

Radiology in Focus

Transorbital penetrating injury of the paranasal sinuses

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Abstract

Penetrating injuries of the paranasal sinuses due to foreign bodies are rare, especially as a result of a traffic accident. Here we report a patient with a ballpoint pen lodged in his left eye following a traffic accident. The pen extended from the medial aspect of the left orbit, through the left ethmoid sinus and the nasal septum, to the right sphenoid sinus. We removed the pen uneventfully using endoscopic sinus surgery. There are no similar reports in the English literature and we therefore present this case because of its rarity.

Key words: Wounds, penetrating; Paranasal sinuses; Foreign bodies

Introduction

Foreign bodies in the paranasal sinuses are uncommon. They are most often seen in adults and are usually traumatic in origin (Grevers and Reiterer, 1990). Various foreign bodies, including glass (Onerci *et al.*, 1997) metal fragments (Dimitriou *et al.*, 1992), wood splinters (Fallon *et al.*, 1992), bullets and pellets (Donald and Gadre, 1995), have been reported as having been lodged in the paranasal sinuses. Here we present a rare case of transorbital penetrating injuries of the paranasal sinuses caused by a ballpoint pen.

Case report

A 36-year-old man was brought to Accident and Emergency (A&E) with a ballpoint pen lodged in his left eye (Figure 1). He had been a front seat passenger of a car and was not wearing his seat belt. Sudden braking forced him forward at high speed, and a pen placed upright on the dashboard stabbed into his left eye. Upon arrival at A&E, physical examination revealed a short, approximately, 5 cm segment of the pen protruding from the left upper eyelid near the medial canthus. Bilateral nasal bleeding was noted. We did not find any neurological deficit. A skull X-ray (posteroanterior view) showed an oblique longitudinal shadow from the left frontal area to the nasal septum. Computerized tomography (CT) scanning demonstrated a tubular object extending from the medial aspect of the left eye, through the left ethmoid sinus and the nasal septum, to the right sphenoid sinus. An ophthalmologist noted no damage to the eyeball from the CT scan. The tip of the pen rested on the surface of the right temporal lobe and there was bony dehiscence (Figures 2 and 3). The dura of the right temporal lobe was thought to be intact by the neurosurgeon. Using endoscopic sinus surgery, we removed the pen uneventfully through the orbital inlet. There was no cerebrospinal

fluid leakage. Post-operatively, the patient's condition was good except for left upper lacrimal canaliculi rupture. There were no sequelae during a one-month follow-up period.

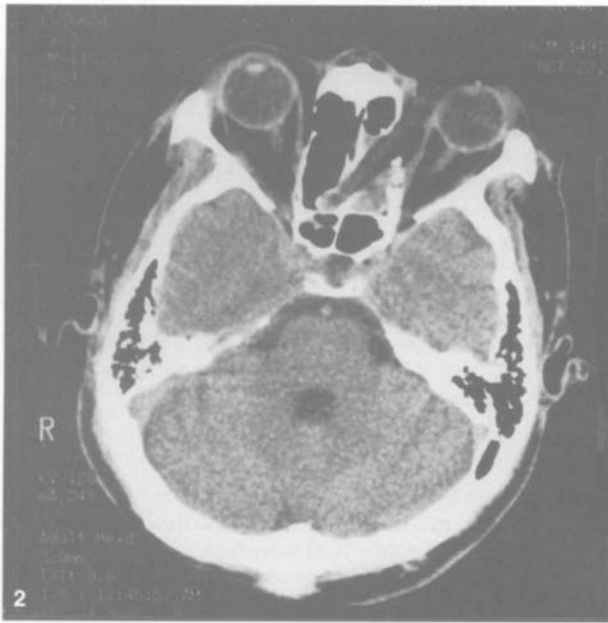


FIG. 1

A segment of a ballpoint pen protrudes from the left eyelid near the medial canthus. The left eye movements were fixed and the light reflex was normal.

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FIGS. 2 and 3

CT scanning reveals the extent of the ballpoint pen penetration. Note the rupture of the left lamina papyracea and the perforation of the nasal septum. The eyeball is intact. The tip of the pen rests on the surface of the right temporal lobe and there is bony dehiscence.

Discussion

Penetrating injuries of the paranasal sinuses due to foreign bodies are rare. These foreign bodies are usually long and sharp objects, such as nails, wooden sticks, and pens, allowing penetration to occur. The routes of penetrating foreign bodies can be transnasal, transorbital, or even transoral. They may even penetrate the dura and cause intracranial lodgings. Fallon *et al.* (1992) reported a patient with transnasal intracranial penetration by a wooden branch. Greene *et al.* (1993) reported a psychotically depressed man who self-inflicted a right eye wound with a ballpoint pen, producing an intracranial injury.

Udwadia *et al.* (1994) reported a woman with the bristle end of a broken toothbrush lying across both the ethmoid sinuses after a fist blow to her right eye. These are the examples of penetrating injuries of the paranasal sinuses with or without intracranial injury.

The extent of a penetrating injury is usually determined by physical examination and routine radiographs. However, when transorbital or transnasal penetration occurs, physical examination is less useful (Doron *et al.*, 1982). When the foreign bodies are wooden or plastic items, plain radiographs may frequently be of no help because of the objects' radiolucency. The CT scan has become an important tool in such patients. In our patient, nasal bleeding was the only evidence of nasal or paranasal sinus injuries, and the skull X-ray could not reveal the exact location of the foreign body. With the aid of CT scanning, we could easily determine the depth of the penetration, the extent of the injury, and the location of the pen. Intracranial and orbital injuries could also be ruled out.

With optimal CT scan imaging, we removed the pen using endoscopic sinus surgery. This provided the advantages of low peri-operative morbidity, avoidance of a facial scar, and minimal invasiveness. However, should difficulty be encountered in defining landmarks due to bleeding or from distorted anatomy, the surgeon must be prepared to employ the more conventional external approaches (Donald *et al.*, 1995). If we had pulled the pen directly from the protruding part instead of performing surgery, the pen might have been removed successfully. However, since the ballpoint pen could be separated into many parts, a remnant might have been left in place in this way. Ferris (1964) reported a patient who stabbed himself in the right eye with a ballpoint pen. The patient removed most of the pen by himself, but left the metal end inside, and it had to be removed through an incision near the medial canthus. Considering this, endoscopic sinus surgery might be more beneficial for removing a pen.

Reviewing the available English literature, we could not find a case similar to ours. As a result of traffic accidents involving vehicle occupants not wearing seat belts, pieces of glass from the windshield may be found in the frontal sinus following fracture of the anterior wall (Onerci *et al.*, 1997). However, no penetrating injury of the paranasal sinuses resulting from a traffic accident was described in the literature.

In summary, this case has been reported to highlight the need to obtain optimal imaging (CT or magnetic resonance imaging) in transorbital or transnasal penetrating injuries. Endoscopic sinus surgery is a good choice in treating these kinds of patients. This case is a rarity, with no previous report in the English literature.

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