

Traumatic Epidural Hematomas in Posterior Cranial Fossa: a Clinical Study in Tertiary Care Hospital

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ABSTRACT

Objective: To determine clinical presentation and outcome of traumatic epidural hematoma in posterior cranial fossa.

Material and Methods: This descriptive case series was conducted in department of Neurosurgery Mardan Medical Complex Mardan from May 2016 to April 2017. All patients presenting with extradural hematoma in posterior fossa of either gender and age were included in the study while patients with recurrent posterior fossa extradural hematoma and hematoma at other side of the brain were excluded. CT scan Brain with bone window was done in all patients. Patients were followed for one month. Outcome was measured on the basis of GCS and GOS.

Results: Total 23 patients were included in the study having age range from 8 to 58 years with mean age was 34 ± 5.23 years. 16 (69.56%) were males and 7 (30.4%) were female. Road traffic accident was the most common cause of head injury in 11 (47.8%) cases. Headache and vomiting was seen in 16 (69.5%) cases, drowsiness in 8 (33%), occipital swelling in 4 (19%), otorrhea in 3 (13%) and coma in 1 (4%) case. 11 (47.8%) were managed conservatively while 12 (52.1%) were managed by surgery. Outcome measured by GOS, 15 (65.2%) fell into GOS 5, 3 (13.04%) fell into GOS 4, 7 (30.4%) into GOS 3, 6 (26%) into GOS 2 and 6 (26%) into GOS 1.

Conclusion: PFEDH is a traumatic substrate with poor clinical picture. Failure to diagnose the condition, level of consciousness at the time of intervention, clinical course and associated cranial injuries are the significant factors influencing morbidity and mortality from this condition. One should maintain high index of suspicion for the possibility of PFEDH in any patient with head injury.

Key words: Epidural hematoma, posterior cranial fossa, outcome.

Abbreviations: PFEDH: Posterior Fossa Epidural Hematoma. GOS: Glasgow Outcome Scale. GCS: Glasgow Score. EDH: Epidural Hematoma.

INTRODUCTION

Epidural hematoma of the posterior cranial fossa is not a common complication in head injuries and account for 0.3% of all craniocerebral injuries and 1.46% to 12.9% of all cases of epidural hematoma.¹⁻³

Trauma is the most common cause of posterior fossa epidural hematoma (PFEDH) occur due to either rupture of venous blood vessel which causes slower clinical course and better prognosis or arterial rupture leads to rapid clinical course and high mortality.²

Patient present with headache, vomiting, loss of

consciousness, scalp swelling, but most of the time it is nonspecific therefore diagnosis is difficult. Patients condition deteriorate within seconds due to sudden compression on vital structures i.e. brain stem, cerebellum and 4th ventricle so early diagnosis and prompt treatment is necessary to save the life of patient.³⁻⁴

Since the advent of CT scanning, the diagnosis of this lesion has been simplified and the prognosis of patients has improved. There has been an increase in cases of PFEDH without mass effect treated conservatively with good results.⁵ The presence of hematoma

more than 10 ml, hydrocephalus and displacement of fourth ventricle are indication for surgery.⁶

If patient is asymptomatic and has good GCS conservative management is an option but patient should be admitted in intensive care unit and kept under close neuromonitoring. These patients should be prepared for surgery if condition deteriorate shifted to operation theater for evacuation of hematoma.⁷ Surgery remains the gold standard Suboccipital craniectomy or craniotomy should be performed depending upon size of hematoma. The decision between surgery and conservative management is difficult one and still a subject of debate.⁸

We conducted this study to know about clinical presentation and outcome of PFEDH after conservative and surgical management.

MATERIAL AND METHODS

This descriptive case series study was conducted after approval from hospital research and ethical committee over 23 Patients in Mardan Medical Complex Mardan from May 2016 to April 2017. All patients presenting with epidural hematoma in posterior fossa on CT Scan of either gender and age were included in the study while patient of recurrent posterior fossa epidural hematoma PFEDH and hematoma at other side of the brain were excluded.

All patients were admitted through emergency department. Patient received initial treatment in emergency department and shifted to radiology department along with doctor on duty. CT Scan Brain with bone window was done in all patients if scan show PFEDH with mass effect sign of brain stem compression obliteration of perimesencephalic cistern, hydrocephalus and displacement of 4th ventricle and clinically patient GCS below 15, and radiologically hematoma size more than 10 ml and midline shift more than 5mm shifted to operation theatre for evacuation of hematoma either through suboccipital craniectomy or craniotomy. And reverse of these finding were candidates for conservative management but admitted in high dependency unit with hourly neuro-monitoring. Outcome was measured on the basis of Glasgow coma scale (GCS) and glasgow outcome score (GOS). Pre-operative and postoperative GCS were recorded to access the level of consciousness. Glasgow outcome score ranges from 1 to 5. 1 death, 2 persistent vegetative state, 3 severe disability 2, moderate disability and 1 low disability.

Patient were followed for one months. All the data

entered in proforma and analyzed by SPSS version 20 and presented in form of tables.

RESULTS

The sample size in our study was 23. Out of these, 16 (69.56%) were males and 7 (30.4%) were females. Age of our subjects was 8 years to 58 years and mean age was 34 ± 5.23 years. Road traffic accident was the cause of head injury in 11 (47.8%) cases, fall from height was responsible for 7 (30.4%), Motor bike accident for 3 (13%) cases, Assault and falling object both for 1 (4.3%) case each (Table 1).

Table 1: Causes of Posterior Fossa Extradural Hematoma (n = 23).

Cause	Frequency	Percentage
Road traffic accident	11	47.8%
Fall from height	7	30.4%
Motorbike accident	3	13%
Assault	1	4.3%
Falling object	1	4.3%
Total	23	100%

Glasgow Coma Scale at admission was 13 – 15 in 13 (56.5%) subjects, 9 – 12 in 5 (21.7%) and 3 – 8 in 5 (21.7%) cases. Regarding the symptomatology, headache and vomiting was seen in 16 (69.5%) cases, drowsiness in 8 (33%), occipital swelling in 4 (19%), otorrhea in 3 (13%) and coma in 1 (4%) case (Table 2). Conservative management was done in case of hematoma size 3ccm which was seen in 2 (8.6%), 6ccm in 3 (13%), 8ccm in 4 (17.3%) and 10ccm in 2 (8.6%) cases. Surgical management was done in cases where the hematoma size was 13ccm which was seen in 3 (13%), 20ccm was seen in 3 (13%) and between 20 – 30ccm was seen in 6 (26%) cases (Table 3). Hematoma sizes were assessed on CT scan.

Post traumatic complications were seen as brain contusions in 4 (18%), cerebellar contusions in 2 (8.6%), subarachnoid hemorrhage and posttraumatic hydrocephalus in 1 (4.3%) each cases. Total number of patients who showed improvement in terms of GCS were 20 (87%) whereas improvement in terms of GOS was noticed in 19 (82.6%) cases. When distribution was done according to GOS grades, 15 (65.2%) fell

into GOS 5, 3 (13.04%) fell into GOS 4, 7 (30.4%) into GOS 3, 6 (26%) into GOS 2 and 6 (26%) into GOS 1.

Table 2: *Symptomatology.*

Symptoms & Signs	Frequency	Percentage
Headache	16	69.5%
Vomiting	16	69.5%
Drowsiness	8	33%
Occipital swelling	4	19%
Coma	1	4%

Table 3: *Hematoma Size and Management (n = 23).*

Conservative Management	Frequency	Percentage
3ccm	2	8.6%
6ccm	3	13%
8ccm	4	17.3%
10ccm	2	8.6%
Surgical Management		
13ccm	3	13%
20ccm	3	13%
20-30ccm	6	26%
Total	23	100%

DISCUSSION

Epidural hematomas comprise for 0.3% of all head injuries and 3.4 to 12.9% of whole EDH cases.⁹ The clinical progress in this condition is so silent that if not treated promptly and in time, may lead to devastating consequences.

In our study, we observed a male predominance amongst the subjects with the male gender comprising 69.56% of study population. This is in comparison to the study done by Dirim BV et al at Turkey, where they observed 85.7% of cases as male gender.¹⁰ Similarly 78% cases were male in study done by Asanin B.¹¹

Regarding the cause of posterior fossa epidural hematoma, road traffic accident was responsible for causation of majority of cases in studies done by

Asanin B and Asif M et al.^{11,12} In comparison to ours and the above two studies, Dirim BV and Malik et al observed fall from height as the most common cause of PFEDH in their studies.^{10,13} Headache and vomiting was seen as the most common symptom in our study, where we noticed 69.5% cases reporting this complaint, this is close to 73% cases in study done by Haq et al⁹ and Asif et al who noticed this complaint in their 73% and 64% of the cases respectively.¹² Same findings were recorded by Karasu A et al.¹⁴

Jang JW et al in their study on posterior fossa EDH showed that 64.7% patients had GCS 13 to 15 and 9 to 12 in 17.6%,¹⁴ which is close to our study. The less number of patients with 13 – 15 GCS in our study is due to the fact that there is poor management of these patients at periphery and majority of our patients were referrals from periphery.

According to literature, the incidence of additional intracranial lesions may be up to 87.5% which is quite a high figure while looking at our study. These include brain contusion, intracerebral hematomas of counter-coup type in frontal and temporal regions, supratentorial epidural hematomas, subarachnoid haemorrhage, subdural hygroma, subdural hematomas and others.¹⁵ In our case the commonest was brain contusion (18%) and cerebellar contusion (8.6%), almost similar to the study by Asif et al.¹² Subarachnoid haemorrhage and posttraumatic hydrocephalus was seen in one case each, similar to the analysis of Haq et al⁹ and a case series by E. Bor-Seng-Shu et al.¹⁶

The decision between conservative or surgical is a challenging one and controversial.^{17,18} Good GCS score, small hematoma size and exclusion of mass effect and associated lesions was criteria for conservative management in our study. Haq et al observed 64.7% of their patients in GOS 5, 17.6% in GOS 4, 8.8% in GOS 2 and 8.8% in GOS 1.⁹ In comparison, we had 65.21% were in GOS 5, 13.04% in GOS 4, 30.4% in GOS 3, 26% in GOS 2 and 26% in GOS 1. Close results were observed by Karasu A et al.¹⁴ Outcome in terms of GOS was 19 (82.6%) in ours whereas 82.35% in their case which is almost same and 64% for Karasu et al.¹⁴

There were several limitations in our study. First, the sample size was small and secondly the follow up period was very short. Thirdly, only Mardan Medical complex was taken as the study place. Inclusion of other hospitals from same locality could have given better idea about the prevalence of a condition in that area.

CONCLUSION

PFEDH is a traumatic substrate with poor clinical picture. Failure to diagnose the condition, level of consciousness at the time of intervention, clinical course and associated cranial injuries are the significant factors influencing morbidity and mortality from this condition. One should maintain high index of suspicion for the possibility of PFEDH in any patient with head injury.

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