

## ***PROGNOSTIC FACTORS OF EXTRADURAL HEAMATOMA EVACUATION***

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### **Abstract**

**Objective:** To assess the *Prognostic Factors of Extradural Heamatoma Evacuation*

**Methodology :** This study was conducted on 50 patients with extradural heamatoma 14 females and 36 males, the oldest was 63 years old and the youngest was 3 years old, with mean age of 38.48 years, the cause of trauma was road traffic accident in 23 patients of them and falling from high in 14 patients of them and assault in 11 patients and animal kick in 2 patients, according to the clinical presentation the most common was manifestation of increase intracranial tension as headache and vomiting in 38 cases, followed by Loss of consciousness in 28 patients and 19 cases have typical lucid interval followed by disturbed conscious level in 12 cases, then weakness of one side of the body in 8 cases, then unilateral dilated pupil in 5 cases followed by fits in 2 cases, while 2 cases were neurologically free and one case has bilateral dilated fixed pupil, the volume of EDH was between 20-30cc in 27 patients and between 30-40cc in 17 patients and between 40 -50cc in 5 patients and more than 50cc in one patient, the EDH located in temperoparietal region in 16 patients and purely in the temporal lobe in 13 patients and in the parietal lobe in 8 patients and frontoparietal in 6 patients and the frontal lobe in 3 patients and in the posterior fossa in 3 patients and biparietal in one patient ,we operate 2 patients in the 1<sup>st</sup> hour and 14 in the 2<sup>nd</sup> and 14 in the 3<sup>rd</sup> and 10 in the 4<sup>th</sup> and 6 in the 5<sup>th</sup> and 4 cases after 5 hours.

**RESULT:** We operate 50 patients 39 of them show full recovery and 7 patients show neurological deficit and 4 patients died and no one show vegetative state and from the 46 patients who recovered 6 patients develop superficial wound infection and one patients show recollection of EDH and reoperation.

**Conclusion:** The EDH is more common in middle aged males .As regard the site of EDH we found that the site play minimal rule in the outcome of EDH and as the most common sites was temperoparietal and temporal so mostly the middle meningeal artery is the most common source of EDH and the posterior fossa is the most dangerous site as one case of the 3 patient presented with posterior fossa EDH died (33.3%) followed by temporal lobe EDH as 2(6.5%) cases from the 15 case died. the size and time from the trauma to evacuation and clinical presentation of EDH thy are the major factors that affect EDH. The clinical presentation especially the conscious level is the main factor affecting the outcome as all the 4 cases who died the GCS was less than 8 when they arrived.

**Keywords:** EXTRADURAL HEAMATOMA, surgical evacuation, Prognostic Factors

## Introduction

Epidural hematoma (EDH) is a traumatic accumulation of blood between the inner table of the skull and the stripped-off dural membrane Seifert V, Kieslich M (2009) .Epidural hematoma occurs in 1-2% of all [head trauma](#) cases and in about 10% of patients who present with traumatic coma.Tallon JM, Ackroyd-Stolarz S, Karim SA, Clarke DB (2008) .An extradural hemorrhage is an emergency because it may lead to permanent brain damage and death if left untreated. There may be a rapid worsening within minutes to hours, from drowsiness to [coma](#) and death Taussky P, Widmer HR, Takala J, Fandino J (2008) .Approximately 70-80% of epidural hematomas (EDHs) are located in the temporoparietal region where skull fractures cross the path of the middle meningeal artery or its dural branches. Frontal and occipital epidural hematomas each constitute about 10%, with the latter occasionally extending above and below the tentorium. Association of hematoma and skull fracture is less common in young children because of calvarial plasticity. The majority of bleeds in extradural cases originate from [meningeal arteries](#), particularly in the [temporal region](#). 10% of epidural bleeds may be [venous](#). due to shearing injury from [rotational](#) forces. Shepherd S. 2004. Epidural hematoma is usually found on the same side of the brain that was impacted by the blow, but on very rare occasions it can be due to a [contrecoup injury](#) Mishra A, Mohanty S (2001) *Neurology India*. The classic lucid interval occurs in 20-50% of patients with EDH. Initially, the concussive force that caused the head injury results in an alteration of

consciousness. After recovering consciousness, the EDH continues to expand until the mass effect of the hemorrhage itself results in increased intracranial pressure, a decreased level of consciousness, and a possible herniation syndrome. .In a study of 41 patients with epidural hematoma at a level I trauma center, the patients' age, severity of traumatic brain injury, and neurologic status were the main factors influencing outcome. Two patients died within 24 hours, and 39 patients (95%) survived. Thirty-two patients (78%) showed good recovery at latest follow-up. *OrthopTraumatolSurg Res*. 2016 Oct. 102

### Aim of the work

The aim of this study is to study factors that affect outcome of patient with extradural heamatoma

Patients and methods :

This prospective and retrospective study were conducted on 50 patients with surgically evacuated extradural heamatoma in Sohag university hospital . All patients or their relatives (in case of comatose patients) were consented and asked to volunteer for the study and the ethical committee of the hospital were approved this study and All patients or their relatives (in case of comatose patients) were informed with the possible risks and written consent were taken

### Inclusion criteria:

Patients with extradural heamatoma treated surgically whatever their age or sex

### Exclusion criteria :

- Patient without extradural heamatoma
- Patient with small extradural heamatoma treated conservatively

The study will include:

**1) Clinical assessment:**

- History from patient or relatives
- General examination.
- Neurological examination.

**2) Investigations:**

- Laboratory investigations.
- Head Computed tomography

**3) Management:**

Patients are managed surgically under general anaesthesia, the patient position and approaches to the extradural heamatoma will be

selected according to the site of the lesion.

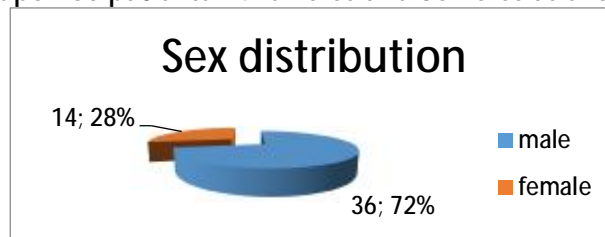
**4) Follow up as regard mortality and morbidity :**

- All patients will be followed up postoperatively, during hospital stay assessing conscious level of patient and presence or absence of neurological deficit and radiographic investigations by:
  - Computed tomography .
  - MRI in some cases.

**Results**

**1) Sex:**

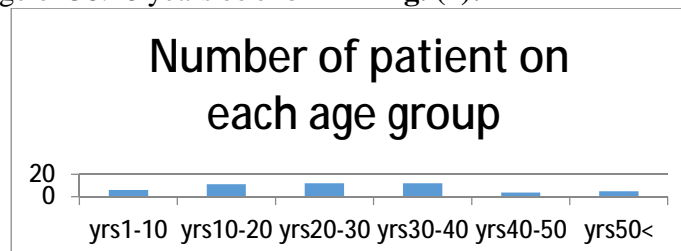
We operated upon 50 patients 14 females and 36males as shown in Fig. (1):



**Fig. (1):** Sex distribution

**2)Age**

As regard age of the patients the oldest was 63 years old and the youngest was 3 years old, with mean age of 38.48 years as shown in Fig. (2):

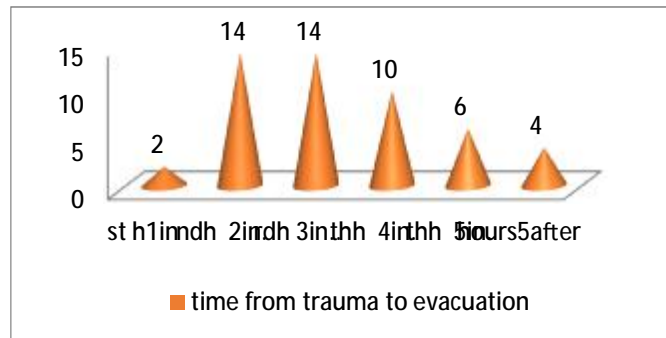


**Fig. (2) Age**

**3)Time from trauma to evacuation**

We operate 50 patients 2 of them in the 1<sup>st</sup> hour and 14 patients in the 2<sup>nd</sup> hour and also 14 patients in the 3<sup>rd</sup> hour and 10 patients in the 4<sup>th</sup> hour and 6 patients in the 5<sup>th</sup> hour and 4 patients after more than 5

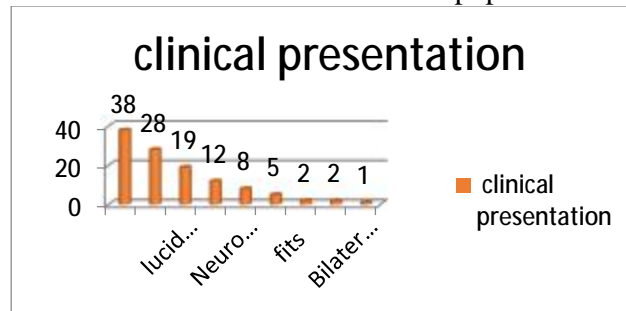
hours .as regard history taken from patients or accompanying persons as shown in Fig. (3):



**Fig. (3):** Time from trauma to evacuation

4) clinical presentation

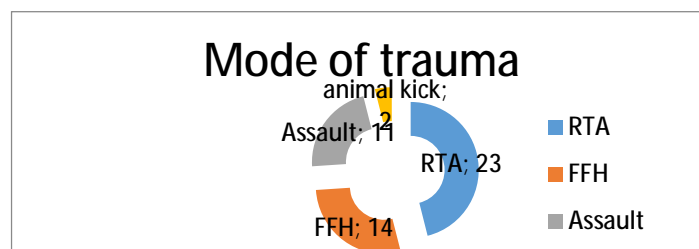
The 50 patients presented to us with several symptoms, the most common was manifestation of increase intracranial tension as headache and vomiting in 38 cases, followed by Loss of consciousness in 28 patients and 19 cases have typical lucid interval followed by disturbed conscious level in 12 cases, then weakness in 8 cases, then unilateral dilated pupil in 5 cases followed by fits in 2 cases, while 2 cases were neurologically free and one case has bilateral dilated fixed pupil as shown in **Fig. (4):**



**Fig. (4)**

5) Mode of trauma

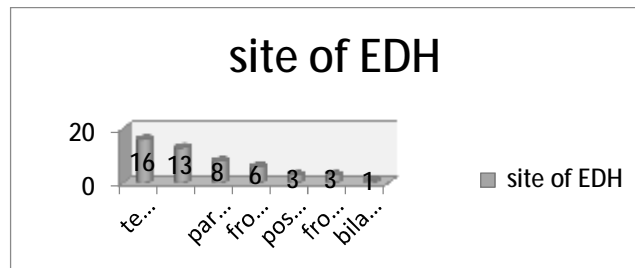
In 50 patients the cause of trauma was road traffic accident in 23 patients of them and falling from high in 14 patients of them and assault in 11 patients and animal kick in 2 patients. as shown in **Fig. (5):**



**Fig. (5)** Mode of trauma

6) Site of EDH

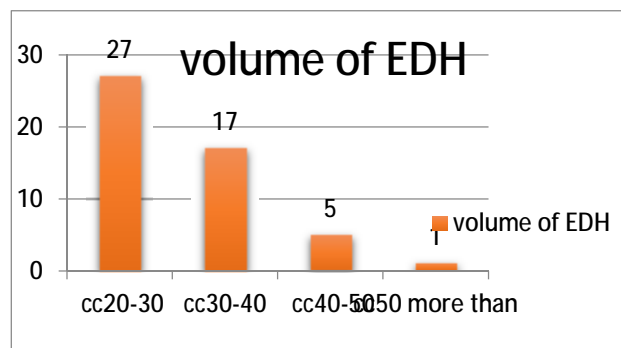
We operate 50 patient the EDH located in the temperoparietal in 16 patients and in the temporal lobe in 13 patients and parietal region in 8 patients and frontoparietal in 6 patients and in the the frontal area in 3 patients and in the posterior fossa in 3 patients as shown in **Fig. (6):**



**Fig. (6):** Site of EDH

7) volume of EDH

The volume of EDH was between 20-30cc in 27 patients and between 30-40cc in 17 patients and between 40-50cc in 5 patients and more than 50cc in one patient as shown in **Fig. (7):**



**Fig. (7)** volume of EDH

8)Outcome

We operate 50 patients 39 of them show full recovery and 7 patients show neurological deficit and 4 patients died and no one show vegetative state and from the 46 patients who recovered 6 patients develop superficial wound infection and one patients show recollection of EDH and reoperation as shown in **Fig. (8):** .

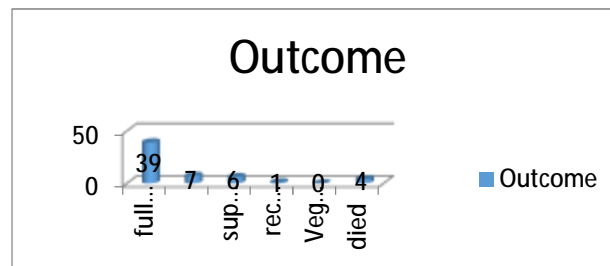


Fig. (8): Outcome

## DISCUSSION

In our series of 50 patients with extradural heamatoma, the oldest was 63years and the youngest was 3 years with mean age of 38years. While . (Phoebe S.Y. Cheung et al., 2007). operated upon 89 patients the oldest was 87years and the youngest was 1month with mean age of 37 years While C. Kuday, et al., 1994). operated upon 115 patients the oldest was 37years and the youngest was 5 years with mean age of 21years While (. (Noman Khaled.et al., 2008).operated upon 610 patients the oldest was 83 years and the youngest was 2.5 years with mean age of 29 years The mean age for EDh is middle age as this is the age exposed to trauma. In our series we operated upon 50 patients 36 males (72%) and 14 females (28%) While Phoebe S.Y. Cheung et al., 2007). 89patients, 70 male (79%) and 19 female (30%), (While (C. Kuday, et al., 1994). it included 115 patients, 78 males and 37 females While (Noman Khaled.et al. 2008). 610 patients 582 males and 84 females So males is exposed to trauma more than females. In our study we operated upon 50 patients, the chief complaint was headache and vomiting in 38 patients, loss of consciousness in present in 28 patients, 19 patients have lucid interval ,12 patients have disturbed conscious level ,and neurological defecit was the presenting symptom in 8 patients, fits in

2 patients while 2 patients have no symptoms and as regard GCS 3 of them was between 3-8 and in 6 of them was between 8-12 and more than 12 in the remaining 41 patients , The pupils was unilaterally dilated in 5 patients and bilateral dilated fixed in one patient While (Phoebe S.Y. Cheung et al. , 2007). operated upon 89 patients, 62 (70%) patients were GCS 13—15, 9 (10%) GCS 9—12 and 18 (20%) GCS 3—8. Pupil reactivity was normal in 78 and One fixed, one reactive in 4 patients Both fixed and non-reactive in 7 patients While (C. Kuday, et al., 1994).,operated upon 115patients the GCS was>8 in 90 patients and <9 in 25 patients and 20 patients have neurological defecit and the pupils was Unequal in 26 patients and fixed and dilated in 8 patients While In (Noman Khaled.et al. 2008)., operated upon 610 patients 388 of them presented with headache and vomiting and 370 presented with loss of consciousness and 282 presented with neurological deficit and there were unilateral Pupillary changes in 93 patient and bilateral pupillary in 18 patients and lucid interval in 196 patients So presentation of EDh almost the same allover the world range from no defecit to deeply comatosed patients. In our series we operated upon 50 patients the EDH was in the parietal lobe in 8 patients and in temporal lobe in 13 patients and frontoparietal in 6

patients and frontal lobe in 3 patients and was temperoparietal in 16 patients and posterior fossa in 3 patient and was bilateral in one patient. While **(Phoebe S.Y. Cheung et al., 2007)**. operated upon 89 patients the EDH was parietal in 12 patients and temporal in 24 patients and frontal in 15 patients and occipital in 5 patients and multiple in 34 patients. While **Saffet Mutluer, et al. 1993** operated upon 146 patients the EDH was parietal in 31 and temporal in 31 patients and temporoparietal in 48 patients and frontal in 13 patients and frontoparietal in 2 patients and fronto temporal in 12 patients and posterior fossa in 9 patients While **Noman Khaled.et al., 2008** operated upon 610 patients the EDH was frontal in 142 patients and parietal in 130 patients and temporal in 74 patients and temperoparietal in 204 patients and frontoparietal in 22 patients and parieto occipital in 24 patients and posterior fossa in 6 patients and occipital in 8 patients so more common site of EDH is temporal and parietal this because the main source is the middle meningeal artery. In our series we operated upon 50 patients, the cause of trauma was road traffic accident in 23 patients of them and falling from high in 14 patients of them and assault in 11 patients and animal kick in 2 patients While **(Phoebe S.Y. Cheung et al., 2007)** operated upon 89 patients. the cause of the trauma was road traffic accident in 50 patients of them and falling from high in 27 patients of them and assault in 10 patients. While **(C. Kудay, et al., 1994)** operated upon 115 patients the cause of trauma was road traffic accident in 41 patients of them and falling from high in 59 patients of them and assault in 15 patients While **(Noman Khaled.et al., 2008)**. operated upon 610 patients

the cause of trauma was road traffic accident in 320 patients of them and falling from high in 94 patients of them and assault in 172 patients and hit to hard object in 18 patients So the main cause of EDH is road traffic accident. In our series We operate 50 patients 2 of them in the 1<sup>st</sup> hour and 14 patients in the 2<sup>nd</sup> hour and also 14 patients in the 3<sup>rd</sup> hour and 10 patients in the 4<sup>th</sup> hour and 6 patients in the 5<sup>th</sup> hour and 4 patients after more than 5 hours. In our series We operate 50 patients the volume of EDH was between 20-30cc in 27 patients and between 30-40cc in 17 patients and between 40-50cc in 5 patients and more than 50cc in one patient. In our series we operated upon 50 patients, 39 of them show full recovery and 7 patients show neurological deficit and 4 patients died and no one show vegetative state and from the 46 patients who not died 6 patients develop superficial wound infection and one patients show recollection of EDH and reoperation.. While **(Saffet Mutluer, et al., 2007)**. operated upon 146 patients 112 of them show full recovery and 20 patients show neurological deficit and 14 patients died and no one show vegetative state. While **(C. Kудay, et al., 1994)**.

operated upon 115 patients 88 of them show full recovery and 15 patients show neurological deficit and 12 patients died

## Conclusion

Our study designed to evaluate factors affecting outcome of EDH evacuation to draw routes that we will follow to decrease the morbidity and mortality of EDH and even to reach to the level of zero mortality from EDH the most emergent neurosurgical trauma . This study included fifty patients with traumatic EDH of different sex and age and mode of trauma and we found that

the age and sex and mode of trauma play no rule in the outcom of EDH but in the other hand we found that the RTA is the most common mode of trauma and so with stander roads and traffic rules we can decrease the frequency of EDH. The EDH is more common in middle aged males as they are the most active part of the community. As regard the site of EDH we found that the site play minimal rule in the outcome of EDH and as the most common sites was temperoparietal and temporal so mostly the middle meningeal artery is the most common source of EDH and the posterior fossa is the most dangerous site as one case of the 3 patient presented with posterior fossa EDH died (33.3%) followed by temporal lobe EDH as 2(6.5%) cases from the 15 case died but the site is not a modifiable factor . AS regard the size and time from the trauma to evacuation and clinical presentation of EDH thy are the major factors that affect EDH . The time from trauma to evacuation is a major factor not by itself but through its effect in the size of EDH and the conscious level and other clinical presentation. The size of EDH play a role through its effect in the clinical presentation and conscious level as the 4 patients who died the size of EDH was more than 40cc . The clinical presentation especially the conscious level is the main factor affecting the outcome as all the 4 cases who died the emergency room presentation GCS was less than 8 So to improve the morbidity and mortality of EDH qualified primary health centers with available computerized tomography at it which allow rapid diagnosis and then available rapid transport method to the centers where qualified neurosurgions and neurosurgery operative room and

available pos operative ICU place if need is the key.

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