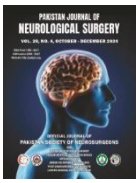

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Case Report

Bilateral Cerebral Ischemia after Epidural Hematoma Evacuation

Taimoor Ali[1], Muhammad Usman[1], Umer Farooq Khawaja[1], Mohammad Ishaq[2], Naeem Ul Haq[2], Naseer Hassan[3]

[1]Department of Neurosurgery, PAF Hospital, Fazaia Medical College, Islamabad – Pakistan
[2]Department of Neurosurgery, Mardan Medical Complex, Bacha Khan Medical College, Mardan – Pakistan
[3]Department of Neurosurgery, Qazi Hussain Ahmad Medical Complex, Nowshera Medical College, Nowshera – Pakistan

ABSTRACT

Background: Unilateral Cerebral Ischemia after Epidural Hematoma (EDH) evacuation is well documented in the literature. We are reporting a case of Epidural Hematoma evacuation, resulting in cerebral ischemia bi-laterally.

Case Report: A 42-year-old male presented to the ER with a history of road traffic accidents. Arrival GCS was 7/15. A CT scan brain showed a huge left-side EDH involving frontal, parietal, and temporal regions. On the right side, there were contusions in the frontal area. EDH was evacuated surgically. The patient's GCS improved after 2 days but deteriorated afterward. Repeat CT shows the expansion of contusions and developing ischemia on both sides involving MCA and PCA territories. Contusions were surgically removed and ischemia was treated conservatively. After a couple of weeks, the patient improved.

Conclusion: Cerebral Ischemia does develop after epidural hematoma evacuation, so the contusions on the conta-lateral side expand. Therefore close monitoring of such patients and timely surgical evacuation are necessary in preventing complications.

Keywords: Epidural hematoma, Cerebral Ischemia, Head Injury, Complications.

Abbreviations: EDH = Epidural hematoma. GCS = Glasgow coma scale. CT = Computed tomography. ER = Emergency room. MCA = Middle cerebral artery. PCA = Posterior cerebral artery. OR = Operating room. ICU = Intensive care unit. MRC = Medical Research Council. HDU = High dependency unit.

Corresponding Author: Muhammad Usman
Department of Neurosurgery, PAF Hospital, Fazaia Medical College, Islamabad – Pakistan
Email: drusman387@yahoo.com

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INTRODUCTION

Cerebral ischemia post-EDH evacuation is documented in the literature with a percentage of

1-1.9%.[1] Several mechanisms have been proposed to explain this ischemia. These include direct compression of the cerebral vessels by pressure effect, vasospasm, and cerebral herniation.[2,3] In some cases vascular dissection of the cerebral arteries during trauma can also result in ischemia. In most studies, Unilateral ischemia is described, but we present a case in which the patient developed cerebral ischemia bilaterally.

CASE REPORT

Ethical committee approval was taken for this manuscript. Informed consent from the patient's relative was also taken. Our patient who is 42 years of age presented in the Emergency department of PAF Hospital, Islamabad with a history of road traffic accidents with a GCS of 7/15, left pupil sluggish reactive to light, and mid-dialted. He was stabilized in the Emergency Room (ER) with ATLS protocol. His CT brain was ordered which showed a huge epidural hematoma in the left fronto-temporo-parietal area, in addition to right frontal contusion (Figure 1). He was shifted to O.R and EDH was evacuated via craniotomy, the bleeding site was the middle meningial artery which was secured with bipolar. After surgery patient was shifted to I.C.U. and after a brief improvement in GCS patient was detoriated on 2nd Post op day. CT brain was advised which showed expansion of the right side contusions and early ischemia on the left side involving the MCA and PCA territories (Figure 2).

The patient was operated on again for contusion evacuation which resulted in improved GCS. Post-op CT scan shows bilateral cerebral ischemia involving the MCA and PCA territories (Figure 3). Clinically patient had only mild weakness on the right side with power 3/5 according to the MRC grading system. The patient remained in ICU for two weeks after which the patient was shifted to HDU. After conservative treatment patient was improved and discharged home with supportive care. The last follow-up CT scan shows significant ischemia resolution (Figure 4).

DISCUSSION

Unilateral cerebral ischemia after EDH evacuation is well-reported in the literature. Many authors have described different mechanisms for the pathogenesis of cerebral ischemia post EDH evacuation, which include compression effect resulting in arterial supply halting to the brain resulting in ischemia, others include vascular

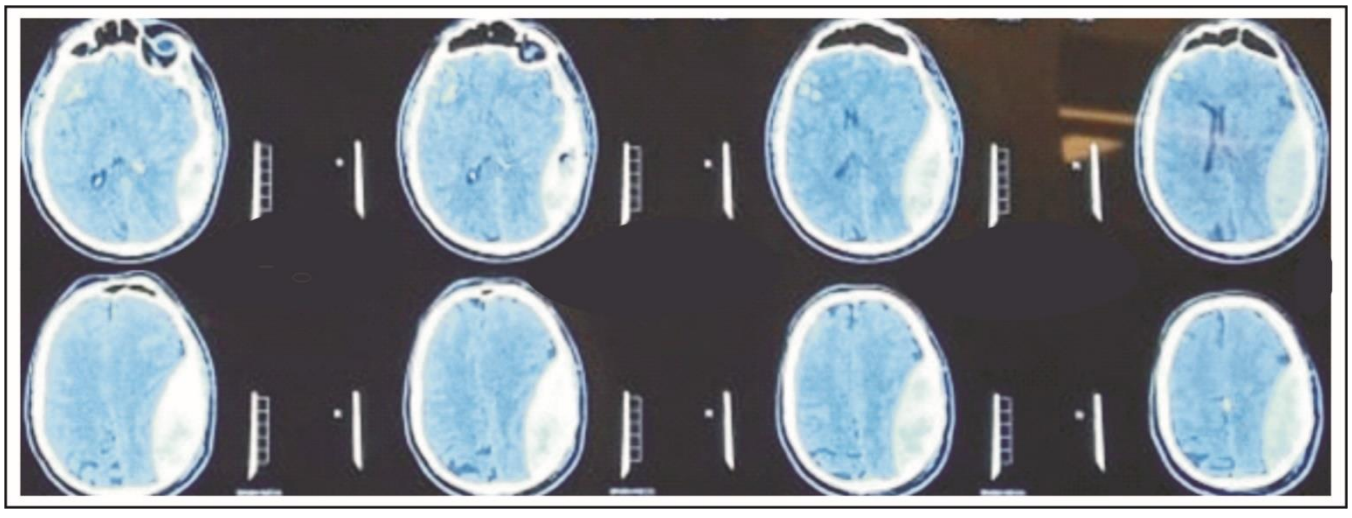

Figure 1: CT Scan of the patient at the time of presentation (Presented with patient's consent).

dissection and even thrombosis causing ischemia.[4] In one study Moros pena-M et al, suggested the compression of the Posterior Cerebral artery at the incisura leading to ischemia.[5] Others like Matthieu Landart et al, suggested huge volume of hematoma leads to ischemia in their study of 47 infants.[6] In one other study Mobbs Rj et al, found that due to the fixed attachment of the middle cerebral artery to the sphenoid bone, compression at this point leads to ischemia in the MCA territory.[7] In another study by Marino R et al, suggested that prolonged cerebral hypertension and edema can also result in ischemia. In most of the studies in the literature mostly PCA was affected along with MCA.[8,9] In our case the ischemia was in the territory of both MCA and PCA bilaterally. Our patient initially had decreased GCS and right-side weakness, all of these symptoms improved with conservative management in three weeks.

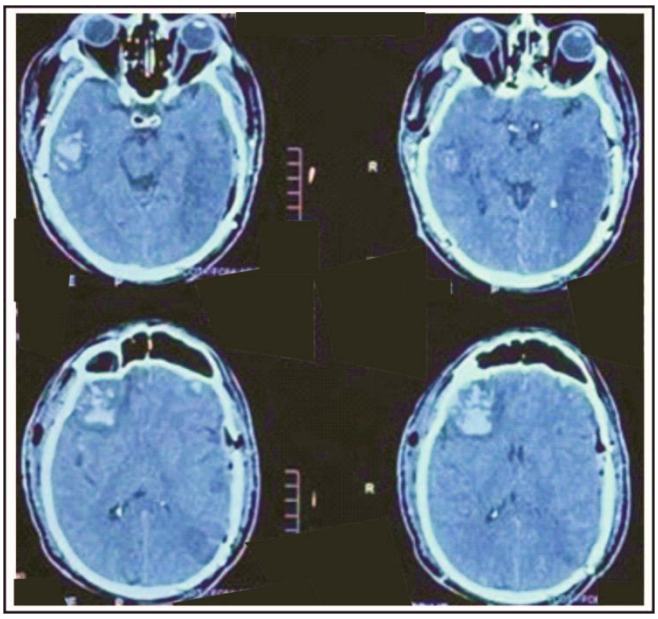

Figure 2: CT scan after the first surgery (Presented with patient's consent).

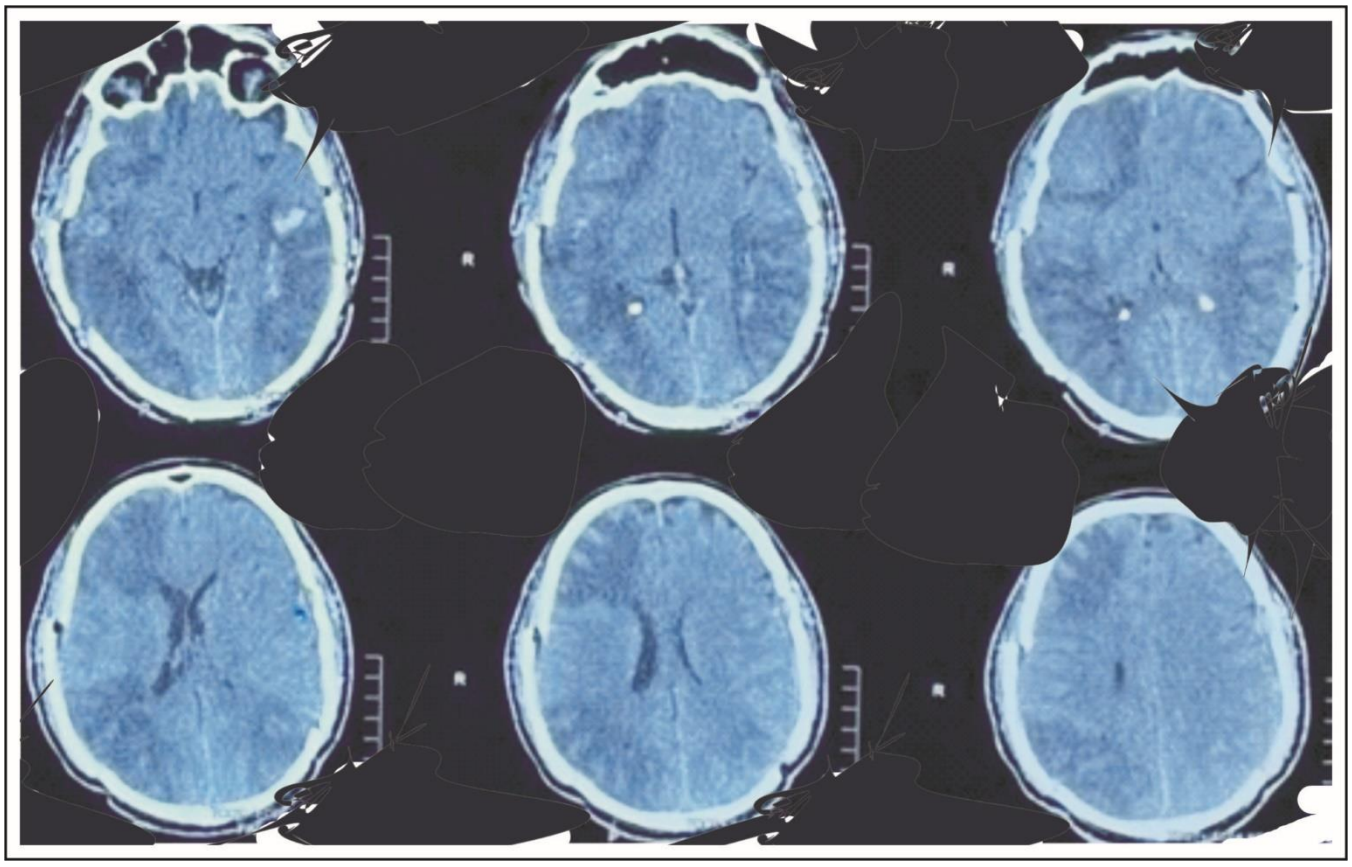

Figure 3: CT scan after second surgery (Presented with patient's consent).

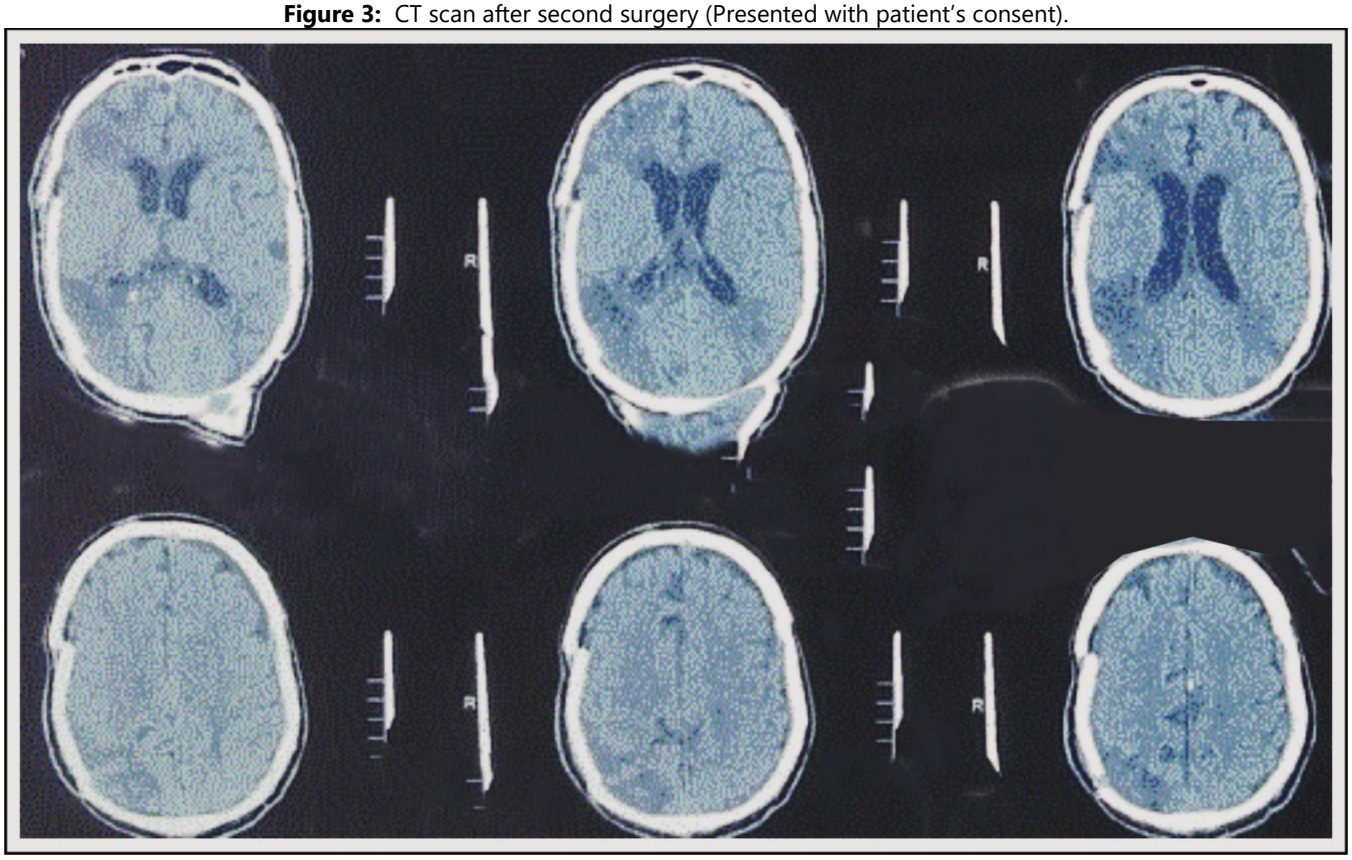

Figure 4: CT scan at the time of discharge (Presented after consent).

CONCLUSION

Our study and literature review suggested that timely evacuation of EDH while securing hemostasis during surgery and minimal brain compression can prevent this deadly complication. Furthermore, proper ICU care of post-trauma patients is crucial in preventing cerebral ischemia and high intracranial pressure. Although Post EDH evacuation ischemia is a dangerous complication timely diagnosis and prompt treatment can save lives and improve outcomes.

RECOMMENDATION

The treatment of every patient with a head injury should be individualized, as it is a dynamic disease and optimum management requires vigilant observation. Timely diagnosis and prompt action in the form of medical or surgical treatment are the key to successful patient outcomes.

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Additional Information

Conflicts of interest: Authors report no conflict of interest.
Human Subjects: Consent was obtained by the patient in this study.
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.
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AUTHORS CONTRIBUTIONS

Sr.#	Author's Full Name	Intellectual Contribution to Paper in Terms of:
1.	Taimoor Ali & Muhammad Usman	1. Study design and methodology.
2.	Muhammad Usman & Taimoor Ali	2. Paper writing.
3.	Umer Farooq Khawaja & Mohammad Ishaq	3. Data collection and calculations.
4.	Mohammad Ishaq, Naeem Ul Haq & Naseer Hassan	4. Analysis of data and interpretation of results.
5.	Muhammad Usman, Naeem Ul Haq & Naseer Hassan	5. Literature review and referencing.
6.	Muhammad Usman & Umer Farooq Khawaja	6. Editing and quality insurer.