Chapter one

1-1 Introduction:

Any injury that results in trauma to the skull or brain can be classified as a Headinjury. The terms traumatic brain injury and head injury are often used Interchangeably in the medical literature. This broad classification includes neuronal injuries, hemorrhages, vascular injuries, cranial nerve injuries, and subdural hemorrhage, among many others. These classifications can be further categorized as open (penetrating) or closed head injuries. This depends on if the skull was broken or not. Because head injuries cover such a broad scope of injuries, there are many causes—including accidents, falls, physical assault, or traffic. Adults suffer head injuries more frequently than any age group. Their injuries tend to be due to falls, motor vehicle crashes, colliding or being struck by an object, and assaults. Children, however, tend to experience head injuries due to accidental falls and intentional causes (such as being struck or shaken).

The conventional x-ray sometimes is not enough to diagnose all cases that come to the emergency department e.g. head trauma which may cause small cranial fractures, cerebral hemorrhage and edema .All of these mentioned cases of trauma need accurate diagnosis to plan urgent treatment .computed tomography became well established in diagnosis of diseases of the central nervous system, and in some cases, and reduced the frequency of cerebral angiography.(seidenwurm DI 2007).

1-2 Problem of the Study:

Most emergency departments have only conventional x-ray and there is no CT scanner emergency, urgent CT scan examinations for patient will be delayed for days, which in turn delay the treatment.

1.3 Objectives:

1.3.1 General objectives:

To study the head trauma in emergency department by using conventional x-ray and computed tomography .

1.3.2 Specific objectives:

- To detect the cause of trauma.
- To detect the type of trauma by conventional x-ray.
- To detect the type of trauma by computed tomography.
- To compare between conventional x-ray and computed tomography.

1.4 Overview of the study:

The research contains five chapters:

Chapter one: include introduction, objectives , Hypothesis, problem of study,

sample size, area of the study and overview of the study,

Chapter two: include brain anatomy, pathology, and previous study.

Chapter three: include material and method.

Chapter four: include the results of the study.

Chapter five: include discussion , conclusion and recommendation, references and appendi

Chapter Two

2.1 Anatomy:

2.1.1 Skull:

The skull or bony skeleton of the head is divided into two main sets of bares the 8 cranial bones and 14 facial bones cranial bones are divided into the clavaria — skull cap‖ and floor .

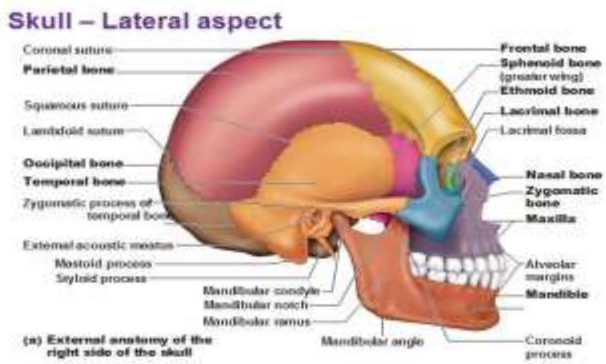


Figure (2-1):the skull anatomy (lateral view), (Kelley,1997).

2.1.1.1 Cranium:

The cranium is composed of eight bones that surround and protect the brain. These bones include the occipital, 2 temporal, sphenoid 1, ethmoid 1, parietal 2, and frontal1.(Kelley,1997)

2.1.1.2Occipital bone:

Forms the inferior posterior portion of the cranium and the posterior cranial fossa , on the inferior portion of the occipital bone is a large oval aperture called the foramen magnum. This opening allow the brain stem to continue as the spinalcord, the occipital bone can be divided into four portions lateral condyles 2 , basilar portion 1 , and squamous portion.(Kelley,1997)

2.1.1.3Temporal bone:

The two temporal bones contain many complex and important structures. They form part of the sides and base of the cranium and together with sphenoid bone, create the middle cranial fossa . The temporal bone can be divided into four portions squamous, tympanic, mastoid and petrous.(Kelley,1997)

2.1.1.4Sphenoid bone:

The butter fly-Shaped sphenoid bone extends completely across the floor of the middle cranial fossa . This bone forms the majority of the base of the skull and articulates with the occipital, temporal, parietal, frontal and ethmoid bones, the main ports of the sphenoid bone are the body, lesser wings 2 and greater wings 2 located within the body of the sphenoid bone is a deep depression called the sella turcica which houses the hypothesis (pituitary gland).

2.1.1.5Ethomoid bone:

Is the smallest of the cranial bones and is situated in the anterior cranial fossa, this cube – shaped bone can be divided into four parts: horizontal portion, vertical portion and two lateral masses (labyrinths). The horizontal portion called the cribriform plate, articulates with the frontal bone this plate contains many foramina for the passage of olfactory nerves.(Kelley,1997)

2.1.1.6Frontal bone:

The frontal bone consists of a vertical and a horizontal portion. The vertical or squamous portion forms the forehead and anterior vault of the cranium (Kelley,1997)

2.1.1.7Parietal bone:

The two parietal bones form a large portion of the sides of the cranium the parietal bones articulate with the frontal , occipital , tempor al and sphenoid bones. The superior point between the parietal bones is the vertex, which is the highest point of cranium. (Kelley, 1997).

2.1.1.8Facial bones:

The face is made up of fourteen facial bones, the facial bones can be difficult to differentiate because of their relatively small size and irregular shape they consist of nasal2 , lacrimal 2 , maxilla2, zygoma 2, palatine 2, inferior nasal conches 2, vomer 1 and mandible 1 (Kelley,1997).

2.1.2 Brain:

Meaningsare the membranes which cover the brain and spinal cord. They are the outer duramater, the middle machnial mater and the inner pia maters:

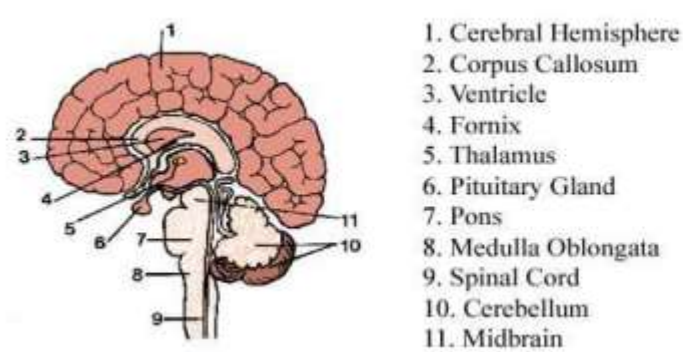


Figure (2.2): Anatomy of Brain, (http://mybrainnotes.com)

2.1.2.1 Dura mater:

This has two layers, an outer, endosteal layer, which consists of the endosteum (periosteum) of the inner surface of the skull bones, and an inner, meningeal layer. The tub layers are indistinguishable from each other except where they separate to enclose the dural venous sinuses. The endosteal layer fuses with the periosteum of the margins of the forming and sutures. It remains adherent to the bones. The meninged layer is dense strong fibrous membrane which forms the proper Dura mater covering the brain, and continuous with the Dura mater of the spinal cord. This layer ensheaths the cranial nerves, at the foramina, as they leave the cranial cavity . (Qurashi, 1998) .

2.1.2.2Dural septa:

The Dura mater also sends four income plate septa which divide the cranial cavity into communicating comportments lodging the various parts of the brain, these are the: the falx cerebri, tentorium cerebella, falx cerebella and diaphragm sellae. There important function is to restrict displacement of the brain during sudden movement. (Qurashi, 1998).

2.1.2.3 The falx cerebral:

Is a sickle shaped fold of meningeal layer of dura mater which occupies the median longitudinal fissure between the cerebral hemispheres. It’s anterior and is attached to the frontal crest and crista galli, its posterior end reaches the internal occipital protuberance and joins the highest points in the tentorium cerebella. The superior sagittal sinus runs in its upper convex edge, between the crista galli and the internal occipital protuberance.The inferior sagittal sinus runs in its inferior concave free margin. The straight sinus occupies the line of the attachment of the falx cerebral with the tentorium cerebella. . (Qurashi, 1998).

2.1.2.4The tentorium cerbeli:

Is ten-like roof for the posterior cranial Fossa, which separates the cerebrum from the cerebellum. It has a convex superior surface which supports the occipital lobes of the cerebella hemispheres. It has free anterior edge that surrounds an opening,the tentorial notch. The edge is attached to the anterior and posterior clinoid processes. The notch is occupied by the midbrain. anterolaterally, the tentorium is attached to the superior petrosal sinus. posterior and laterally, it is attached to the edges of the groove for the transverse sinus on each side of the occipital bone. The falx cerebra and Falx cerebella are attached to the superior and inferior surfaces of the tentorium cerebella respectively. The lower layer of the tentorium cerebella pouches for wards near the apex of the petrous temporal bone below the superior petrosal sinus to form recess between the endosteal and meningeal layers of the middle cranial Fossa. The recess is called trigeminal (cavum trigeminal). It covers the roots of the nerve and the proximal art of the ganglion of the trigeminal nerve. (Qurashi, 1998).

2.1.2.5The Falx cerebella:

Is a small sickle. Shaped dural fold in the sagittal plane between the two tube cerebella hemispheres . It extends along the occipital crest from the inferior surface of the tentorium. Its anterior edge is free and its posterior fixed margin contains the occipital sinus. (James, 2002).

2.1.2.6 The diaphragm sellae:

Is a small circular dural sheath which roofs the sella turcica. It covers the pituitary gland, hypothesiscerebral. It contains a central hale for the stalk of the pituitary gland.blood supply and innervations of dura mater the arterial supply comes from meningeal branches of the arterial carotid artery for the anterior fossa, maxillary artery for the middle fossa, and vertebral, ascending pharyngeal .And occipital arteries for the posterior fossa. The largest of these branches is the middle meningeal artery. The arteries lie in the extra Dural space. The veins follow the arteries the middle meningeal veins drain to the ptrygoid venous plexus. The dura mater is innervated by bronchus from the trigeminal, vagus, upper three cervical nerves and the sympathetic system. The dura mater of t he anterior and middle fossa is supplied by branches from the divisions of the trigeminal nerve. Meningeal nerves to the posterior Fossa are derived from the upper three cervical, vagus and hypoglossal nerves. (James, 2002).

Due to the presence of numerous nerves ending the Dura matter is sensitive to stretch which produces headache pain from the Dura above the tentorium is referred to the same side of the head while that from the infra -tentorial regions is referred to the back of the head and neck (distrib ution of the greater occipital nerve). (Qurashi, 1998).

2.1.2.7 Arachnoids matter:

This is the middle layer it is thin delicate imtermede membrane which is closely related to the Dura mater externally the space between the Dura and arachnoids, subdural space, is a site where hemorrhage may occur, subdural hemorrhage. The space between the Dura and arachnoids, subdural space, is a site where hemorrhage may occur, subdural hemorrhage. The space between the arachnoids and pia, subarachnoids space, is filled with C.S.F, blood ,blood vessels and fine strands which traverse the space, the arachnoids bridges the sulci of the brain in which the pia dips allowing the subarachnoid pia are widely separated to form cisterns. The largest of these is the cerebellomeduallary cistern (cistern magna) between the inferior surface of the cerebellum and posterior surface of the medulla oblongata. The interpeduncular and pontine cisterns lie between the cerebral peduncles and the ventral surface of the pons, respectively. The cisterns communicate freely with each other and with the remainder of the subarachnoid space .The arachnoids mater forms small finger. Like processes which protect into the venous sinuses to form arachnoids villi which are most numerous along the superior sagittal sinus. The villi aggregate to form arachnoids granulations. The dura is pushes into the venous sinus by villi and fuses with the endothelial lining of the sinus. The arachnoids villi are the main sites at which the CSF returns to the circulation.Structures leaving or entering the brain pass through the subarachnoid space. These include the cerebral arteries and cranial nerves. The arachnoids mater fuses with the epineurium of the nerves of the point of their exit from the skull. The arachnid around the optic nerve extends to be attached to the sclera allowing the space to reach the eyeball. This allows easy detection of intracranial pressure by examination of retina.The C.S.F which is produced by the choroid plexus of the lateral, third and fourth ventricles of the brain escapes from the ventricular system by three foramina in the roof of the fourth ventricle. The CSF enters the subarachnoid space and circulates around the brain and spinal cord down to the second sacral vertebra, where the space ends. (James, 2002).

2.1.2.8 Pia mater:

This is a thin vascular connective tissue sheet which covers the gyri and dips into the sulci of both the cerebrum and cerebellum. It extends on the cranial nerves and fuses with their epinurium. It ensheaths the blood vessels as they enter the substance of the brain . The cella choroidea of the third an d fourth ventricles if formed by the Pia and ependyma fused around the choroid plexus.(James, 2002).

2.1.2.9 The cerebrum:

The cerebrum consists of two symmetrical hemispheres, the outer layer of the cerebrum is known as the cortex and this is arranged in connections, that is deep Irregularly shaped fissures or indentations . This is the gray matter of the brain.under neath the cortex lies nerve fiber or whit matter the function of the cerebrum is to control voluntary movement and to receive and interpret conscious sensations. It is the seat of the higher functions such as the senses, memories, reasoning, intelligence and moral sense. (James,2002).

2.1.2.10 the medulla oblongata:

The medulla oblongata is about 3 cm long and connecting the rest of the brain with the spinal cord with which it is continuous. it is made up of interspersed white and grey matter, the medulla oblongata not only acts as the linked between the brain and the CNS of the body but it is also the centre of those parts of the ANS which control the heart , lungs , processes of digestion , etc . (James, 2002).

2.1.2.11 The Pons varoli:

Is bridge of nerve fibers linking the right and left hemispheres and also the cerebellum with the cerebrum above and the medulla oblongata below all impulses which pass between the brain and the spinal cord traverse the Pons varoli (James, 2002).

2.1.2.12 the pituitary gland:

Or hypothesis is a small gland about the size of a pea and lies in the pituitary fossa in the space of the skull. Its Function is control other endocrine glands in the body, it secretes hormones that control sexual development, promote bone and muscle growth and respond to stress and fight disease. (James, 2002).

2.1.2.13 the hypothalamus:

Is situated in the area of the floor of the third ventricle of the brain and it exercise an influence over the autonomic nervous system. It contains the heat regulating centre and is generally believed to be involved with appetite. (James, 2002).

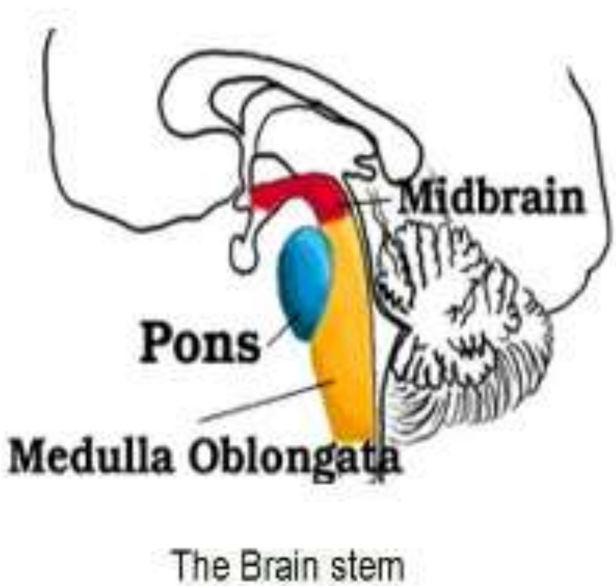


Fig.(2.3)Show The brain Stem. (http://www.halls.md/ct/ct.htm)

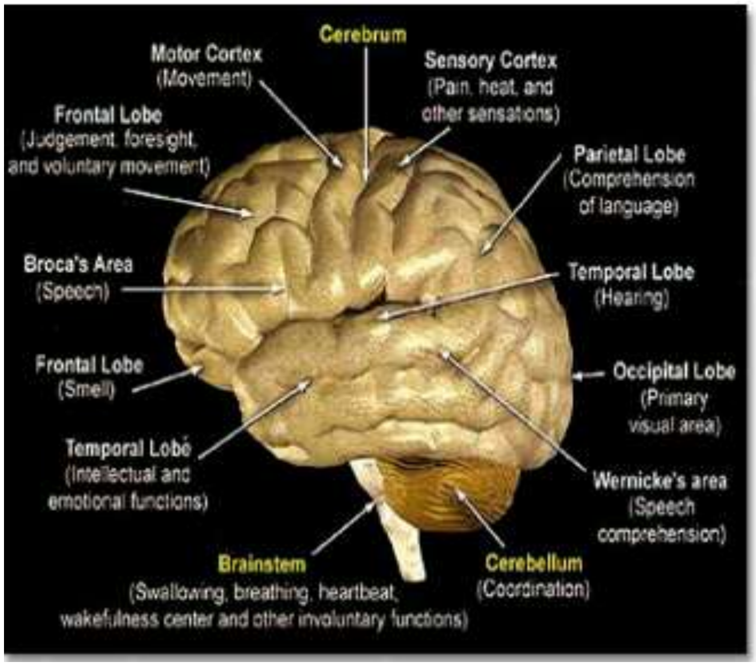


Fig.(2.4)Show Lobes and sensory areas Of Brain.

(http://www.slaney.org/pct/)

2.2 physiology

Regulate the heart beating ,Pick the message from all parts of the body via the nerves ,Mental activities involved in memory such as :(sense of responsibility ,intelligence ,thinking),the brain play role in learning and language processing (cerebellum) and It coordinates activities associated with maintenance of balance and equilibrium (cerebellum).(QurashiM,1998) .

2.3 Pathology of head trauma:

Cerebral trauma is most frequent in young males who may then survive with varying degrees of incapacity for many years .Injuries affecting the brain fall into groups

2.3.1 Epidural hematoma:

Develop after rupture of one of the meningeal arteries, usually the middle meningeal, that run between the drug and the skull. Since the drug is in part, the periossteum of the skull and is therefore firmly attached to it , a skull fractures is usually present. Because they are a product of arterial bleeding . Epidural hematomas accumulate quickly and cause rapid and progressive rise in intracranial pressure, which usually develops within minutes to a few hours of the trauma typically; patients recover from the initial trauma. If not immediately drained it will produce brain herniation , medullary compression leads to respiratory. (Robbins, 1987).

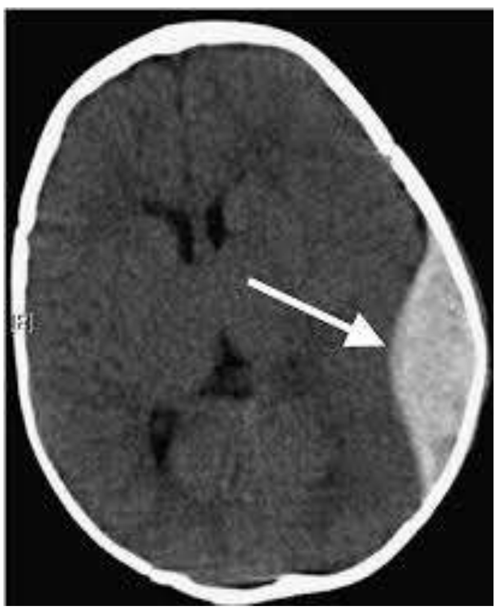
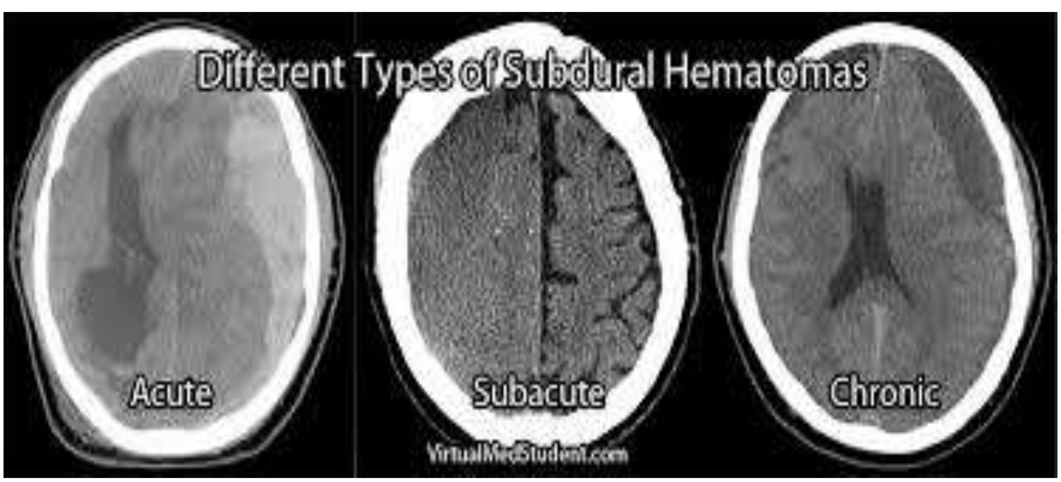


Fig (2.5): CT Brain Epidural Hematoma, (Robbins, 1987**)**

2.3.2Subdural Hematoma:

Occur after rupture of some of the bridging veins that connect the renous system of the brain with the large venous sinuses that are enclosed within the dura.Since the brain in its both or C.S.F can move, where as the verous sinuses are fixed, the displacements of the brain that occur in trauma can tear some of these deticate veins at the point where they penetrate the durra, with subsequent bleeding into the subdural space, SDH occur most frequently over the convexities of the hemispheres , where the freedom of movement of the brain is greatest, and are brain that occur in trauma can tear some of these dedicatedveins at the point where they penetrate the dura, with subsequent bleeding intothe subdural space, SDH occur most frequently over the convexities of the hemispheres , where the freedom of movement of the brain is greatest, and are Relatively infrequent in locations such as the Posterior fosse, where little movement is possible , they may be either acute or chronic.(Robbins, 1987).



Fig(2.6): CT Brain Subdural Hematoma, (www.virtualmedstudent.com)

2.3.2.1A cute subdural hematoma:

Brain disorder involving a collection of blood in the space between the inner and the outer membranes covering the brain where symptoms usually develop within a short time after a head injury. (Robbins, 1987).

Fig (2.7): CT Brain Acute Subdural hematoma, (Robbins, 1987).

2.3.2.2 Chronic subdural hematoma:

A brain disorder involving a collection of blood in the space between the inner membranes that cover the brain and the outer membrane covering the membranes of the brain with symptoms occurring 2 weeks or move after the causative injury . (Robbins, 1987).

Fig (2.8): CT Brain Chronic Subdural hematoma, (Robbins, 1987).

2.3.3Fractures:

Fracture or break in the cranial (skull — bones) fractures of the skull are common complications of trauma to the head , these fractures may be closed or open, linear or comminuted and may or may not be depressed. They may be occult or evident from the presence of blood or CSF draining from the nose or ears. (Robbins, 1987).

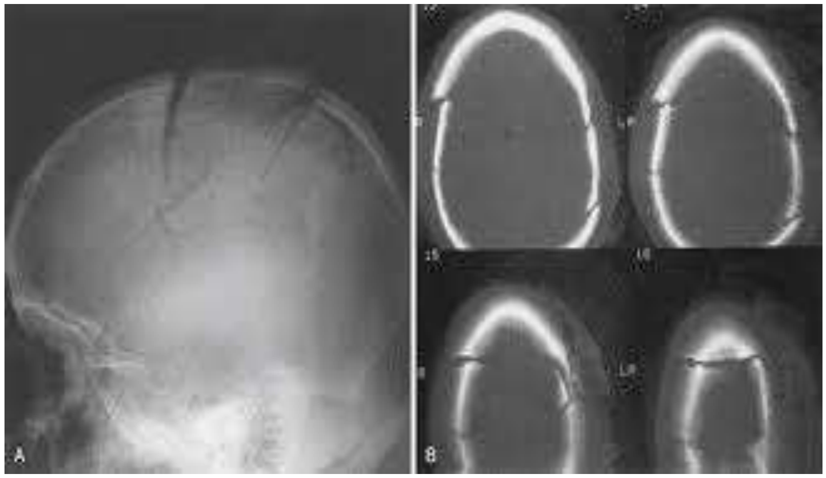


Fig (2.9): conventional x-ray and CT image of skull fracture (Robbins, 1987).

2.3.3.1Linear skull fracture:

Does a break in cranial bone resemble at inline, without depression or distortion of bone (Robbins, 1987).

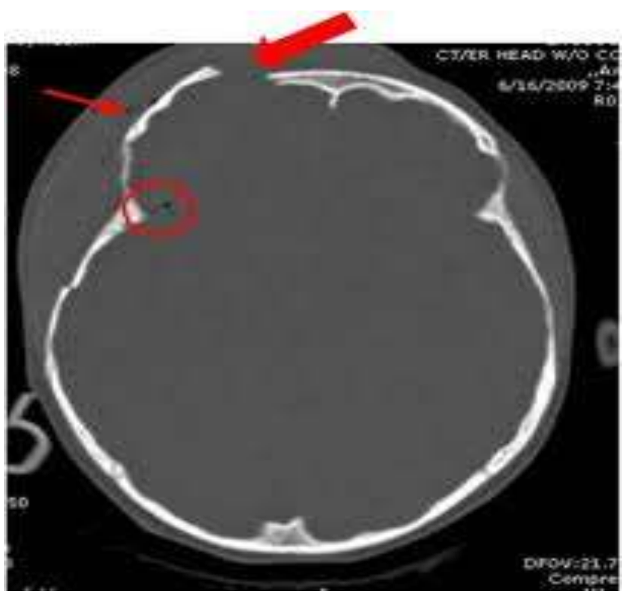


Fig (2.10): CT Brain Linear Skull Fracture, (Robbins, 1987).

2.3.3.2Depressed skull fracture:

Is a break (in a cranial bone) or crushed, portion of skull) with depression of the bone in toward the brain. (Robbins, 1987).

Fig (2.11): x-ray and CT Brain Depressed Skull Fracture, (Robbins, 1987).

2.3 Previous study:

-Study done by AbdElrahimet al 2014in emergency neurosurgery department of Teaching Khartoum Hospital, is the only specialized department in Sudan, which deals with the management of head injury patients. The objective of the study is to maintain the efficiency of CT in diagnosing head injuries as a first accurate radiological Investigation in emergency department. This study is descriptive case study concerning patients with head injuries in order to compare between CT and conventional skull x-ray investigations. The incidence of the head injuries is higher in males rather than females, and the occurrence had been at the age of 16-30 years. Most of the head injuries were caused by road traffic accidents (RTA) (158 cases – 63.2%).No difference between the CT scanning and the conventional skull x-ray in demonstrating the linear fractures of the skull (100% to 98.7%).Most of the head injuries used by road traffic accidents (RTA) (158 cases – 63.2%).

-Second study international study done by Dr.Broder JS 2010that

showed Non contrast computed tomography (CT) provides important diagnostic information for patients with traumatic brain injury. A systematic approac h to

image interpretation optimizes detection of pathologic air, fractures,

hemorrhagic lesions, brain parenchyma injury, and abnormal cerebrospinal fluid

spaces. Bone and brain windows should be reviewed to enhance injury

detection. Findings of midline shift and mass effect should be noted as well as

findings of increased intracranial pressure such as hydrocephalus and cerebral edema, because these may immediately influence management. Compared with

CT, magnetic resonance imaging may provide more sensitive detection of

diffuse axonal injury but has no proven improvement in clinical outcomes. This article discusses key CT interpretation skills and reviews important traumatic brain injuries that can be discerned on head CT. It focuses on imaging findings

18that may deserve immediate surgical intervention. In addition, the article

reviews the limits of non contrast CT and discusses some advanced imaging modalities that may reveal subtle injury patterns not seen with CT scan.

-Study done by Badreldin Mohamed Ahmed Elhag on 2001 in emergency department of Teaching Khartoum Hospital. The main objective in this study to know which modality is the best in imaging head injuries,the conventional x-ray or computed tomography,to know this 30image with x-ray and 30 image with CT were done for pts subjected to head injury.

The result obtained were as The incidence of the head injuries is higher in males rather than females, and the occurrence had been at the age of 20-35years. Most of the head injuries were caused by road traffic accidents (RTA) (20cases – 66.6%).

Chapter Three

Material and Methods

3.1Material

3.1.1 Sample of the study:

This study includes 50pts male and female with different age from 1 year to 60 years, all patients came to the radiology department had head trauma .in this study excluded all normal cases and cases with history of brain pathology .

3.1.2 Place and time of the study:

The study was performed in emergency department in AL Rebate university Hospital.

Data were collected on February 2018.

3.1.3 Machine used:

- For conventional X-ray used TOSHIPA .

- For CT machine used Siemence16slices .

3.2 Methods

3.2.1 Technique used:

3.2.1.1 Conventional x-ray technique :

- the sagittal midline of the patient's head is parallel to the image detector .
- sellaturcica in profile .
- temporomandibular joints are superimposed.
- the beam travels laterally, with 0° of angulation, through a point ~4 cm above the external auditory meatus.

- source-to-image distance: 40" (100 cm).
- IR size & orientation 24*30cm landscope.
- Center ray directed to5cm superior to EAM.
- Collimation was outer skin margins of the skull.
- kVp 70-75 .
- mAs 20
- FFD 100cm.
- grid is used.

3.2.1.2 CT technique :

The pt is placed supine on the C.T table without rotation or tilt of head for good image quality, Head is rest on the head holder, axial scan started from the base of skull to vertex, Slice thickness 10mm, spacing 10mm,KVP 120 ,MAS 320 ,Slice thickness 5 mm and gantry tilt zero degree.

CT images are viewed with two sets of window settings. One set allows optimal visualization of the brain (brain windows) with lower contrast, the other set display optimal bony detail (Bone windows) with higher contrast.

3.3 Interpretation and getting results:

A radiologist, a physician specifically trained to supervise and interpret radiology examinations, will analyze the images and send assigned report to primary care or referring physician

Data is collected from image reports that demonstrate size, site, texture and enhanced tumors

3.4 Data analysis:

Data were first summarized into master data sheet ,then analyzed by SPSS program and then used Microsoft excel for data presentation .

Chapter Four

4-Result

Table (4.1): Shows study group gender distribution:-

Gender		
	Frequency	Percent
Male	29	58%
Female	21	42%
Total	50	100%

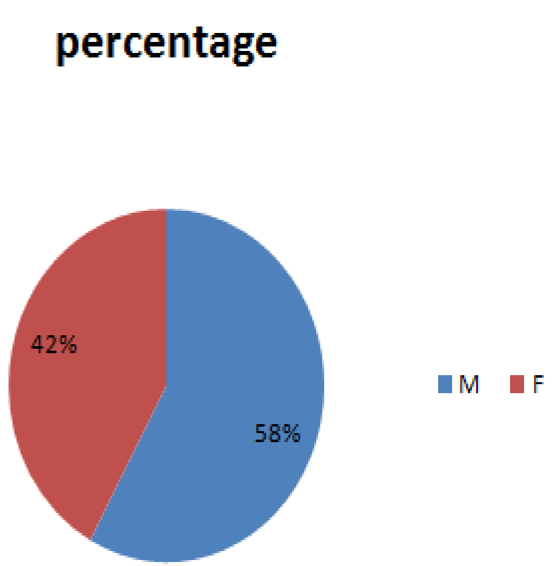


Fig (4.1): illustrated study group gender distribution

Table 4.2: Shows study age group distribution

Age group	Frequency	Percentage
1-10	6	12%
10-20	8	16%
20-30	11	22%
30-40	12	24%
40-50	5	10%
50-60	8	16%
Total	**50**	**100%**

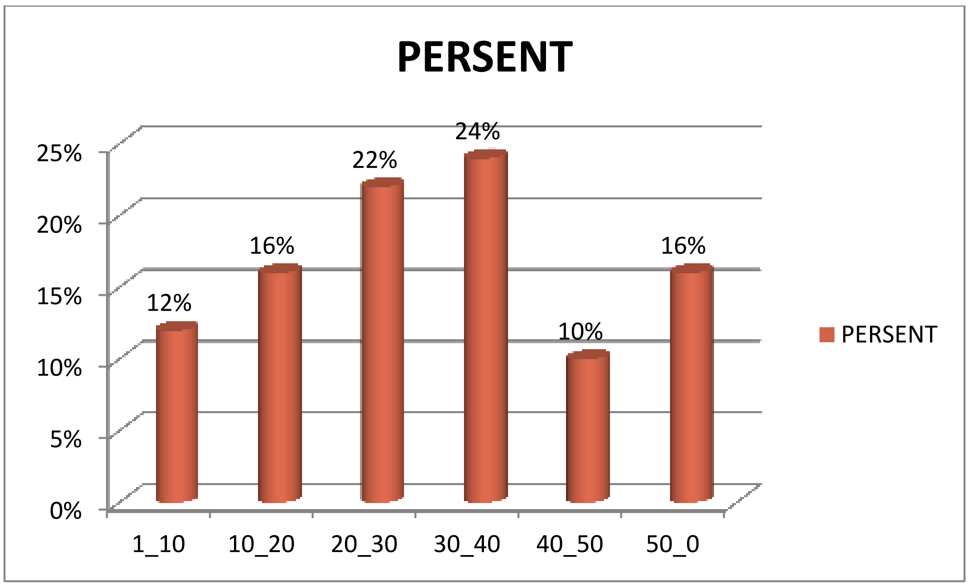


Fig4.2: illustrated study age group distribution

Table 4.3: Shows type of trauma

Type of trauma	Frequency	percentage
RTA	30	60%
Fall down	10	20%
Head by stick	10	20%
Total	**50**	**100%**

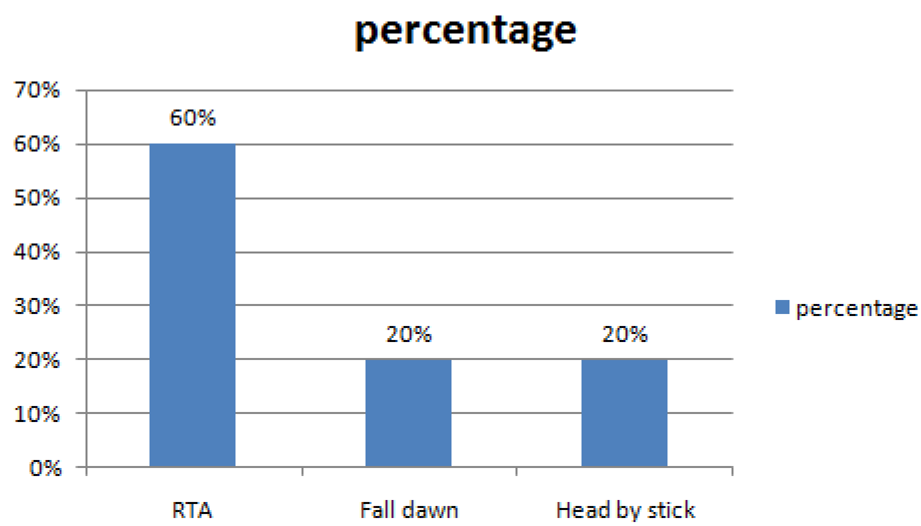


Fig 4.3: illustrated type of trauma

Table 4.4: Shows x-ray finding:

x-ray finding	Frequency	Percentage
Normal	22	44%
Fracture	28	56%
Total	50	100%

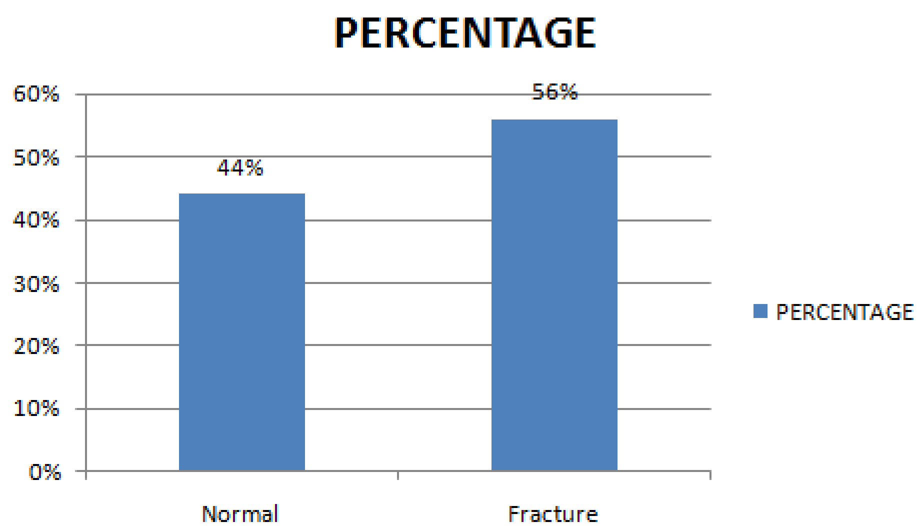


Fig4.4: illustrated x-ray finding

Table 4.5: Shows CT finding:

CT finding	Frequency	Percentage
fracture	23	46%
subdural hematoma	5	10%
fracture +epidural hematoma	8	16%
epidural hematoma	4	8%
fracture +subdural hematoma	2	4%
intracerebral hematoma	6	12%
fracture +EDH +SDH	1	2%
fracture +intracerebral hematoma	1	2%
Total	**50**	**100%**

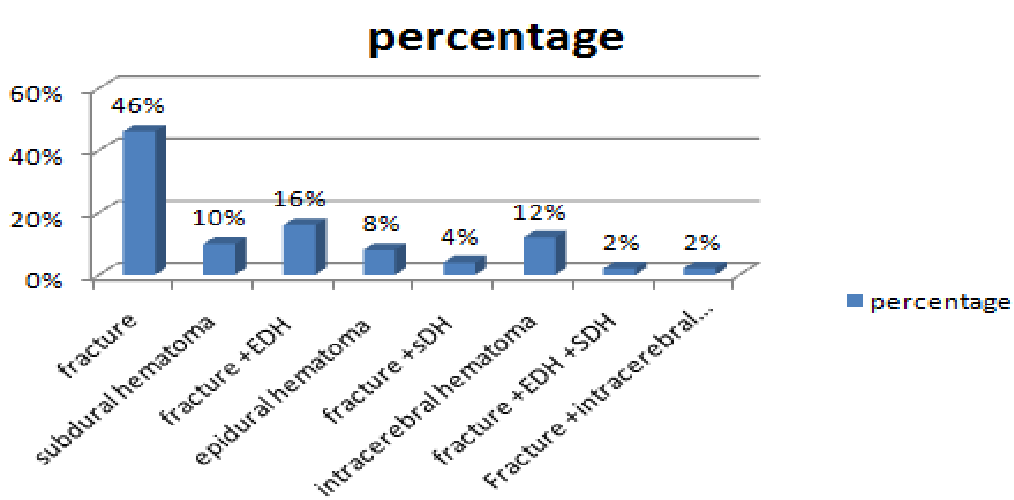


Fig4.5: illustrated CT finding

Table4.6: Shows correlation between x-ray finding and type of trauma:

Type of trauma	X-ray finding		Total
	normal	Fracture	
RTA	15	16	31
Fall down	4	5	9
head by stick	3	7	10
Total	22	28	50

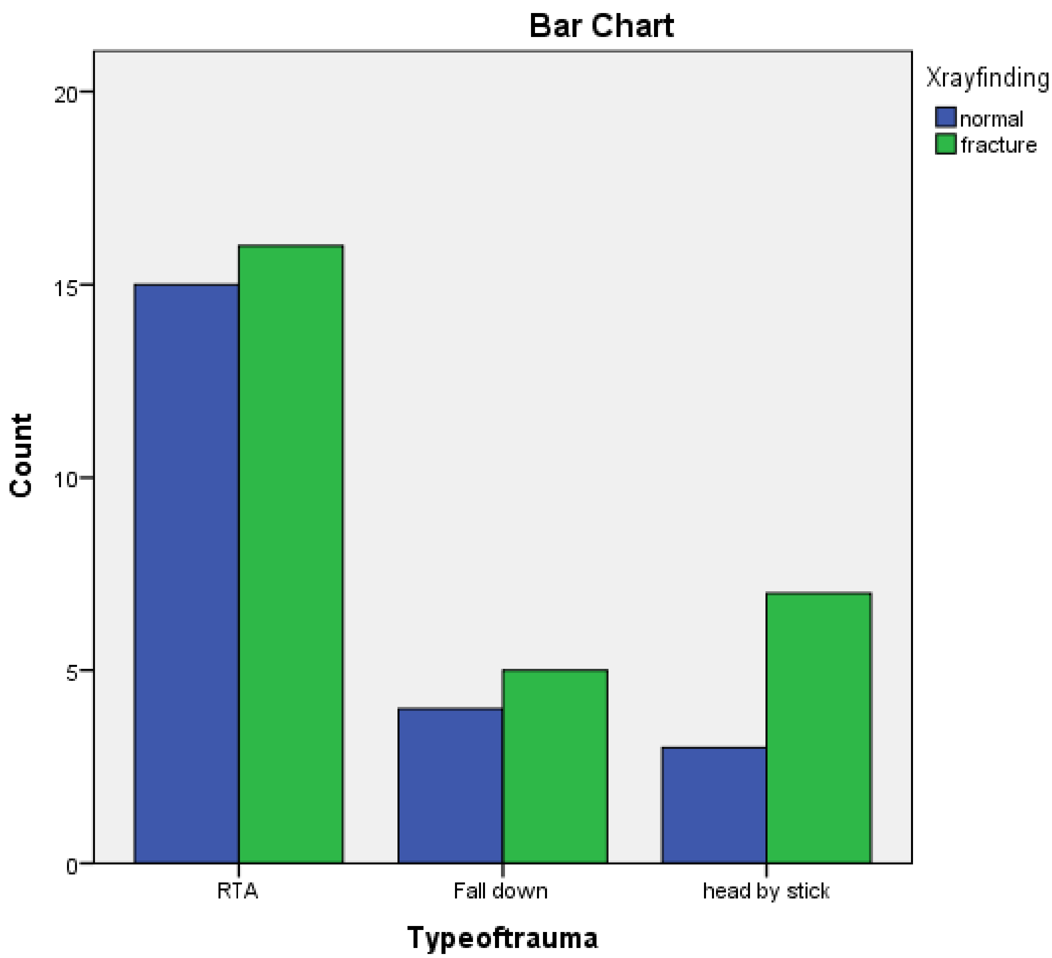


Fig4.6: illustrated correlation betweenx-ray finding and type of trauma

Table4.7: Shows correlation between CT finding and type of trauma :

Type of trauma	CT finding							
	Fracture	SDH	Fracture +EDH	EDH	Fracture +SDH	Intracerebral hematoma	Fracture +EDH +SDH	Fracture+ Intracerebral hematoma
RTA	9	5	7	3	0	5	1	1
Fall dawn	7	0	0	1	0	1	0	0
Head by Stick	7	0	1	0	2	0	0	0
Total	**23**	**5**	**8**	**4**	**2**	**6**	**1**	**1**

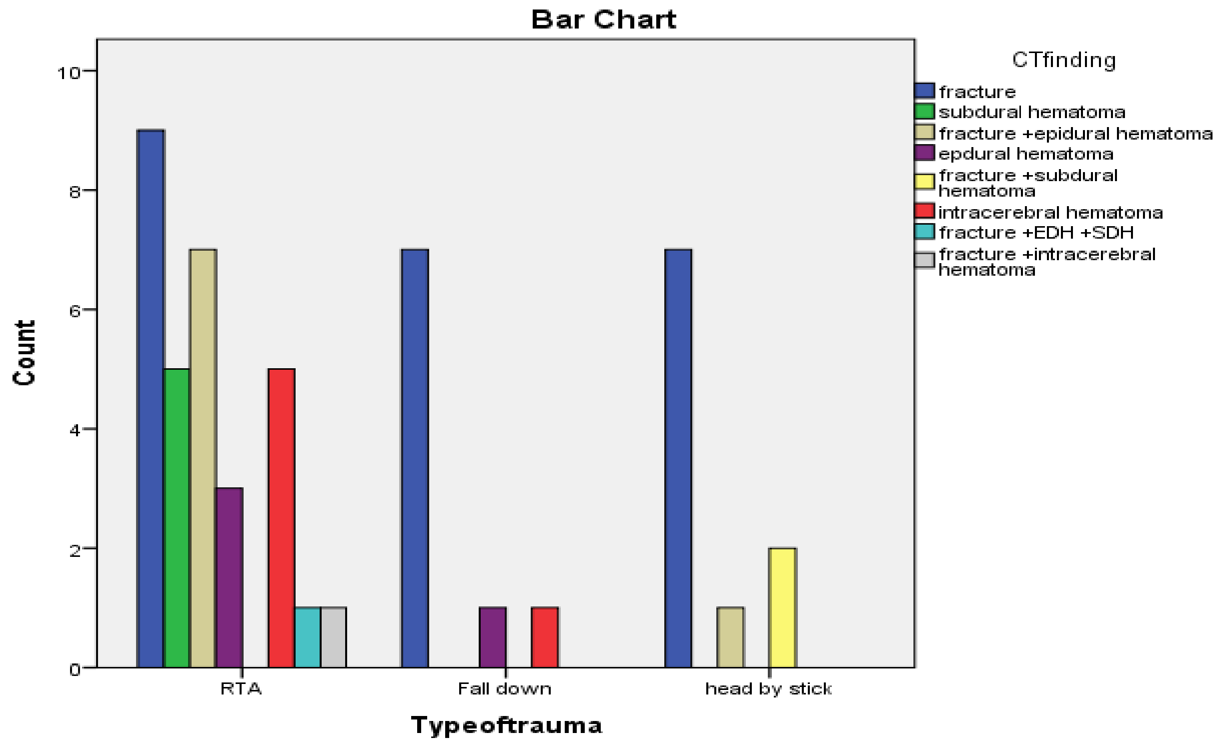


Fig4.7: illustrated correlation between CT finding and type of trauma

Table 4.8: Shows correlation between X-ray finding and CT finding

X-ray finding	CT finding							
	Fracture	SDH	Fracture +EDH	EDH	Fracture +SDH	Intracerebral hematoma	Fracture +EDH +SDH	Fracture+ Intracerebral hematoma
Normal	7	5	0	4	0	6	0	0
Fracture	16	0	8	0	2	0	1	1
Total	**23**	**5**	**8**	**4**	**2**	**6**	**1**	**1**

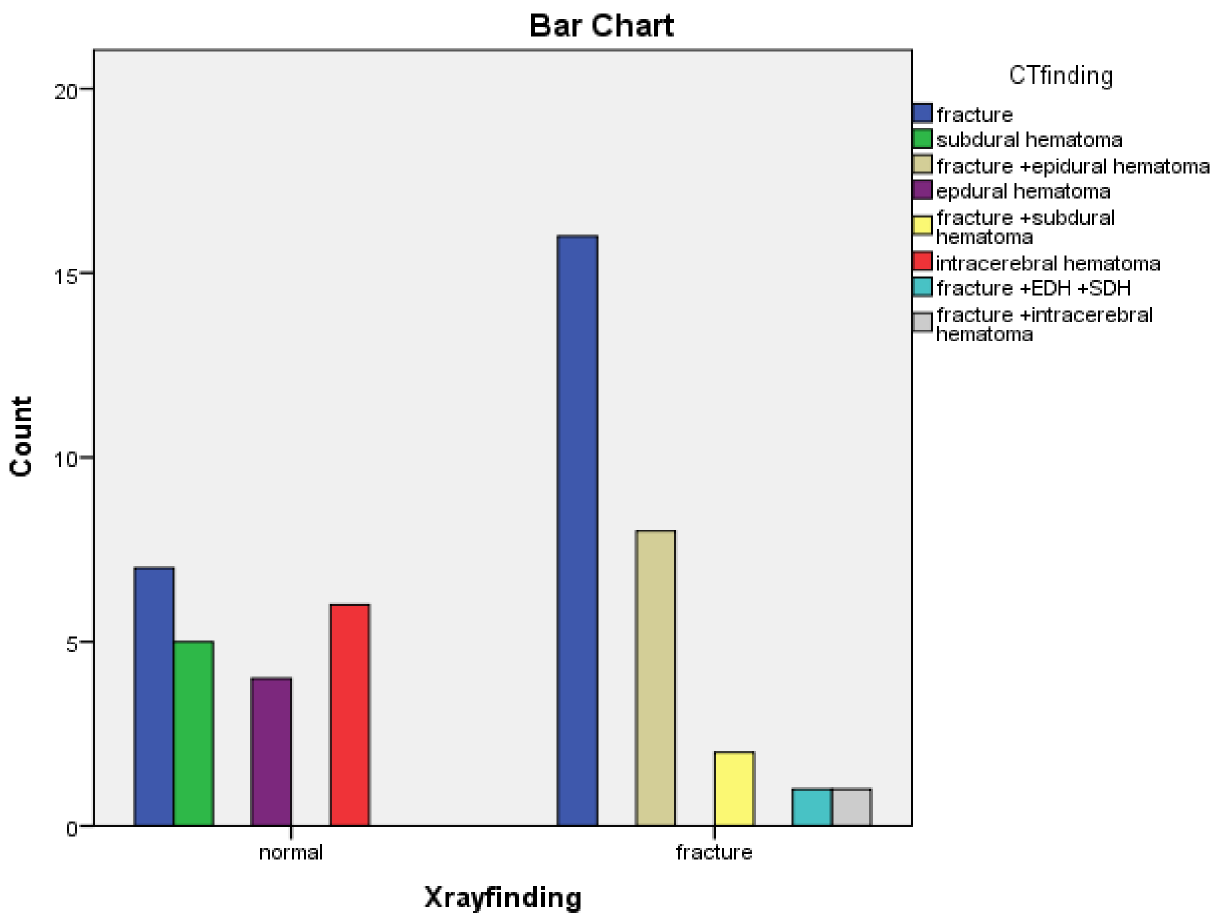


Fig4.8: illustrated correlation between X-ray finding and CT finding

Chapter Five

Discussion, Conclusion and Recommendations

5.1 Discussion

The objective of this descriptive study was to study the head trauma in emergency department by using x-ray and CT scan.

In the our study, 50 patients were had head trauma with different gender 29 male and 21 female, the result agree with previous study(AbdElrahimetal 2014) (Table 4-1) .

The sample was classified according to age starting from (3-60)years and the most age group effected was 30-40 years and this result disagree with previous study (Badraldin Mohamed Ahmed Elhag 2001)that means the age had no effect this was present in table (4-2) .

We found the most common type of trauma was RTA (60%) then fall down and head by stick was same percent (20%) and this result agree with previous study (AbdElrahimetal 2009) Table(4-3).

X-ray finding in this study, fracture finding was higher (56%) than normal finding(44%) Table (4-4) .

CT finding in this study, fracture (46%), fracture +EDH (16%), intracerebral hematoma (12%), subdural hematoma (10%), epidural hematoma (8%), fracture + SDH (4%),fracture + EDH+SDH (2%) and fracture +intracerebral hematoma (2%) Table (4-5).

In correlation between x-ray finding and type of trauma, result that in RTA type the fracture was 16 pts and normal was 15 pts, fall down type the fracture was 5 pts and normal was 4pts and in head by stick type fracture was 7 pts and normal was 3 pts,and this result agree with previous study (AbdElrahimetal 2009) Table(4-6).

In correlation between CT finding and type of trauma, result that in RTA type the fracture was 9pts ,subdural hematoma 5pts,fracture +EDH 7pts,epidural hematoma 3pts,intracerebral hematoma 5pts,fracture +EDH +SDH 1pt and fracture +intracerebral hematoma 1 pt,and fall down type the fracture was 7pts, epidural hematoma1pt and intracerebral hematoma 1pt,finally in head by stick type the fracture was 7pts,fracture +EDH 1pt and fracture +SDH 2pts Table(4-7).

In correlation between X-ray finding and CT finding , result that in normal x-ray finding the CT finding fracture was 7pts, epidural hematoma 4pts, subdural hematoma 5pts, ,intracerebral hematoma 6pts,and in fracture x-ray finding CT finding fracture was 16pts, fracture +EDH 8pts,fracture +SDH 2pts,fracture +EDH +SDH 1pt and fracture +intracerebral hematoma 1pt. Table (4-8)

5.2 Conclusion

As conclusions the study found that the head trauma was higher in males than females,the most effected age group were the ages between 30-40 y ,the RTA was the most common type of trauma and the fracture was the most common finding in x-ray and CT .

The CT scan is best modality in diagnosis of head trauma because it has high accuracy in detect of fracture and hemorrhage but x-ray can detect the fracture only.

4.3 Recommendations:

We recommend that C.T scan should be available in inside teaching hospitals.

We recommend that to reduce the incidence of head trauma injure in RTA by use seat belts, motor cycle helmets, speed limits in high way road.

For future study we advice to make a wide study on this topic in other

parameter and other states.

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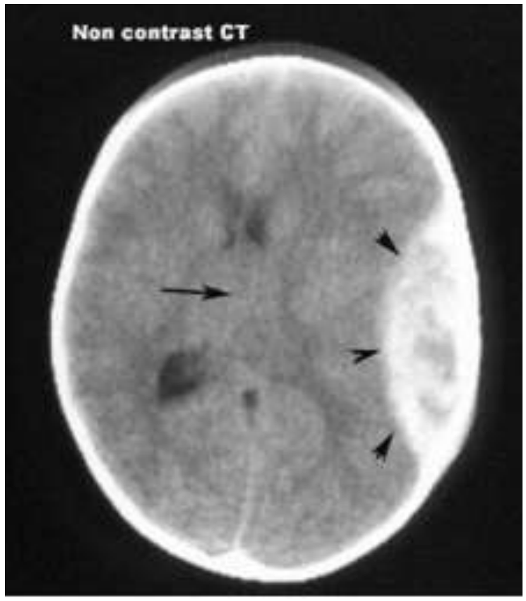
Appendix 1

DATA COLLECTIN SHEET

NO	Age	Gender	Type of trauma	x-ray finding	CT finding

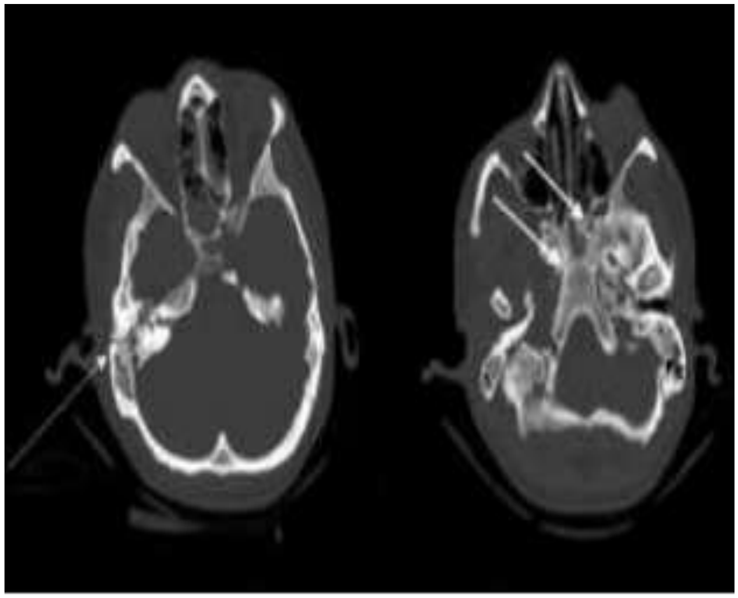
Appendix 2



CT scan of an 46-year-old male status of RTA showing Hemorrhagic stroke

CT scan of an 19-year-old female status of RTA showing aspread of the subdural hematoma (single arrows), midline shift (double arrows)

CT of an 87-year-old female status fall downshowing a large subdural hematoma along the leftcerebral convexity with significant midline shift .



CT scan of 35-year-old male with recentmotor vehicle accident demonstrating longitudinalfracture of the right petrous bone (thin arrow) thatextends into the skull base (thick arrow).