

IMPACT OF DELAYED PRESENTATION ON THE SURGICAL OUTCOME OF EXTRADURAL HEMATOMA IN HEAD TRAUMA PATIENTS

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Abstract:

Objectives:

To determine the impact of delayed presentation on the surgical outcome of extradural hematoma in head trauma patients.

Materials and Methods: After taking detailed history and thorough CNS examination, CT imaging of brain was performed. GCS for all the patients was recorded. Patients with evidence of diffuse axonal injury, subdural hematoma or brain contusions and those who requiring conservative management were excluded from the study. Frequency of favorable and unfavorable outcomes was noted after three months follow-up. Data entered and analyzed using SPSS and presented in the form of table and graphs.

Results: Out of total 119 patients, 74.8% (n=89) were males with the mean age of 27.6 years \pm 8.5 SD and 25.2% (n=30) of patients were females with mean age of 29.5 years \pm 10.6 SD. Unfavorable outcome was noted in 37.8% (n=45) of total patients with delayed presentation to the hospital, while favorable outcome was noted in 62.2% (n=74) of patients. Good recovery and moderate disability as per our operational definition was observed in 27.7% (n=31) and 34.5% (n=41) of total patients respectively. While, severe disability and vegetative state was recorded in 26.1% (n=31) and 7.6% (n=9) of patients respectively.

Conclusion: Frequency of unfavorable surgical outcome of extradural hematoma found to be 37.8% in head trauma patients who presented later than 6 hours of onset of injury. Better surgical outcome of EDH can be achieved by ensuring the early presentation to the healthcare setting.

Key Words: Extra-dural Hematoma, Glasgow Coma scale, Surgical Outcome

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INTRODUCTION:

Extradural hematoma is the blood accumulation in the potential space between dura and bone ⁽¹⁾. Globally it is considered as a major public health issue and one of the leading cause of death. It has been stated that 15% of deceases taking place between 15 and 24 years are secondary to head injury ⁽²⁾. Extradural hematoma is a serious emergency and surgical intervention at time for significant extradural hematoma is considered as the standard treatment ⁽³⁾. Extradural hematomas have presented in three different pattern. 1st, short-term post-traumatic loss of consciousness. 2nd, a lucid interval for numerous hours. 3rd, obtundation, contralateral hemiparesis, ipsilateral pupillary dilatation ⁽²⁾. The most common mechanism are motorbike accident and a height fall (4-6). The main objective of this study is to determine the impact of delayed presentation on the surgical outcome of extradural hematoma in head trauma patients. The rationale of this study is to elaborate the impact of delayed presentation following trauma on the surgical outcomes of extradural hematoma.

Objective:

To determine the impact of delayed presentation on the surgical outcome of extradural hematoma in head trauma patients.

MATERIALS AND METHODS:

Settings and study design:

This Descriptive Case Series study was performed at Department of Neurosurgery, Lady Reading Hospital, Peshawar.

Sample Size:

The sample size was calculated 119 keeping the 50% proportion, 95% confidence interval and 9% Precision by using WHO sample size calculator.

Inclusion Criteria:

- Patients suffering from Epidural Hematoma with H/O head trauma regardless of GCS score presented after 06 Hours.
- Patients of 15-45 year of age.
- Both gender.
- Size of hematoma more than 20 ml as per calculated by the scale on axial images of CT brain.

Exclusion Criteria:

- Extradural hematoma with evidence of diffuse axonal injury, subdural hematoma or brain contusions.
- Those Epidural Hematoma requiring conservative management.
- Non consenting patients.

Methods:

Approval was obtained from college of Physicians and Surgeons Pakistan (CPSP) and hospitals ethical committee. Demographic data was obtained in pre designed proforma. Patients fulfilling the inclusion criteria were included in the study. Informed consent was taken from all the patients or their guardians. Patients were enrolled from neurosurgery department of Lady Reading Hospital Peshawar. Detailed history was taken and thorough CNS examination was performed to assess the preoperative status of patient and relevant investigations was done. The GCS of each

patient was recorded and graded as per GCS scale. Time of presentation to the neurosurgery department from the time of head trauma was noted and patient were labeled as delayed presentation as per our operational definition. Surgery was performed by the trainee researcher in the supervision of a consultant and experienced neurosurgeon. Final outcome was assessed at 03 months of follow up as favorable and unfavorable outcome. Follow up was ensured through telephone contact or at patient follow up visit. Detailed demographic information sought from the patient. All the data collection was conducted by the researcher himself to maintain data quality and compliance to the study protocol. All the gathered information was entered in the proforma.

Statistical Analysis: By using the SPSS version 23.0, all the collected data were analyzed. Frequency and percentage were calculated for qualitative variable like gender, educational status final outcome, grade of outcome, economic and marital status. Quantitative variables like Age, GCS at presentation, mean time of presentation, BMI and size of hematoma were presented by mean and standard deviation. Effect modifiers like age, gender, GCS at presentation, size of hematoma, BMI, Marital status educational status and socioeconomic status were controlled by the stratification. Post-stratification chi-square test was applied and P value less than 0.05 will be considered significant.

RESULTS:

Table 1: Distribution of patients according to gender (*n=119*)

Variable	Frequency	Percentage
Gender:		
Male	89	74.8
Female	30	25.2
	Mean	SD
Age	28.1	9.1

Table 2: Demographic Profile of associated variables of study Population (*n=119*)

Variables	Mean	SD
BMI (kg/m2)	23.55	3.3
GCS at time of admission	9.89	2.1
Time to presentation at healthcare setting (hours)	9.06	1.7
Volume of hematoma (ml)	28.97	5.6

Table 3: Demographic Profile of the study Population (*n=119*)

Variables	FREQUENCY	PERCENT
Marital Status:		
Single	49	41.2
Married	70	58.8
Socioeconomic Status		
PKR/Month		
<20,000	41	34.5
20.-50,000	58	48.7
>50,000	20	16.8
Educational Status		
Under Matric	63	52.9
Inter	43	36.1
>14years	13	10.9

Table 4: Outcomes of the study Population (*n=119*)

Variable	Frequency	Percentage
Favorable	74	62.2
Unfavorable	45	37.8

Table 5: Grades of Outcomes of the study Population (n=119)

Variable	Frequency	Percentage
Grade of Outcome		
Good Recovery	31	27.7
Moderate Disability	41	34.5
Severe Disability	31	26.1
Vegetative State	9	7.6
Death	5	4.2

Table 6: Stratification based on age groups

Age Group	Outcomes		Total	P-Value
	Favorable	Unfavorable		
≤ 25 Years	40	13	53	0.007
	54.1%	28.9%	44.5%	
> 25 Years	34	32	66	
	45.9%	71.1%	55.5%	
Total	74	45	119	
	100.0%	100.0%	100.0%	

Table 7: Stratification based on GCS score

GCS Score	Outcomes		Total	P-Value
	Favorable	Unfavorable		
≤ 8	30	9	39	0.067
	40.5%	20.0%	32.8%	
9-12	36	30	66	
	48.6%	66.7%	55.5%	
>13	8	6	14	
	10.8%	13.3%	11.8%	
TOTAL	74	45	119	
	100.0%	100.0%	100.0%	

Table 1: Stratification based on BMI

Bmi	Outcomes		Total	P-Value
	Favorable	Unfavorable		
≤ 19 kg/m ²	5	5	10	0.703
	6.8%	11.1%	8.4%	
19-25 kg/m ²	44	26	70	
	59.5%	57.8%	58.8%	
>25 kg/m ²	25	14	39	
	33.8%	31.1%	32.8%	
Total	74	45	119	
	100.0%	100.0%	100.0%	

Discussion:

Epidural hematoma (EDH) is a well-recognized secondary insult of TBI. EDH is classically considered to be an acute complication of TBI. It is neurosurgical emergency that mostly emerges at temporal region. Timely surgical intervention for significant extradural hematoma is the standard treatment. The most significant factors influencing outcome are Glasgow Coma score or consciousness level on admission, age, and associated intradural lesions and also time taken in evacuation of hematoma due to transfer of patient to neurosurgical unit.

The Patients who were carried immediately after road traffic accidents and with good GCS have favorable outcome.

In our study one hundred and nineteen (n=119) adult patients with age 15-45 years of either gender who were diagnosed cases of EDH, fulfilling the inclusion criteria of study and presented to

neurosurgery department of Lady Reading hospital Peshawar after 6 hours of onset of head trauma were enrolled in the study. 74.8% (n=89) were males with the mean age of 27.6 years \pm 8.5 SD and 25.2% (n=30) of patients were females with mean age of 29.5 years \pm 10.6 SD. Our results are similar to the already published data on the subject. Rehman L et al, in a descriptive case series assessed the surgical outcome of acute extradural hematoma in terms of neurological recovery and survival in patients admitted and operated for acute traumatic extradural hematoma in a follow-up period of 3 months. They found in their study that twenty-four patients had good outcome, one patient had moderate disability in the form of left sided weakness, one patient remained in vegetative state, while 3 (10%) patients died. Chi-square test was significant for good outcome in patients with GCS 13-15 ($p=0.01$) and for death in patients with GCS 3-8 ($p=0.01$)⁽⁷⁾. Our study results are also in accordance with the study results presented by a recent study conducted by Singh A et al with an aim to evaluate the outcome of the patients operated for acute extradural hematoma (EDH) at the discharge from the hospital and after 3 months. Their study results found that the patients were operated around 9.91 h after the trauma (ranging 2–24 h). Out of sixty patients, 25, 17, and 18 patients had GCS of mild, moderate, and severe groups. Prompt surgery with better care obtained us with mortality 1.6%, morbidity 21.7%, and complete recovery in 83% patients. They further elaborated that timely surgery in the patients creates a significant differences in the outcome of the patients⁽⁸⁾.

In another retrospective study, Balik V et al, tried to find the factors influencing outcome in patients

with EDH and they found that the best outcomes were obtained by patients with GCS scores of 15-14 on admission. Patients in the fourth to seventh decade of life had less favorable outcomes than younger ones. More than half of the patients with PFEDH had associated intradural lesions. Only patients with concomitant brain contusion had a more favorable recovery. The 3 worst levels on the Glasgow Outcome Scale (GOS) were observed in patients suffering from subdural or intracerebral haematoma, or both, associated with the PFEDHs. The majority of patients with concurrent lesions and supratentorial extension of the haemorrhage were in the subgroup undergoing craniotomy between 24 and 72 h after injury. Patients treated in this time interval also had the most unfavorable outcomes. A classical lucid interval was observed only in one patient. The mortality rate in the series was 4.2%⁽⁵⁾. Seelig JM et al in their study found that the delay from injury to operation was the factor of greatest therapeutic importance. Patients who underwent surgery within the first four hours had a 30 per cent mortality rate, as compared with 90 percent in those who had surgery after four hours ($P<0.0001$). They concluded that if all patients with traumatic ASDH were taken directly to hospitals equipped to diagnose and remove the hematoma within four hours of injury, mortality rates could be reduced considerably⁽⁹⁾.

Our results are also showing similarity with the results presented by Sharif MM et al in their study. They conducted a descriptive study and determined the impact of time taken on the surgical outcome of extradural hematoma in patients with road traffic accident. Their results elaborated that 90% of the patients who presented within one hour of injury have favorable outcome and those who

presented more than 1 hour but less than 6 hour have 70% favorable outcome. They further evaluated that the patients who presented more than 6 hours, only 50% of the patients have favorable outcome (6). However, in the present study, in the patients who presented delayed for surgery, frequency of unfavorable outcome was noted in 37.8% of patients that is close enough to the above said study.

CONCLUSION

Frequency of unfavorable surgical outcome of extradural hematoma found to be 37.8% in head trauma patients who presented later than 6 hours of onset of injury. Better surgical outcome of EDH can be achieved by ensuring the early presentation to the healthcare setting.

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