

Traumatic Rupture of the Left Main Bronchus Case report & review of the literatures

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Summary:

Rupture of the trachea or main bronchus can occur during severe chest trauma and this event has been reported since more than a century. This is a report of a 19 year old male patient sustained car accident leading to loss of consciousness due to multiple trauma, involving specially the head and the chest that he needs assisted ventilation in an intensive care unit and later a tracheostomy. The patient regain his consciousness gradually, and a late diagnosis of traumatic rupture of the left main bronchus, which was approved by bronchoscopy and CT chest. Surgical repair of the ruptured left main bronchus was accomplished sixty days from the admission with the lung fully expanded on a post operative chest X-ray. The patient referred later to the ENT Department, thereafter a successful weaning from the tracheostomy was performed. The patient discharged well, but he was in need for regular bronchoscopic dilatation for a tracheal stricture as a complication of tracheostomy. The patient is still well during the follow up period. The report will include a review of the literatures about this relatively uncommon post traumatic condition.

Keywords: Bronchoscopy, CT chest.

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Introduction:

Rupture of a main bronchus during severe chest trauma has been diagnosed and reported in the literatures since long time. Seuvre (1) in 1873 first reported rupture of the main bronchus discovered at autopsy in a 74-year-old woman who was crushed beneath the wheel of an omnibus and nowadays traumatic rupture of the trachea and main bronchi is reported with increasing frequency. Nissen (2) & Sanger (3) reported the first successfully performed surgical treatment through pneumectomy of a delayed traumatic stricture of the main bronchus

Case history:

Falah h. Saeed is a 19 year old Iraqi man, a victim of road traffic accident. Received in the accident and emergency Department of the Medical City Teaching Hospital on the 18th of December 2009. On the initial examination, the patient was unconscious, with multiple bruises on the scalp, face and chest. Chest wall movement was reduced on the left side. The patient was tachypneic with a palpable surgical emphysema extending all over the chest and shoulder and up to the neck. Air entry was diminished on both sides of the chest. Immediate chest X-Ray revealed bilateral pneumothorax with fractures of the 1st, 2nd & 3rd ribs on the right side. Bilateral tube thoracostomy were inserted and well functioning with a more air leak on the left side. The patient was increasingly tachypneic, distress so the decision was to be transfer to the respiratory care unit of the surgical specialties hospital in which the patient intubated and connected to the mechanical ventilator, he remained unconscious. Brain CT scan was done for the patient on the 20th of December 2009 and it showed right sided fronto-parietal haemorrhagic brain contusion with minimally depressed skull fracture associated with significant

mass effect upon the lateral ventricle, along with fracture base of the skull at the medial border of the left middle cranial fossa. The neurosurgical decision was to continue on the conservative treatment and no need for surgical intervention. Two weeks later tracheostomy was done to the patient due to long stay on ventilator. On the 29th of December 2009, the patient regained his consciousness and became fully oriented and cooperative but remained on ventilator support. A new brain CT scan was done to the patient on the 11th of January 2010 which showed no intra cranial hemorrhage, but areas of recent brain infarct are seen in the right frontal region and left cerebellar hemisphere. A chest X-Ray (Figure 1) was done at the same time which showed left lung atelectasis so the decision was to consult the thoracic surgeon for opinion for bronchoscopy. On the 17th of January 2010 bronchoscopy was done for the patient and a lot of secretion was sucked from left main bronchus while the left main bronchus was totally obstructed by granulation tissues and the suspicion of rupture was kept in mind so CT chest was arranged for the patient on the 20th of January 2010 which showed total collapse of the left lung. Trachea and the right main bronchus were patent with clear right lung parenchyma and only the proximal 1 cm from the left main bronchus was seen to be patent so the diagnosis that the patient is having left main bronchus fracture and disrupted and that the patient is in need for left thoracotomy. On the 21th of January 2010, the patient was connected to T-piece for a trial of weaning and gradually was weaned successfully and breathing spontaneously on the 23th of January 2010. On the 28th of January 2010, the patient was discharged from the RCU to home with the tracheostomy. Readmitted one week later due to increasing dyspnea. On the 15th of February 2010 left thoracotomy was done through right lateral decubitus position and with the use of double lumen roberthow endo tracheal tube. Entering the chest through the fourth intercostals

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space .Adhesion between the lung and chest wall was resected and the findings that the left main bronchus was avulsed just distal to the carina .The distal bronchial stump was visualized and clotted blood was evacuated from the stump and a simple test was done by pushing air into the distal stump which showed that the lung is still expandable .The difficulty was to exposed the proximal stump that mobilization and retraction of the aorta was necessary to exposed it and the stump was cleared from the surrounding adhesion .Approximation of the two ends was done and facilitated by division of the inferior pulmonary ligament .Re anastomosis of both ends was done by single layer non absorbable 2/0 ethibond (polyster) and the left lung started to reexpand gradually ,then the anastomosis was wrapped by pleural flap .Haemostasis was done and a single chest drain was left .Immediate post operative chest X-Ray(Figure 2), showed a well expanded lung but a post operative bronchoscopy was necessary to clear the accumulated secretion that the patient was unable to expectorate . The patient respiratory status improved rapidly and eventually and successfully weaned from the tracheostomy on the 3rd. of March 2010.The patient discharged home in a good condition on the 10th. March 2010. The patient readmitted on the 28thof March 2010 complaining of stridor and dyspnea , but chest x-Ray showed a well expanded lung so rigid bronchoscopy was done under general anesthesia which revealed a tracheal stenosis at the site of previous tracheostomy and some granulation tissue formation at the anastomotic site .Tracheal dilatation was done successfully together with the removal of the granulation tissue and patient discharged in a good condition on antibiotic ,expectorant and a short course of steroid . The procedure of bronchoscopic dilatation of the tracheal stenosis needs to be repeated for three time and patient was in a very good condition during the follow up visit in the out patients clinic for the last three months.



Figure (1): Total collapse of the left lung.



Figure (2) A post operative CXR a nearly fully expanded lung.

Discussion:

Traumatic rupture of the bronchus after blunt injury to the chest is an uncommon injury and appears to be rare (4) the incidence of tracheo bronchial injury following blunt chest trauma is reported to be 1% (5). Tracheo bronchial injury had been considered to be inevitably fatal .Until 1927 when Krinitzki (6) reported the case of human long –term survivor Our patient sustained severe chest trauma with fracture ribs , pneumothorax ,and subcutaneous emphysema and these findings are significant enough to indicate lesions of the air way (7) The clinical presentation and radiological examination categorized two types of patient with air way lesion (7).In the first group the air ways opens directly into the pleural cavity .In the second type the pleural integrity is preserved and the air leak is sealed off by the mediastinum Increasing sub cutaneous emphysema starting from the neck , head and slipping down on the chest is typical of the second group classes and this was what has happened in our patient. The diagnosis of main bronchial injury secondary to blunt trauma is not always straight forward and initially can be missed in patient with multiple injuries. Chest X-Ray showed complete collapse of left lung expansion and this finding is in agree with others studies (8, 9) Bronchoscopy was nearly diagnostic in our patient and it is the most important step in the diagnosis and the diagnostic importance of the flexible bronchoscopy is confirmed in many studies (9, 10) CT chest confirmed the diagnosis of rupture of the main bronchus in our patient and the diagnostic significance of CT is confirmed by others studies (4, 10). Surgical repair and re anastomosis of the ruptured bronchus is mandatory as early as possible to preserve lung function and this was performed 48 days after the accident in our patient but repair of the injured bronchus was reported as early as within hours of admission (10) and as late as eight years following the injury (11). Successful repair and smooth post operative course is reported with the disappearance of dyspnea and other respiratory symptoms , except the case reported by Rober M. & Ross G.(12) as the patient expired within an hour of admission before further measures

could be instituted and autopsy finding was of rupture of the left main bronchus.

Conclusion:

Clinical findings with High level of suspicion With the additional use of CT findings and flexible bronchoscopic appearance are the major tools necessary for early diagnosis and early prompt surgical intervention for a successful outcome preserving lung function and avoiding the high mortality in missed cases.

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