



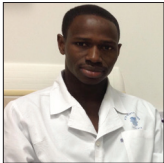
Case Report

# Management of a large intraorbital wooden foreign body: Case report

John Nute Jabang<sup>1</sup>, Lamin Dampha<sup>1</sup>, Binta Sanyang<sup>1</sup>, Charles Adeyemi Roberts<sup>2</sup>, Bakary Ceesay<sup>3</sup>

<sup>1</sup>Neurosurgery Unit, Department of Surgery, Edward Francis Small Teaching Hospital, <sup>2</sup>Department of Surgery, Edward Francis Small Teaching Hospital, <sup>3</sup>Ophthalmology Unit, Department of Surgery, Edward Francis Small Teaching Hospital, Banjul, Gambia.

E-mail: \*John Nute Jabang - jjabang@utg.edu.gm; Lamin Dampha - dampha85@gmail.com; Binta Sanyang - bntsanyang@gmail.com; Charles Adeyemi Roberts - adeyemir@yahoo.com; Bakary Ceesay - bakary149@gmail.com



**\*Corresponding author:**

John Nute Jabang,  
Neurosurgery Unit,  
Department of Surgery,  
Edward Francis Small Teaching  
Hospital, Independence Drive,  
Banjul 00220, Gambia.

jjabang@utg.edu.gm

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## ABSTRACT

**Background:** Intraorbital foreign bodies are a global injury and occur with a frequency of one in six orbital injuries; however, intraorbital wooden foreign bodies are uncommon. Intraorbital wooden foreign bodies predominantly affect the male population with a mean age ranging from 21 to 22 years. The diagnosis of intraorbital wooden foreign bodies depending on their size can be challenging on imaging and if not removed early the risk of infection is high.

**Case Description:** A 23-year-old motorcyclist presented to the ER following a collision with a donkey cart carrying wood 3 h before presentation. Examination revealed an acutely ill-looking man in painful distress with a right supraorbital laceration associated with ipsilateral ptosis and periorbital edema. There was a retained intraorbital wooden foreign body. Computed tomography scan showed evidence of both an intraorbital bone fragment and a wooden foreign body. Surgery was done 3<sup>rd</sup> day of admission before which vision has declined with only perception to light. Only the wooden foreign body was removed. Evolution was favorable with recovery of vision and improvement of the ptosis.

**Conclusion:** The management of intraorbital wooden foreign bodies demands a multidisciplinary approach after a thorough history, examination, and imaging. Treatment of choice is timely and meticulous removal of the foreign body to avoid infection and other associated complications.

**Keywords:** Computer tomography scan, Intraorbital wooden foreign body, Magnetic resonance imaging, Orbital cellulitis, Orbital trauma, Visual acuity

## INTRODUCTION

Intraorbital foreign bodies (IOFBs) are a global injury and occur with a frequency of one in six orbital injuries; however, intraorbital wooden foreign bodies are uncommon.<sup>[9]</sup> These vegetative foreign bodies must be removed as they serve as a nidus for orbital infection.<sup>[3]</sup> We report a case of a large intraorbital wooden foreign body together with a bone fragment presenting with visual decline which improved after removal of the wood.

## CASE DESCRIPTION

A case of a 23 years old who presented to the ER after 3 h of an RTA. He was riding a motorbike and collided with a donkey cart that was carrying wood. On examination, he was in acute

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painful distress with GCS of 15. He had right supraorbital laceration with associated ptosis and ipsilateral periorbital edema and conjunctival ecchymosis. There was a wooden foreign body [Video 1]. A brain computed tomography (CT) scan showed an evidence of a wood associated with an intraorbital bone fragment [Video 1]. He was then admitted and boarded on IV augmentin, T.T stat, and dexamethasone eye drop. Two days into admission he was operated using the same supraorbital laceration that was widened and the large intraorbital wood measuring 5 cm×3 cm [Video 1] was extracted; however, the bone fragment was left *in situ*. Surgery was uneventful and post-operative evolution was favorable with slight eye opening achieved on POD2 and improved vision.

## DISCUSSION

An IOFB is defined as an object located inside the bony orbital walls, posterior to the orbital septum but outside the ocular globe.<sup>[8,10]</sup> Its position can be extraconal or intraconal,<sup>[10]</sup> and it can be classified as metallic or nonmetallic; in turn, non-metallic IOFBs can be organic or inorganic.<sup>[10]</sup> Intraorbital wooden foreign bodies (IOWFBs) predominantly affect the male population with a mean age ranging from 21 to 22 years in some of the largest series<sup>[1,9]</sup> similar to our case of a 23-year-old male. The distribution of wooden foreign bodies ranges from tree branches, pencil, stick, and bush.<sup>[9]</sup> The time lapse from injury to presentation ranged from 3 h to 22 months according to Taş and Top series where the size of the foreign body was indirectly proportional to time lapse. A similar case was seen in our patient with a large IOWFB presenting to hospital 3 h after the incident.

IOFBs represent an uncommon pathology in neurosurgical practice. Larger neurosurgical case series that report the characteristics in terms of diagnosis and treatment of different categories of foreign bodies, according to their material and location in the orbit, as a reference for neurosurgeons who encounter this pathology is very rare.<sup>[8]</sup> Whereas they account for 3% of the consultations in emergency departments in the U.S the organic foreign bodies, especially wooden ones are linked to a high risk for bacterial and fungal infections, inflammatory granuloma formation, and calcification. Wooden foreign bodies are particularly difficult to remove due to their soft structure, making them prone to fracture during extraction with the risk of remnant fragments and consequent infection.

The most frequently manifesting clinical symptoms of traumatic optic neuropathy were orbital pain, diplopia, and decreased vision or visual field defect. The pathognomonic sign was the presence of an open or closed entry wound. In our cases, the entry wound was located primarily on the eyelids.<sup>[8]</sup> According to the material, the metallic foreign bodies leaved entry wounds the most frequently in the

conjunctival fornix, while all the non-metallic foreign bodies penetrated the eyelids.

Different imaging modalities are available for these types of trauma. The utility of X-rays aside from the identification of intraorbital metallic foreign bodies is more or less insignificant.<sup>[6,7]</sup> Magnetic resonance imaging (MRI) is preferred to CT scan in the investigation of intraorbital wooden foreign bodies giving a sensitivity of 57% and 42%, respectively. The density of intraorbital wood varies according to the degree of hydration,<sup>[6]</sup> from fat density to that of air. In the acute phase of the trauma, the wood is dry hence hypodense as opposed to the orbital fat, however in the chronic phase the wood becomes hydrated due to inflammatory process with a density similar to that of orbital fat and therefore making the CT diagnosis more difficult.<sup>[6]</sup> IOWFBs often have delayed presentations and are missed on initial imaging. In one large series, wood was not definitively identified on 35% of initial CT scans.<sup>[11]</sup> MRI is more sensitive in the diagnosis of an intraorbital wooden foreign body which appears hypo-T1 and hypo-T2 compared to fat.<sup>[6]</sup> However, it is important that radiologists be informed regarding the width and level settings when there is a suspicion of IOWFB.<sup>[11]</sup> In the literature, it is reported that standard CT image is not an appropriate method for showing acute IOWFB due to the possibility of its mimicking air images.<sup>[2]</sup>

The surgical approach, for removal, depends on the nature of the body, its location (anterior or posterior orbit), and associated complications (infections, optic nerve lesions, or compression, and lesions to the extraocular nerve or intraorbital blood vessels). As an unusual case both for the Neurosurgery Unit and the Ophthalmology unit (in fact first of its kind), a series of interdisciplinary consultations and planning were convened before we finally decided to operate the 3<sup>rd</sup> day on admission, thus delaying the surgery. Suffice to say that this delay in surgery further increases the risk of infection in patients with intraorbital wooden foreign body. The surgical approach was chosen according to the location of the foreign body, the foreign body was extracted by the use of the entry route in our patient as it was visible and easily accessible after circumferential dissection done by a combined neurosurgery and ophthalmology team.<sup>[5]</sup> However, after removal of the wooden foreign body, we attempted reducing the bone fragmented which was not successful as a result we considered it prudent to leave it *in situ* and not to risk other vital intraorbital structures though this may also occasion the risk of ophthalmoplegic injuries. Our patient however had a favorable outcome and at discharge never had any complication. Conventional open methods of removal increase morbidity, scarring, disfigurement, and other complications. Various approaches have been used in IOFBs largely depending on the size,

nature, and location of the foreign body. These include: anterior transpalpebral approach, anterior transconjunctival approach, lateral approach, superior transfontanel, and transnasal endoscopic removal which has been described as safe, less damaging, and easy because it gives you direct visualization.<sup>[7,8]</sup> Ultrasound guidance has also been reported.

Rates of infection in the context of IOWFB are reported as high as 64%, antibiotics are essential, especially as culture of the excised IOWFB is frequently polymicrobial. As a general recommendation, empirical broad-spectrum antibiotics should be administered in each case, and antifungal treatment should be used in cases of wooden foreign bodies.<sup>[4]</sup> Our patient received ceftriaxone and flagyl on admission till discharge.

## CONCLUSION

The management of intraorbital wooden foreign bodies demands a multidisciplinary approach after a thorough history, examination, and imaging. Their diagnosis, depending on their size and duration can pose a challenge as they are not easily identifiable on CT scan. The high risk of bacterial and fungal infection of intraorbital wooden foreign bodies are dependent on their duration as a result, meticulous removal of the foreign body so as to avoid such complications is the treatment of choice.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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