Unusual Penetrating Head Injury.
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Abstract

Introduction: Penetrating head injury (PHI) remains an important issue in our neurological work, even in modern neurosurgery¹. In Gaza PHI is a frequent type of head injury. We present some interesting and unusual cases of PHI with very good surgical results.

Clinical histories: Two patients had PHI in form of knife and metallic sharp fork. They exhibited signs of increased ICP (headache, vomiting, and deterioration in consciousness.). Brain CT revealed evidence of FBs intracranially.

Management: Craniotomy and successful removal of the FBs were done without complications.

Conclusion: PHI with such FBs needs urgent craniotomy and removal of the FBs with coverage of antibiotics and antiepileptic drugs.

First Case: Male patient, 41 years old, presented to the ER in Shifa Hospital, Gaza, after 30 minutes of stab injury to the head (assault). He was also suffering of vomiting, headache and was drowsy, GCS 14. CT of head showed a knife penetrating into the left occipital lobe above the protuberance and 1cm left to midline and 4cm intracranially (figures 1, 2, 3). Intubation was done in the prone position to prevent movement of the knife. The length of the knife was approximately 60cm. Ceftriaxone 1 gram, Gentamycine 80mg and phenytoin was given preoperatively.

Surgical procedure: In the prone position, the operator area was shaved and sterilized with povidone-iodine Sol. 10% (figure 4). Horse shoe incision was done, then craniotomy through 4 Burr holes and removal of the bone flap with knife. The brain was contused and bleeding from the tract seen and from a small laceration from the end of superior sagittal sinus, hemostasis was achieved using bipolar, surgicel and gelfoam. Dural repair was performed after washing the field with NS and H2O2. Banners drain and repositioning the bone flap was then carried out. The patient was transferred to ICU and he kept under sedation for 24 hours. The patient has started to improve, after 24 hours of surgery, and gained full consciousness and no residual deficit was noted (figures 5-6). The surgical wound healed without complications. A follow up head CT 3 days later was normal and the patient was discharged on the 6th day of surgery. Follow up after 1 week and 1, 3, 6 and 12 months revealed that the patient has recovered fully.

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Second Case: Male patient, 15 years old, presented to the ER in Shifa Hospital Gaza, after 20 min of stab injury to the head (assault). He was suffering from repeated vomiting, headache, dizziness and was drowsy with GCS 13 (figure 7). Head CT showed a fork in the left temporal retroauricular area with its sharp end 5cm intracranially (figure 8). There was bleeding from the entrance wound and left mastoid fracture was noted. The CT and intubation were done in a lateral supine position to prevent movement of the fork. The length of the fork was approximately 20cm. Ceftriaxone500mg, metronedazole200mg and phenytoin was given preoperatively.

Surgical procedure: patient was put in the right lateral position, the operative area was shaved and sterilized with povidone –iodine sol. 10% (figure 9). Question mark incision was done and craniotomy through 4 Burr holes was undertaken. The bone flap with the fork down was then removed. The brain surface was contused and bleeding from the fork’s tract and from the right sigmoid sinus was seen together with penetrated mastoid fracture. There was no otological lesion and middle and inner ear was normal. Hemostasis was achieved using bipolar and surgicel, sinus and dural repair was performed after washing the field with NS and H2O2. Hemovac drain and repositioning the bone flap was done. Fracture of mastoid bone was treated conservatively. Patient was then transferred to the ICU and kept under sedation for 24 hours. Following that, the patient has improved and was fully conscious and well orientated on the second day after surgery and without any neurological deficit (fig. 14). The surgical wound healed without complications.

Follows up head CT, after 3 days was normal. The patient was then discharged on the 7th day following surgery. Follow up after 1 week and 1,3, 6 and 12 months revealed that the patient has fully recovered.

Figures 7-8: (7) The patient in ER. (8) The patient on the operating table.
Figures 9-11: (9) CT temporal bone with mastoid bone fracture. (10) The patient with introperative incision. (11) Assault weapon showing degree of penetration.
**Discussion:**

PHI remains an important issue in neurological work, even in modern neurosurgery\(^1\), and is still a widespread problem that happens mainly among young individuals. According to the literature, more stab wounds of the brain occur through the orbit or temporal region\(^2\), due to thinning of the bone in these areas. This sort of injury appears to be commoner in males and due to male to male violence. Force needed to penetrate the skull is believed to be about 5 times higher in the temporal region and 11 times higher in the parietal region than the force needed to perforate the skin\(^3\)\(^4\). CT scans are the most appropriate investigation tools in this sort of injuries\(^5\). Cerebral hemorrhage, meningitis and abscess formation are the most common complications with their consequive morbidity and mortality\(^6\). Therefore, the use of broad spectrum antibiotics is essential in such cases. Prophylactic antiepileptic drugs for 1 week was used. The size of the craniotomy depends on the need to evacuate haematoma during surgery\(^7\). In some cases of PHI, venous sinus injury is present as is the case our two cases.

These FBs should be removed immediately in a qualified Neurosurgical center. Patients treated in this manner have less morbidity and short hospital stay.

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**References**


