# MANAGEMENT OF EPIDURAL HEMATOMAS OF THE POSTERIOR CRANIAL FOSSA

**Mohammad Siddiq[1], Khalid khanzada[2], Riaz ur Rehman[3], Mian Iftiha ul Haq[4]**

## ABSTRACT

**Objective:** To present our experience in the management of posterior fossa epidural hematoma (PFEDH).

**Materials and Methods:** This descriptive study was conducted in Head injury unit Hayatabad Medical Complex, Peshawar, from October 2006 to October 2009. All patients with PFEDH from all ages and both sexes were included. However supratentorial extradural hematoma, PFEDH due to bleeding disorders or post operative PFEDH were excluded from the study. All patients were evaluated regarding age, gender, and mechanism of trauma, presentation and Glasgow coma score by the time of admission. Diagnosis was established in with CT scanning .Treatment was either surgical or conservative in selected cases. Patients were followed for one month after surgery. Treatment outcome was considered favorable if GCS was more than 8 and unfavorable if GCS was 8 or below.

**Results:** Total twenty two patients were studied. Eighteen (81.81%) were male and 4 (18.18%) were female patients. Male to female ratio was 4.5:1 Ages of the patients ranged from 5-60 years. Mean age (± standard deviation) was 29.2 ± 22.3 years. Commonest presentations were vomiting fallowed by altered consciousness. Fifteen patients (68.18%) had vomiting while twelve patients (54.55%) had altered level of consciousness. GCS ranged between 4 and 15 at presentation. The lowest GCS was E1M2V1.This patient expired one hour after surgery. Nine patients (40.9%) had no other intracranial associated lesions. The rest had other skull or intracranial pathologies as well. Nineteen cases (86.36%) with epidural hematoma were operated based on clinical and radiological evaluation. Three patients (13.64%) were conservatively treated. One patient (4.55%) died just after admission. This patient had large extradural hematoma in the posterior fossa and brain stem herniation was already occurred. Eighteen patients (81.8%) had favorable while three patients (13.63%) had unfavorable outcome after one month fallow up.

**Conclusion:** Although posterior fossa is not a common site for EDH, it can be fatal if missed. The clinical picture is variable but strong clinical suspicion is needed. CT Scan brain should be immediately done if there is even little doubt of PFEDH. Posterior fossa creniectomy has got good results. Those cases which are being treated conservatively should be carefully monitored. Mortality and morbidity can be decreased in PFEDHs if they are diagnosed earlier and promptly treated

**Key words:** Epidural hematoma. Posterior cranial fossa, Management

## INTRODUCTION

Posterior fossa epidural hematoma (PFEDH) constitutes only 4%-7% of all epidural hematomas[1,2] and 0.1%-0.3% of all cranial traumatic conditions. It is of venous origin in 85% of the cases and develops as a result of injury to the transverse or sigmoid sinuses[3].

Common causes include road traffic accident and physical assault. Altered conscious level, headache, vomiting and nuchal rigidity are common presentation. CT scan brain is the investigation of choice[4]. Since the introduction of computed tomography PFEDHs is diagnosed more easily and hence the prognosis has improved a lot[5]. The treatment of epidural hematoma is surgical except for very small hematomas that are treated conservatively[4,5].

Clinical outcome is predicted by the conscious level at presentation, early use of CT scan, neuroradiological findings and presence of other intracranial lesions[6]. Higher mortality was quoted in earlier studies, more recent date from various studies have shown marked decline in mortality[5,6].

The aim of this study is to present our experience in the management and clinical outcome of posterior fossa epidural hematoma. This will help neurosurgeons in early diagnosis and timely management of PFEDH and thus mortality and morbidity of PFEDH will decrease markedly.

## MATERIALS AND METHODS

This study was conducted in Head injury unit Hayatabad Medical Complex, Peshawar from October 2006 to October 2009. It was a descriptive study.

Permission for this study was taken from the ethical committee Hayatabad Medical Complex,

Department of Neurosurgery, lady Reading Hospital, Peshawar[1]
Department of Neurosurgery Hayatabad Medical Complex, Peshawar[2]

**For Correspondence**

Dr Riaz ur Rehman
Al-noor Drug Agency, small industrial estate, kohat road, Peshawar. Email: drriazurrehman@yahoo.com
Cell No: +92-91-3339250932

Peshawar. Written informed consent was taken from all patients.

All patients with PFEDH irrespective of age and gender discrimination were included in the current analysis. However supratentorial extradural hematoma, PFEDH due to bleeding disorders or post operative PFEDH were not considered for this study. Twenty two cases qualified the inclusion criteria.

These patients were evaluated with regard to age, sex, mechanism of trauma and presenting complaints. Glasgow Coma Scale was used to evaluate the level of consciousness at presentation and after treatment or during follow-up. Those patients were operated where the volume of hematoma on CT scan was more than 10 ml, deteriorating GCS and features of mass effect on CT scan. Surgery consisted of doing occipital creniectomy and evacuation of the hematoma.

All patients were followed up to one month after surgery. GCS scale was used to measure the outcome. GCS 9 and above was considered as favorable and below 9 unfavorable.

All above preoperative and postoperative information were put in a semi structured Performa and stored in our computer database. The data was then entered into SPSS 16 and analyzed. Mean $\pm$ SD was calculated for age. Age distribution, clinical features, associated intracranial lesions and surgical outcome were presented as tables.

## RESULTS

In this study 22 patients with posterior cranial fossa EDH were studied. Of these patients with PFEDH, 18 (81.81%) were male and 4 (18.18%) were female. Ages of the patients ranged from 5-60 years. Mean age ($\pm$ standard deviation) was 29.2 $\pm$ 22.3 years. Age distribution is shown in table 1. Causes of injury were RTA in ten patients (45.45%), fall in eight patients (36.36%) and physical violence in four cases (18.18%). Fifteen patients (68.18%) had vomiting while 12 patients (54.55%) were presented with altered level of consciousness. Most of the patients would have more than one symptom. Clinical features are given in table 2. GCS ranged from 4 to 15 at presentation. The lowest GCS was E1M2V1 (E: eyes opening, M: motor, V: verbal).This patient had concomitant occipital depressed fracture and subarachnoid hemorrhage as well. This patient expired one hour after surgery. Nine patients (40.9%) had no other intracranial associated lesions. The rest had other skull or intracranial pathologies. Details are in table 3. Nineteen cases (86.36%) with epidural hematoma were operated based on clinical and radiological evaluation. Three patients (13.64%) for whom surgery was not planned, were followed up clinically and with CT brain. Hematomas in these cases decreased in size. One patient (4.55%) died just after admission. This patient had large extradural hematoma in the posterior fossa and brain stem herniation was already occurred. Favorable outcome was noted in eighteen patients (81.8%) after one month. Three patients (13.63%) had unfavorable outcome.

## DISCUSSION

Epidural hematoma of the posterior fossa is rare and can easily be missed. Due to the small volume of the posterior fossa and contained important structures mortality can be high if the haematoma is missed. A

**Table 1: Age Incidence**

| Age range | Number | Percentage |
|---|---|---|
| 3-10 | 2 | 9.09% |
| 11-20 | 4 | 18.19% |
| 21-30 | 8 | 36.37% |
| 31-40 | 4 | 18.19% |
| 41-50 | 3 | 13.64% |
| 51-60 | 1 | 4.45% |

**Table 2: Clinical Features**

| | | | |
|---|---|---|---|
| **Clinical Features** | Vomiting | 15 | 68.18% |
| | Altered level of consciousness | 12 | 54.55% |
| | Headache | 14 | 64% |
| | Incontinence | 1 | 4.55% |
| | Cranial nerve palsies | 2 | 9.09% |

**Table3.Associated Lesions**

| | Number | | | Percentage |
|---|---|---|---|---|
| **Pure PFEDH** | 9 | | | 41% |
| **Associated Lesions** | Skull Factures | 5 | 23% | 59% |
| | Contusions | 4 | 18% | |
| | Subarachnoid Hemorrhage | 4 | 18% | |
| | Subdural Hematoma | 1 | 5% | |

**Table 4: Outcome after one month**

| Recovery | No of cases | Percentage |
|---|---|---|
| Favorable | 18 | 82.81% |
| Unfavorable | 3 | 13.63% |
| Mortality | 1 | 4.55% |

high index of suspicion is needed for timely intervention to prevent death.

PFEDHs are common in the third and fourth decades as well as in the pediatric age group[4,8,9]. In our study the highest incidence is in third decade followed by first and forth decade. There were eight out of 22 cases who were in their second decade of life.

In the present study, male-female ratio of 4:1 is reflection of our social culture where most of our females are housewives and are not exposed to external works.

Signs and symptoms in the majority of cases are nonspecific for acute PFEDHs

Previous studies have shown that vomiting and headache are the commonest clinical features[4]. In the present study vomiting (15=68.18%) fallowed by headache (14=63.64%) were the commonest complaints. However altered level of consciousness was common finding in some other studies[10]. This difference is because of the fact that PFEDH has got a very variable presentation. In few cases, PFEDH can be diagnosed on clinical findings. A study conducted by Bor-Seng-Shu et al reported that radiological changes always occur earlier than clinical changes[11]. So, if a trauma patient has an occipital, suboccipital or retro mastoid swelling, CT scanning should be performed as a routine procedure[11,12].

In the present study CT scan brain was routinely performed as soon we noticed that history and clinical findings are suggestive of trauma to posterior cranial fossa.

In several studies it has been reported that more than 50% of patients with PFEDH have other intracranial lesions. We noticed that in 59.09% cases there were other intracranial lesions apart from PFEDH. Zucarello et al reported 87.5% incidence of these associated lesions[13].

Surgery remains the treatment of choice for symptomatic PFEDH[4]. This may be in the form of suboccipital craniectomy or craniotomy or both depending on the size of the hematoma [(14)]. We performed occipital creniectomy in all surgically treated cases.

Depending on the clinical status of the patient and available facilities, patients with PFEDH can be conservatively managed. There have been case reports of these hematomas resolving spontaneously without any intervention[15]. We treated only three cases conservatively. In all these cases hematoma was less than 10 ml, GCS was 15/15 and there was no mass effect. Mortality ranges between 4% and 26.5% in the literature and lower GCS is correlated with higher mortality rate[16,17]. One patient died in our cases after surgery(4.55%). Patients were followed for one month at two weeks interval after discharge. Glasgow outcome score was used to measure the outcome.18 (81.82%) patients had favorable outcome(GCS more than 9). Similar results (79%)were reported by Roka YB et al[18].

## CONCLUSION

Although posterior fossa is not a common site for EDH, it can be fetal if missed. The clinical picture is variable but strong clinical suspicion is needed. CT Scan brain should be immediately done if there is even little doubt of PFEDH. Posterior fossa creniectomy has got good results. Those cases which are being treated conservatively should be carefully monitored. Mortality and morbidity can be decreased in PFEDHs if they are diagnosed earlier and promptly treated

### *Disclaimer:*

The authors report no conflict of interest concerning the materials or methods used in this study or the findings specified in this paper.

## REFERENCES


1. Ammirati M, Tomita T. Posterior fossa epidural hematoma during childhood.Neurosurg 1984; 14: 541-544.
2. Gutierrez FG, McLone DG, Raimondi AJ.Epidural hematomas in infancy and childhood. Concepts Pediatr Neurosurg 1981; 1:188-201.
3. Garza-Mercado R. Extradural hematoma of the posterior cranial fossa: report of seven cases with survival. J Neurosurg 1983; 59:664-672.
4. Azam F,Amanullah,Ilyas M,Nisar W:Extradural hematoma of posterior cranial fossa-A single center study. Pak Jour of Neurol Surg 2005;9:78-81
5. Bor-Seng-Shu E, Aguýar PH, Leme RJDA, Mandel M, Andrade AFD, Marýn RJR: Epidural hematomas of the posterior cranial fossa. Neurosurg Focus 2004; 16: 1 – 4.
6. Bozbuga M,Izgi N,Polat G.Posterior fossa ectradural hematomas :observation on a series of 73 cases.Neurosurg Re1999;22(1):34-40.
7. Rivas JJ, Labato RD, Sarabia R, et al.Extradural hematoma: analysis of factors influencing the courses of 161 patients.Neurosurgery 1988; 23: 44-51
8. Ammirati M, Tomita T: Posterior fossa epidural hematoma during childhood Neurosurgery 1984;14: 541–44.
9. Ersahin Y, Mutluer S. Posterior fossa extradural hematomas in children. —Pediatr Neurosurg 1993;19: 31–33.
10. Mahajan RK, Sharma BS, Khosla VK, et al. Posterior fossa extradural haematoma-experience of nineteen cases. Ann Acad Med Singapore 1993 May; 22(3 Suppl ):410-3.
11. Bor-Seng-Shu E, Aguýar PH, Leme RJDA, Mandel

M, Andrade AFD, Marýn RJR: Epidural hematomas of the posterior cranial fossa. Neurosurg Focus 2004; 16: 1 – 4.

12. Bor-Seng-Shu E, Aguiar PH, Matushita H, Manreza LA, Ferreira AA: Actual asymptomatic epidural hematomas in childhood. Report of three cases.Childs Nerv Syst 1997;13:605–7.

13. Zuccarello M, Pardatscher K, Andrioli GC, Fiore DL, Iavicoli R, Cervellini P: Epidural hematomas of posterior cranial fossa. Neurosurgery 1981; 8: 434–7.

14. Devkota UP, Kumar P, Roka YB. Surgery for posterior fossa extradural... haematoma: Case report. PMJN 6;1:2006.

15. Kang SH, Chung YG, Lee HK.Rapid disappearance of acute posterior fossa epidural hematoma. Neurol Med Chir (Tokyo)2005 Sep; 45(9):462-3

16. Ateþ Ö, Koçak A, Önal Ç, Tarým Ö, Çaylý S, TektaþÞ: Travmatik posterior fossa hematomlarý. Ýnönü Üniversitesi Týp Fakültesi Dergisi 2002; 9:205–9

17. Lui TN, Lee ST, Chang CN, Cheng WC: Epidural hematomas in the posterior cranial fossa. J Trauma 1993; 34: 211–5.

18. Roka YB, Kumar P, Bista P, Sharma GR,Adhikari D: Traumatic Posterior FoFossa Extradural Haematoma. JNMA 2008;47(172):174-8.