

## A challenging case of a large intraorbital foreign body perforating the nasal septum in a child

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A 5 year old boy with a history of fall from a height of about 4 feet, presented after one week with swelling, watering and discharge of the right eye. He had severe conjunctival chemosis with superior displacement of the globe. Computed Tomography (CT) showed a linear low attenuation tract in the right orbit extending from the inferolateral wall up to the left uncinat process of the ethmoid bone with increasing Hounsfield unit after 10 days. The parents did not agree for early exploration. After 10 days an exploration was done and a large linear and irregular wooden foreign body (FB) measuring 4.5 × 1.5 cm<sup>2</sup> was removed from the right orbit and a smaller one from the nasal cavity. Four weeks post surgery, his vision was 6/9 in the right eye with the eyeball in the normal position. This case was challenging because of the late presentation, parents not agreeing for early exploration, difficulty in diagnosing by CT and a large and very deep penetrating FB.

**Key words:** Foreign body, intra-orbital, nasal septum, wooden

Orbital wooden foreign bodies (FBs) penetrating into the orbital and facial areas are common during falls, with children and young adults being more susceptible to these injuries.<sup>[1]</sup> Wooden FBs being organic and porous act as a good medium for bacterial growth and if not removed promptly may lead to infections and severe complications such as orbital cellulitis,

orbital abscess, fistulas, optic neuropathy, and so on.<sup>[2-4]</sup> Moreover, radiological imaging of wooden FBs is complex due to their varied appearances and presents a unique diagnostic challenge.<sup>[5]</sup> We report here a challenging case of a large intraorbital wooden FB in the right orbit of a child following a fall, perforating the nasal septum and extending up to the left uncinat process of the ethmoid bone.

### Case Report

A 5 year old presented to the casualty with swelling, watering and discharge of the right eye (RE) for 4 days. The parents gave a history of fall from a height of about 4 feet, one week before the presentation. On examination, there was severe periorbital oedema. Examination of the eye could be done only with the help of lid retractors. The vision in the RE was perception of light with accurate projection of rays. However, there was severe conjunctival chemosis and the eyeball was not visible and appeared to be displaced superiorly [Fig. 1]. Extra ocular movements could not be assessed. On palpation, a hard structure was felt below the displaced globe. The consensual pupillary light reaction was present in the left eye. A superficial, small linear lacerated wound was noted in the lateral aspect of the right inferior eyelid. Ocular ultrasound (USG) showed displaced but intact globe; no FB was seen. Axial CT soft tissue window showed a linear low attenuation track with attenuation values of -300 Hounsfield unit (HU) approximately in the right orbit extending from inferolateral wall through the medial orbital wall, bony nasal septum and medial turbinate reaching up to the left uncinat process of the ethmoid bone, causing superior displacement of the right globe [Fig. 2a]. Coronal section showed the globe to be intact and displaced superiorly due to mass effect [Fig. 2c]. Extraocular muscles were found to be intact. Axial CT bone window showed fracture of the medial wall of the right orbit and nasal septum with hyperattenuating contents in the right and left maxillary sinus and nasal cavity. The parents refused exploration and took discharge against medical advice. However, they returned back after 10 days and a repeat CT scan showed the presence of the linear attenuation track but the attenuation values increased to approximately -30 HU [Fig. 2b]. With full written consent of the parents, an exploration was done under general anaesthesia. A linear and irregular wooden FB measuring 4.5 × 1.5 cm<sup>2</sup> [Fig. 3] was

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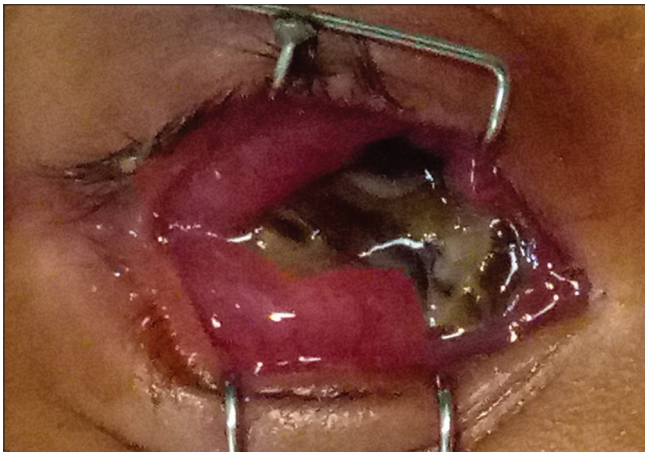
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removed and a track extending through the medial orbital wall was traced. There was a lamellar laceration of the inferior one-third of the cornea which was repaired with 10-0 Nylon suture. The otorhinolaryngologist explored the nasal cavity in detail with the help of a video-assisted nasal endoscope and a wooden FB measuring about  $0.7 \times 0.5 \text{ cm}^2$  only was removed. No other FB was found. Therefore, no further active intervention was required and the nasal cavity was packed. Postoperatively, the child was started on intravenous broad spectrum antibiotics and anti-inflammatory medications. Topical antibiotic, antifungal, artificial tears and atropine 1% eye drops were given for the RE. The nasal packing was continued for 2 days.

Four weeks after the surgery, his best corrected vision in the RE was 6/9 with total resolution of the periorbital oedema and conjunctival chemosis. The eyeball was in its normal position, there was inferior corneal opacity with vascularization [Fig. 4], extraocular movements were full and fundus was normal.

## Discussion

Detection of an intraorbital wooden FB in small children is quite challenging. Wooden FB if not diagnosed correctly and removed promptly may lead to severe complications.<sup>[2-4]</sup> It is important for clinicians to take proper history and have a high index of suspicion of intraorbital FB in a patient with periocular trauma, especially in small children.



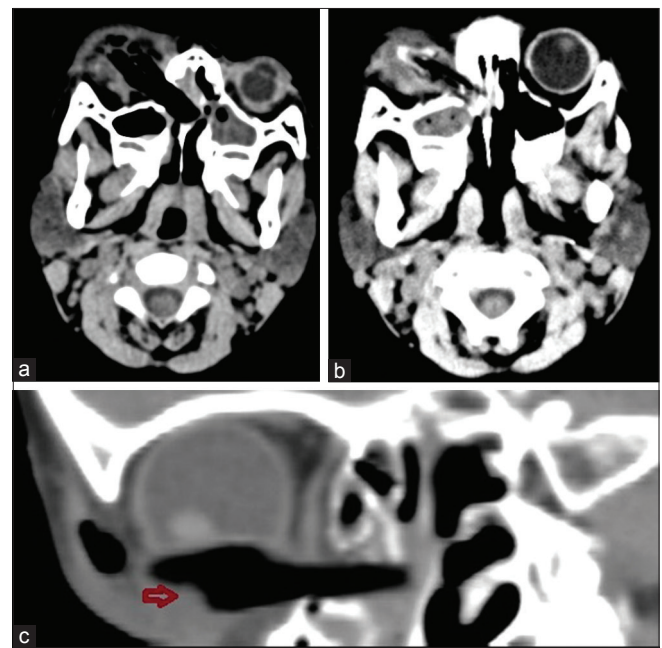
**Figure 1:** Clinical photo showing severe conjunctival chemosis of the Right eye with superior displacement



**Figure 3:** Photo showing a linear and irregular wooden FB measuring  $4.5 \times 1.5 \text{ cm}^2$  after removal

Diagnostic imaging should be performed in all patients with suspicion of a FB. However, wooden FBs may present a real radiological diagnostic challenge due to their varied appearance on different imaging modalities and factors like nature and porosity of the material.<sup>[5]</sup> USG may not detect wooden FB due to the interference of gas. Therefore, localization of FB is not precise.<sup>[5,6]</sup> Even on CT scan, intraorbital FB may be mistaken for air or fat and may be misdiagnosed.<sup>[7]</sup> But it has been documented that the Hounsfield unit of wooden FB increases over time.<sup>[8]</sup> Magnetic resonance imaging scans should be performed after a negative CT scan if an intraorbital wooden FB is suspected and if not contraindicated.<sup>[9]</sup> In our case there was an evidence of increasing Hounsfield unit from  $-300$  to  $-30 \text{ HU}$  after 10 days which was in favour of a wooden intraorbital FB on CT scan.

The challenges we faced in our case were a) late presentation, b) parents not agreeing for early exploration,



**Figure 2:** (a) Axial Computed Tomography (CT) showing a linear low attenuation track in right orbit extending from inferolateral wall to medial wall with attenuation values of  $-300 \text{ HU}$  approximately. The medial wall of right orbit and nasal septum is fractured. (b) A repeat CT scan after 10 days showing an increase in the attenuation values of the linear track in right orbit extending from inferolateral wall to medial wall to approximately  $-30 \text{ HU}$ . (c) CT coronal section showing a linear and irregular wooden IOFB with superiorly displaced globe



**Figure 4:** Clinical photo four weeks after the surgery, showing total resolution of the periorbital oedema and conjunctival chemosis with inferior corneal opacity with vascularization. The eyeball is in its normal position

c) FB being wooden, could not be detected with USG and could not be confirmed with initial CT and d) large and very deep penetrating FB.

## Conclusion

In conclusion, in cases of ocular trauma we suggest proper history taking, high index of suspicion for intraorbital FB, no matter how trivial the trauma may be, especially in small children and timely investigations for early diagnosis and proper management.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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