Use of video-assisted thoracoscopic surgery in the removal of an intrathoracic bullet: A case report

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ABSTRACT
The use of video-assisted thoracoscopic surgery (VATS) as a minimally invasive surgical technique in many lung and pleural diseases is well-established. However, the efficacy of VATS in the removal of retained intrathoracic foreign bodies is unclear. Here, we report the use of VATS in the successful removal of an intrathoracic bullet from a 7-year-old patient.

Key Words: Bullet, child, thoracoscopy

INTRODUCTION
Video-assisted thoracoscopic surgery (VATS) is a minimally invasive surgical technique with a well-established role in trauma patients, including the assessment of penetrating injuries in the diaphragm and the treatment of hemothorax, empyema, and persistent pneumothorax.[1-3] However, despite its potential as an alternative to extensive thoracotomy[4] and its ability to remove retained foreign bodies, including bullets, from the thoracic/pleural cavity, the literature contains few reports on the use of VATS in these settings.[1,2,3-7] Here, we describe the use of VATS in the removal of a bullet located in the thoracic cavity of a 7-year-old girl.

CASE REPORT
A 7-year-old girl was referred to our hospital on the identification of a suspected foreign body (bullet entry) on a posteroanterior chest X-ray obtained during her initial admission to another hospital. A wound in her neck had been recognized by her parents after she returned home from playing in the garden of their house. At our hospital, her examination revealed a good general condition, and she was conscious, with stable vital signs. A penetrating injury on the left lateral side of the neck appeared to be a gunshot entry wound [Figure 1], confirmed by visualization of the bullet in the thoracic cavity on further radioimaging, including trans-cervical and transthoracic radiography and multidetector computed tomography [Figures 2 and 3]. The bullet had exited the lung parenchyma at the basal right lower lobe. The diagnosis was a bullet free in the thoracic cavity and removal through VATS was indicated. Under general anesthesia, the patient was placed in the left lateral decubitus position and intubated with a double-lumen endotracheal tube. A 10-mm trocar and two 5-mm trocars were introduced, and the bullet was easily removed with the aid of a forceps.

The chest tube was left in place for 48 h, and the patient was discharged from the hospital on postoperative day 3. No problems were detected within the 6-month postoperative follow-up period.
DISCUSSION

This case of a 7-year-old accidental gun-shot victim demonstrates the efficacy and safety of VATS in the removal of an intrathoracic bullet. Further advantages were the short hospital stay, the absence of operative or early postoperative complications, and no long-term complications during the 6-month follow-up.

Successful outcomes following the use of VATS in the removal of foreign bodies from the thoracic cavity have been reported. Those cases included a Kirschner wire, a bullet, and a grenade fragment located in the pleural cavity, a bullet located in the pericardial sac, glass fragments in the pleural cavity, bullets from the pleural cavity, iatrogenic material or sharp objects in the thoracic cavity, and a bullet in the pericardial cavity.

Our study, together with those previous reports, establish VATS as a safe and less invasive method allowing the removal of a foreign body from the pleural cavity under direct viewing. Consistent with the faster and favorable complication-free recovery seen in our patient, VATS offers an alternative to extensive thoracotomy. Other reports have additionally determined a lower risk of complications, milder postoperative pain, shorter chest tube duration time, shortened length of hospitalization, reduced hospital costs, and an earlier return to work.

Despite its current, relatively minimal role in acute trauma care, the widespread use VATS in trauma patients can be expected, accompanied by clearer indications and standardized protocols. The increased popularity of minimal access surgery, continued technological improvements, and the increased training and experience of trauma surgeons will also contribute to the greater adoption of VATS.

In conclusion, our findings support the use of VATS as an easy, simple, and practically risk-free minimal invasive method allowing the early removal of an intrathoracic foreign body and a favorable long-term outcome in hemodynamically stable pediatric patients.

Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that name and initials will not be published and due efforts will be made to conceal the identity, but anonymity cannot be guaranteed.

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Conflicts of interest
There are no conflicts of interest.

Ethical conduct of research statement
This case report did not require approval by the Institutional Review Board / Ethics Committee.
authors followed applicable EQUATOR Network (http://www.equator-network.org/) guidelines, specifically the CARE guideline, during the conduct of this research project.

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