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## Case Report

# Retained periocular wooden foreign body – A near miss

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### ABSTRACT

Wooden foreign bodies (WFBs) in and around the orbit are known to go undetected partially or in toto by conventional modalities like computed tomography (CT) and magnetic resonance imaging (MRI) and have serious long term complications such as infection, abscess or fistula formation, orbital cellulitis and intracranial migration. A keen inspection of the wound site before, during and after primary removal are crucial in preventing development of vision-threatening and potentially fatal complications due to retained vegetative elements. With a case report, we aim to highlight the importance of radiological investigation and a high degree of suspicion in cases of injuries with WFBs.

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## 1. Introduction

Ocular trauma is almost always a sight threatening event. From complicated cases like open globe injury to minor scrapes and bruises, timely management, regular follow up and chronic suspicion of potential complications are necessary. The presence of coexisting fractures and other cranio-facial damage requires multidisciplinary efforts for optimal outcomes.

Retention of foreign bodies following trauma is commonly seen in and around the eye- statistically more common in males and in those working outdoors.<sup>1</sup> They may be identified based on the presenting symptoms, or go undetected for years until they are either detected incidentally or when they start causing damage to nearby structures. Intraorbital migration of foreign bodies is a documented phenomenon. A higher degree of suspicion is warranted in cases involving friable material like wood,

as these are cases where smaller fragments may be easily missed during preliminary imaging and even on subsequent investigation.<sup>2</sup> Although cases of spontaneous extrusion and complete resolution of symptoms have been reported, the organic nature of WFBs hinders their management and holds potential for multiple complications.

## 2. Case Report

A 30 year old male presented to our hospital ten days after he had an injury with a piece of wood from a coconut palm leaf that fell on his head and perforated the skin of the forehead, with no visible exit wound. He also sustained minor abrasions over the lower lid skin on the left side. By the patient's report, a piece of the leaf stem petiole around 8 cms long was removed at a nearby clinic and he received a course of systemic amoxicillin-clavulanic acid.

When he presented to us, he had mild left upper lid ptosis, a painless and well defined swelling above the medial canthus and scanty purulent discharge from the wound on his forehead, which had been worsening over the last

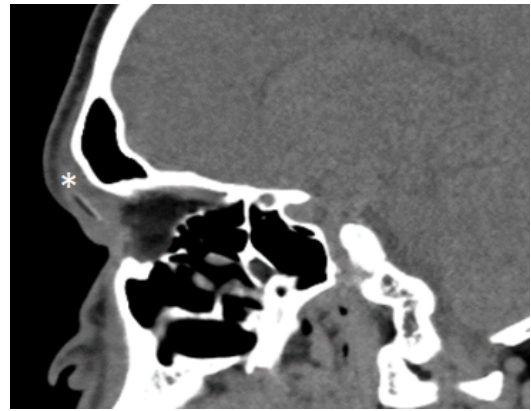
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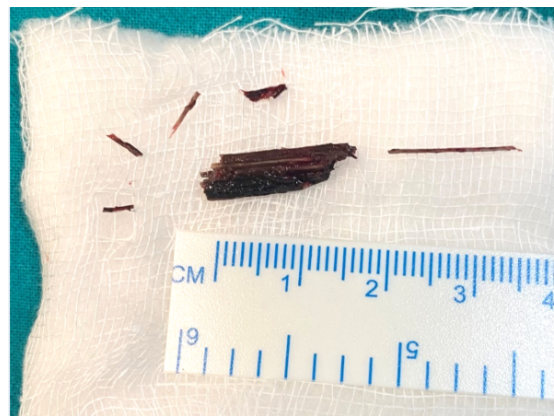
two days (Figure 1). A tensely cystic, mobile mass was palpated below the medial end of left eyebrow without any tenderness. There was no subcutaneous foreign body felt on palpation. The vision, anterior segment and fundus examination were within normal limits in both eyes, and no extraocular muscle involvement was noted in the form of painful or limited movements.

A computed tomography (CT) scan identified a vertically positioned linear hypodense region with a hyperdense rim in the periorbital fascia over the superonasal rim of the left orbit- suggestive of a foreign body with surrounding inflammation (Figure 2). It also confirmed no damage to the bone, orbit or extraocular structures including paranasal sinuses. The presence of a retained wooden foreign body was suspected in view of the history.

After pre-operative assessment, and with informed consent, the abscess was incised and drained under local anaesthesia. Upon deeper exploration, a large retained WFB with splintered edges measuring 19.5mm x 5mm x 3mm was recovered. Four more friable splinters were found on flushing the wound, ranging from 4 mm to 16mm in length (Figure 3). After a thorough antibiotic and povidone wash the wounds were closed and the patient was given oral metronidazole and amoxicillin-clavulanic acid for a week. On subsequent follow-up visits, the patient was comfortable and there was no recurrence of the swelling or other fresh complaints (Figure 4). Scanty growth of *Klebsiella pneumoniae* resistant to ampicillin/amoxicillin was detected on culture-sensitivity analysis of wood and purulent matter from the abscess.



**Fig. 2:** Sagittal section of the CT scan showing a vertically positioned linear hypodense region with a hyperdense rim- indicated by the asterisk



**Fig. 3:**



**Fig. 1:**



**Fig. 4:**

### 3. Discussion

The patient in this report had a wooden foreign body that entered the skin of his forehead and traveled through the subcutaneous space to enter the preseptal space. Important structures like the brain within the cranium and the eyeball within the orbit were just a few millimetres away. Probably, even a small change in the direction or position of his head during the trauma could have been disastrous especially in the setting of a retained foreign body.

This report highlights an instance of multiple retained WFBs, which notoriously escape detection on routine radiological scans commonly performed in the emergency setting. It is a common occurrence; especially because X-rays are practically unable to identify the wood. The density of wood is lower than that of most soft tissues in the human body, making wooden objects discernible by shape or size only when viewed from certain angles or in contrast to surrounding structures.<sup>3,4</sup>

While some sources suggest the same is true of CT scans, others argue that they can identify WFBs in most cases but demonstrate poor consistency when it comes to their description- ranging from hypodense air-like bubbles to hyperdense streaks. Besides being variable in appearance, the measured density (in Hounsfield Units) could lie anywhere from ‘-618 HU to +23 HU’ according to the only study comparing radio density of various intraorbital foreign bodies.<sup>2</sup> These can be easily explained as soft tissue alterations in the presence of surrounding inflammation and damage. In addition to a soft tissue window (350 HU width/40 HU level), a bone window (4000 HU width/400 HU level) can enhance edge definition to reveal reticular patterns in suspicious cases.<sup>5–10</sup>

Magnetic resonance imaging (MRI) has been able to describe the inflammation that surrounds retained wooden matter but is as variable as other imaging when illustrating the foreign body itself, which may lead to a missed or misdiagnosis. It is better at detecting dry wood (hypointense to fat on T1) as the decreasing hydration in freshly cut wood gives it the appearance of various soft tissues over time.<sup>5,7</sup>

Ultrasonography provides a more sensitive detection of such structures, with relatively consistent descriptive features of hyperechogenicity, acoustic shadowing and a hypoechoic halo of inflammatory activity seen in some chronic cases.<sup>4,5</sup> It however has disadvantages of lower resolution and being highly dependent on the operator’s skill and experience.

To further complicate matters, wood being a natural element has a high degree of variability depending on its source and the changes it undergoes while retained in the body. Higher density is seen in hard wood like oaks as compared to soft wood. The porous network structure, in addition to being a nidus for infection, can cause radiologically significant variations in its appearance over time. Green wood, which has been freshly cut, has a higher

water content which is replaced by air over time as it dries.<sup>9</sup>

Metallic or glass foreign bodies in contrast pose less of a threat when comparing the possibility of long term complications, as they are easily detected on all imaging modalities. Being inorganic they are easily wrapped by surrounding tissue and may even be left in vivo when retrieval itself would likely worsen the situation.

Knowing the difficulties in identifying a wooden foreign body on imaging techniques, it is very important to have a high index of suspicion in such cases. In our case, the presence of a frontal subcutaneous space which the foreign body could easily traverse, and the orbital septum which prevented its entry into the orbit saved the patient from a lot of grief- a near miss indeed!

### 4. Acknowledgement

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### 5. Conflict of Interest

The authors declare that there are no conflicts of interest in this paper.


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