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A case of traumatic intrapleural foreign body with progressive supranuclear palsy removed by thoracoscopic surgery

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ABSTRACT

Traumatic intrathoracic foreign bodies are said to occur in many cases when the patient himself/herself is aware of the trauma. However, at the time of injury, the patient may sometimes be accompanied by loss of consciousness. We report a case of traumatic intrathoracic foreign body that was difficult to diagnose due to loss of consciousness at the time of injury.

A 51-year-old female was brought to our emergency department with a fall trauma due to loss of consciousness while bathing. The head computed tomography and electrocardiogram showed no abnormalities, and the laceration of approximately 3 cm in length was found on the left side thorax, and it was sutured and the patient was sent home. Four days later, she returned to our hospital with a complaint of left anterior chest pain, and chest X-ray showed a left degree pneumothorax and mediastinal emphysema. She underwent semi-emergency thoracoscopic removal of the foreign body, and was discharged from the hospital on the fourth postoperative day.

She had progressive supranuclear palsy, and her memory at the time of injury was not clear due to loss of consciousness caused by central autonomic neuropathy, and she also had dementia, making it difficult to interview her. She had no thoracic symptoms, and the glass fragment that had strayed into the thoracic cavity was not exposed outside the body, making the diagnosis difficult at the time of initial examination.

When a patient with loss of consciousness is difficult to interview at the time of injury, it is advisable to perform an imaging examination appropriate for the site of injury, taking into consideration the presence of foreign bodies.

Introduction

Unlike iatrogenic intrathoracic foreign bodies such as Kirschner steel wire and gauze aberration, traumatic intrathoracic foreign

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Abbreviations

CT	Computed tomography
VATS	Video Assisted Thoracic Surgery
3D	Three dimensions

bodies such as bullets and industrial accidents are said to occur in many cases when the patient himself/herself is aware of the trauma [1]. However, at the time of injury, the patient may sometimes be accompanied by loss of consciousness. We report a case of traumatic intrathoracic foreign body that was difficult to diagnose due to loss of consciousness at the time of injury.

Case report

A 51-year-old female with progressive supranuclear palsy was brought to our hospital with a fall trauma with loss of consciousness in the bathroom. Since she had no memory before and after the traumatism, a head computed tomography (CT) and electrocardiogram were performed, but no abnormal findings were not found, and since the laceration of about 3 cm was observed in the left side thorax, and was sutured. She did not complain of chest pain and a chest x-ray was not performed and was decided to follow up as an outpatient. However, 4 days later, she came to our hospital again with a chief complaint of left anterior chest pain.

Body temperature was 36.1 °C, pulse rate was 87 beats/min, blood pressure was 128/71 mmHg, SpO2 was 99 % (room air). The upper body had abrasions. The suture wound of 3 cm was observed on the left side thorax.

The blood test revealed the rise of slight inflammatory reaction with WBC 5950/ μ l and CRP 1.43 mg/dl.

Chest X-ray showed left pneumothorax and a rod-shaped foreign body with a sharp tip with pleural effusion on the left diaphragmatic angle (Fig. 1). It also revealed subcutaneous emphysema.

Chest CT showed a rod-shaped foreign body on the left diaphragm (Fig. 2A). The sagittal section revealed a knife shaped foreign body with a sharp tip (Fig. 2B).

In the three dimensions (3D) construction image, the foreign body of the knife type was similarly recognized (Fig. 3). Since the surface was smooth without ruggedness, the intrathoracic invasion of the glass piece was suspected from her clinical history.

Thoracoscopic extirpation was performed to remove the foreign body. A small amount of bloody pleural effusion was observed in the thoracic cavity, and a piece of glass was partially penetrated into the parietal pleura at the 10th intercostal space (Fig. 4). A piece of

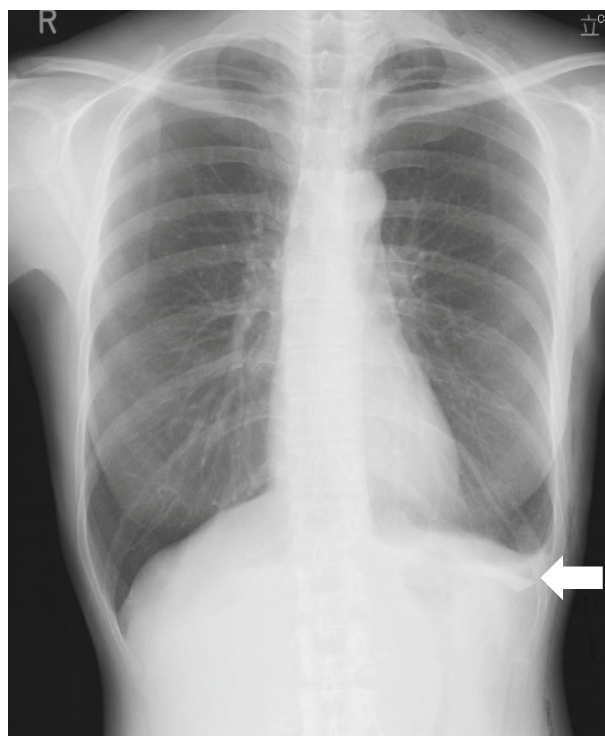


Fig. 1. Chest X-ray.

A left pneumothorax of the first degree was observed, and subcutaneous emphysema was also noted. A rod-shaped foreign body with a sharp tip was found on the left diaphragm angle along with pleural effusion.

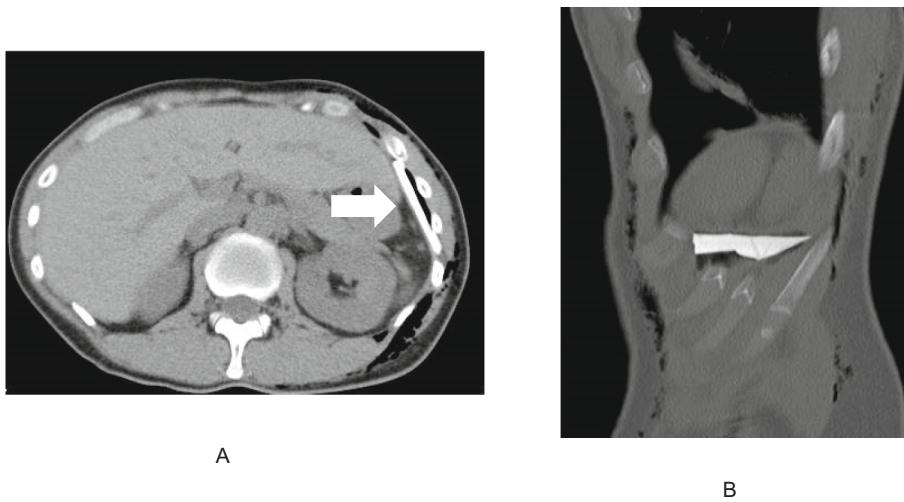


Fig. 2. A: Chest computed tomography. A rod-shaped foreign body was observed on the left diaphragm angle.
B: Chest computed tomography. Sagittal section showed a knife-shaped foreign body with a sharp tip over the left diaphragmatic angle.

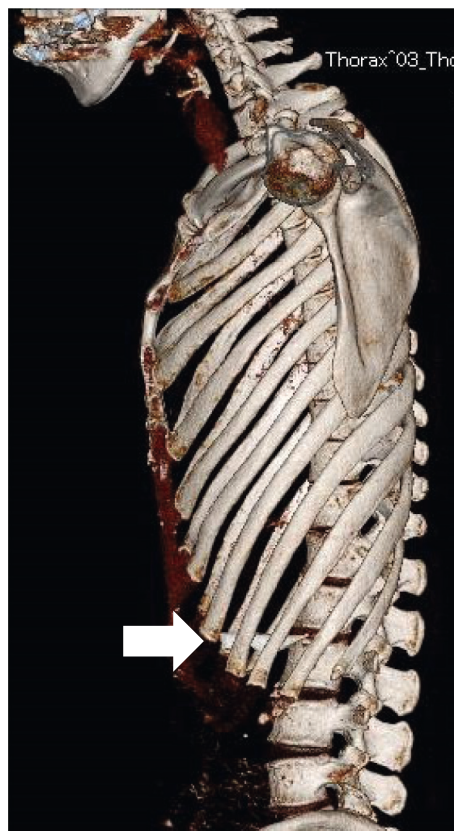


Fig. 3. 3D-CT image. A knife-shaped foreign body was observed on the left diaphragm angle. The surface was smooth with no irregularities.

glass was gently removed from the port hole. The glass pieces were 55 × 12 × 4 mm in size. The postoperative course was good, and the case left hospital on the postoperative fourth day.

Discussion

Intrathoracic foreign bodies include iatrogenic foreign bodies such as gauze, sponge, and K-wire [2–4], dentures and teeth that have migrated through the airways into the thoracic cavity [5], intrathoracic stones against the background of pulmonary tuberculosis, charcoal dust, and parasites [6], and traumatic intrathoracic foreign bodies caused by trauma such as bullets, grenade fragments, and glass fragments.

Traumatic intrathoracic foreign bodies occur more when the patient himself/herself is aware of it [11], but sometimes he/she is not aware of the invasion of foreign bodies. Especially, the patient with neurodegenerative disease and psychiatric disorder is often accompanied by the loss of consciousness by the autonomic neuropathy [7], and the lowering of the recognition function may be recognized, and there are many cases in which the interview is difficult. We report a Thoracic trauma patient with progressive supranuclear palsy. Progressive supranuclear palsy is a neurodegenerative disorder reported by Steele, Richardson, and Olszewski in 1964 [8]. It is a representative 1 disease of the parkinsonism mainly on postural reflex failure, muscle rigidity, and it is a feature that it is accompanied by the vertical eye movement failure. In addition, cognitive function decreases. Therefore, the risk of falls is higher than other parkinsonian syndromes, and the falls often cause severe trauma [9,10].

It is a reflection of this case that imaging studies should have been performed even if the trauma was minor. In this disease example, the interview from the patient person was difficult, because it was accompanied by the slight dementia in addition to the unconsciousness, and the diagnosis was made to be difficult because the family also did not observe the falling field.

For Intrathoracic foreign bodies, aggressive extraction is not recommended for metal pieces 2 cm or less as long as they are asymptomatic [11], and metal pieces larger than that and non-metal objects including sharp glass pieces as in this case are objects of extraction. The glass piece is comparatively high in the radiolucency, and there is a time when it is difficult to identify by the simple roentgenogram, and the diagnosis by CT is useful and becomes a definite diagnosis [12]. It is reported that CT is particularly easy to identify in multislice CT. Also, Habu et al. reported that even a 2– 4 mm piece of glass, which cannot be distinguished by plain radiography, can be depicted by digital image processing of radiographs in radiography [13]. In this case, chest CT was not carried out, because it was diagnosed as abrasion and contusion wound caused by the fall by the loss of consciousness in the initial diagnosis. However, we could make the diagnosis of the intrathoracic invasion of the glass piece stronger, because the foreign body was identified in the multislice CT inspection in the re-examination, and in addition, the foreign body was able to be evaluated three-dimensional in the 3D construction image. It is considered that the 3D image construction is useful, when the internal invasion of the foreign body is suspected.

Thoracoscopic removal of foreign body is chosen as a therapy. VATS is now the standard of care because it is minimally invasive for patients, relieves postoperative pain, leads to good postoperative lung expansion, and reduces hospital stay. Especially, in the thoracic trauma operation, it can be called a low invasion therapy established in the thoracic trauma operation, because it is possible to simultaneously carry out not only the evaluation of complications such as hemorrhage and empyema but also evaluation of the injury of the diaphragm, etc., and also to place the pleural cavity drain from the port insertion position. The surgical treatment by VATS was similarly carried out in this patient, and she was able to leave hospital in the short period of postoperative 4 days. The 3D image construction also made it possible to accurately determine the location of the glass fragments, which facilitated the removal surgery.

Fall patients with neurodegenerative diseases and psychiatric disorders may be accompanied by loss of consciousness, and there are many cases with severe trauma, and interview is also difficult in many cases. In the trauma of the patient in question, taking into consideration the possibility of foreign bodies entering the body, a CT scan appropriate for the injured area should be performed, and it is important a 3D image should be used for evaluation.

Conclusion

3D-CT is useful for trauma patients who are difficult to interview with neurodegenerative disease.

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Availability of data and materials

The dataset supporting the conclusion of this article is included within the article.

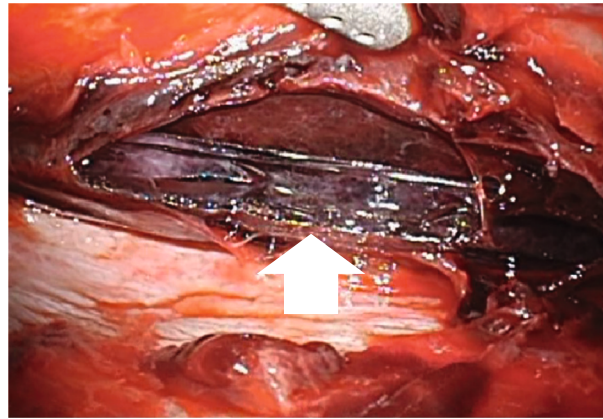


Fig. 4. Intraoperative finding.
A glass fragment exposed from the parietal pleura was observed.

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CRedit authorship contribution statement

MK was responsible for the study concept, data collection, and writing the paper. The other authors collected data, reviewed and corrected the manuscript. The authors read and approved the manuscript.

Declaration of competing interest

The authors declare that they have no competing interests.

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