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ORIGINAL ARTICLE

Determine the Outcome of Traumatic Extradural Hematoma and to Compare the Outcome of Small and Large Size Extradural Hematoma

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ABSTRACT

Objective: The aim of this study is to determine the outcome of traumatic extradural hematoma and to compare the outcome of small and large size extradural hematoma.

Study Design: Descriptive case study

Place and Duration: Study was conducted at the department of Neurosurgery, Saidu Teaching Hospital, Saidu Sharif, Swat for duration of two years from January 2016 to December 2017.

Methods: Total one hundred and forty patients of both genders with ages 2-70 years were presented. Patients had traumatic extradural hematoma within duration first 24 hours were included and admitted through the emergency department. Detailed demographics of enrolled cases age, sex, GCS on arrival and cause of injury were recorded after taking informed written consent. CT scan of all the patients was done for diagnosis. Glasgow Outcome Score (GOS) was used for determination of outcomes. SPSS 23.0 version was used to analyze the data.

Results: There were 110 (78.6%) male patients and 30 (21.4%) patients were females. Mean age of the patients was 32.78±10.43 years. RTA was the most common cause found in 84 (60%) followed by falling 29 (20.7%) and assault in 27 (19.3%). Small size hematoma volume among 100 (71.4%) cases and large size was in 40 (28.6%) patients. According to Glasgow outcome score, 24 (17.1%) cases had 1-3 score and 116 (82.9%) cases had 4-5 score. Mean GOS was 4.01±1.12. We found successful outcomes among 116 (82.9%) cases in which majority of the patients were from small size extradural hematoma.

Conclusion: We concluded in this study that a significant relationship exists between the volume of extradural hematoma and both the clinical and functional outcome. Prognosis becomes increasingly worse with rising extradural hematoma size.

Keywords: Traumatic Brain Injury, Extradural Hematoma, Glasgow Outcome Score

INTRODUCTION

For patients with a sizable EDH, prompt surgical intervention is the established standard of care for the management of acute extradural hematoma (EDH). One to fifteen percent of people who have had serious head traumas have acute (EDH) symptoms. [1] Male to female ratio is approximately 4:1, and it is rare before the age of 2 years and after the sixth decade of life. CT scans remain the imaging method of choice for the diagnosis of this potentially fatal illness. [2,3] Each patient's age, hematoma size, location, patient's neurological status, and course of EDH treatment must be taken into consideration while making a decision and scheduling for treatment. [4]

The death rate can be cut in half and the prognosis can be improved when the disease is caught early. Prior to the CT period, mortality was between 20 and 55 percent; it is now between 12 and 20 percent. [5] Surgeons are advised to intervene as soon as possible in symptomatic patients. [6] Patients in developing nations face an intolerable wait before being appropriately referred to an expert neurosurgery facility because of the ongoing evolution of the country's neurosurgical service.

Patients with acute traumatic EDH are affected by a wide range of variables that operate independently. Admission According to the GCS and existence of cerebral lesions, outcome appears to be most strongly influenced by these two factors. [7,8] The age of the patient, the time from the injury to treatment, immediate coma or lucid interval, presence of pupillary abnormalities, GCS score on admission, CT findings (hematoma volume, degree of midline shift, presence of signs of active hematoma bleeding, associated intradural lesion), and post-operative intracranial pressure are all important factors in determining the patient's outcome. [7] Polytrauma patients' co-morbidities and the severity of their injuries may also have a role in their long-term prognosis.

Epidural hematomas are formed as a result of external blows to the skull causing bleeding from the interposed vessels. [9] In head trauma, fractures in adults are extremely prevalent. Hematomas arise as a result of both arterial and venous injuries. Vein involvement can lead to a long-term disease. However, epidural hematomas can produce exceptions to the rule. [10] Most often, the main meningeal artery is implicated (66 percent). Damage to the front ethmoidal artery occurs when the frontal bone is assaulted. The transverse or sigmoid sinuses can be damaged by occipital trauma. A bleed in the superior sagittal sinus is caused by an injury to the vertex. The incidence of bilateral epidural hematomas in adults is between 2% and 10%, while in children they are extremely rare [11]. Epidural hematomas are more common when a person is intoxicated. Intracranial hypertension is a common complication following an epidural/extradural haemorrhage [12]. Epidural hematomas can also be caused by vascular abnormalities, coagulopathies, and metastases in the absence of trauma.

The purpose of this study was to assess the outcome of traumatic extradural hematoma and to compare the fate of small and big extradural hematomas.

MATERIAL AND METHODS

This descriptive case study was conducted at Department of Neurosurgery, Saidu Group of Teaching Hospitals, Saidu Sharif, Swat for duration of two years from January 2016 to December 2017. The study comprised of 140 patients of both genders. Demographically detailed of enrolled cases were recorded after taking informed written consent. Patients < 2 years of age and those did not give any written consent were excluded from this study.

Patients were aged between 2-70 years were presented. Patients had traumatic extradural hematoma within duration of 24 hours were included and admitted in through the emergency department. Whenever possible, we took X-rays of the skull and a CT scan. According to Peterson and Epperson's formula, EDH's volume was estimated by multiplying its diameters in each of the three planes (sagittoral/axial/coronal) by 0.5. When it was determined that the patient had EDH, the hematoma was surgically removed in the operating room. Occurrence of intradural bleeding, as well as any concomitant intradural disease or status of the underlying brain was recorded during surgery. For as long as possible after the procedure, we kept an eye on the patient's vital signs, classical symptoms, and the Glasgow Coma Score. Morbidity in terms of neurological impairment was noted at the time of discharge. All patients were followed up for six months. Glasgow Outcome Score (GOS) was used for determination of outcomes. SPSS 23.0 version was used to analyze the data.

RESULTS

There were 110 (78.6%) male patients and 30 (21.4%) patients were females. Mean age of the patients was 32.78±10.43 years**.** RTA was the most common cause found in 84 (60%) followed by falling 29 (20.7%) and assault in 27 (19.3%).(table 1)

Table 1: Characteristics of enrolled cases

Variables	Frequency	%age
Mean age (years)	32.78±10.43	
Gender		
Male	110	78.6
Female	30	21.4
Causes		
RTA	84	60
Falling	27	20.7
Assault	27	19.3

Small size hematoma volume (25-50 mL) among 100 (71.4%) cases and large size (>50mL) was in 40 (28.6%) patients.(table 2)

Table 2: Association of hematoma with respect to size

Variables	Frequency (n=140)	%age
Hematoma Volume		
25-50 mL	100	71.4
>50mL	40	28.6

According to Glasgow outcome score, 24 (17.1%) cases had 1-3 score and 116 (82.9%) cases had 4-5 score. Mean GOS was 4.01±1.12.(table 3)

Table 2: Outcomes by using Glasgow score

Variables	Frequency	%age
Mean GOS	4.01±1.12	
GOS		
1-3	24	17.1
4-5	116	82.9

We found successful outcomes among 116 (82.9%) cases in which majority of the patients were from small size extradural hematoma.(table 4)

Table 4: Stratification of outcomes with respect to volume

Variables	Frequency	%age
Successful		
Yes	116	82.9
No	24	17.1
Size of extradural hematoma		
Small (25-50 mL)	85	73.3
Large (>50mL)	31	26.7

DISCUSSION

Between 20 and 50 percent of people with EDH will experience the traditional lucid interval. Acute extradural bleeding and a herniation syndrome cause the patient to lose consciousness after a few hours of waking up from a quick loss of consciousness following the impact. [13] Systemic hypertension with bradycardia and respiratory depression is the hallmark of the Cushing reaction, which occurs in patients with severe hypertension. When the brainstem suffers a hypoxic injury, this happens. [14]

In this descriptive study 140 patients of both genders having extradural hematoma with ages 2-70 years were included. There were 110 (78.6%) male patients and 30 (21.4%) patients were females. Mean age of the patients was 32.78±10.43 years**.** Our results were comparable to the studies conducted in past.[13,14] RTA was the most common cause found in 84 (60%) followed by falling 29 (20.7%) and assault in 27 (19.3%). In terms of volume, they divided EDH into two categories: high volume and small volume (25 mL to 50 mL). Small size hematoma volume (25-50 mL) among 100 (71.4%) cases and large size (>50mL) was in 40 (28.6%) patients. According to Glasgow outcome score, 24 (17.1%) cases had 1-3 score and 116 (82.9%) cases had 4-5 score. Mean GOS was 4.01±1.12. We found successful outcomes among 116 (82.9%) cases in which majority of the patients were from small size extradural hematoma. Mushtaq et al also found via their investigation that outcome in EDH is depending on the size and volume of the hematoma. 50 mL to 100 mL is considered a large volume while 25 mL to 50 mL is a moderate volume. Study by McKissock et al found similar conclusions. [15]

EDH volume and GCS were found to have direct correlation in Van den Brink et al[16]. It is crucial to notice how these studies directly linked GCS and volume of EDH. It is clear from this study, therefore, that a patient with a high GCS is more likely to have a small hematoma volume, and vice versa. The volume of the hematoma was found to be a significant predictor of the patient's outcome in most investigations. [18] Our findings are also consistent with those of the previous study. They measured the outcome in terms of "favourable" or "unfavourable" at 2 weeks, but we

measured it in terms of "Glasgow Outcome Score" after 6 months, as Dubey A et al [17] established a positive correlation at only 30 ml above or below group.

There is a belief that patients with more than 150ml hematoma can be expected to survive**,** however our data reveals that as the volume grows, death and morbidity increase progressively. As long as there is no temporal hematoma, patients with EDH less than 30ml can be treated conservatively. [19,20] Extradural hematoma outcomes are strongly correlated with the size of the hematoma and the patient's GCS. GCS and hematoma size influence the outcome of an extradural hematoma. The prognosis is terrible for large hematomas, whereas the prognosis is good for smaller hematomas.

CONCLUSION

We concluded in this study that a significant relationship exists between the volume of extradural hematoma and both the clinical and functional outcome. Prognosis becomes increasingly worse with rising extradural hematoma size.

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