

**Case Report**

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# Right Main Bronchus Rupture Due to Blunt Chest Trauma without Typical Radiologic Sign



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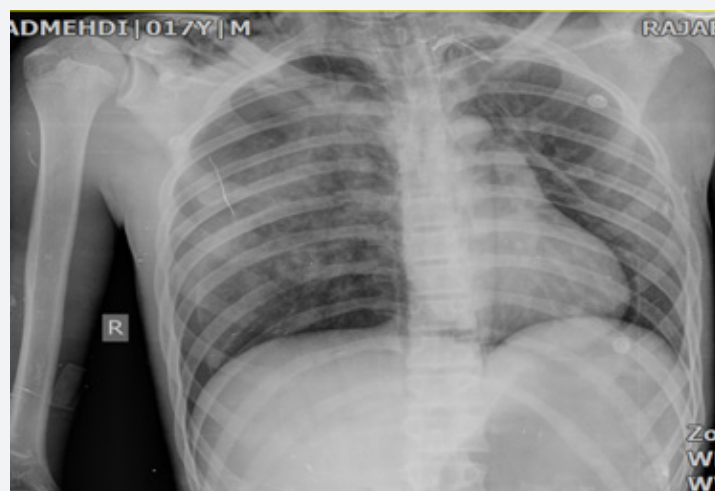
## Introduction

Tracheobronchial ruptures are most frequently caused by forceful trauma like motor vehicle accidents. They are rather uncommon and probably have a high prehospital mortality. It appears to occur in approximately 1% to 2% of individuals sustaining blunt injury [1, 2]. Bronchial rupture following major blunt chest trauma should be suspected in every case of massive and persistent air leak through the intercostal drain tube [3]. Chest radiogram offers indirect signs, while chest computed tomography scan (CT scan) demonstrates specific signs highly suggestive for this extremely rare tracheobronchial injury [4, 5]. A case of right

main bronchus rupture caused by motor-car accident was treated by thoracotomy and repair at the Department of Thoracic Surgery of Rajae Hospital. Due to the rarity of our case, we presented the clinical course of our patient.

## Case Presentation

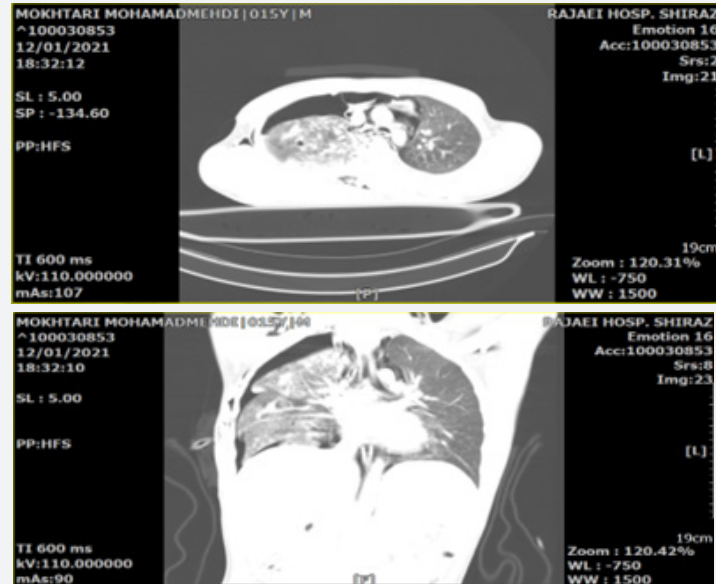
The patient was a 15 y/o male, a case of motor-car accident, brought to ER due to dyspnea and chest pain. On admission and at first examination vital sign was stable,  $SO_2=96\%$ . Glasgow Coma Score was estimated as 14.



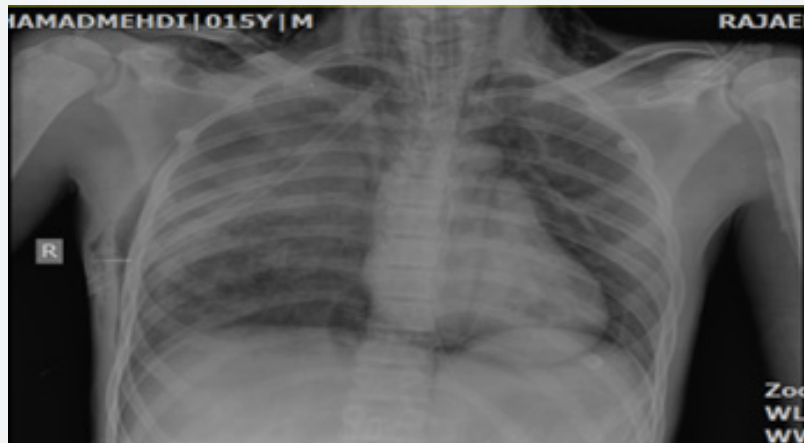
**Figure 1:** First Chest X-Ray (Right clavicular fracture, multiple Rib fractures, Right pneumothorax, pneumo-mediastinum, and subcutaneous emphysema).

In chest X-Ray (Figure 1) we found Right clavicular fracture, multiple Rib fractures, Right pneumothorax (but no complete collapse or fallen lung), and pneumo-mediastinum and subcutaneous emphysema was detected (Table 1). The right chest tube inserted for him, and a massive air leak was detected. However, he still complained from dyspnea. Chest CT

was performed, and we found sever pulmonary contusion, sever right side pneumothorax, significant pneumo-mediastinum, subcutaneous emphysema, multiple right-side ribs fracture, and displacement of right main bronchus that suggestive of bronchial avulsion. Although we did not find any definitive sign of bronchial rupture (Figure 2 and Figure 3).



**Figure 2 and Figure 3:** Chest CT scan (sever pulmonary contusion, sever right side pneumothorax, significant pneumo-mediastinum, subcutaneous emphysema, multiple right-side ribs fracture, and displacement of right main bronchus).



**Figure 4:** Second Chest X-Ray.

Chest CT scan (sever pulmonary contusion, sever right side pneumothorax, significant pneumo-mediastinum, subcutaneous emphysema, multiple right-side ribs fracture, and displacement of right main bronchus) Due to sever dyspnea and agitation he received sedation and intubation was performed. Mechanical ventilation was started, but mechanical ventilation showed “low

TV” alarm. The exact position of ETT confirmed by CXR (Figure 4). Second ABG shows: PH: 7.29, Po2: 135.7, So2: 98.2, Pco2: 55.2, Hco3: 27.3, BE: -0.4. The mechanical ventilation device was changed with possibility of device errors, however; new device also declared “low TV” alarm.

**Table 1:** ABG Findings.

Value	First ABG	Second ABG	Third ABG
PH	7.39	7.29	7.21
PO <sub>2</sub>	64.1	135.7	81.9
SO <sub>2</sub>	92.2	98.2	93.1
PCO <sub>2</sub>	38	55.2	74.9
HCO <sub>3</sub>	23	27.3	29.6
BE	-1.1	-0.4	-0.4

ABG shows PH: 7.21, Po<sub>2</sub>: 81.9, So<sub>2</sub>: 93.1, Pco<sub>2</sub>: 74.9, Hco<sub>3</sub>: 29.6, BE: -0.4

We considered that mechanical ventilator was revealed Pmax: 7 (very low) and P. platue & expiratory TV wasn't detected and NO change was happened in this value with increase TV. Therefore, with impression of massive "bronchopleural fistula that cause disturbance in ventilation" the patient was immediately transferred to operation room. Thoracotomy was performed and laceration of the right lower lung's lobe and complete avulsion of right main bronchus and lateral tearing of trachea was detected during the operation, so these lesions were repaired completely. Forty-eight hours after the operation he developed pneumonia (with *Enterobacter* confirmed by plural effusion culture), therefore antibiotic therapy was started, and due to weaning failure tracheotomy was done for him. After 45 days, he was discharged from hospital completely healthy.

## Conclusion

Bronchial rupture due to blunt thoracic trauma is rarely seen [6]. It may present with non-specific signs and symptoms

challenging prompt diagnosis. Difficulties of the diagnosis would cause delay in the treatment and increase the rate of complications [7,8]. In general, the most common symptom is dyspnea and the main findings on chest X-ray (CXR) are pneumothorax, pneumomediastinum, subcutaneous emphysema and atelectasis. We found that attention to dynamic measurements of mechanical ventilation is a very sensitive guide for early diagnosis of bronchial rupture. Early diagnosis and rapid repair of the bronchus injury can preserve the complete function of the lung tissue and healthy life of the patient.

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