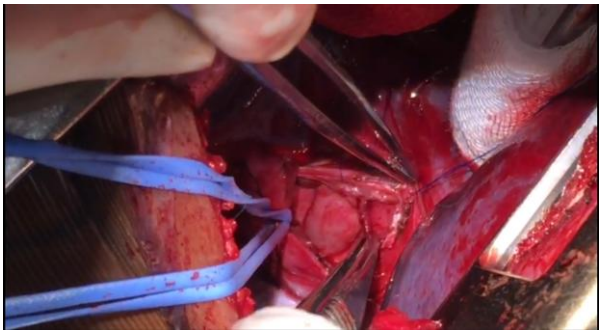

Fig-2: Direct visualization of the Right main Bronhus tear intraoperatively, where a direct end-to-end anastomosis was performed

Despite early intervention and successful surgery, potential complications should not be overlooked. As in this patient, post-surgery was complicated with Pneumonia and subsequently thoracic empyema. Decortication was performed thus improving the lung function. Follow up bronchoscopy is necessary if there is evidence of stenosis as bronchoscopic

intervention e.g. stent, etc can be offered as an option of treatment.

CONCLUSION

We describe a case of a delayed tracheobronchial transection successfully managed surgically in the primary instance. Post-operatively it was complicated with empyema thoracis which was also dealt effectively. Early detection and airway protection is essential to improve outcome in tracheobronchial injuries. Early surgical intervention when warranted, with the intention of a primary anastomosis produces good results. Multiple complications can arise post-operatively, however these can be managed successfully and lead to a full and satisfactory recovery.

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