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Case Report

Perforating head injury with iron rod and its miraculous escape: Case report and review of literature

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ABSTRACT

Civilian perforating head injury is rare. Because rarity of this injury, there is no standard management protocol. We report a case of perforating head injury with iron rod, review the literature on the subject and discuss the challenges in the management of such case. We have not found similar case in the literature. Civilian perforating head injury is rare. A 25-year-male brought to the emergency department with approximately two feet perforating iron rod in the head, entering via frontal region, left side of midline and coming out of the occipital region. He developed right sided hemiplegia and global aphasia. He underwent series of imaging for the evaluation of the course of the iron rod and injury sustained because of it. Under strict aseptic precaution, iron rod removed in the operation theater. His clinical condition improved over a period of three weeks. At one year follow up- he had almost normal speech and language functions and was able to walk without support. This case illustrates the possibility of bizarre type of such injury in the presence of protective helmet and challenges in the management. Preoperative planning on the basis of images, prophylactic antibiotics and anticonvulsant medications, cleaning of the objects with antiseptic solutions, anterograde extraction after adequate exposure around entry and exit points resulted in good clinical outcome after successful removal of the rod.

Introduction

Penetrating and perforating head injuries are serious brain injuries and associated with significant morbidity and mortality. Penetrating craniocerebral injuries are commonly seen in war related situations, mainly caused by missiles [1,2,3]. Civilian Non-missile intracranial injuries caused by foreign bodies are quite rare [1,2]. The vast majority of deaths from penetrating trauma are due to unintentional accidents while a significant minority follow suicides and homicides [2,3,4,5]. Civilian Perforating head injury is extremely uncommon. Literature search we found only three cases of perforating head injury [6,7,8]. We present a case of accidental perforating head injury with iron rod and its miraculous escape, review the literature on the subject and discuss the challenges in management of such case.

Case Presentation

A 27-year-male presented to our emergency department with altered sensorium with right sided hemiparesis and global aphasia.

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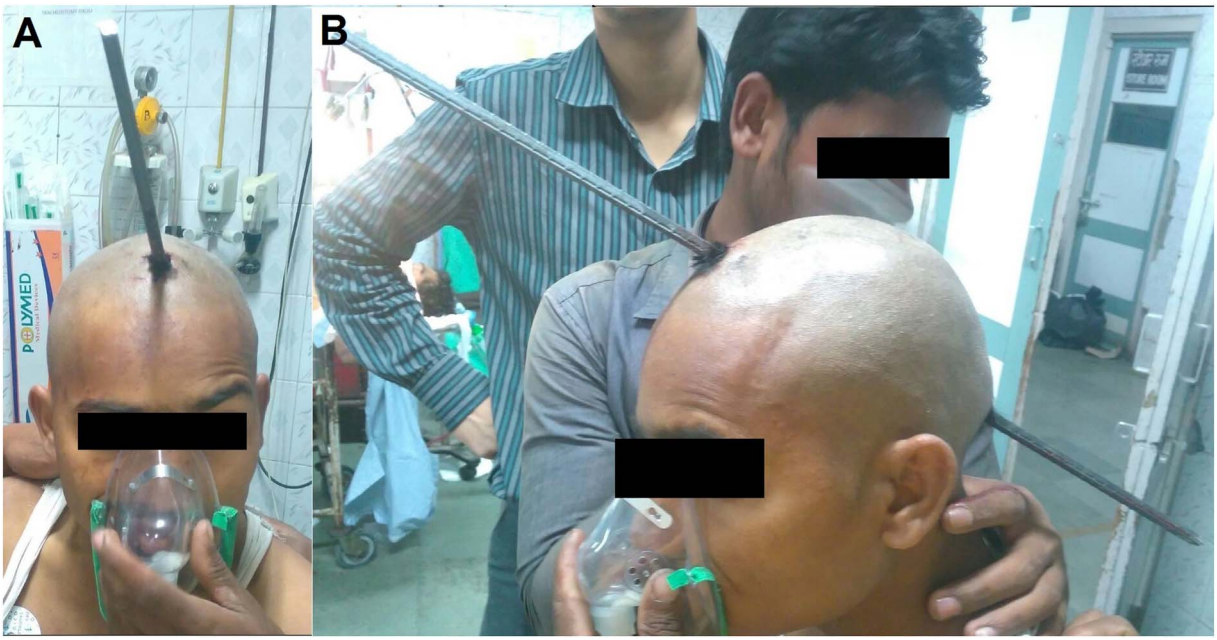

Fig. 1. Iron rod passing through head; from frontal to occipital region. (A) Antero-posterior view, (B) Lateral view.

He was conscious but drowsy and his Glasgow coma scale was 10/15(E3M6VI). His pupils were bilaterally 3 mm reacting to light. He had iron rod in the head perforating through left side of midline and was coming out of left occipital region about 4 cm from the midline (Fig. 1 A, B).

Mechanism of injury: Earlier as a construction site worker, he was working on the ground with protective helmet very close to a building under construction. Of the same building, on the 4th floor a person standing close to parapet was passing bunch [2,3] of iron rods (about 8–10 ft) to a person standing on the 5th floor. Suddenly one of the rod got slipped and felt down. Listening to the shout to clear the ground, person working just below tried to look up and got the iron rod through his head; of course through his helmet. Following the injury he was conscious and well awake but felt down on the ground. With the help of the rod cutter, part of the iron rod on the frontal site was cut at the construction site and he was taken to the private hospital in conscious status. He has received primary treatment in the form of tentanus prophylaxis, intravenous broad spectrum antibiotics and anti-convulsive medication. Within next two hours he developed weakness and difficulty in speech and he was brought to our institute.

Position in the bed:

On arrival, he was conscious but drowsy. He was aphasic and had right hemiplegia. He was kept in supine position, head tilted in such a way that rod remains almost paraller to the bed. He underwent computed tomography (CT) scan and similar precaution taken in the CT room.

Imaging

Head CT scan revelad metallic foreign body entering in the frontal region and coming out of the occipital region with metal articfact. Also few specks of haemorrhage noticed along the tract. The extent of brain injury could not be ascertained on the CT images as a consequence of severe metallic artifacts (Fig. 2A, B). CT bone window revealed iron rod penetrating through the frontal bone almost close to the midline on the left side and coming out of the occipital bone about 3–4 cm from the midline just above the left transverse sinus (Fig. 3A, B,C,D). Brain CT angiography revelaed no abnormality. CT venography revealed close relation of iron rod to the superior sagittal sinus and coming out just above the left transverse sinus (Fig. 4 A, B).

Preparation for surgery

He was prophylactically intubated and kept on ventilator. Under general anesthesia, his head was fixed with the mayfield clamp in such a way that if require, left sided frontal, parietal or occipital craniotomy can be performed without any difficulty and rod can be pulled easily from the occipital region (Fig. 5A,B). Iron road was throughly washed with saline, hydrogen peroxide and betadine solution for 15 min. Painting and drapping of the operative site done. Scalp flap marked and cut opened across the sinus over the frontal region and craniotomy performed (Fig. 6A). Similarly, occipital region via 'Z' shaped incision, sclap flaps retracted and occipital craniectomy performed around iron rod (Fig. 6B). Iron rod became relatively loose. Dura opened around the rod in cruciate manner ove the frontal region. Loosened iron rod held firmly and via gentle progressive very very minimal rotatory movements pulled out at the occipital end without any difficulty (Fig. 6C). Minor ooze at both the ends stop spontaneouly. Both wound sites