AN UNUSUAL CAUSE OF TRAUMATIC BRAIN INJURY IN KHYBER PAKHTUNKHWA: A CASE REPORT

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ABSTRACT

Penetrating head injuries can be the result of numerous intentional or unintentional events, including missile wounds, stab wounds, motor vehicle and occupational accidents (nails, iron rods) or assaults (screw-drivers). Penetrating head injuries caused by screw-drivers constitute only a small part of the total number of traumatic head injuries seen in casualty. We report a case of neuro-trauma who was operated in our institution. A 25 years gentleman presented in casualty on with a screw-driver penetrating into the skull, as an unusual case of violence.

***Key Words**: Violence, Screw driver, Traumatic brain injury.*

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INTRODUCTION

Screwdrivers are fortunately only rarely used as weapons[1,2]. However, when used in an assault on the head the concentration of force into the small area at the tip of these rigid tools may enable penetration into the vault of the skull. Once through the bone the shaft of the screwdriver may then pivot around the entry point in the skull, causing an arc of intracranial injury. If the screwdriver is withdrawn, then clinical examination later may miss the small entry wound, and the seriousness of the injury may not be appreciated as intracranial injuries from screwdrivers have a high mortality rate[1,2,3]. Unlike the penetrating injuries to the brain caused by missiles, injuries by stabbing are largely restricted to the wound tract. Early recognition, debridement, and judicious antibiotic therapy can limit or prevent complications in the management of stab wounds.

CASE REPORT

A 25 years old gentleman from Dara Adem Khel presented to Accident and Emergency department, Lady Reading Hospital Peshawar-Pakistan on 15th October 2011 having head injury by a screwdriver hammered by someone, as an assault in the street with loss of consciousness and vomiting. He was resuscitated in the Accident and emergency department, and was referred to Neurosurgical department.

Examination showed open wound on left parietal aspect of skull (Figure 1). He was stable with a pulse of 80/minute, Blood Pressure 120/80mmHg and Chest & Abdominal examination was unremarkable. Neurological examination revealed Glasgow Coma Scale;12/15 (E4, V3, M5), pupils were equal is size and reactive to light, right hemiplegia with power 0/5 according to Medical Research Council (MRC) Scale.

Neuro-imaging Findings

Computerized Tomography Brain with bone window was performed, showing left parietal depressed skull fracture and large left parietal intracerebral hematoma.

Management

Baseline investigations and viral profile was done. Tetanus prophylaxis, I/V fluids, I/V antibiotics were given. The patient was shifted to Operation Theater, left craniectomy and hematoma evacuation was done. Operative findings were skin laceration, left parietal bone fracture, dural tear and clotted blood in left parietal lobe. The patient was given general anesthesia in supine position, the head was tilted towards right, incision site was shaved, and prophylactic antibiotic (ceftriaxone 1 Gram) was given. Horse-shoe shape skin incision

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Figure 1: Pre-operative Computerized Tomography Brain with Bone Window showing Linear Fracture in left Parietal Bone and left Parietal Hematoma

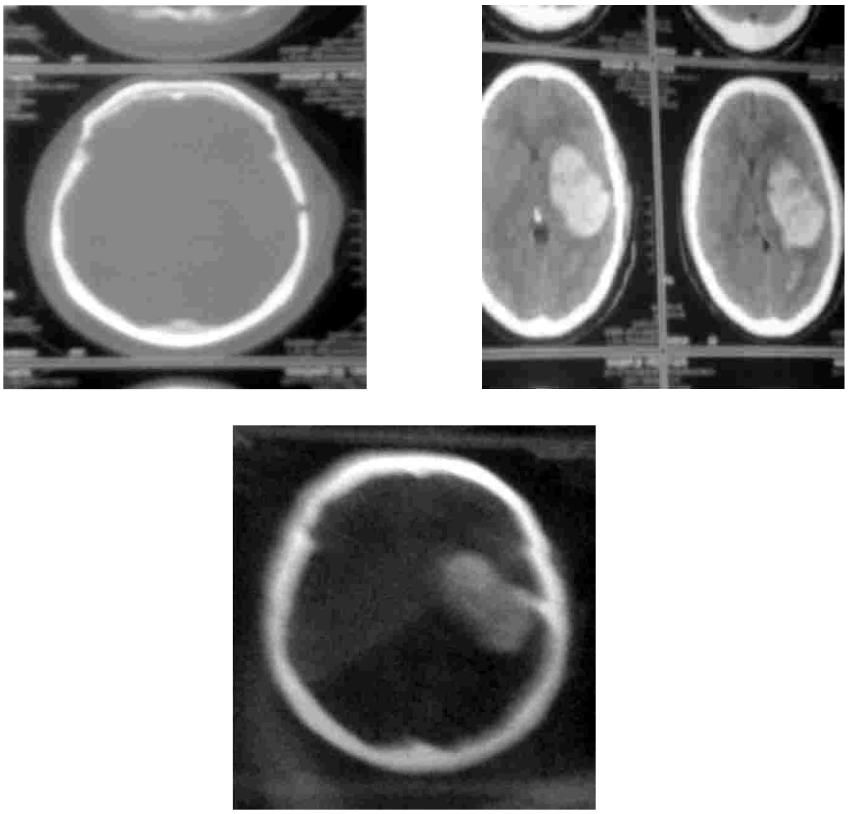
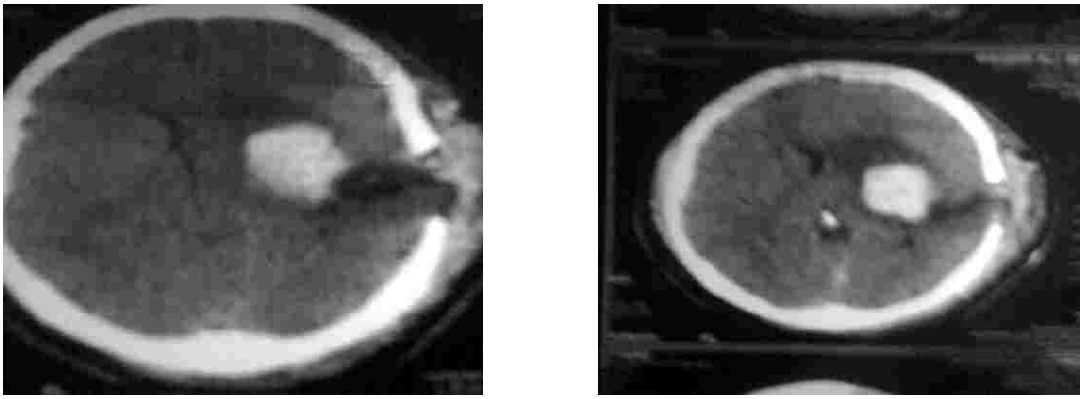


Figure 2: Post-operative Computerized Tomography Brain Showing Craniectomy defect and some Residual Hematoma



was made, fracture site identified, small craniectomy done, Dura opened in the line of tear. Above findings noted, hematoma evacuated, hemostasis secured, wash done with normal saline. Duroplasty done and the wound closed in reverse.

Postoperatively he was given I/V fluids, I/V antibiotics, analgesics, antiepileptic and steroids. Recovery was smooth within 3 days, except persistent right hemiplegia (Figure 2).

DISCUSSION

The penetrating intracranial injuries seen are predominately gunshot wounds. Occasionally more unusual weapons have been used to penetrate the cranium including nails, wooden objects, and drills[4,5,6].The commonly used weapons such as knives and broken bottles rarely penetrate the skull, and are more likely to glance off the cranial surface or break. However screwdrivers, because of their rigid structure and narrow tip, may forcefully penetrate the cranial bone. If the screwdriver is not still embedded then the external injury may appear insignificant.

Unlike cranial stab wounds when the damage is usually limited to a focal area along the tract[7], being a tool with a narrow diameter the intracranial injury can be extensive from pivoting of the tip of the screwdriver within the brain substance. In patients where there is a possibility of a penetrating intracranial injury, skull radiographs and subsequent computed tomography are indicated. As compound wounds these injuries require appropriate antibiotic cover and tetanus prophylaxis. Further neurosurgical assessment will determine whether formal debridement and removal of hematoma and devitalized tissue or depressed bony fragments is indicated[8].

High incidences of stab on the left side of skull are probably due to right-handedness of the assailant except when the victim is hit from the back[1,8,9]. The most common injury site is the frontoparietal region[1,9]. Temporal stab wounds are more likely to demonstrate major neurological deficits. Penetration is facilitated by thinness of the temporal bone and because of short distance to the deep vital brain and vascular structures[10]. Stab wounds at the craniocervical junction are also reported[11].Injuries caused by stab wound evoke similar therapeutic consideration as in cases of missile injuries but these are modified primarily by a general absence of significant impact force and its deleterious secondary consequence resulting in good recovery. The kinetic energy by an object dissipated into the tissues determines the type of injury inflicted. Thus, velocity squarely affects the tissue destruction. At low velocity (i.e, below 300 m/sec) injury results from direct disruption and laceration of tissues while at high velocities, tissue cavitations and shock waves are the main cause of cerebral damage and poor prognosis[11,12].

Immediate radiological examination is mandatory because small entrance wound usually does not correspond with size of the foreign body and associated intracranial injury. A trivial wound in an asymptomatic patient may lead to death within few days to weeks later because of rupture of a traumatic intracranial aneurysm or infection[12]. Plain radiograph of the skull is useful to delineate the depth and direction of penetration[1,2]. It quickly reveals the presence of slot fracture beneath a trivial scalp laceration. CT scan is mandatory to diagnose intracranial injuries, associated contusion, hematoma, major vascular injury, or brainstem injury. It is an essential means in decision making of surgical strategy[5,6,8].

Cerebral angiography may be indicated if injury to a major cerebral vessel or venous sinus is suspected and in cases of delayed Subarachnoid hemorrhage or intracerebral hemorrhage[13,14]. If vascular injury is detected a decision regarding the advisability of endo-vascular or surgical treatment can be made with adequate exposure of the proximal vessels in the area of injury. Postoperative CT scan should be performed to exclude the presence of delayed hemorrhage.

CONCLUSION

In patients where there is a possibility of a penetrating intracranial injury, skull radiographs and subsequent computed tomography are indicated. As compound wounds these injuries require appropriate antibiotic cover and tetanus prophylaxis. Further neurosurgical assessment will determine whether formal debridement and removal of hematoma and devitalized tissue or depressed bony fragments is indicated.

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