



Case Report

# Lung resection for extensive lung injury causing severe hemorrhage

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## Abstract

We have presented here a case of a twenty three year old male who successfully recovered of a massive right lung injury by rapid transport, insertion of inter costal drain, emergency thoracotomy for resection of upper and middle lobes and post operative intensive care.

## Key words

Hemothorax, Thoracotomy, Lung injury, Lung resection.

## Introduction

Rapid transport to hospital, primary survey and resuscitation, secondary survey and surgical intervention as required are lifesaving in major trauma [1, 2]. In chest injury recognition of hemo-pneumothorax and insertion of intercostals (IC) tube in emergency room are required. In face of an initial return of more than 1500 ml of blood from the IC tube emergency thoracotomy is required [3]. Thoracotomy is required only in 10-15% [4]. We have presented here a case report of a young male who presented with a massive hemothorax due to

severe lung injury who survived following resection of upper and middle lobes.

## Case report

A 23 years old male was brought into emergency treatment unit following an accident while riding in a motor cycle. He was admitted within thirty minutes. His airway was intact, tachypnoeic with a respiratory rate of thirty and a blood pressure of 70/50 mmHg. He had clinical evidence of a right hemothorax and a chest drain inserted which drained 1500 ml of blood. He was conscious with no other injuries. He was started



on fluid resuscitation but blood pressure remained low with continued bleeding through the chest drain. FAST scan revealed no intra peritoneal bleeding. He was brought into emergency operating theatre by which time the return into inter costal bottle was 2000 ml. An inter costal tube was inserted to left side as well which drained about 500 ml. Blood transfusion was started and emergency thoracotomy was performed, patient being intubated with a single lumen tube. Right lateral thoracotomy revealed blood filled hemithorax of about 500 ml and severe bleeding from shattered upper and middle lobes of the right lung. Compression was applied to get some control of the bleeding. The damage was more severe in the upper lobe with continued bleeding when compression was released. We decided to resect the upper lobe and achieve suture control of the middle lobe.

Following resection of the upper lobe, the damaged middle lobe continued to bleed and suture control failed requiring lobectomy. The patient was transfused 15 units of blood. Fresh frozen plasma and platelet transfusions were done as required.

The patient had a cardiac arrest towards the end of the procedure which was successfully managed. He was admitted to intensive care unit and ventilated. Right inter costal tube drained 500 ml during the first six hours which decreased later. The cardiovascular and respiratory parameters were stable, initially with addition of inotropes. He had a good urine output.

Patient's post-operative chest X-ray revealed fractured ribs on right side from first to 9<sup>th</sup> rib. The left inter costal tube was removed after 48 hours and the right after one week. Patient was extubated the next day but required re-intubation. Several attempts to wean off

ventilation failed and a tracheostomy was performed on the seventh post operative day.

The patient was started on naso-gastric feeding from the first post operative day. Following tracheostomy patient was started on oral feeding but had to abandon due to aspiration. He was evaluated by the ENT team and right vocal cord palsy revealed.

Patient was transferred to high dependency after ten days. Chest physiotherapy was continued. The tracheostomy was removed two weeks after its insertion. Oral liquids continued to cause aspiration. However he tolerated semi-solids. Later he managed to take solids and was capable of having liquids after about five weeks from injury. He was discharged six weeks after admission by which time had recovered of his hoarse voice significantly.

## Discussion

Hemothorax with an initial return of more than 1500 ml is an indication for thoracotomy [3]. The patient under discussion had a massive lung injury accounting for the bleeding. The methods to control lung hemorrhage are suturing, lobectomy or pneumonectomy [4]. We had to resort to resection of upper and mid lobes of right lung as suturing did not control bleeding.

Patient required 15 liters of blood during surgery. Thoracotomy was started with a blood pressure of 60/40. Damage control resuscitation plays a key role in the management of such a critically ill patient. It includes early blood product transfusion, immediate arrest and/or temporization of ongoing hemorrhage, hypotensive resuscitation (permissive hypotension) and restoration of blood volume and physiologic stability by correcting coagulopathy, acidosis and hypothermia [5]. Tissue trauma, shock, hemodilution, hypothermia, acidemia and inflammation all

play key trigger roles in the acute coagulopathy of trauma in patients with shock which is further aggravated by massive transfusion [5, 6]. Therefore current massive transfusion protocol includes delivery of 1:1:1 ratio of RBC: fresh frozen plasma: platelets and monitor for and correct hypothermia, hypofibrinogenemia, and electrolyte disturbances such as hypocalcemia and hyperkalemia [6]. Cardiac arrest of the patient towards end of the procedure is likely to be as a consequence of cardiac depression secondary to such electrolyte and acid base disturbances.

The patient was managed with double lung ventilation. Literature gives support for both single and double lung ventilation for lung resection in trauma [4, 7]. The evidence to support lung isolation is to prevent aspiration of blood to the ventilated lung. However, proper placement of a double lumen tube especially without having a flexible bronchoscope in emergency setting is difficult. In this patient the endotracheal tube was frequently sucked to minimize blood aspiration and oxygen saturation was well maintained.

The patient required prolonged ventilator support possibly due to multiple rib fractures, loss of lung volume and right vocal cord palsy. Prolonged ventilation is associated with ventilator-associated pneumonia (VAP) [8, 9]. Acute Respiratory Distress Syndrome (ARDS), pulmonary embolism, barotrauma, and pulmonary edema are also among the complications that can occur in patients receiving mechanical ventilation [9].

Tracheostomy is an adjunct to continued mechanical ventilator support. Tracheostomy has several advantages over endotracheal intubation, including lower airway resistance, smaller dead space, less movement of the tube within the trachea, greater patient comfort and

more efficient suction [8, 10, 11]. Therefore early tracheostomy is recommended for patients requiring prolonged ventilation and late tracheostomy more than 21 days after intubation is associated with prolonged weaning periods and low rates of successful weaning [8, 10]. Therefore tracheostomy of this patient was performed on the seventh post-operative day.

Nutrition was maintained through naso-gastric (NG) tube from day one. Aspiration of liquids delayed oral feeding and NG feeding had to be continued. He managed to tolerate semi solids and then solids before he could take liquids without aspiration. Incidence of recurrent laryngeal nerve palsy leading to swallowing difficulties has been reported following blunt chest trauma with tracheobronchial disruption [12] and pneumonectomy [13].

## Conclusion

This case illustrates the importance of rapid control of massive hemorrhage in chest trauma by timely transport, quick assessment and resuscitation, emergency surgical intervention with anesthetic support to save life. The post operative care should be intensive to overcome multiple problems related to major trauma.

## References

1. Mackowski MJ, Barnett RE, Harbrecht BG, Miller KR, Franklin GA, Smith JW, Richardson JD, Bennis MV. Damage control for thoracic trauma. *The American surgeon*, 2014; 80(9): 910-3.
2. Desforges JF, Trunkey D. Initial treatment of patients with extensive trauma. *N Engl J Med*, 1991; 136: 5.
3. Jones RK, Jurkovich GJ, Nathens AB, Shatz DV, Brundage, Wall MJ, Engelhardt S, Hoyt DB, Holcroft J, Knudson MM. Timing of thoracotomy for hemorrhage



- after trauma. *Arch Surg.*, 2001; 136(5): 513-518.
4. Weigolt AJ. Pulmonary resection for trauma. *Rob and Smith Operative surgery*. 4<sup>th</sup> edition. Butterworths, 1989; p. 311-317.
  5. Ball CG. Damage control resuscitation: History, theory and technique. *Can J Surg.*, 2014; 57(1): 55–60.
  6. Hess JR, Brohi K, Dutton RP, et al. The coagulopathy of trauma: a review of mechanisms. *J Trauma*, 2008; 65: 748–54.
  7. Richter T, Ragaller M. Ventilation in chest trauma. *J Emerg Trauma Shock*, 2011; 4(2): 251–259.
  8. Hsu CL, Chen KY, Chang CH, Jerng JS, Yu CJ, Yang PC. Timing of tracheostomy as a determinant of weaning success in critically ill patients. *Critical Care*, 2005; 9: R46-R52.
  9. Kahn JM, Goss CH, Heagerty PJ, et al. Hospital volume and the outcomes of mechanical ventilation. *N Engl J Med*, 2006; 355: 41-50.
  10. Heffner JE, Miller KS, Sahn SA. Tracheostomy in the intensive care unit. Part 1: Indications, technique, management. *Chest*, 1986, 90: 269-274.
  11. Diehl JL, El Atrous S, Touchard D, Lemaire F, Brochard L. Changes in the work of breathing induced by tracheotomy in ventilator-dependent patients. *Am J Respir Crit Care Med*, 1999; 159: 383-38.
  12. Baumgartner F, Sheppard B, et al. Tracheal and main bronchial disruptions after blunt chest trauma: Presentation and management. *The Annals of thoracic surgery*, 1990; 50(4): 569-574.
  13. Carew JF, Kraus DH, Ginsberg RJ. Early complications. Recurrent nerve palsy. *Chest Surg Clin N Am.*, 1999; 9(3): 597-608.

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