

Case Report**Penetrating Cranial Nail Injury an Unusual Domestic Assault: Case Report**

M.G. Yilkudi¹, P.I. Ogolekwu², S.J. Yiltok³ ¹Consultant General Surgeon, ²registrar, Department Of Surgery, Gwagwalada Specialist Hospital Abuja FCT Nigeria. P.O. Box 10313 Garki Post Office Abuja FCT Nigeria. ³Consultant Surgeon JOS University Teaching Hospital and Senior Lecturer Department of Surgery University of JOS Nigeria.

Correspondence to: Dr. Yilkudi MG, Fax 09-8821382. E-mail yilkudim@yahoo.com

A rare case of intracranial nail injury caused by domestic violence is presented. The 35-year old female patient was found unconscious with a 12cm nail almost completely buried into her skull. X-ray of the skull showed the nail in the cranial cavity. A burr hole was made and the nail removed. Immediate post-operative period showed a Glasgow coma score of 10/15 and right hemi paresis which improved with time. At six month after the injury, her neurological status was normal. Despite the lack of a CT scan in some areas attempt must be made using clinical judgment and performance of burr holes to treat such patients who cannot afford transfer to a standard neurological centre. This report also highlights the fact that penetrating brain injuries of this nature can occur without much neurological deficit and that a minimally invasive surgical approach can be used successfully to manage such cases while avoiding serious postoperative complications.

Introduction

Domestic violence is on the increase in our environment and more unusual injuries are appearing. It is unusual to have a nail driven in the skull of an individual as a result of assault. This is a report of a case of a 12cm nail hammered into the skull in an attempted murder by a suspected family member. This shows that, this type of injury often have good outcome and can be managed with minimal surgery even in situations of lack of a vital assessment tool like the CT scan.

Case Report

A 35-year-old woman was found unconscious in her room with a hammer lying beside her. On careful examination of the head it was discovered that the patient had a nail which had almost been completely driven into her skull. The nail was on the left mid-parietal area close to the midline. There was no significant external bleeding, as the scalp had only a cut corresponding with the point of entry of the

nail. She was brought to our emergency unit a few hours after sustaining the injury. Physical and neurological examinations showed an unconscious woman with a Glasgow coma score of 10/15. The head of the nail was firmly attached and lying flush with the scalp. Skull X-ray disclosed a single, 12-cm long, radiopaque

foreign body penetrating into the left parietal skull bone into the brain. Clinically she had no evidence of raised intracranial pressure and she was haemodynamically stable. There was a right-sided hemi-paresis with muscle power 2/5. With the diagnosis of penetrating intracranial nail injury, a burr hole was made on the parietal area adjoining the nail and its removal effected with a redivac drain placed in the subdural space. No significant intracranial bleeding was found and no significant Cerebrospinal fluid leak was observed.

Three-weeks later she was fully conscious with slurred speech and improved muscle power on the right limbs 4/5. After six months of follow up she has returned to normalcy.

Discussion

It is rare to have a patient present with an intracranial nail from assault. Most of the intracranial foreign bodies occur around the orbital, the frontal sinus, and the nasal areas¹. To the best of the author's knowledge, this is the first report of an intracranial nail hammered into the parietal bone as a result of domestic assault. Other reported cases of nail injury are caused by accidental nail gun injuries at work⁴ or during suicide attempts^{7,13}.



Nail in head (Arrow)

Nail after
Removal

Studies have shown that penetrating injuries to the head have a poorer outcome than that of closed head injury^{3,8} but the good outcome in our patient agrees with similar injuries reported by Pan and Wang². This suggests that penetrating injuries with a smooth linear object like a nail is often associated with good outcome⁴. This is so because often, the nail which is narrow, may avoid very major vessels and other vital areas of the brain such as was the case in this patient where the superior sagittal sinus, though lying close to the line of passage of the nail, was not injured, thus limiting the injury to local damage along the line of passage.

Unlike penetrating missile injuries, the damage here is limited to the line of passage of the nail

only. This type of injury is commonly complicated by infection leading to brain abscess, which may even occur long after the injury¹¹ or bleeding if major vessels are affected which commonly leads to aneurysm of the affected vessel¹².

During patient follow up angiography is important to rule out complicating aneurysm. Early surgery like in this patient can help to reduce the risk of sepsis and give a good outcome. In the absence of a CT scan, which is the case in our centre and indeed in a most of centres in Africa, one can rely on clinical judgment as well as performing a burr hole to help drain clots and provide decompression in situations of raised intracranial pressures, where necessary.

Glasgow coma score of patients prior to surgery has been shown to be a good predictor of outcome in penetrating head injury⁵ and our good result is also in line with that since our patient came in with a score of 10/15. Penetrating injury was not suspected initially because the history was limited and the significance of a careful examination of the head was really appreciated. Unless the patient is carefully examined a penetrating injury of the skull can be easily missed⁶.

Clinical neurological abnormalities are a reliable predictor of intracranial injury⁹ and may be the only assessment tool in environments where CT scan is not available. This report is in agreement with other reports of similar injuries and serves to highlight that penetrating brain injury can occur without much neurological deficit and that a minimally invasive surgical approach was successful in avoiding any complications¹⁰

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