

Bullet lung injury in adolescent: a case report

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ABSTRACT

Gunshot injuries to adolescents involve a proportionate minority of the overall injury population. Especially thorax bullet injuries are even less common. This report aimed to express our experience by sharing the clinical process of our patient with this injury. A fourteen-year-old female patient was injured by a gunshot from a distance of approximately 10 meters while she was in the garden. It was understood that the bullet entry hole was from the scapular supraspinatus region towards the clavicle and the apex of the left lung. It was determined that the exit hole was in the hemithorax region below the left clavicle. The patient was admitted for follow-up and treatment. Since the patient's general condition was stable, after clinical follow-up, a thoracotomy was performed under elective conditions, intraparenchymal bone fragments were cleaned, and the left apical lobe was excised. Clinical follow-up is problem-free, and post-discharge follow-up is also problem-free.

Keywords: Bullet, thorax, children, surgery

INTRODUCTION

Penetrating traumas in children have increased to constitute 10-20% of child traumas worldwide.¹⁻⁴ Lung injuries caused by bullets in children occur mostly under war conditions.¹ In recent years, there has been an increase in child injuries caused by firearms in environments other than war conditions.¹ Among these, firearms add up to a significant part.¹ A study conducted in the USA determined that the financial loss resulting from workforce loss due to these types of injuries was approximately 48 billion dollars annually.³

The effect of the bullet varies. Mostly, emergency surgery is performed for those whose condition is unstable. If this effect does not disrupt the patients' stability, time can be gained to complete the appropriate preparations for surgery. Alternatively, in very selective situations, surgery may not even be performed on asymptomatic people because surgery may cost complications in perioperative or postoperative period.¹

Contrary to popular belief, the "wait-and-see" method can be used to monitor how the process is going, depending on the patient's stability.¹ We aimed to share our experience of lung injury with firearm. Although it is infrequent, we managed a patient like this with proper management for operation. We aimed to compare literature with our experience.

CASE

The fourteen-year-old female patient was injured by gunfire from a distance of approximately 10 meters while she was in the garden. She had no previous diseases or thoracic pathologies. It was understood in computerized tomography that the bullet entry hole was from the supraspinatus region on the scapula towards the clavicle through the apex of the left lung (Figure 1).

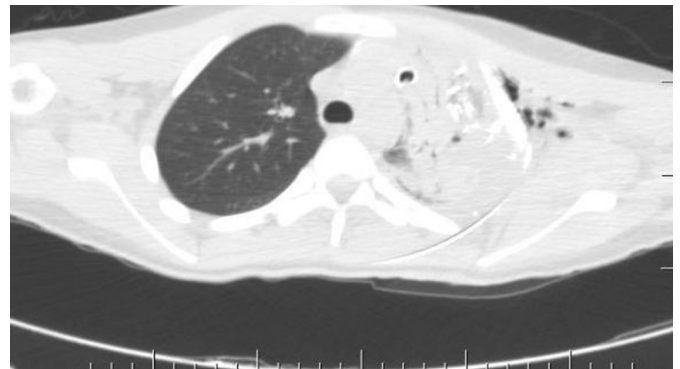


Figure 1: Computerized Tomography of the patient demonstrating the wounded parenchyma and fractured bone in it.

The apex was consolidated, and bone opacities could be seen in upper lobe of the lung. The exit hole is in the hemithorax region below the left clavicle. The patient was admitted for follow-up and treatment.

In her first examination, it was understood that his general condition was stable. Oxygen saturations were found between 93 and 97. A pleural drainage catheter was placed since hemothorax was detected on the chest x-ray. Since approximately 400-600 cc of serohemorrhagic fluid was detected during the daily follow-up, the patient was followed for surgery with appropriate preparations as long as her general condition was stable.

Two days later, under elective conditions, a left lateral thoracotomy was performed by entering the fourth intercostal space. It was observed that the apex segment of the lung parenchyma was dissected almost completely (Figure 2).

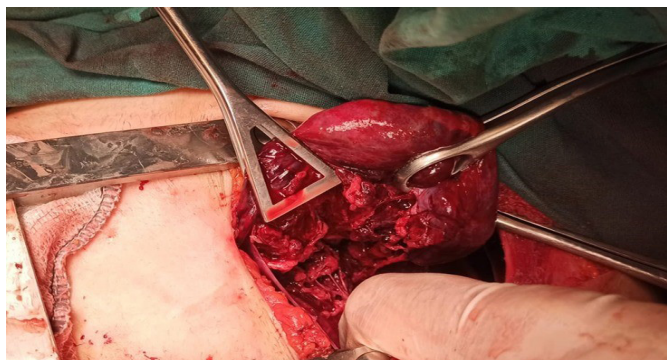


Figure 2: Perioperative illustration during the excision of the left lung apical segment

Excision was performed because there was tissue loss. In addition, it was determined that bone fragments found in the lung parenchyma were removed with an excised segment. A few small bone fragments in other adjacent segments were also excised during the manual evaluation, and the parenchyma was cleared of all bone fragments. When a double-row repair was performed to the lung, and it was observed that there was no leakage, the procedure was terminated by placing a pleural drainage catheter. As she had no complaints during the seven-day follow-up, the catheter was removed, and she was discharged. There were no additional problems during follow-up examinations. Control chest radiography showed deformed bone tissues and post-traumatic lung tissue (Figure 3).

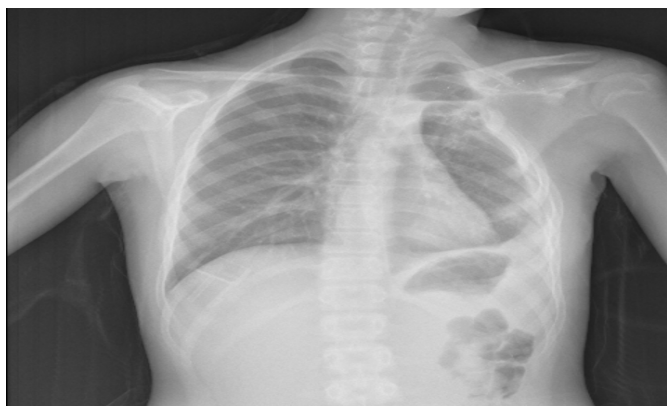


Figure 3: Follow-up plain chest X-ray graph. Remarkable deformity of ribs and scapula can be detected

The patient did not come for a check-up because she had no complaints during phone communications for the last year.

DISCUSSION

Clinical treatments vary with foreign bodies, such as bullets penetrating the thorax.² Studies have shown that 90% of patients with penetrating trauma to the thorax die during or immediately after arrival at the hospital.⁵ However, the impact of foreign bodies, such as bullets in the thorax, usually occurs when they affect the pleuroparenchymal functioning.² Radiologic findings containing cardiac tamponade, right ventricular damage, and involvement in more than one area must be calculated as factors that increase mortality.⁵ In these cases, urgent intervention is required, and delay in going to the operating room increases mortality.² Bleeding appears to be the most common cause of mortality in bullet injuries in children.⁴ Mortality percentage can be expected to increase even more in combined body traumas.⁴ Our patient did not have any liver or spleen injuries associated with lung injury. Computerized tomography showed clearly that only a part of left lung was affected.

The critical factor is determining where the affected area in the thorax is.⁵ It is essential because the treatment will be planned according to the direction of the bullet.⁵ In our patient left apical trauma with some bone fractures and without major vessel injury demonstrated obviously that there was no reason for clinical destabilization. There are some other factors that are important. The speed of the bullet determines the degree of damage.¹ In addition, the shock wave effect caused by the bullet, or its collateral effects depends on the angle of the bullet.¹ It should not be forgotten that faster action is needed in patients with problems such as spleen injury accompanied by multiple traumas.⁴ Considering all these factors, it can be said that it is not easy to give a definitive opinion.¹

In fact, consequences are not always dramatic. If the aforementioned factors are less destructive to parenchyma and vital functions, treatment strategy may be revisited. In the initial trauma evaluation, it is essential to decide whether the intervention will be made under emergency or appropriate conditions.⁴ Work can be done to prepare appropriate conditions for a patient whose condition is stable.⁴ Fortunately, our patient's condition was determined to be stable. Although there was bleeding, which was not surprising, the bleeding was slow and replaceable in 24-hour calculations; she was taken into surgery two days later to complete the examinations and blood preparation—no clinical problems or complications developed during this period.

CONCLUSION

In childhood thoracic injuries caused by gunshot, treatment might be tailored according to the patient's circumstances. Surgery can be performed in selective patients by arranging appropriate conditions or urgent surgery could be performed. To clarify which one will be preferred, not only clinical condition will be definitive, but also radiologic findings must be thoroughly understood. Radiologic evaluations defining damages of cardiovascular system, respiratory insufficiency or contribution of other solid organs must be

alerting for urgent operation. Most affective clinical factors determining whether the patient is selective are vital signs and hemorrhage. It is also necessary to carefully examine how the injury developed.

ETHICAL DECLARATIONS

Informed Consent

All patients signed and free and informed consent form.

Reviewer Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

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Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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