

Delayed Diagnosis of an Occult Wooden Orbital Foreign Body

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ABSTRACT

An orbital foreign body should be suspected in cases of penetrating orbital injury, but they are not typically seen with low-velocity trauma and no obvious penetrating injury. Wooden foreign bodies are difficult to distinguish from orbital fat on computed tomography (CT), and without a high degree of suspicion for a foreign body, techniques to distinguish wood in the orbit may not be utilized. The authors present here a case of an initially unrecognized wooden orbital foreign body in the setting of orbital trauma where the patient denied any possibility of a foreign body and no evidence of a penetrating injury. The diagnosis was eventually made with an interdisciplinary review of the imaging between the orbital service and radiology, and the foreign body was subsequently removed via orbitotomy. Surgeons should maintain a high index of suspicion when there is a question of a foreign body on imaging, and a low threshold to involve radiology colleagues in the diagnostic evaluation.

KEYWORDS: orbital foreign body, orbital trauma, wooden foreign body, occult foreign body, interdisciplinary collaboration

CASE REPORT

A 66-year-old male presented to the hospital emergency department four days after trauma to the left side of his head. He stated that while bending down to pick something up off the floor he suffered an unwitnessed syncopal episode and fell. He was unsure if he had hit his head. He reported that at the time of injury there was a total “black out” of vision in the left eye and difficulty moving the eye. Two days after the injury his vision began to improve and he noted binocular diplopia. He reported some mild epistaxis and blew his nose several times. On presentation to the ED his visual acuity was 20/30 right eye and count fingers at 1 foot in the left eye with an ipsilateral relative afferent pupillary defect. He had marked left proptosis without periorbital swelling or ecchymosis and near-total ophthalmoplegia of the left eye (**Figure 1**). Intraocular pressure of the left eye was 8 mm Hg. The patient denied any possibility of foreign body and, on exam, no intranasal foreign body or periocular lacerations were appreciated. Emergency department clinicians were concerned for retrobulbar hematoma and/or fracture with muscle entrapment and a CT scan was obtained.

The initial CT interpretation described a comminuted fracture of the left medial orbital wall with an area of



Figure 1. Ocular motility on presentation: (center) primary gaze, clockwise from top up gaze, left gaze, down gaze, right gaze.

Figure 2. CT scan showing radiolucency in the left orbit, (A) axial scan and (B) coronal scan.

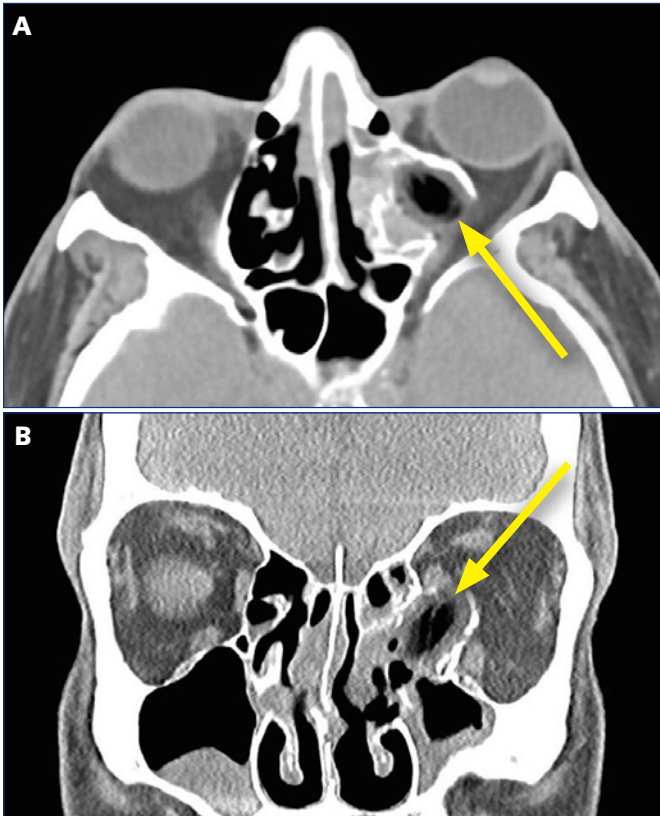
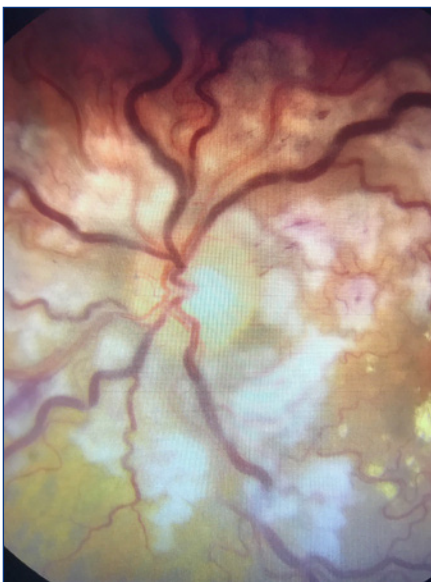


Figure 3. Fundus photograph showing venous tortuosity, peripapillary subretinal hemorrhage and retinal ischemia.



radiolucency initially read as intraorbital air or possibly a foreign body (**Figure 2**). Ophthalmology was consulted. Fundus exam showed venous tortuosity, peripapillary subretinal hemorrhage and retinal ischemia (**Figure 3**). Since the patient denied being struck with any object, was injured in a fall from a low height in his home, and with an equivocal CT scan, it was felt that the patient sustained a medial wall fracture and developed orbital emphysema from blowing his nose, with the displaced bone fragments responsible for his ophthalmoplegia and proptosis. Since his visual loss was several days old, the patient was discharged on prednisone and amoxicillin/clavulanic acid to be followed up in the outpatient clinic within the next 2 days.

The attending radiologist reviewed the patient's chart the following day and contacted the ophthalmology service to tell them there was a foreign body in the left orbit. He described a tubular structure with a calcific density suspicious for foreign body. The structure extended through the left nasal cavity, through the left ethmoid sinus and into the left orbit where the density of it appeared to be encapsulated gas. The exact nature of the foreign body was uncertain. The radiologist reformatted the CT in an oblique plane in order to demonstrate the entire length of the foreign body (**Figure 4**).

The patient returned to the outpatient ophthalmology clinic. He reported subjective improvement in vision but was bothered by diplopia. Visual acuity on the left was counting fingers at 2 feet. The remainder of the exam was unchanged.

Figure 4. Obliquely reformatted CT showing entire foreign body.

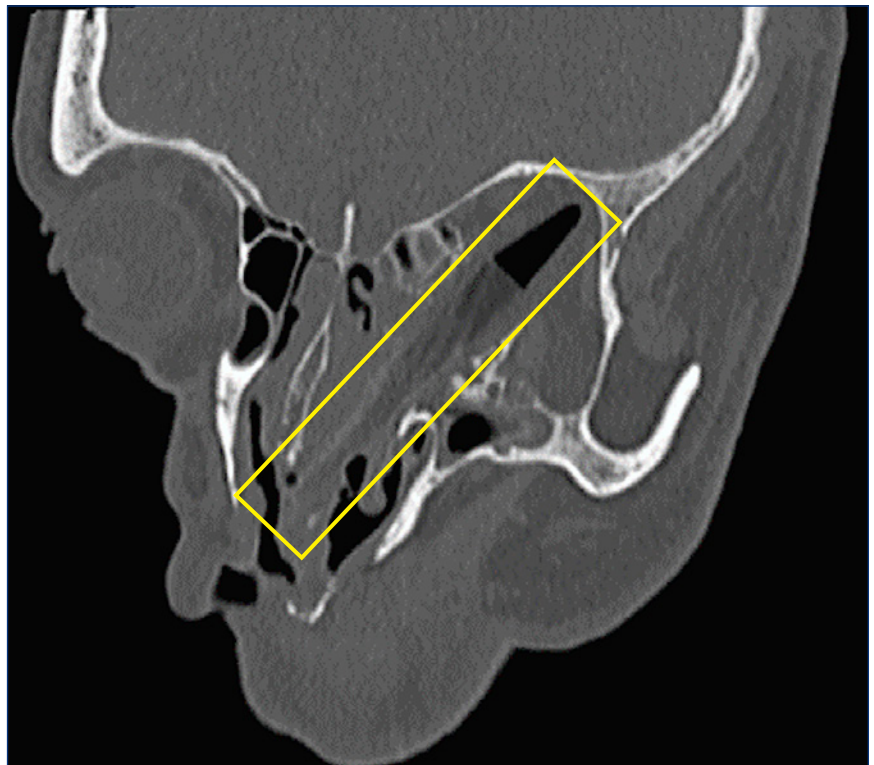


Figure 5. Foreign body removed from the left orbit



The patient was taken to the operating room for orbital exploration. Intranasal inspection revealed a perforated nasal septum but no visible foreign body. An anterior orbitotomy was performed via an inferomedial transconjunctival approach. Upon entering the medial orbit, a wooden foreign body was discovered just below the medial rectus muscle. The foreign body was backed out from within the orbit through the nares and the perforated nasal septum (**Figure 5**). After it was removed, the orbit was copiously irrigated with polymyxin solution.

When the patient was shown the foreign body in the post-operative care unit, he identified it as the tip of a small wooden flagpole. He recalled that there was a vase with several miniature flags on top of the hope chest at home. He evidently fell on the flagpole after fainting, and the pole entered his right nostril, perforating the septum, and passed into the left orbit, breaking off in his nose.

One month postoperatively, the patient's vision had returned to 20/30 in both eyes with resolution of his afferent pupillary defect, proptosis, and return of full motility.

DISCUSSION

Recognition of orbital foreign bodies in the trauma setting can be a challenging clinical task. Patients may not recognize that their injury involved an object entering the orbit and initial history and mechanism of injury can be misleading. Foreign bodies of the orbit may also go unrecognized despite high-resolution diagnostic imaging in the trauma setting, further complicating the diagnosis. Complications of delayed diagnosis of an orbital foreign

body include exophthalmos, infection, and damage to intraorbital structures.¹

The incidence of intraorbital foreign body in orbital trauma cases has been reported as 2.9%.² Early detection of wooden foreign bodies can be particularly difficult given their radiolucency, making them almost impossible to detect on plain film.³ Shelsta, et al.⁴ reported 23 cases of wooden foreign bodies, 22 of which were imaged with CT. A definite wooden foreign body was only identified in 61% of these cases and in 35% of cases the radiologist was unable to diagnose the foreign body at the time of presentation.

Our patient was unable to remember the exact mechanism of his injury but was confident that he was not struck by a foreign body. This denial of foreign body and absence of intranasal findings on initial exam overpowered the concern for foreign body raised on the initial CT report. It required review of the imaging by an attending radiologist and oculoplastic surgeon to overcome this bias and agree on the presence of a foreign body.

This case demonstrates the importance of reconciling the patient's history, physical findings and imaging results to make the most accurate diagnosis. It also demonstrates the importance of interdisciplinary collaboration between emergency physicians, radiologists, and ophthalmologists in orbital trauma cases with conflicting history and imaging findings.

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