



Radiodiagnosis

CURRENT ROLE OF – PLAIN CT SCAN (COMPUTED TOMOGRAPHY) OF BRAIN IN HEAD INJURY [A STUDY OF 100 PATIENTS OBSERVED DURING PERIOD OF 6 MONTHS – I.E. FROM THE MONTH MAY TO OCTOBER 2018]

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ABSTRACT Head injury is considered as a major health problem that is a frequent cause of death and disability and makes considerable demands on health services. CT remains essential for detecting severity of head injury that require immediate neurosurgical intervention as well as those that require in-hospital observation and medical management. The present study has endeavored to evaluate the computed tomography findings in patients sustaining head injury and to emphasize the importance of computed tomography scan in head injury. Our study includes total number of 100 patients of head injury those were evaluated by CT scan of brain using GE Bright speed 16 slice CT Machine in our radiology department. CT scan of brain is currently the most appropriate diagnostic modality in cases of head injury for early diagnosis and to decide appropriate medical or surgical management which helps in predicting ultimate outcome.

KEYWORDS : Head injury, CT Brain in trauma, Computed tomography (CT), Glasgow coma scale (GCS)

INTRODUCTION:

The term head injury is synonymous to traumatic brain injury (TBI) or craniocerebral trauma.^[1] It accounts for a large number of hospitalizations and considerable mortality throughout the world. It is estimated that nearly 1.5 to 2 million persons are injured and 1 million succumb to death every year in India. Road traffic injuries are the leading cause (60%) of TBIs followed by falls (20%-25%) and violence (10%). Alcohol involvement is known to be present among 15%-20% of TBIs at the time of injury.^[2]

Computed tomography (CT) remains the mainstay for initial diagnostic evaluation of head trauma patients. The fast examination time, wide availability, lack of contraindications and high accuracy for detecting hemorrhages have made CT the diagnostic study of choice for initial evaluation of head injury.^[3]

OBJECTIVES:

To evaluate the role of computed tomography (CT) and CT scan findings in patients sustaining head injury and to emphasize its importance in the management and outcome of the patients of head injury.

MATERIALS AND METHODS:

The study includes total number of 100 patients of head injury, which were admitted in the emergency department of P.D.U Medical college and civil hospital, Rajkot during the period of 6 months (May to October 2018). All CT scan of brain plain were performed with GE Bright speed 16 slice CT Machine in our hospital.

For each patient who sustained head injury: A complete clinical history was taken, which included, age, sex, type of injury, principal presenting complaints. The type of trauma was further classified into Road traffic accidents, falls, assaults and miscellaneous. This was followed by general physical examination and detailed examination of the central nervous system. Injuries involving the other systems of the body were also noted. After initial resuscitation, severity of the craniocerebral trauma was graded with the help of Glasgow Coma Scale (GCS) into mild (GCS 13- 15), moderate (GCS 9-12) and severe head injury (GCS 3-8)^[4].

RESULTS:

A total number of 100 patients who sustained head injury presenting in emergency room were analyzed. 72 (72%) patients were male and 28 (28%) were female. Ages ranged from 1 to 70. The highest frequency of head trauma occurred in the 31-50 year group (39%). The most common causes of head injury were RTA (65%), fall injuries (20%) and physical assaults (15%). Loss of consciousness (LOC) and vomiting were the commonest clinical features in head injury patients brought to emergency. Clinical picture of patients enrolled in study were as follows.

Table 1: Clinical presentations: in the study of 100 cases of head injury

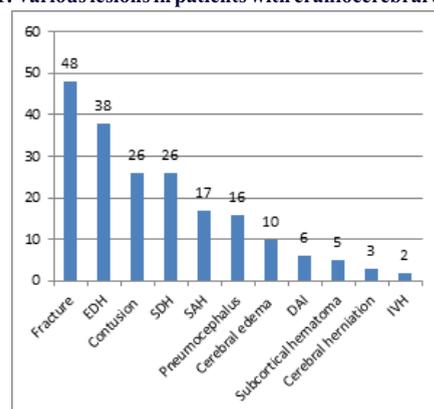
Clinical presentation	Frequency	Percentage
LOC	50	50
Vomiting	35	35
Seizure	16	16
Black eyes	14	14
Headache	12	12
ENT bleeding	08	08
CSF rhinorrhoea	06	06

Out of 100, 68 cases (68%) sustained mild head injury, 21(21%) cases sustained moderate head injury and 11(11%) had severe head injury. RTA was the prime etiological factor in all types of severity of head injury. There were 66.1% patients in mild, 71.4% in moderate and 72.7% patients in severe head injury who sustained RTA as below.

Table 2: Severity of head injury (GCS) based on mode of head injury

GCS	Mode of injury			Total
	RTA	Fall	Assault	
Mild (13-15)	45	15	08	68
Moderate (9-12)	15	04	02	21
Severe (3-8)	08	02	01	11

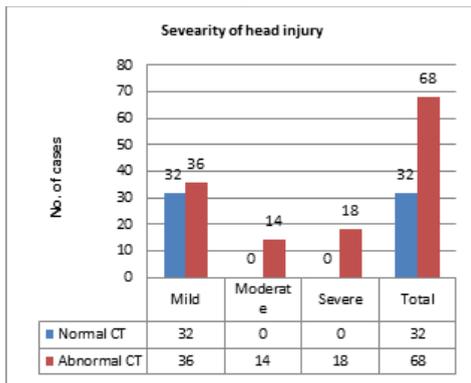
Figure 1: Various lesions in patients with craniocerebral trauma



EDH: Extradural hemorrhage, SDH: Subdural hemorrhage, SAH: Subarachnoid hemorrhage, DAI: Diffuse axonal injury, IVH: Intraventricular hemorrhage

Linear skull fracture was predominant seen in 30% cases followed by basilar (18%), comminuted (9%), depressed (7%) and diastatic fractures (3%).

Figure 2: Correlation of CT findings with severity of head injury



12 out of 18 patients with severe head injury had mortality. RTA was the most common mode of injury to cause the mortality. 5 patients with severe head injury also had cervical spine injury.

DISCUSSION:

Head injury is an increasing health problem globally. It is a leading cause of death and disability in children and adults in their most productive years. Precise assessment of the patients presenting with head injury will be very useful in the management of the patients.

In our study the age of patients varied from 1 year to 70 years. Majority of patients found to be in third and fourth decade of life. The male: female ratio of 2.6:1 observed. Loss of consciousness and vomiting were the most common clinical presentation in patients with head injury which was similar to the study done by Bhandari et al^[5] and Agrawal et al^[6].

In our series 68 (68%) of 100 patients presented abnormal CT findings related to head trauma. There were 68% patients sustaining mild head injury, 21% moderate and 11% severe head injury had abnormal CT findings. In this study, skull fracture was the most common finding (48%). Our finding was thus not in keeping with the above mentioned.

Even though MRI is more sensitive for DAI, it was seen that 6% CT Scan demonstrated DAI. In this study, most of the patients had more than one CT findings. In our study, 12 patients (12%) expired. All the patients who expired had severe head injury (GCS 3-8). RTA was the commonest mode of injury in the patients who expired. 5 out of 100 patients (5%) had sustained cervical injury.

Figure 3: showing different types of skull fracture.

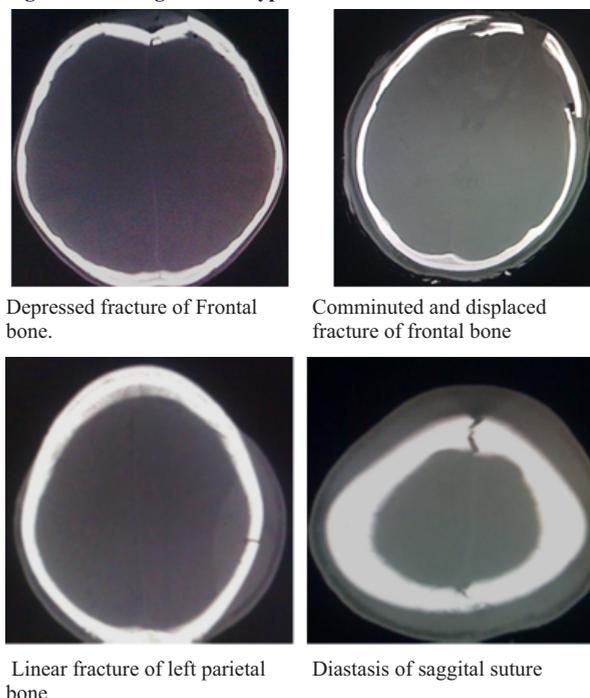
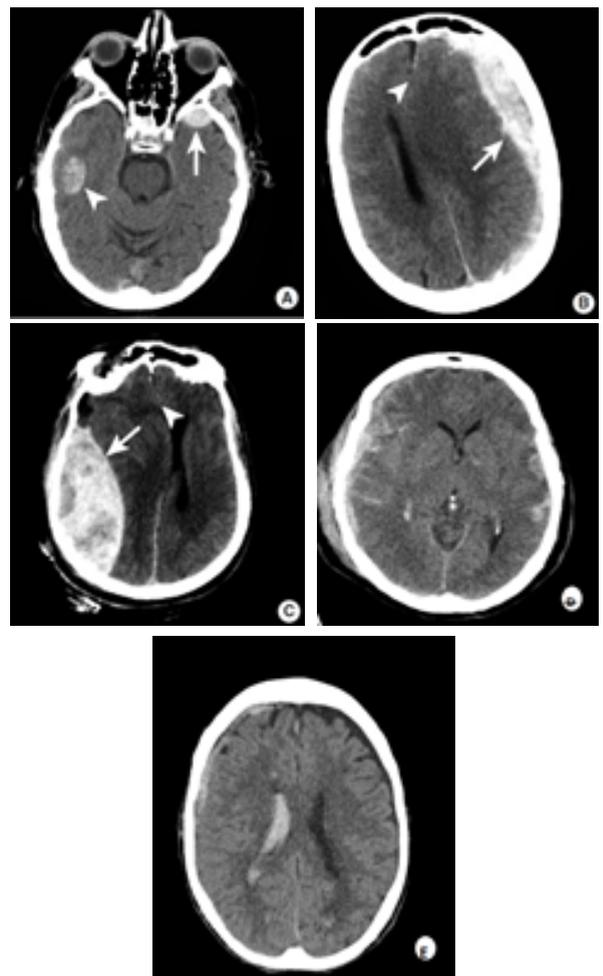


Figure 4: Types of hemorrhage



- A: Hemorrhagic parenchymal contusion**
- B: Subdural hematoma**
- C: Epidural hematoma**
- D: Subarachnoid hemorrhage**
- E: Intra ventricular hemorrhage**

CONCLUSION:

CT scan of brain is currently the most appropriate diagnostic modality in cases of head injury for early diagnosis and to decide appropriate medical or surgical management, which helps in predicting ultimate outcome of the patients.

REFERENCES:

1. Ghebrehiwet M, Quan LH, Andebirhan T. The profile of CT scan findings in acute head trauma in Orotta Hospital, Asmara, Eritrea. JEMA 2009; 4:5-8.
2. Gururaj G. Epidemiology of traumatic brain injuries: Indian scenario. Neurol Res. 2002 Jan;24(1):24-8. Review. PubMed PMID: 11783750.
3. L.R. Gentry: Magnetic Resonance Imaging of acute head injury. In: R.R. Edelman, J.R. Hesselink, M.B. Zlatkin, J.V. Cruess -Clinical Magnetic Resonance Imaging. Elsevier 2006;2:1346-65
4. Strenbach G. L. The Glasgow Coma Scale. J. Emerg. Med., 2000, 19 : 67-71.
5. Bhandari R, Mahato IP, Poudel M, Giri R. Head injury: a case profile study from Eastern region of Nepal. Health Renaissance 2010; 8(2): 110-3
6. Agrawal A, Agrawal CS, Kumar A, Lewis O, Malla G, Khatiwada R et al. Epidemiology and management of pediatric head injury in eastern Nepal. Afr J PaediatrSurg 2008;5:15-8.