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Accidental chest penetration of glass foreign bodies in a 53 year old lady—The challenges with video assisted thoracoscopic extraction



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ABSTRACT

INTRODUCTION: In rare cases, a foreign body may penetrate the thoracic cavity without the person's awareness. I report a case of the traumatic intrathoracic foreign body of glass implants that the patient did not have awareness about.

PRESENTATION OF CASE: The 53-year-old woman was unsteady on her foot and leaned against the sliding door of the glass in a washroom. She fell unto a crashing glass panel sustained chest injury, and then she noticed bleeding from the left chest. Dyspnea and chest pain were emergent gradually. Chest Computed Tomography (CT) showed two foreign bodies which she did not complain of in a left pleural cavity. We performed an emergency video-assisted thoracic surgery by the diagnosis of traumatic hemopneumothorax and the foreign bodies. We could remove two glass pieces.

DISCUSSION: I found 15 cases of intrathoracic foreign body without the patient's awareness in a Japanese medical central magazine for the years 1993–2015. In some cases identifying a glass piece on perioperative X-rays may be difficult. Thus, all means for determining the accurate number of glass pieces and their approximate positions should be used, including multi-slice CT. I realize that a preoperative strategy is also important.

CONCLUSION: The patients who injured the chest with the glass without awareness of the implant of the foreign body, we take an intrathoracic foreign body by the penetration of the glass piece into consideration, need the search by the imaging. The extraction of the glass foreign bodies by VATS is very useful.

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1. Introduction

In most cases in which a person is injured by penetration of foreign bodies, such as broken glass, bullets, or shrapnel, the person has some awareness of the traumatic implantation of these foreign bodies. However, in rare cases, a foreign body may enter the thoracic cavity without the person's awareness. I report a case of a patient unaware of traumatic intrathoracic foreign bodies of glass. One of the pieces was easily removed via a thoracoscopic procedure. I will also discuss about the difficulty in extracting the piece which is deeply located in the lung parenchyma.

2. Case

A 53-year-old woman steadied herself by leaning against a sliding glass door in a washroom. The sliding door came off its track and fell sideways, with its glass shattering. The woman fell unto a crashing glass panel and sustained chest injury, subsequently noticed

bleeding from her left chest. The left eighth intercostal space has a 2 cm laceration. Because the bleeding was minor, she dismissed its severity. However, dyspnea and chest pain gradually became apparent. She consulted a primary physician 9 h after the incident. A chest X-ray revealed a left hemopneumothorax, so the physician inserted a thoracic tube into her chest. Chest CT showed foreign body pieces in the left pleural cavity. The physician determined that he would have difficulty extracting the foreign bodies and the patient was transported to our hospital 12 h after the initial injury.

Upon clinical examination, the patient was lucid and had a blood pressure of 94/54 mmHg, heart rate of 79 beats/min, respiratory rate of 18 breaths/min, and body temperature of 36.1 °C. The left eighth intercostal space had a 2-cm laceration.

A thoracic tube was in place in the left third intercostal space and there was persistent leakage of air. A small amount of bloody pleural effusion exuded from the wound. A blood test showed a red blood cell count of $242 \times 10^4/\text{mm}^3$, hemoglobin level of 6.1 g/dl, hematocrit level of 20.0%, and distinct anemia. The coagulation profile was normal. The patient reported a history of anemia. A chest X-ray showed a permeability decrease and shadows of two foreign

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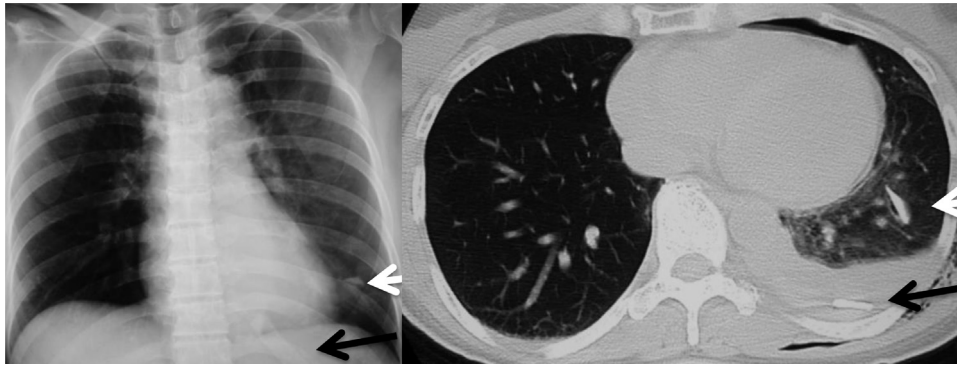


Fig. 1. Chest radiograph, anteroposterior view, show two foreign bodies (arrows) in the left lower lobe [left]. CT scan clearly demonstrates the presence of two glass pieces in the left lower lobe (white arrow) and pleural effusion (black arrow) [right].

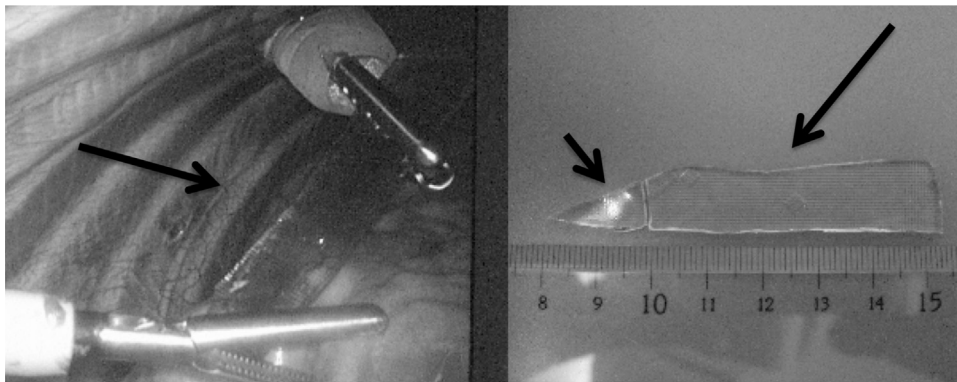


Fig. 2. Thoracoscopic photograph shows a foreign body (arrow) which was grasped by forceps before removal [left]. Photograph shows foreign bodies after removal. The long glass piece was removed from the intrathoracic space at first (long arrow), the short glass piece was removed from the right lung parenchyma through hardship last (short arrow) [right].

bodies in the lower lung field. We were able to confirm these two foreign bodies on computed tomography of the chest (Fig. 1).

We performed emergency surgery for the treatment of a traumatic hemopneumothorax under general anesthesia and the removal of the foreign bodies in the left pleural cavity. We started thoracoscopic surgery (video-assisted thoracic surgery, VATS) with the right decubitus. We found no active bleeding in the visual field. We were able to easily detect one glass piece, 1.5 × 5.0 cm, in the left pleural cavity and removed it with retention forceps. However, we were not able to find another one at a glance. We needed to take a different approach to find it. We extended the entry wound of the eighth intercostal space to 8 cm and palpated the lung with one hand in the thoracic cavity to search for the second foreign body but felt none. Since we had confirmed the presence of one more foreign body by preoperative computed tomography, we continued searching. We discovered an incised wound of approximately 1.0 cm on the surface of lung segment 8; we inserted forceps into the wound and investigated but did not feel the glass piece. We opened the parenchyma of the lung with a linear incision and finally discovered a 1.5 × 2.0 cm piece of glass in the parenchyma near the pulmonary hilum and removed it (Fig. 2). We completely sealed the air leakage from the injured lungs and finished the surgery. She was receiving blood transfusions during the surgery. Before the VATS, we performed informed consent of large surgical wound, if need be.

Postoperative chest CT showed no other glass pieces. The thoracic tube was removed 3 days. Chest physiotherapy was no need. The patient was making satisfactory progress and discharged from the hospital 8 days after the initial injury.

3. Discussion

Intrathoracic foreign bodies are classified according to the site of their presence: intrapulmonary site, endobronchial site, and thoracic cavity outside of the lungs and bronchi. A foreign body in the mediastinum is excluded from this classification. The foreign body may reach its site by a transthoracic, transthoracic, or transdiaphragm route. I conducted an Internet search for “the intrathoracic foreign body, foreign body in lung” for the years 1993–2015 with a Japanese medical central magazine and found 15 cases of intrathoracic foreign body without the patient’s awareness in Japan (Table 1) [1–14]. These cases typically involved adults. The causes of trauma were acupuncture, work accidents, falls, and iatrogenesis in medical treatment. The foreign body typically reached its site by a transthoracic route and the site was mostly intrapulmonary. The foreign bodies were needles, metal pieces, chopsticks, bamboo stick, Kirschner wires and pieces of glass. In the articles that described the time from injury to diagnosis, there were some cases in which a foreign body was found early, as in this case, and the patient underwent surgery promptly and there were other cases in which the presence of the foreign body was found after more than 40 years [3]. In each of those cases with a long time between the injury and the surgical treatment, the patient reported no symptoms and did not have a pneumothorax for intrathoracic adhesion.

The treatment was almost always surgical. VATS was performed in eight cases. Bartek et al. [15] reported the use of thoracoscopy to remove intrathoracic fragments of glass and avert the need for a thoracotomy. As shown in Table 1, one case was followed up to avert the damage of a subsequent major operation after two nee-

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