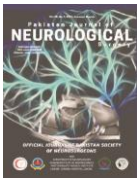

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Original Article

Improvement of Headache in Patients after Occipital Extradural Hematoma (EDH) with Less Than 15 ml of Volume after Single Burr Hole Evacuation and Placement of Drain

Rana Zubair Mahmood[1], Sikandar Ali Dehraj[1], Sarfraz Khan[2], Usama Mansoor[1], Abdul Wajid[1] Muhammad Zayed Qamar[1], Touqeer Ahmad[1]

[1]Department of Neurosurgery, Punjab Institute of Neurosciences (PINS), Lahore – Pakistan

[2]Department of Neurosurgery, Kohat Institute of Medical Sciences, Kohat – Pakistan

ABSTRACT

Objectives: We hypothesized that if we operate occipital extradural hematoma (EDH) having a volume less than 15 ml by single burr hole evacuation of extradural hematoma (EDH) and placement of drain without doing craniotomy then clinical status of the patients particularly headache improves.

Material and Methods: An observational study of 15 patients (with presenting GCS: 8 – 13) was conducted on patients who were operated in Punjab Institute of Neurosciences (PINS). All patients had acute extradural hematoma less than 15 ml after a road traffic accident (RTA). The age range was 22 – 45 years. All patients were operated on within 12 hours of road traffic accident. The timing of surgery was in the range of 1-2 hours.

Results: In all patients, surgery was performed by a single burr hole at the occipital region at the site of occipital EDH and the drain was placed in an extradural position. Co-morbidities in our patients were DM, polytrauma. Receiving GCS was 9 in 2 (13.33%) patients, was 13 in 10 (66.67%), was 8 in 1 (6.66%) patient and receiving GCS was 15 in 2 (13.33%) patients. All patients were assessed clinically on 5th post-operative day. It was seen headache was relieved on 5th post-operative day in all patients except 1 (6.66%) patient. Our 1 (6.66%) patients came for follow-up with the complaint of headache and vomiting which was managed conservatively.

Conclusion: Surgery by single burr hole evacuation and placement of drain is a safe method if occipital EDH is less than 15 ml in volume.

Keywords: Extradural Hematoma (EDH), Headache, Single Burr Hole Evacuation.

Corresponding Author: Rana Zubair Mahmood
Department of Neurosurgery, Punjab Institute of Neurosciences (PINS), Lahore – Pakistan
Email: 33ranazubair356@gmail.com

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INTRODUCTION

Extradural Hematoma is caused mainly by rupturing of the middle meningeal artery. The cause is most cases is trauma which damages the

artery or causes fracture in the temporal bone. Acceleration deceleration forces cause EDH.[1-8] In EDH, lucid interval is very common which means there is a temporary loss of consciousness for a brief duration then the patient regains consciousness. Other clinical features of EDH may be vomiting, confusion, weakness in parts of the body particularly limbs due to pressure in crossed pyramid pathway. In complications, seizures may develop. When EDH puts pressure on the posterior cerebral artery than vision loss may occur. EDH may be asymptomatic. EDH may cause tonsillar herniation leading to respiratory arrest. If EDH occurs in the posterior cranial fossa, then Cushing's triad can occur i.e., hypertension, bradycardia, and irregular respiration.[9]

As the quantity of blood accumulation increases, it puts pressure on the 3rd cranial nerve so pupils become fixed dilated. Trauma is a major cause of EDH but other causes may exist i.e., bleeding disorders and blood vessel malformations. [1,2,3,9] EDH can occur in the brain as well as in the spine where it is called as spinal EDH. EDH mainly occurs in the pterion region, at skull prominences ipsilateral to the site of impact. But on rare occasions, it may occur on countercoup injury sites.[10] EDH may be acute if occurs within one day, maybe sub-acute if occurs within 2 to 7 days, and chronic if occur with 7 to 20 days. If etiology is from venous then it may occur late.[1,12] EDH can occur in the temporal region, frontal region, occipital region, and parietal region.[1,12]

For diagnosis of EDH, CT scan is an investigation of choice. If CT brain is negative then MRI can be used as a diagnostic modality that has high sensitivity than CT scan.[1,12] Differential diagnoses for EDH are TIA, brain abscess, and mass in the brain.[1,12] If GCS is above 8, the volume of EDH is less than 30 ml and there are no neurological deficits then EDH can be managed conservatively.[13-15] In patients when only lucid interval present then the prognosis is good. If patients are comatose and volume is greater than 50 ml then the prognosis is worse.[1,12] Comorbidities like HTN, IHD, DM, bleeding disorders, age, pupils' abnormalities, GCS score, and duration from the time of injury to the time of operation all tell prognosis.[1,12] EDH occurs in both sex but predominantly it occurs in males more than females.[13] Craniotomy and evacuation is a surgical option for EDH and in some cases, decompressive surgery may be needed.[13] After surgery, antiepileptics, antibiotics, pain killers, fluid, and antiemetics (if needed) should be given.[14-15]

MATERIAL AND METHODS

Study Design

An observational study was conducted on 15 patients who were operated at the Punjab Institute of Neurosciences in Neurosurgery Unit 2 in 4 months from 1st February 2021 to 31st May 2021. Prior ethical approval was taken from IRB Committee.

Inclusion Criteria

Male and female patients with ages between 22 – 45 years were included who had acute extradural hematoma after a road traffic accident (RTA), having co-morbidities and poly-trauma, those who found with the volume of extradural hematoma less than 15 ml in volume, and those who were having a duration of injury of 12 hours. Those patients were included who were having GCS above 8.

Exclusion Criteria

Patients excluded who had GCS low than 7, who had a duration of injury more than 12 hours, who had age less than 22 and more than 45 years and those who had a volume of extradural hematoma greater than 15 ml.

Data Collection

Patients' data were entered on a pre-designed proforma. Informed consent was taken from the patients' attendants for the data. SPSS version 22 was used for the data analysis.

RESULTS

Age Incidence

The age range was 22 – 45 years and the mean age was 33.5 years.

Gender Incidence

In our study, 14 (93.33%) patients were male while 1 (6.67%) patient was female.

Operative Technique

In all cases we evacuated occipital EDH by localizing the site on a CT scan. In all cases, we did only a single burr hole and then evacuated EDH by saline irrigation. Then, we placed the drain in an extradural position.

Outcome

Most of the patients showed a good outcome (93.3%). No mortality reported. The complication was reported only in one patient. See Table 1.

Table 1. Outcome of Surgery.

Outcome	Number of Patients (%)
Good	14 (93.33%)
Complications	1 (6.67%)
Mortality	0 (0%)
No improvement	1 (6.67%)

DISCUSSION

In current study, the mechanism of injury in 15 (100%) patients were RTA mostly fall from the bike. 15 (100%) patients' evacuation of acute extradural hematoma done by single burr hole method at the site of hematoma after localizing on CT scan. In all cases, we placed drain after the evacuation of EDH in extradural position. In 2009, Huisman et al. mentioned that there is no need for routine craniotomy if the volume of occipital EDH is less than 10 ml.[16] In 2006, Liu et al. reported that burr hole evacuation and placement of drain is the best method to cure extradural hematoma in post-traumatic patients.[17] Aurangzeb et al reported that single burr hole evacuation of extradural hematoma is the best treatment modality for an extradural hematoma in mass head-injured patients for example in earthquakes.[18]

Habibi et al. reported that if the coagulation profile of patients is deranged then burr hole evacuation of extradural hematoma is the best treatment modality rather than conventional craniotomy.[19] In 2004, Panourias et al. documented that if the epidural hematoma is present and contralateral chronic subdural hematoma is present then it is better to do burr hole evacuation of extradural hematoma rather than doing craniotomy.[20] The presenting complaints in our patients were loss of consciousness (lucid interval), multiple episodes of vomiting, ENT bleed, and headache. All patients we operated within 12 hours of injury. In our set-up usually, patients present late i.e., after 6 hours due to lack of neurosurgical facilities in peripheral hospitals. In our study, 10 (66.67%) patients presented with receiving GCS of 13/15, 2 (13.33%) patients with receiving GCS of 9/15, 1 (6.67%) patient presented with receiving GCS of 7/15 and 2 (13.33%) patients were presented with receiving GCS of 15/15.

In patients who were presented with traumatic extradural hematoma, all baseline, ECG, chest X-ray, and bleeding profile were monitored. Their surgery was planned on the CBC report only as EDH is considered an emergency. Post-operatively CT brain was performed after 12 hours in all cases to see residual EDH and re-collection. In all cases, we performed CT brain

plan on presentation to neurosurgical department and repeat scan done after 12 hours of surgery. Postoperatively, antiepileptics, antiemetics (prophylactically), antibiotics, and fluid therapy were given. Blood pressure monitored were attached and BP was kept in the range of 140 – 160 mmHg. GCS of all patients was monitored 4 hourly. In all patients, the drain was removed after 24 hours. In 2 patients, drains were removed after 3 days as these patients were hypertensive and were taking aspirin and clopidogrel for IHD (ischemic heart disease). These were those patients who presented with GCS of 7/15 to 9/15.

In our study, GCS of all patients were monitored 4 hourly. On the 5th postoperative day, the GCS score of all patients returned to 15/15. All patients were discharged within a week. Headache of 12 (80%) patients resolved completely on the 5th post-operative day. Headache of 2 (13.33%) patients converted from severe too mild on 5th post-operative day. Headache of 1 (6.66%) patient took 3 weeks to resolve and this patient developed headache and vomiting and returned to the hospital after 2 weeks with complaints of headache and vomiting. We re-admitted this patient for 1 a week and his headache was resolved completely by conservative management. All patients were discharged after re-assessment of clinical status on 5th post-operative day.

CONCLUSION

Headache of patients having traumatic occipital EDH with a volume less than 15 ml resolve completely with single burr hole evacuation and placement of a drain. Single burr hole evacuation is the best option for occipital EDH of less than 15 ml in volume. If we do single burr hole evacuation of occipital extradural hematoma of volume less than 15 ml rather than craniotomy then there are the following advantages: fewer hospital stays and fewer chances of wound infection, short timing for surgery.

Limitations

The number of cases was small. Hence, large case series for further evaluation by this is awaited.

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Additional Information

Disclosures: Authors report no conflict of interest.
Ethical Review Board Approval: The study was conformed to the ethical review board requirements.
Human Subjects: Consent was obtained by all patients/participants in this study.
Conflicts of Interest:
In compliance with the ICMJE uniform disclosure form, all authors declare the following:
Financial Relationships: All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work.
Other Relationships: All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

AUTHORS CONTRIBUTIONS

Sr.#	Author's Full Name	Intellectual Contribution to Paper in Terms of:
1.	Usama Mansoor	Study design and methodology.
2.	Rana Zubair Mahmood	Paper writing, referencing, and data calculations
3.	Sarfraz Khan	Literature search, proof reading.
4.	Touqeer Ahmad	Data collection and calculations
5.	Sikandar Ali Dehraj	Analysis of data and interpretation of results etc.
6.	Abdul Wajid	Literature review and manuscript writing
7.	Muhammad Zayed Qamar	Analysis of data and quality insurer