



## Comparative study on the operative outcome of EDH done under Regional Scalp Block and under General Anesthesia

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### Abstract

*An Epidural hematoma (EDH) is the direct result of physical trauma to the head which occur between inner surface of the skull and outer layer specially occur in children and young adults. In most cases involve arterial damage, disrupting one of the dural venous structure results EDH. In this case data were collected by a pre-designed proforma. Patient's information was obtained through using patient's information sheet which involved questionnaire, clinical findings, CT scan findings. Purposive sampling method was followed for the study. It was a prospective observational study. Clinically and radiologically diagnosed with EDH, 60 patients with head injury were included in the study. Group A: (regional scalp block): 30 and Group B (Anesthesia General): 30. History was taken from the relatives or attendants of the patients. Surgery was conducted and complication and outcome were recorded and compared between the two groups. In view of the fact that the surgical outcome and postoperative complication of extradural hematoma under regional scalp block (RSB) did not differ significantly from that of general anesthesia. As an appropriate and safe anesthetic procedure, RSB can therefore be recommended as a significant difference in the incidence of postoperative complication between two groups in EDH surgery. This study therefore suggests that RSB surgery is effective, safe and appropriate for extradural hematoma.*

**Keywords:** Epidural Hematoma, Regional Scalp Block, Anaesthesia, Extradural Hematoma.

### Introduction

A symptomatic bleeding between the inside of the skull and the outside cover of the brain is defined as an epidural or extradural hematoma. EDH

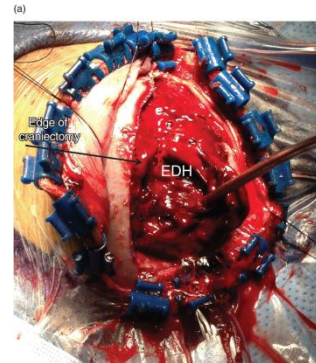
results from traumatic head injury, usually related to fracture of the skull and arterial aceration. The inciting event is often a concentrated blow to the head, like a hammer or a baseball bat. It is usually

found in the temporoparietal region where a skull fracture crosses the path of the middle or dural branches. It is classified as a focal brain injury and accounts for about 50% of all head injuries and 60% of the mortality rate in patients with head injuries. <sup>[1]</sup> About 70 - 80% of the EDH is located



**Figure 1:** Epidural Hematoma and during surgery <sup>[3]</sup>

in the temporo- parietal region, although extension to neighboring frontal and occipital areas is common. EDH is usually of arterial origin but can be caused by venous bleeding or oozing from the fractured skull bones in one third of patients. <sup>[2]</sup>



While many vascular problems are associated with trauma, vascular malformations and coagulopathies can be familiar and lead to spontaneous epidural hematomas. The two treatment options for these patients are (1) immediate surgery and (2) initial conservative, close clinical observation with possible delayed evacuation following the earliest clinical description of an epidural hematoma (EDH). The standard of treatment for the prevention of death or neurological morbidity was quick surgical evacuation. <sup>[4]</sup> Recently, nonsurgical management of small asymptomatic EDH is increasingly accepted as a means of treating patients with convexity lesions that do not have a significant mass effect or a midline shift. In fact, since the 1960s, the percentage of patients not surgically managed in clinical series has gradually increased from less than 1 percent to more than 60 percent (Lee et al 1998).

## Objectives

### General objectives

- Evaluate the outcome of the regional scalp block (RSB) extradural haematoma operation.

### Specific objectives

- To justify the feasibility of regional scalp surgery as a means to evacuate EDH.

- Comparison of the operational results of evacuation under regional scalp block and general anesthesia.

## Methods

### Selection and Inclusion criteria

Patients with EDH have the following criteria  
Traumatic acute EDH has been diagnosed clinically and radiologically, both under RSB and GA surgery.

- In all cases the EDH was the supratentorial age of 16 years or more of the study population.

### Exclusion criteria

Patient with EDH having the following criteria was excluded from the study

- Complex craniofacial injury.
- Posterior fossa haemorrhage
- Associated parenchymal injury and IC clot.
- Patient not attending the follow-up.

## Variables

### Demographic variables

- Age Sex
- Clinical variables
- Occupation
- Mode of Injury
- Unconsciousness
- Vomiting

- Convulsion
- GCS

#### Imaging variables

- CT scan of brain findings
- Site of the lesion:
- Associated injuries (contusion, brain oedema, multiple aerocele, linear fracture, depressed fracture).

#### Outcome variables (GOS)

- Good recovery (5)
- Moderate disability (4)
- Severe disability (3)
- Persistent vegetative state (2)
- Death (1)

#### Data collection

Data was gathered through a pre-designed proforma. The information of the patient was obtained using a patient information sheet that included a questionnaire, clinical findings and CT scan results.

#### Study procedure

After detailed history and examination, further confirmation and classification was made using CT scanning all clinically diagnosed cases of head injury. Diagnosed cases of EDH were planned for surgery using CT scanning of the brain. The history of the patients was taken from the relatives or attendants. The correct history of the lucid interval could not be given. Therefore, the lucid interval could not be included in the clinical presentation of this study. Patients selected for surgery were randomized into two anesthetic treatments-RSB and GA. Each group consists of 30 patients. Surgery was performed and

complications and results were recorded and compared between the two groups.

#### Intraoperative Details

The surgical treatment of epidural hematomas involved the opening of the calvary on the hemorrhage site. After raising the bone flap, the EDH was readily apparent and removed. Bleeding coagulation of dural vessels was usually performed. Epidural tack sutures were placed on the craniotomy bone edge from the dura to the pericranium to tamponade epidural bleeding from areas beyond the craniotomy edges and to prevent recurrence. Dural venous sinus bleeding was controlled by tamponade with gelatin sponges and cotton strips and elevation of the head of the bed to prevent venous air embolism.

#### Statistical analysis of data

A statistical analysis of the results was obtained using window-based computer software developed with SPSS-13 (SPSS Inc, Chicago, IL, USA) Statistical Packages for Social Sciences. Testing Chi-square and t were used.

#### Ethical consideration

The research protocol was approved by the thesis committee (the local ethics committee) before the start of this study. The aims and objectives of the study, together with its procedure, alternative diagnostic methods, risks and benefits, were explained easily to the patients. Local and informed consent was obtained from each patient. It was assured that all information and records will be kept confidential and that the procedure will help both surgeons and patients to make the case management rational.

## Results and Observations

**Table I:** Distribution of age by group

Age (in years)	Group		p value*
	Group A	Group B	
16-25	10 (35.33%)	11 (36.67%)	
26-35	12 (40%)	10 (33.33%)	
36-45	3 (10%)	4 (13.33%)	
46-55	4 (13.33%)	3 (10%)	
56 and above	1 (3.33%)	2 (6.67%)	
Total	<b>30 (100%)</b>	<b>30 (100%)</b>	<b>0.946</b>

\*t test was done to measure the level of significance.

In group A, 40% of the patients belong to age 26-35 years and 35.33% of the patients belongs to age 16-25 years. In group B, 36.67% of the patients belong to age 16-25 years and 33.33% of the patients belongs to age 26-35 years. Statistically no significant difference was

observed between two groups ( $p=0.946$ ). About 63.3% of group A and 76.7% of group B was male, 36.7% of group and 23.3% of group B was female with no significant difference ( $p=0.260$ ) Male-Female ratio in group-A was 1.7:1 and group-B was 3.2:1

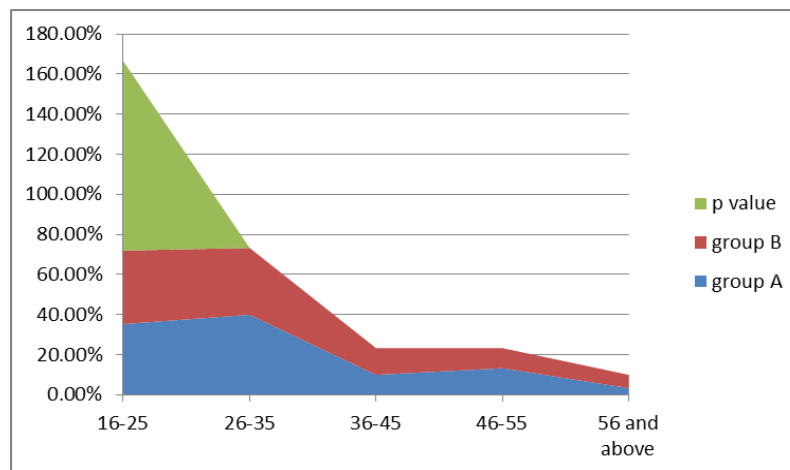


Figure 2: Distribution of sex by Group ( $p$  value= 0.260)

\*Chi-square test was done to ensure the level of significance.

Table II: Distribution of occupation by group

Occupation	Group		p value*
	Group A	Group B	
Service	2 (6.7%)	7 (23.3%)	0.373
Student	11 (36.7%)	12 (40%)	
House wife	7 (23.3%)	4 (13.3%)	
Business	5 (16.7%)	3 (10%)	
Day laborer	5 (16.7%)	4 (13.3%)	
Total	30 (100%)	30 (100%)	

\*Chi-square test was done to measure the level of significance.

In group A, 6.7% was Service holder, 36.7% Student, 23.3% was House wife, 16.7% Businessman, 16.7% Day laborer. In group B, 23.3% was Service holder, 40.0% Student, 13.3% was House wife, 10.0% Businessmen, 13.3% Day laborer.

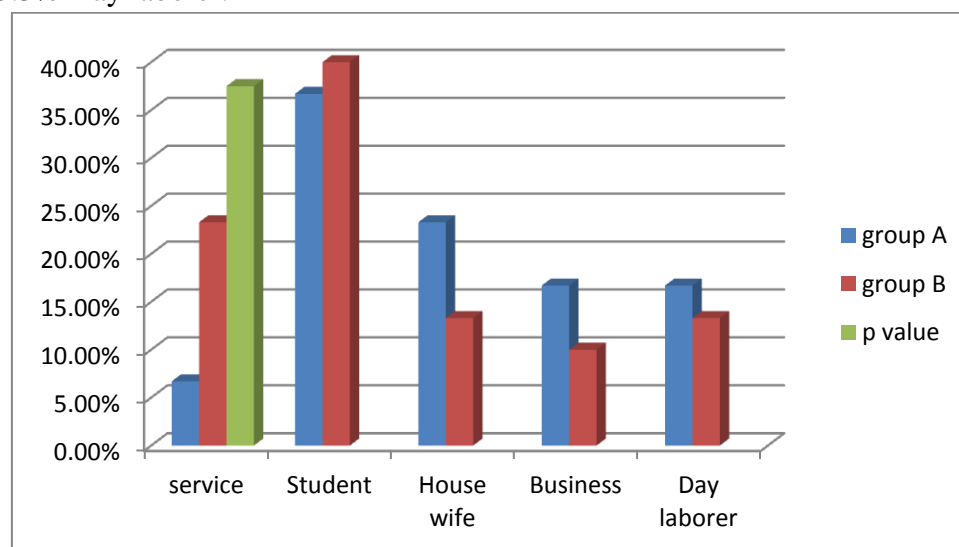


Figure 3: Distribution of occupation by group

## Discussion

Traumatic brain injury (TBI) is a major cause of death and disability worldwide, especially in children and young adults. Causes include fall from height, vehicle accidents, and violence. TBI can cause a host of physical, cognitive, emotional, and behavioral effects, and outcome can range from complete recovery to permanent disability or death. EDH usually occurs in young adults and is rare before age 2 years or after age 60 years. Perhaps the dura is more adherent to the inner table in these groups (Green Berg and Mark, 1997). The current study was conducted to evaluate the surgical outcome of extradural hematoma (EDH) done under regional scalp block (RSB), comparing with that of under general anaesthesia. However recent finding also show that , Epidural hematomas are usually arterial in origin but main result from venous bleeding in one third of patients. Occasionally, torn venous sinuses cause an epidural hematoma, particularly in the parietal-occipital region or posterior fossa. These injuries tend to be smaller and associated with a more benign course. EDH is very much uncommon in elderly patients because of the dura is strongly adhered to the inner table of the skull. In case series of EDH, fewer than 10% of patients are older than 50 years. Epidural hematoma complicates 2% of cases of head trauma . Alcohol and oher forms of intoxication have been associated with a higher incidence of epidural hematoma.<sup>[5]</sup> No racial predilection has been reported. Intracranial and spinal epidural hematomas are less frequent in women, than men with a male-to-female ratio of 4:1.The present study demonstrated that low systolic BP, the presence of coagulopathy, decompressive craniectomy, and a shorter time interval between injury and the first CT scan were the risk factors for the development of PEDH<sup>[6]</sup>

## Conclusion

The recovery after RSB EDH operation at discharge and at 1st month was comparable to under GA. There was no significant difference

between two groups in the incidence of post-operative complication. This study therefore suggests that RSB surgery is effective, safe and appropriate for extradural hematoma.

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