

CLINICAL PRESENTATION AND OUTCOME OF TRAUMATIC EPIDURAL HEMATOMAS IN POSTERIOR FOSSA: STUDY OF 34 CASES

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ABSTRACT

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

Methodology: This observational study was conducted in Department of Neurosurgery Lady Reading Hospital, Peshawar from 30th November 2009 to 29th November 2014. We collected data for both operated and non-operated cases of traumatic posterior fossa epidural hematoma, of any gender and age. Patients were followed for 6 months and all the data was analyzed by SPSS version 20 and presented in figures.

Results: Total 34 patients were included in the study having age range from 5-60 years with mean age of 32.5±16.24 years. Males were 25(73.52%) and females were 9(26.47%). The most common cause was motor vehicle accident found in 15(44%) cases. seventeen (50%) patients were managed conservatively, while 17(50%) were managed by surgery. Good outcome was found in 28(82.35%) and in remaining 6(17.64%) there was poor outcome.

Conclusion: The frequency of posterior fossa epidural hematoma was more in males. Motor vehicle accident was the most common cause in this study. Good outcome was found in a significant number of treated patients.

Key Words: Outcome, Traumatic epidural hematoma, Posterior fossa, Motor vehicle accident

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INTRODUCTION

Epidural hematoma (EDH) is most common post traumatic pathology. Traumatic brain injury is the leading cause of death and disability in children and adult age¹⁻³. Epidural hematoma is defined as collection of blood between the dura and inner surface of the bone after sustaining head injury and accounts for 1% of head trauma admissions which is 50% the incidence of acute subdural hematoma. Ratio of male: female is 4:1. It usually occurs in young adults, and is rare before age of 2 years or after age 60. Perhaps dura is more adherent to bones in these cases⁴. Pathophysiological epidural hematoma occurs when there is separation of dura from the inner table of the calvarium with the disruption and arterial and venous structures leading to the collection of blood in the available space but limited by the tight adhesion of dura to the suture lines⁵. The most common location of epidural hematoma is temporoparietal region (66%) which occurs due to injury to the middle meningeal artery. Other locations in which it can occur are frontal region due to anterior ethmoidal artery, occipital region having transverse or

sigmoid sinus injuries and posterior fossa epidural hematomas (PFEDH) represent 5% of all cases of epidural hematomas^{6,7}. Extra dural hematoma in posterior fossa is rare, and some studies show its incidence from 1.2% to 11%⁸⁻¹². Although it is rare but it can create difficulty in diagnosis and management because it can be clinically silent and then patients suddenly deteriorates due to much narrow space in this area leading to increased intracranial pressure and compression of brain stem resulting in cardiac arrest and ending on sudden death.

The origination of this hematoma occurs either from the traumatic injury to temporal lobes resulting in middle meningeal artery branches laceration or tear or fracture of occipital bones with secondary injury to transverse sinus¹³. Before the CT scan radiological diagnosis was often missed but non contrast CT scan proved to be very useful tool in trauma patients to diagnose EDH in posterior fossa. Hence CT scan is of great importance in diagnosis of post traumatic EDH in posterior fossa¹⁴⁻¹⁶. Occipital fracture is common with PFEDH and is present in 85% cases¹.

As posterior fossa has very important structures like

brain stem and 4th ventricle, hematoma in the vicinity can rapidly deteriorate neurological condition of the patient, so we conducted this study to know about its clinical presentation and outcome of this posterior fossa EDH after conservative and surgical treatment.

METHODOLOGY

This observational study was conducted in Department of Neurosurgery Lady Reading Hospital Peshawar from 30th November 2009 to 29th November 2014. After taking approval from ethical research committee of the hospital data was collected. Medical record and radiological findings of all patients meeting inclusion criteria were analyzed. All patients both operated and non-operated for traumatic posterior fossa epidural hematoma with any gender and age, were included in the study. While patients of recurrent posterior fossa epidural hematoma, epidural hematoma at the other sites of the brain and other types of traumatic brain injuries were excluded from the study. All patients were received in casualty. After initial management for trauma, all patients were subjected to CT brain with Bone window, Axial cuts 15 degree angle to the orbito-meatal line, 5mm through the posterior fossa and 10 mm cuts were taken, because the trauma CT scan commonly takes cuts 10 mm cuts in neutral position of supra-tentorial compartment (unless supra-tentorial traumatic lesion). After neuro-radiological investigations patients were admitted in neurosurgery trauma and ICU. Hematological investigations like FBC, PT/APTT, urea, sugar and serologic investigations like HBsAg/HCV and blood grouping was done. After initial resuscitation and preparation in ward, patients with small hematoma without mass effect and no intracranial lesion were managed conservatively. Also patients with hematoma thickness less than 10 mm, midline shift less than

5mm, and clot thickness less than 15 mm were managed conservatively. And reverse of these findings were considered for surgical evacuation. Patients with hydrocephalus, obliteration of perimesencephalic cistern, and displacement of 4th ventricle were candidates for early surgical intervention. 19 patients were initially put on conservative treatment. 15 patients had midline sub occipital craniectomy and evacuation of hematoma done. 2 patients of conservative treatment deteriorated on subsequent follow up and were operated. So finally 17 patients were managed conservatively, and 17 patients were operated. The GCS was used to assess the level of consciousness in all patients and also to measure clinical status in patients to compare the surgical outcome. Pre-op GCS, and post-op GCS were recorded. Patients were followed till 6 months. Outcome of the patients was measured by Glasgow outcome score. All the data were put in proforma and analyzed by SPSS version 20 and presented in figures.

RESULTS

We studied 34 cases. Male were 25(73.52%) and female were 9(26.47%). Age ranged from 5 to 60 years (mean 32.5 ± 16.24 years). Motor vehicle accident was cause of head injury in 15(44%), fall from height in 12(35.29%), bicycle accident in 4(11.76%), assault in 1(2.94%) and bomb blast injury in 2(5.88%). GCS at admission was 13 to 15 in 15(44%) patients, 9 to 12 in 12(35%) patients and 3 to 8 in 7(20.58%) patients. Headache and vomiting were present in 25(73%) patients, drowsiness in 10(29%), occipital swelling in 5(14%) and coma in 1(2.94%). Hematoma thickness on CT brain was 3cm in 3(8.82%), 6cm in 4(11.76%), 8cm in 5(14.70%) and 9 to 11cm in 5(14.7%), which were managed conservatively. Posterior fossa epidural hematoma thickness was 13 cm in 4(11.7%), 20cm in 3(8.82cm)

Figure 1: Pre-op and post-op CT brains of patients showing posterior fossa epidural hematoma and then complete removal of it with mild hydrocephalus in post-op scan

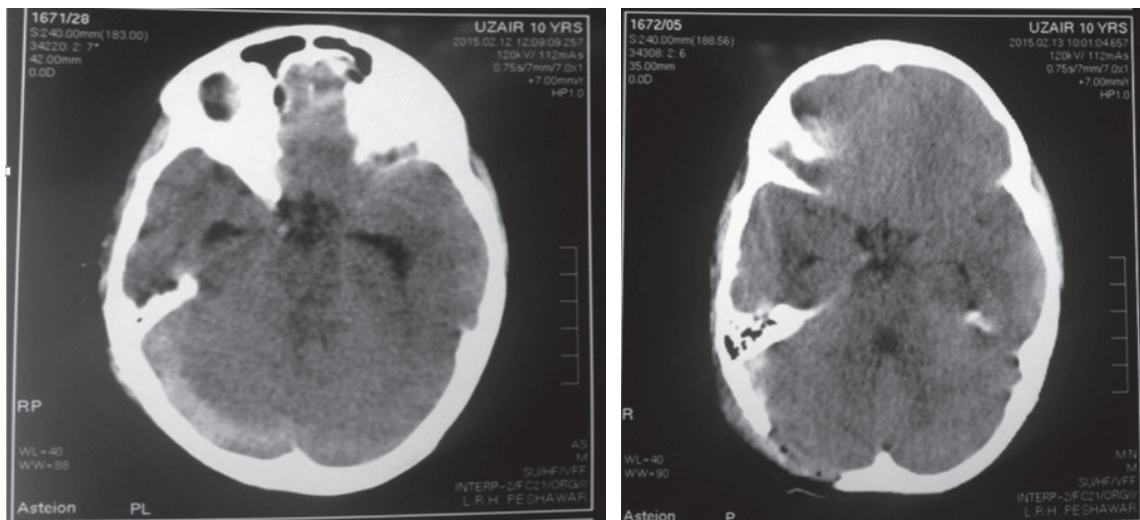
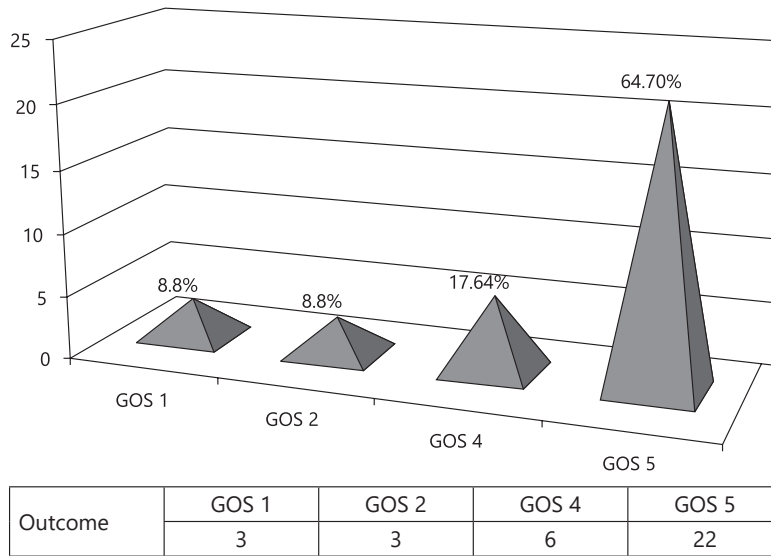


Figure2: Overall outcome of posterior fossa epidural hematoma (n=34)



and 20 to 30 cm in 10(29.41%) which were managed surgically. Compressed basal cistern, displaced 4th ventricle and hydrocephalus were present in 1(2.94%) (figure 1). Supra-tentorial extension showed occipital linear fracture in 17(50%), pneumocephalus in posterior fossa and supra-tentorial in 8(23.52%), countercoup injuries and contusions in 5(14%) and frontal contusion and sub-arachnoid hemorrhage in 1(2.94%) patients. Total number of patients which showed improvement (in terms of GCS) was 29(85.29%). Outcome in terms of Glasgow Outcome Score (GOS) was 28(82.35%) of patients. (figure 2).

DISCUSSION

Epidural hematomas (EDH) are considered the most common traumatic space-occupying lesion of the posterior cranial fossa¹⁸ and accounts for about 0.3% of all head injuries¹⁹and represent from 3.4 to 1 2.9% of the entire group of EDH cases^{20,21}. In posterior fossa EDH, the clinical deterioration can be sudden and can lead to death, so early diagnosis and management are crucial for good postoperative neurological recovery. It can present with history of trauma, headache, and vomiting. In our study, most common findings were, headache and vomiting in 25(73%) of patients, followed by drowsiness and occipital swelling. While study conducted by Aykut et al²² reported occipital swelling, headache, vomiting, transient loss of consciousness, disturbance of consciousness, and cerebellar signs and symptoms. In our study GCS on admission ranged from 5 and 15. GCS ranged from 13 to 15 in 15(44%), 9 to 12 in 12(35%) and 3 to 8 in 7(20.58%) patients. Jang²³ had studied posterior fossa EDH and showed that 13 to 15 GCS in 22(64.7%) patients, 9 to 12 in 6(17.6%) patients. So it was comparable with our study. Since the initial man-

agement of head injury patients in periphery hospitals is poor due to the lack of ATLS protocols therefore we had less number of patients at GCS 13- 15 .

We had motor vehicle accident as cause of head injury in 15(44%), and fall from height in 12(35.29%) patients. Other causes of head injury were bicycle accident, history of assault and BBI. Malik et al²⁴ had studied 61 cases of posterior fossa epidural hematoma and reported history of fall in 31(51%) and RTA in 28(46%) cases. Supra-tentorial extension showed occipital linear fracture, frontal contusions, pneumocephalus in supra-tentorial compartment and SAH. We had occipital linear fracture in 17(50%) patients. In literature the frequency of occipital fracture has been mentioned from 65-100%. Our results are near to the international study²⁴.

Since posterior fossa contains very narrow space therefore the outcome of it is poor and the total mortality which has been mentioned in international literature is in the range of 0-57%²⁵⁻²⁷. Mortality in our series was 3(8.82%). Although mortality of our study lies in the range of international range but it is slightly lower this is because our data sample is smaller than most of the international series. Karasu et al²³ followed 65 patients of posterior fossa epidural hematoma till to the discharge from hospital for both managed conservatively and surgically. They found that 36 patients were independent (GOS 5), 6 had a moderate disability but were independent (GOS 4), 7 had a disability and were dependent (GOS 3), 5 were in a vegetative state (GOS 2), and 7 died (GOS 1). In our series 22(64.70%) had GOS 5, 6(17.64%) achieved GOS 4, 3(8.8%) got GOS 2 while 3(8.8%) patients were in GOS1. Our good outcome in terms of GOS was 82.35%, while that of Karasu et al²³ was 64% while poor out come in our series was 19 %

and that of Karasu et al, was 36% of patients. We had limitation in our study, because we followed patients for 6 months duration only.

CONCLUSION

The frequency of posterior fossa epidural hematoma was more in males. Motor vehicle accident was the most common cause in this study. Good outcome was found in a significant number of treated patients.

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CONTRIBUTORS

NUH conceived the idea, planned the study, and drafted the manuscript. MI and BZK helped acquisition of data and did statistical analysis. FA and AJ critically revised the manuscript. All authors contributed significantly to the submitted manuscript.