



Unusual “Spontaneous Sealing” of Deep Penetrating Lung Injury Caused by Sharp Object

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Abstract

Penetrating chest injuries due to sharp objects are the cause of mortality and morbidity since ancient times. Despite the introduction of firearms and more commonly vehicular accidents, in certain areas of the world, stab injuries are yet prevalent probably due to the restriction of carrying firearms and lack of high speed autobahns.

We describe herein a case of a deep penetrating stab injury that resulted in only a small self-limiting pneumothorax despite of the depth of lung penetration. This is radically different from the expected method of treatment. This deep injury demonstrated spontaneous sealing without even decompression of pneumothorax.

Keywords: CT Scan; Chest; Video Assisted Thoracic Surgery (VATS)

Case Report

Mr. _____, a 19 year old male had altercations in the family and in the heat of the moment, was attacked by his own close family member with a long knife. He had a complete penetration of the left hemithorax but no exit wound. He was rushed to a peripheral hospital and after chest x-ray, the entry wound was sutured without probing or exploration, on the day of injury. CT scan chest was taken and showed a moderate sized pneumothorax and a large linear penetrating laceration in the lingular lobe of the left lung (segment 3) with surrounding zone of haziness suggestive of inflammation or injury induced contusion. The linear injury clearly visible on the chest scan was about 10cm long and surrounded with a hazy halo of injured or collapsed lung. Despite this the patient showed normal oxygen saturation and did not need oxygen therapy. There was mild cough that was dry and not productive and there was no hemothorax.

He was brought to our hospital after a period of 2 days and was investigated with repeat CT scan chest and serial chest x-rays. The pneumothorax resolved gradually and there was no increase in the lung consolidation or any opacification of lung. He was totally asymptomatic and had neither dyspnoea nor cough. Hence, no intervention was contemplated and he was discharged after 3 days of observation.

Surprisingly, the patient did not need any exploration or any chest tube and the original skin closure that had been done at the peripheral hospital was all that was needed. This was against the conventional surgical wisdom. Despite protocols on penetrating chest injury diagnosis and exploration, we decided to take a conservative approach as the patient was totally stable after two days of conservative management at outside hospital. This is not in line with the usual literature support. The method of treatment cannot be generalised and this incident of self sealing of the chest wound is rare.

Discussion

Chest injuries may occur due to various causes and in the modern world it is usually due to vehicular high speed trauma, bullet/projectile injury or stab injuries. Depending on the availability of firearms, bullet injury does not seem to be common in the stable part of the third world unlike in developed Western countries.

In case of penetrating injuries due to sharp objects such as knives and swords, there is usually a leak in the lung and this leads to a tension pneumothorax and hemothysis. In the patients who have a cardiac stab injury, there may be presentation with pericardial tamponade and this was the first cardiac surgery done in 1897 by Rehn [1].

Stab injury of chest need to be addressed by removal of the offending weapon within the operation theatre after anaesthesia and after a formal thoracotomy/sternotomy. If, however, the weapon has already been withdrawn by the assailant or anyone else, then expeditious exposure of the potential injury site should be performed and immediate control of the bleeding or air leak should be done [2]. There may not be time enough for formal scans in such a situation especially if there is cardiovascular trauma [3]. Conservative management is avoidable as a potentially curable situation may get missed and usually the patient reaches the hospital with an emergency situation or deteriorating hemodynamics or respiratory parameters. The reason is that stab injuries are incised wounds on the lungs or heart and with little or negligible zone of collapse around the injury unlike a contusion of lung with blunt injury. Therefore the resultant air leak is not likely to stop due to clot or collapse consolidation of the affected lung. This patient had an unusual presentation of immediate air leak followed by complete self healed recovery and he needed no further measures including superficial wound management. Therefore, it is a dictum to explore the wound or perform an exploration depending on the site of injury. In case the patient is stable, one can perform diagnostic imaging and then proceed [4]. It is not that lung injuries do not heal spontaneously especially if they are small such as lung biopsies or accidental iatrogenic injuries [5]. Simple suturing of the stab entry wound without knowing about the internal damage is fraught with danger. In case the foreign body or weapon is still protruding in the chest, then it should not be removed and instead exploration should be performed with the weapon sticking in the

chest cavity [6]. Under complete exposure and with availability of backup measures such as heart-lung machine or cell saver and hemostatic means, then only the offending object should be extracted [7]. It is at this moment that there may be severe bleeding, air leak or both or even hemothysis. Chou., *et al.* [8] have used video assisted thoracic surgery (VATS) for diagnosis and management of penetrating injuries. The common method is of exploration under anaesthesia with an incision (thoracotomy/sternotomy) after diagnostic imaging if there is stability and feasibility of the same [9].



Figure 1: Sutured stab wound in anterior chest wall.

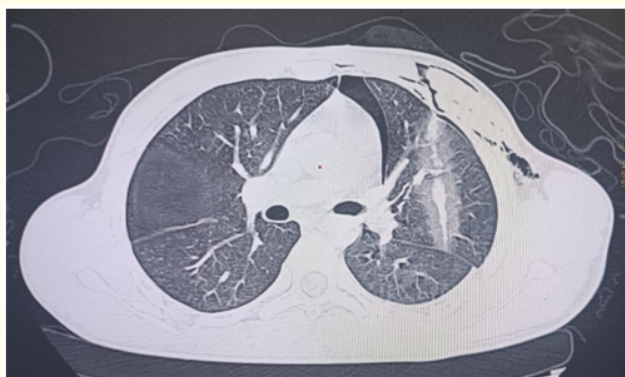


Figure 2: CT scan chest showing linear lung injury and resolving pneumothorax.



Figure 3: Pre-discharge chest x-ray showing complete resolution.

Conclusion

Normally, penetrating chest injury should be explored and the internal injury should be treated. However, we describe a rare case wherein there was no indication for exploration as the air leak had subsided totally spontaneously although the stab had entered the lung for about 10cm. The clinical outcome of this patient is an exception and cannot be generalized into a rule.

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