

Case Report

A novel approach in retrieving retained pulmonary bullet injury

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ABSTRACT

Video-assisted thoracoscopic surgery can be a useful tool in selected penetrating chest trauma patients for diagnostic and therapeutic purposes. It is currently a safe and feasible alternative to thoracotomy in the management of chest trauma especially for hemodynamically stable patients.

Penetrating chest trauma with retained bullet was removed successfully in a 25 years old patient using double-port VATS technique in combination with fluoroscopy, he made full recovery, hospital stay was very short.

Introduction

Penetrating thoracic trauma is managed based according to hemodynamic status. Initially thoracotomy has been considered as the standard approach for exploration, for many reasons. It was believed that it allows the fullest visualization of injuries, removal of foreign bodies, control bleeding, and resection of damaged lung tissue [1]. However, with time video assisted thoracoscopic surgery (VATS) has been established and became the standard approach for most elective thoracic operations, not only the elective cases but also in the emergency operations [1]. Several studies have demonstrated its feasibility and safety [2–4]. VATS in combination with fluoroscopic guidance for localization during operation became a safe option in dealing with intrapulmonary foreign body. There are some reports emphasizing its role [5,6]. This technique should be applied in stable patients without any great vessel or cardiac injuries [1–3]. We report a case of successful use of 2-port VATS in combination with fluoroscopy as the first-line approach for exploration and removal of deeply retained bullet in lung parenchyma.

The case

A 25 years old not known to have any medical illnesses presented to the emergency room with penetrating chest injury (bullet injury). He was conscious and alert, hemodynamically stable, complaining of mild dyspnea and pain on the back, on clinical examination there was minimal bleeding, the entrance point was in the left nipple, around 4th intercostal space, midclavicular line, there was no exit point elsewhere and the rest of the exam was unremarkable. Focused assessment with sonography for trauma was negative, chest X-ray showed the presence of retained foreign body, bullet in the left lower zone (Fig. 1). Computed tomography revealed fracture rib, left lower lobe lung contusion, bullet retained and minimal hematoma in the posterior basal segment (Fig. 2). The decision was to explore the patient since it was a penetrating chest injury to the “anatomical box of traversing the mediastinum”, since the patient was hemodynamically stable and would tolerate single lung ventilation, flexible bronchoscopy was done and showed minimal bleeding from posterior segment of lower lobe, he underwent VATS exploration. The first port was introduced in the 5th intercostal space, midaxillary line, through which a 5 mm, 30° scope was introduced. Up on exploration, there was minimal hemothorax. The pericardial fat showed small hematoma, the posterior segment of the left lower lobe was contused. Introduction of

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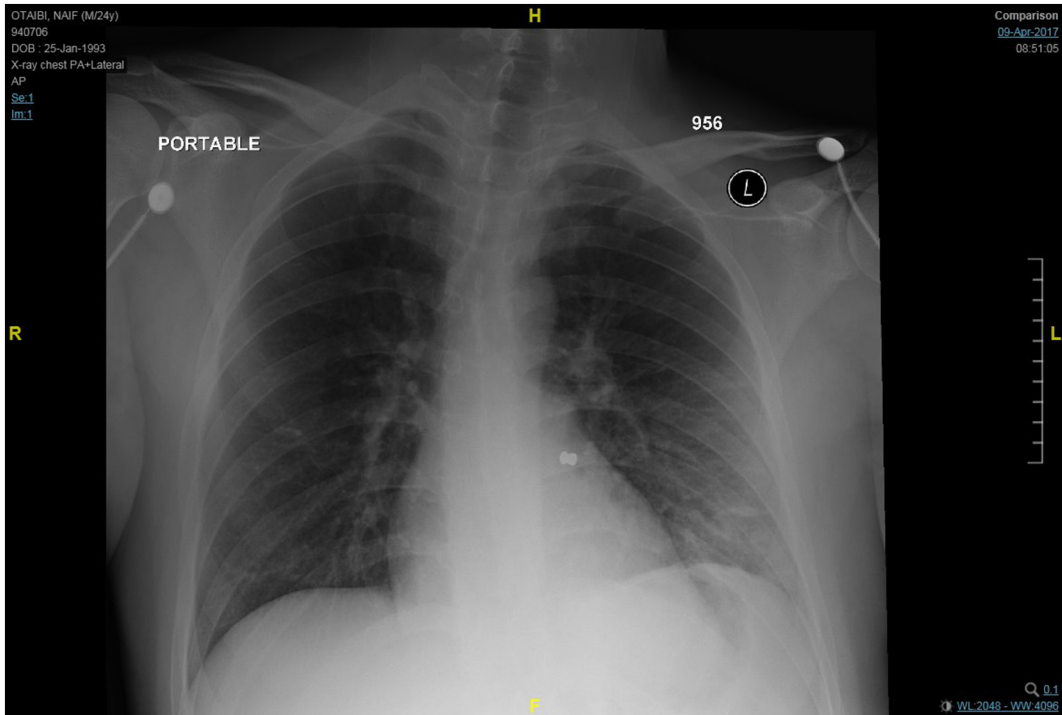


Fig. 1. Plain chest X-ray showed retained foreign body in the left lower zone.

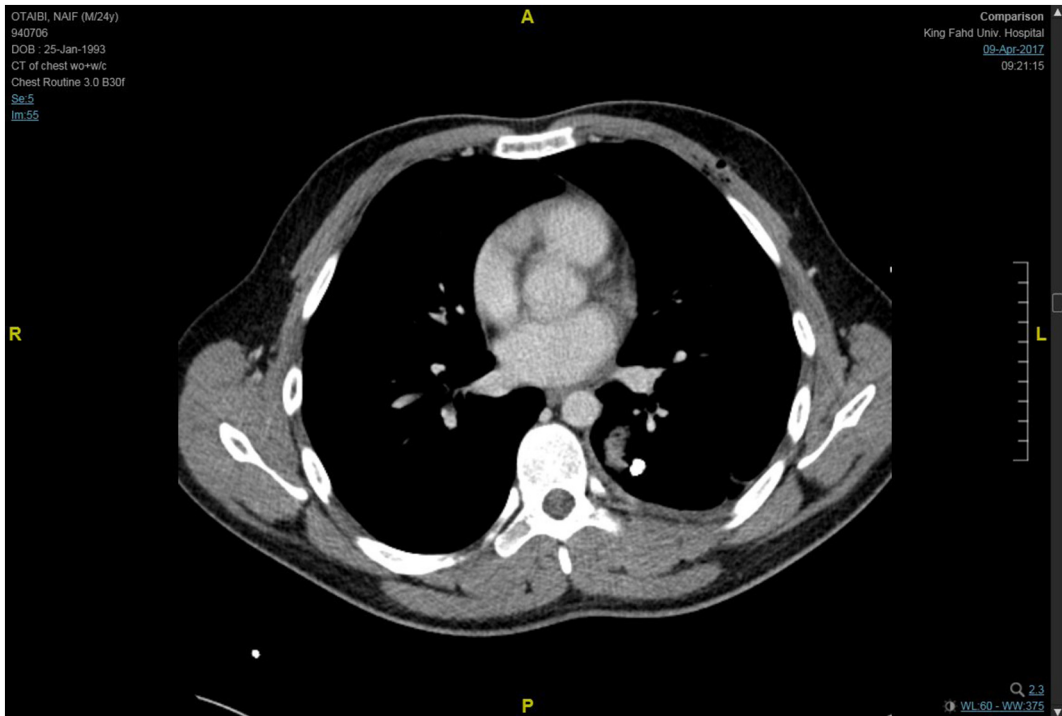


Fig. 2. Computed tomography revealed lung contusion, retained bullet and minimal hematoma.

the second port at 7th intercostal space posterior axillary line was done. The bullet was difficult to feel since it was deep in the lobe parenchyma. The C-arm fluoroscopy was used to locate definitely the bullet. A VATS DeBakey was used to hold the involved lung. A stapler 60 mm purple Covidien TM was used (Fig. 3). The resected wedge confirmed the presence of the bullet by fluoroscopy. An intercostal tube size 28 F was introduced through the first part. The patient had an uneventful post-operative course. His clinic follow

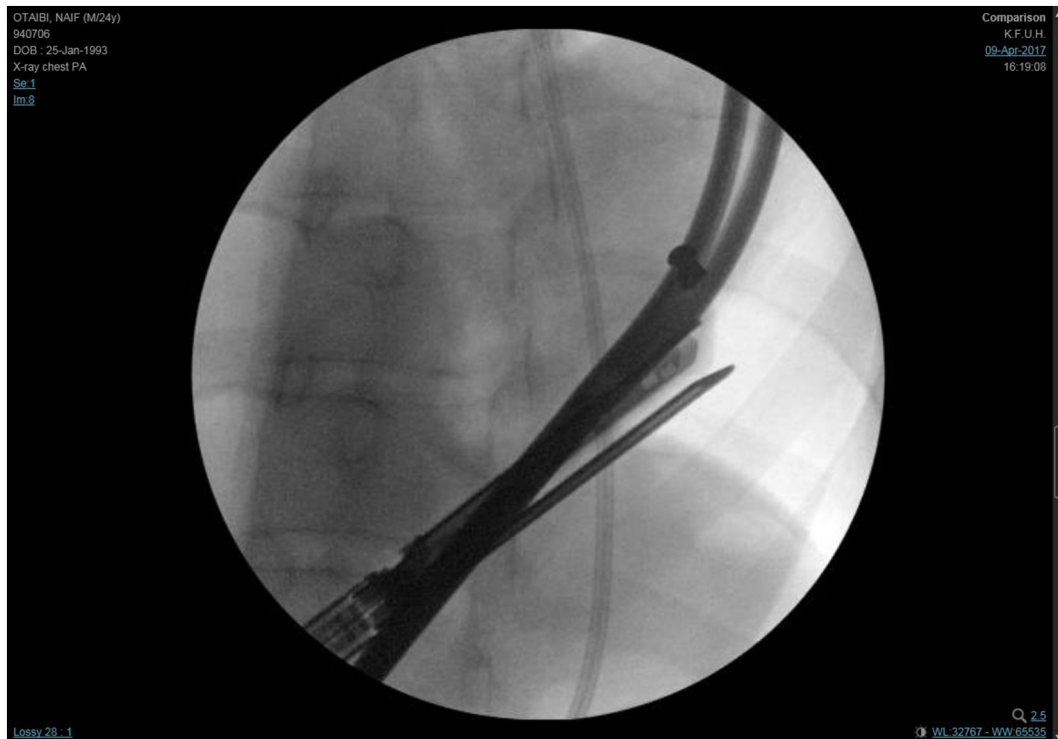


Fig. 3. Intra operative fluoroscopy picture showing the VATS DeBakey forceps holding the lung and the stapler introduced prior to the wedge resection.

up after 1 and 6 months respectively was unremarkable with full resolution of his condition.

Discussion

Chest trauma whether blunt or penetrating is a significant cause of morbidity and mortality [2]. There is a shift in the management of hemodynamically stable patient in terms of more radiological intervention and utilizing minimal invasive surgical options. In comparison to open thoracotomy, VATS is an effective treatment for improving perioperative outcomes in hemodynamically stable patients with chest trauma and reduces the complication rate [3]. Since 1946, thoracoscopy has been used as a method of exploration in selected chest trauma cases with chest trauma [7]. In 1981, thoracoscopy has been proved to be a valuable diagnostic and therapeutic measure in patients with chest trauma [8]. Due to the potential advantages of small incisions and less pain, VATS became increasingly popular in both diagnosis and treatment of trauma in the 1990s [9]. VATS is an established technique for treating thoracic surgical conditions at large these days. VATS used in patients with chest trauma where it was found to be safe and feasible has resulted in better patient satisfaction, favorable postoperative course, and superior long-term outcome [2]. In addition to smaller incision and less pain, short duration of hospitalization and operation time, and less amount of bleeding and transfusion volume in operation [3]. All the reports in the literature have emphasized that VATS should be used only in hemodynamically stable patients. It has been noted that management of hemodynamically stable thoracic injuries by VATS provides high diagnostic accuracy and also offers the possibility of therapeutic intervention. In comparison between chest trauma patients undergoing VATS and open thoracic procedure, it was found that the incidence of wound and pulmonary complications are higher in the thoracotomy group of patients [2]. Moreover, long-term patient satisfaction in terms of the rate of return to a normal lifestyle was 81% in the VATS group and 60% in the thoracotomy group [2]. Patients in the VATS group were found to be more satisfied with their health status and surgical scars [2]. By VATS and intraoperative navigation which is heavily dependent on external aid, such as fluoroscopy and is much better for localization because of the lack of tactile feedback, unless a portion of the foreign body is readily visible in the pleural cavity [5].

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