Sleeve Resection for Delayed Presentation of Traumatic Bronchial Transection

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Abstract

Tracheobronchial disruption occurs approximately in 1-2% of individuals sustaining blunt chest trauma. Many of these patients die before reaching the hospital. In the majority of survivors diagnosis is occasionally delayed resulting in complications like airway stenosis and lung collapse. Thus it is important to have a high index of suspicion. The decision for intervention is guided by the clinical presentation and radiological follow up. As the stenosis increases it becomes difficult to preserve lung tissue4 even if the rupture is old. Sleeve resection can be an excellent option to conserve lung tissue in delayed presentation of bronchial transection.

Introduction

Tracheobronchial disruption occurs approximately in 1-2% of individuals sustaining blunt chest trauma. The possible mechanisms of injury are rapid deceleration with forward swing of the torso, sudden internal pressure with intraabdominal rupture of the chest, comminuted fracture of the clavicle and a rapid rise of airway pressure on impact. Clinical signs of a tear include dyspnea, haemoptysis; findings of an airleak (pneumomediastinum/subcutaneous emphysema). Persistent pneumothorax despite suction drain can be critical links for the diagnosis.

Case Report

A 40-year male was admitted to a regional hospital after sustaining blunt trauma in a car crash. On admission he was conscious with bilateral pneumothoraces, surgical emphysema and multiple fractures. He was treated with bilateral chest drains and internal fixation. He made a good recovery from his injuries and his CXR prior to discharge showed expansion of both lungs. The patients was re-admitted six weeks later with acute onset dyspnea, fever and complete white out of the right lung (Figure 1) with deviation of the mediastinum to the right on CXR. Fibre optic bronchoscopy showed a complete blockage of the right main bronchus (RM B). He was transferred to our unit for further assessment. A rigid bronchoscopy was performed and it revealed total obliteration of the (RM B) proximal to the right upper lobe (RL UL) take off. CT chest (Figure 2) confirmed the obstruction of the (RM B). The patient was scheduled for elective surgery the following week and intensive physiotherapy was commenced. During that week there was progressive reexpansion of the right lung. The bronchoscopy was repeated again prior to surgery, however it showed no sputum even with forceful suction. A postero-lateral thoracotomy through the 5th intercostal space was performed. At surgery there was little evidence of trauma initially. In particular no adhesions and only after dissection complete transection of (RM B) at the origin of the upper lobe (UL) was demonstrated. The stenosis involved the (UL) bronchus making that lobe unsalvageable. A straightforward right upper sleeve lobectomy was carried out. Post operative recovery was uneventful and CXR was static. The patient made a steady recovery and was discharged ten days later. At 12 months follow up he was very well.

Figure 1: CT images demonstrate narrowing and almost obliteration of (RM B) with complete RL lung collapse.

Figure 2: Post operative (sleeve resection) X-ray showing full expansion of the lung.

Discussion

Tracheobronchial injury should be suspected in blunt trauma where there is a picture of pneumomediastinum, subcutaneous emphysema or after chest tube insertion there is a persistent pneumothorax and a very large air leak. In this case surgical emphysema and pneumothorax subsided following chest tube insertion and airway injury remained unnotified until it presented six weeks later as total lung collapse with evidence of severe infection. A likely explanation for this sequence of events is that despite the tracheobronchial transection being complete, continuity of the airway was somehow maintained by surrounding tissues. The communication between proximal transected bronchus, mediastinum and pleural space was sealed off, allowing the pneumothorax to resolve with a chest drain. Bronchoscopy was important to rule out mucoid plugging as the cause of collapse. Bronchial rupture is uncommon in blunt trauma. Difficulties in the diagnosis may cause delay in treatment.

Conclusion

Tracheobronchial injury should be a suspected in blunt trauma where there is a picture of pneumomediastinum, subcutaneous emphysema or persistent pneumothorax. A high index of suspicion is important to prompt investigation and early treatment. Inhalation of foreign bodies and vigorous physiotherapy the patient received in the hospital while awaiting surgery and therapy delay in surgery allowed a sleeve resection rather a more destructive pneumonectomy to be performed. Bronchoscopy was performed to confirm the diagnosis and to rule out other causes of airleak.

References