

A Decade-Old Retained Intrapleural Glass Fragment in an Asymptomatic Skydiver: A Case Report and Review of the Literature

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Case Report

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Abstract

Retained intrathoracic foreign bodies are usually discovered after a traumatic event that the patient clearly remembers. Glass, however, can be especially problematic. It is frequently retained, may be missed during the initial assessment, can appear variably on imaging, and may migrate months or even years after injury rather than becoming securely encapsulated. To our knowledge, an entirely asymptomatic intrapleural glass fragment discovered incidentally in a skydiver has not previously been reported.

We describe a 34-year-old male skydiver who was referred after a routine screening chest radiograph showed an abnormal shadow in the right hemithorax. Ten years earlier, he had sustained a penetrating right-sided chest injury during a parachute landing, when he crashed through a window. At that time, he was treated for haemopneumothorax with intercostal drainage, but no foreign body was suspected or actively sought. On current examination, he had a contracted right hemithorax. Computed tomography revealed a radio-dense pleural foreign body. Right-sided thoracotomy was performed, and a 7 × 2.5 cm glass fragment was removed from dense pleural adhesions. His postoperative recovery was uneventful, and he later returned to skydiving.

Introduction

Retained foreign bodies in the tracheobronchial tree, gastrointestinal tract and peritoneal cavity are well recognised. By contrast, foreign bodies retained in the pleural cavity or chest wall are uncommon, and there is no universally accepted approach to their management¹. Most cases of penetrating thoracic trauma are associated with a clearly remembered injury. Occasionally, however, the diagnosis is delayed or made incidentally, particularly when the initial clinical focus is on a more urgent problem such as haemopneumothorax, when consciousness is impaired, or when the possibility of a retained object is not considered^{2,3}.

Glass deserves particular attention in this setting. It accounts for a substantial proportion of traumatic wounds, is among the foreign bodies most often retained and missed initially, and may not always become stably encapsulated^{4,5}. Migration has been reported months to decades after injury, with potential complications including haemothorax, pneumothorax, empyema, and cardiac or vascular injury⁶.

We report the case of an asymptomatic skydiver in whom a retained intrapleural glass fragment, the unrecognised consequence of a parachute-jump chest injury treated a decade earlier with intercostal drainage alone, was discovered only on routine chest radiography and removed surgically via thoracotomy. To our knowledge, this combination of mechanism, delayed incidental detection and complete absence of symptoms in a skydiver has not previously been reported.

Case Report

A 34-year-old male skydiver was referred to the department of pulmonary medicine at a tertiary care hospital after a screening chest radiograph, obtained during a routine medical evaluation, showed an abnormal opacity in the right hemithorax (Figure-1). He was completely asymptomatic. He denied cough, breathlessness, haemoptysis and chest pain, and had continued unrestricted physical activity.

On directed questioning, he recalled a significant injury approximately ten years earlier. During landing from a parachute jump, he had crashed through a window and sustained a penetrating injury to the right side of the chest. He had presented to a peripheral hospital with right-sided chest pain and breathlessness and was diagnosed with a right haemopneumothorax. Intercostal drainage was performed, and the drain was removed after 12 days. He recovered uneventfully. At that time, no retained foreign body was suspected or investigated. He resumed parachute jumping about two years later and remained symptom-free thereafter.

At the current presentation, he was afebrile and haemodynamically stable, with a pulse rate of 82/min, blood pressure of 118/78 mmHg, respiratory rate of 18/min, and oxygen saturation of 97% on room air. A well-healed scar was present over the right posterolateral chest wall. The right hemithorax appeared contracted, with rib crowding, ipsilateral tracheal shift, reduced chest expansion and diminished breath sounds in the right infrascapular region. Haematological and biochemical investigations, including coagulation profile and inflammatory markers, were within normal limits.

Contrast-enhanced computed tomography of the thorax demonstrated an elongated, sharp-edged, radio-dense foreign body within the right pleural space. There was adjacent localised pleural thickening, but no significant pleural effusion, vascular contact or lung parenchymal involvement (Figs. 2A–2C). Three-dimensional reconstruction localised the fragment, which measured $7 \times 2.5 \times 0.28$ cm, in relation to the chest wall (Fig. 3).

After informed consent, right-sided thoracotomy was performed under general anaesthesia with single-lung ventilation, with the patient in the left lateral decubitus position. Dense pleural adhesions were encountered and carefully released. A 7×2.5 cm glass fragment was retrieved intact from the pleural cavity (Fig. 4). Haemostasis was secured, and an intercostal drain was placed.

The postoperative course was uneventful. The drain was removed on postoperative day 7 after confirmation of full lung expansion, and the patient was discharged on day 10. The retrieved object was confirmed to be a glass fragment. At 6-month follow-up, he remained asymptomatic, his chest radiograph was normal, and he subsequently returned to skydiving after two years of surgery.

Discussion

Intrapleural glass foreign bodies are rare. Ehrt et al. identified only 21 intrapleural cases from ten reports spanning nearly a century, along with eight additional cases involving other intrathoracic sites⁶. The present case is unusual for three reasons: the mechanism of injury, with glass entering the chest during a parachute landing through a window; the completely asymptomatic presentation a decade later;

and the recreational skydiving context. To our knowledge, these features have not previously been reported together. The clinical, radiological and operative features of the present case are compared with representative reported cases of intrathoracic glass foreign bodies in Table 1.

The mechanism in this case can be viewed as a form of impalement, which is the dominant mechanism described in the literature, although previously reported examples more often involve falls onto glass doors, windows or tables⁶. The patient's age and activity level also make the case notable. Reported patients have ranged widely in age and include both sexes^{1-4,6}, but this patient remained physically active and continued high-demand recreational activity for years after the injury.

The size of the retained fragment is also striking. At 7 × 2.5 cm, it is larger than many reported pleural glass fragments and comparable to some of the larger intrathoracic glass foreign bodies described in the literature. Despite its size and ten-year dwell time, it did not erode into a vessel or migrate into a vital structure. This favourable outcome, however, should not be assumed in similar cases. The known potential for migration and delayed complications is one of the main reasons elective removal is recommended.

The presentation is perhaps the most instructive part of this case. Retained intrathoracic glass usually presents acutely, with haemopneumothorax, chest pain, dyspnoea or shock, or later with symptoms such as cough, sputum production, haemoptysis, pain or infection^{2,4,6-8}. Truly silent, incidentally detected fragments are exceptional and tend to occur when the patient was unaware of the retained object, had forgotten the injury, or when the initial clinical priority was a more urgent thoracic complication^{3,6}.

In this patient, the original haemopneumothorax understandably drew attention during the first presentation, and the possibility of a retained glass fragment was missed. Over time, adhesions likely sealed the pleural space around the fragment, explaining the absence of pneumothorax or ongoing symptoms. Interestingly, although glass is often considered less likely than some other materials to provoke a strong fibrous reaction, dense adhesions and a contracted hemithorax were present in this case. The initial haemopneumothorax, pleural inflammation and intercostal drainage may have contributed to this fibrothoracic response.

Radiographic detection is another important lesson. Glass is often described as difficult to detect, but many glass fragments are radio-dense and can be visible on plain radiographs, particularly when 2 mm or larger and not obscured by overlying bone⁹. In the present case, the abnormality was first recognised on routine chest radiography. Computed tomography then confirmed the diagnosis, localised the fragment, assessed its relationship to adjacent structures and helped guide operative planning. Where available, multi-slice CT and three-dimensional reconstruction can be particularly useful when multiple fragments are suspected or when operative anatomy is complex²⁻⁴.

Management of retained intrathoracic foreign bodies must be individualised, but there is broad agreement that loose, sharp intrapleural glass fragments should be removed when feasible, even in

asymptomatic patients. This is because glass may migrate and cause delayed haemorrhagic, infective, pulmonary, cardiac or vascular complications. Observation may be reasonable for selected small, blunt, inert metallic fragments, but sharp glass is generally treated differently^{1,3,6,8}.

Video-assisted thoracoscopic surgery offers a minimally invasive and effective approach for retrieval in suitable cases. A 2023 systematic review of intrathoracic foreign-body removal reported favourable outcomes with VATS across a range of thoracic sites and clinical settings^{10,11}. In the present case, the dense pleural adhesions and contracted, fibrothoracic hemithorax made open thoracotomy the safer approach, and the fragment was removed intact with an uneventful recovery. Thoracotomy should remain an option when adhesions are extensive, localisation is difficult, or safe thoracoscopic extraction is not possible^{1,4,6}.

This case therefore reinforces a simple but important clinical message: a remote history of penetrating chest trauma should not be dismissed when evaluating an unexplained thoracic radiographic abnormality, even if the patient is entirely asymptomatic.

Conclusion

A retained intrapleural foreign body should be considered whenever a chest radiograph shows an unexplained abnormality in a patient with previous thoracic trauma, even if the injury was remote, apparently minor or followed by years without symptoms. In this case, a large glass fragment retained after a parachute-jump chest injury remained silent for a decade and was discovered incidentally, having produced fibrothoracic changes. Given the potential for migration and delayed complications, CT-guided planning followed by elective surgical removal – thoracoscopic where feasible, or open thoracotomy when dense adhesions preclude it – is a safe and definitive strategy in appropriately selected patients.

Declarations

Disclosure of Competing Interest

The authors declare that they have no competing interests.

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Patient Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Ethics declaration: Not applicable

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Table 1

Table 1 is available in the Supplementary Files section.

Figures

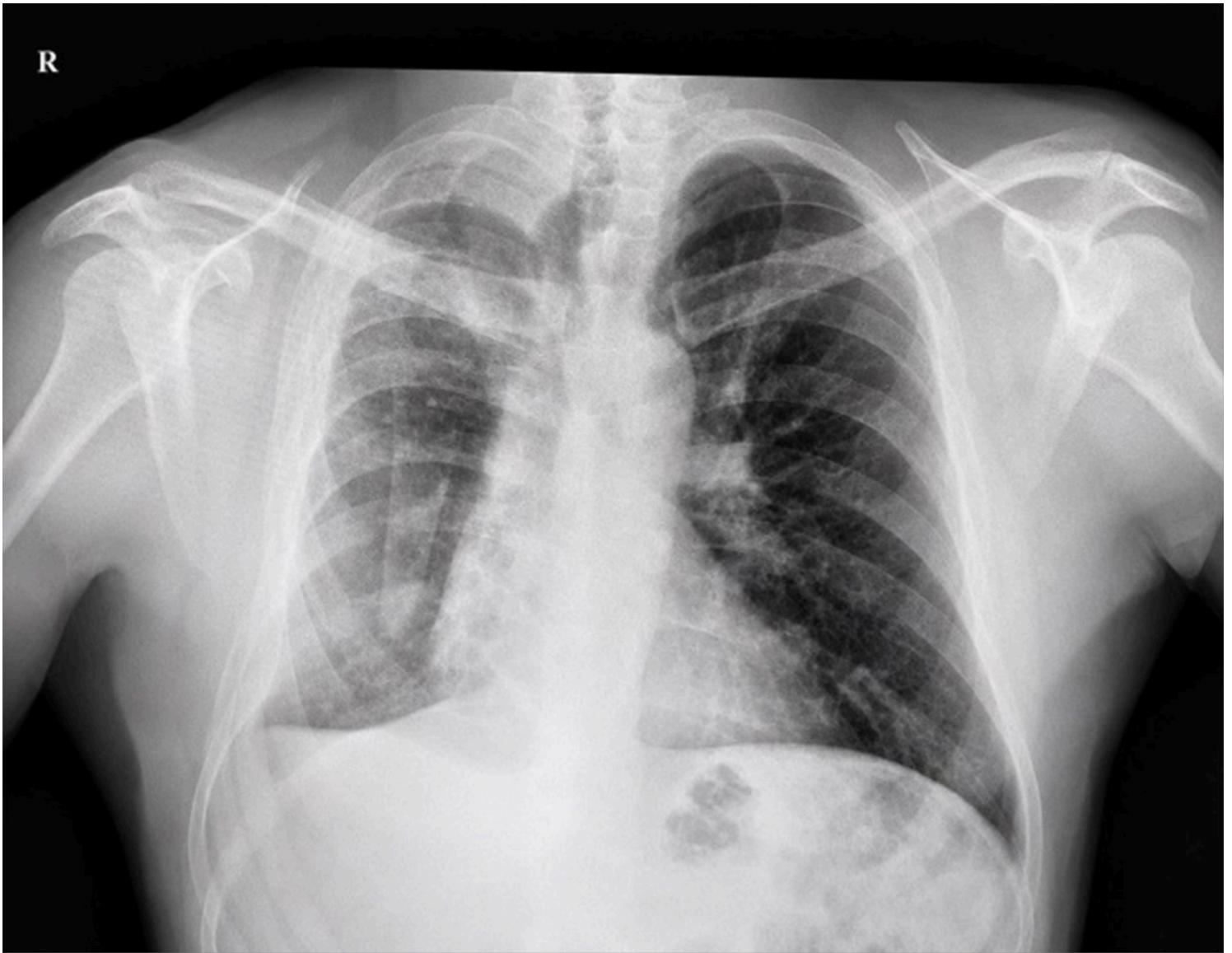


Figure 1

Chest radiograph PA view demonstrating an elongated linear radiopacity projected over the right mid and lower lung zones, associated with chronic right fibropleural scarring and ipsilateral volume loss.

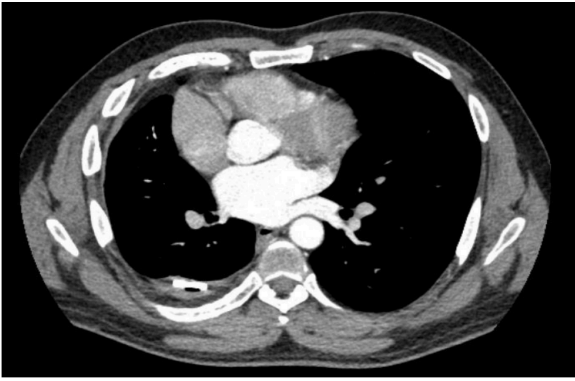


Figure-2A



Figure – 2B



Figure – 2C

Figure 2

A, B & C. Contrast-enhanced computed tomography of the thorax (axial, coronal and sagittal view) demonstrating an elongated, sharp-edged, radio-dense intrapleural foreign body (high attenuation; HU [insert correct positive value]) in the right pleural space, with adjacent pleural thickening and volume loss in right hemithorax and mediastinal shift.

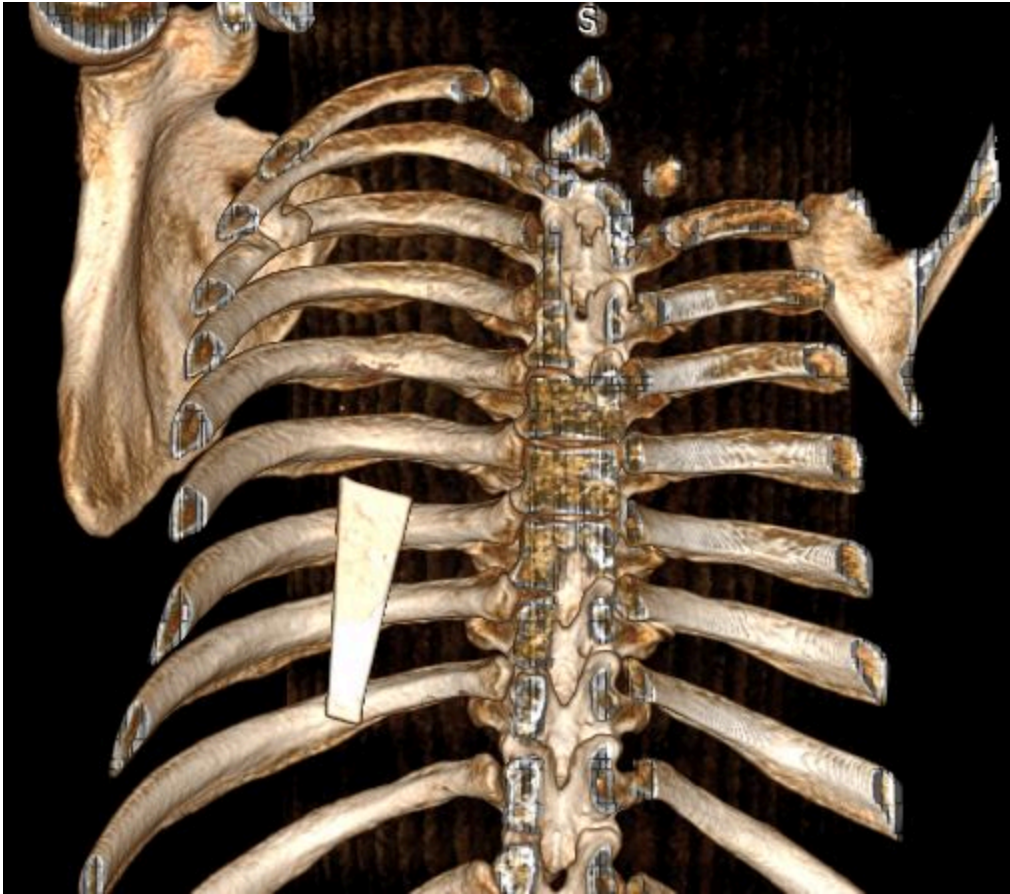


Figure 3

Three-dimensional reconstruction localising the fragment measuring $7 \times 2.5 \times 0.28$ cm in relation to the chest wall



Figure 4

Retrieved glass fragment

Supplementary Files

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- [Table1.docx](#)