

Content available at: <https://www.ipinnovative.com/open-access-journals>

IP Indian Journal of Anatomy and Surgery of Head, Neck and Brain

Journal homepage: <https://www.ijashnb.org/>

## Original Research Article

## Assessment of outcome in surgically treated traumatic extradural haematoma patients

Bhavuk Kapoor<sup>1,\*</sup>, Mayank Kapoor<sup>2</sup>, Parul Vaid<sup>3</sup><sup>1</sup>Dept. of Neurosurgery, Government Medical College and Hospital, Jammu, Jammu & Kashmir, India<sup>2</sup>Dept. of Neurosurgery, All India Institute of Medical Science Rishikesh, Uttarakhand, India<sup>3</sup>Dept. of Neurosurgery, SMGS Govt Medical College Jammu, Jammu and Kashmir, India

## ARTICLE INFO

## Article history:

Received 29-08-2022

Accepted 03-10-2022

Available online 21-10-2022

## Keywords:

Extradural hematoma

Glasgow coma scale

Glasgow outcome score

Outcome

## ABSTRACT

**Background:** In approximately 2% of all patients with head injuries, Extradural haematoma occurs. Immediate diagnosis and surgical evacuation is usually required. Outcome in patient with EDH can be assessed using Glasgow outcome score (GOS). Five parameters of outcome we have measured in our study are - good recovery, moderate disability, severe disability, vegetative state and death.

**Materials and Methods:** Assessment of outcome of patient by using Glasgow outcome score (GOS) and assessing the outcome with respect to the initial GCS at admission was done.

**Results:** Most (51.42%) of the patients were in the age group of 16-31 years. RTA was the most common (51.42%) cause for EDH occurrence. Most of the patients (57.14%) had GCS of 13-15 in our study. Majority of the patients (68.57%) had a Glasgow outcome score of 5, indicating a good outcome. 51.42% of patients having a GCS of 13-15 had a good outcome, whereas 11.42% of patients having GCS of 9-12 and 5.71% of patients having GCS of  $\leq 8$  had good outcome.

**Conclusions:** EDH is one of the most serious complications in head injury. It requires immediate diagnosis and management. Urgent surgical intervention improves the outcome Mild head injury patients (GCS 13-15) have good outcome (GOS 5) as compared to with severe head injury (GCS  $\leq 8$ ) patients. Lower GCS patients have poor outcome.

This is an Open Access (OA) journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License](https://creativecommons.org/licenses/by-nc-sa/4.0/), which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: [reprint@ipinnovative.com](mailto:reprint@ipinnovative.com)

## 1. Introduction

Traumatic brain injury (TBI) occurs with an incidence of 20-40 cases per 100000 population per year in head injury patients.<sup>1</sup> It is the most common cause of death in young adults and males are more commonly involved than females.

EDH is one of the most serious complications of head injury, requiring immediate diagnosis and surgical intervention. It mostly occurs in young adults. Other risk factors are road traffic accidents, falls, sports and physical assaults.<sup>2</sup> CT scan head is the investigation of choice in these patients. Deterioration in the level

of consciousness and development of focal signs like ipsilateral pupil dilatation and contralateral hemiplegia, indicate a rapidly expanding EDH.<sup>3,4</sup> Immediate surgical evacuation is usually required.<sup>5</sup>

Outcome in patient with EDH can be assessed using Glasgow outcome score (GOS). Five parameters of outcome we have measured in our study were - good recovery, moderate disability, severe disability, vegetative state and death. This study was carried out to find out the GOS with respect to the initial Glasgow Coma Scale (GCS) at the time of admission.

\* Corresponding author.

E-mail address: [kapoorbhavuk@yahoo.in](mailto:kapoorbhavuk@yahoo.in) (B. Kapoor).

## 2. Materials and Methods

Thirty five patients who underwent surgical evacuation of EDH were included in the study.

### 2.1. Inclusion criteria

Traumatic EDH patients who underwent surgical intervention.

### 2.2. Exclusion criteria

EDH patients managed conservatively

After taking informed consent, patients were taken for evacuation of EDH. Aim was assessment of outcome of surgically treated patients by using Glasgow outcome score (GOS) and assessing the outcome with respect to the initial GCS at admission.

Glasgow outcome score and its interpretation

1. Score 1 Dead
2. Score 2 Permanent vegetative state
3. Score 3 Severe disability and dependent
4. Score 4 Moderate disability but independent
5. Score 5 Good recovery

**Table 1:** Age Incidence

Age Group (Years)	Frequency	Percentage (%)
0 – 15	8	22.85
16 – 31	18	51.42
32 – 47	7	20
48 – 63	2	5.71

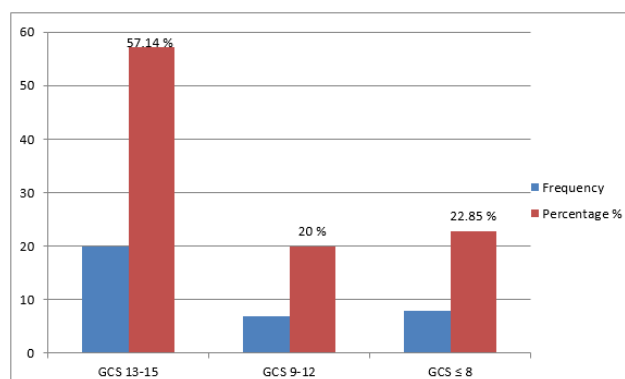
**Table 2:** Glasgow outcome score of operated EDH

Glasgow outcome score	Frequency	Percentage (%)
5	25	68.57
4	5	17.14
3	4	11.42
2	0	0
1	1	2.85

## 3. Results

There were 74.28% male and 25.71% female patients in our study. In our study mostly (51.42%) the patients were in the age group of 16-31 years. (Table 1) Road traffic accidents were the most common (51.42%) cause for EDH occurrence in our study, followed by fall in 45.71% and assault in 2.85% of cases. In our study, most of the patients had GCS of 13-15 (57.14%) at admission. (Figure 1)

Majority of the patients had a good outcome following surgery with 68.57% of patients having a Glasgow outcome score of 5. There were 17.14% of patients with moderate



**Fig. 1:** Severity of head injury

disability (GOS 4). 11.42% of patients were having severe disability (GOS 3). (Table 2) In our study, 51.42% of patients having a GCS of 13-15 had a good outcome (GOS 5). 5.71% of patients with GCS of 13-15 had moderate disability (GOS 4) but were independent. In patients having GCS of 9-12, 11.42% had a good outcome (GOS 5), 5.71% had moderate disability and 2.85% had severe disability. In patients having GCS of ≤ 8, 5.71% had a good outcome (GOS 5), 5.71% had moderate disability, 8.57% had severe disability. (Table 3)

## 4. Discussion

EDH is a common neurosurgical emergency, usually requiring urgent surgical evacuation. We assessed the outcome after surgery using GOS and analysed the outcome with respect to the initial GCS at the time of admission. In this study, 74.28% of patients were males and 25.71% of patients were females. In a study by Cheung et al, there were 78.7% male and 21.3% female patients.<sup>6</sup> Similar findings were observed in studies by Mezue et al. and Özkan et al respectively.<sup>2,7</sup>

As males travel more, they are more prone to accidents and head injuries, so cases of EDH in males are high. Most (51.42%) of the patients were in the age group of 16-31 years. Similar findings were seen in studies by Özkan et al and Araujo et al respectively.<sup>7,8</sup> People in younger age group are more active and this increases the risk for head injuries and subsequent EDH occurrence. In elderly people the meninges are usually adherent which makes them less prone to occurrence of extradural hematomas.

RTA was the most common (51.42%) cause for EDH occurrence in our study. In a study by Phobe et al, RTA was the commonest (56%) mode of trauma leading to EDH occurrence.<sup>9</sup> In our study, mostly the patients (57.14%) had GCS of 13-15 and 20% of patients had GCS of 9-12. So in our study, most of the patients had a mild to moderate head injury. These findings were also seen in studies by Mezue et al and Araujo et al respectively.<sup>2,8</sup> Majority of the patients (68.57%) had a Glasgow outcome score

**Table 3:** Glasgow outcome score in relation to GCS at admission

Glasgow outcome score (GOS)	GCS 13-15	GCS 9-12	GCS ≤ 8	Outcome
5	18 (51.42%)	4 (11.42%)	2 (5.71%)	Good
4	2 (5.71%)	2 (5.71%)	2 (5.71%)	Moderate disability
3	-	1 (2.85%)	3 (8.57%)	Severe disability
2	-	-	-	Neurovegetative state
1	-	-	1 (2.85%)	Death

of 5, indicating a good outcome. 17.14% of patients had moderate disability but were independent (GOS, 4). 11.42% of patients were having severe disability (GOS, 3). The good recovery percentage in this study may be explained by the fact that most of the admitted patients had mild to moderate head injury.

In patients with GCS 13-15 in the present study, 51.42% had good outcome (GOS 5). 5.71% of patients with GCS of 13-15 had moderate disability (GOS 4) but were independent. In a study by Phoebe et al and Rehman et al, 58.9% and 38.6 % patients had Good outcome (GOS 5) respectively.<sup>9,10</sup> In many studies, authors had reported zero mortality for patients with GCS of 13 or above.<sup>2,7</sup> In our study, patients having GCS of 9-12, 11.42% had a good outcome (GOS 5), 5.71% had moderate disability and 2.85% had severe disability. In studies by Phoebe et al and Rehman et al, 6.7% and 31.6 % patients had Good outcome (GOS 5) respectively.<sup>9,10</sup> In our study, patients having GCS of ≤ 8, 5.71% had a good outcome (GOS 5), 5.71% had moderate disability, 8.57% had severe disability. In studies by Phoebe et al and Rehman et al, 7.8% and 5.3 % patients had Good outcome (GOS 5) respectively.<sup>9,10</sup> In our study in patients with GCS of ≤ 8, 2.85% of patients had GOS of 1. In studies by Phoebe et al and Rehman et al, 9.0% and 1 % patients had GOS 1 respectively.<sup>9,10</sup>

## 5. Conclusions

EDH is one of the most serious complications in head injury. It requires immediate diagnosis and management. EDH is more common in men, most common cause being RTA. Urgent surgical intervention whenever indicated, improves the outcome of patients. Mild head injury patients (GCS 13-15) have good outcome (GOS 5) as compared to patients with severe head injury (GCS ≤ 8). Lower GCS patients have poor outcome.

## 6. Source of Funding

None.

## 7. Conflict of Interest

None.

## 8. Ethical Approval

The study was approved by the Institutional Ethics Committee.

## Acknowledgements

The authors acknowledge the support of their family members. The authors would like to thank all the patients as well.

## References

- Williams N, Connell O. Bailey & Love's Short Practice of Surgery; 2018. p. 1632–53.
- Mezue WC, Ndubuisi CA, Chikani MC, Achebe DS, Ohaegbulam S. Traumatic extradural hematoma in enugu, Nigeria. *Niger J Surg.* 2012;18(2):80–4.
- Mahapatra AK, Vaidya VK. Extradural hematoma. Rajkumar Ramamurthi and Tandon's Manual of Neurosurgery. *Jaypee Brothers Med Publishers.* 2014;34(1):274–6.
- Sankar SK, Mahadevan A. Ramamurthi and Tandon's Manual of Neurosurgery. vol. 24; 2014. p. 1640.
- Lee E, Jian YC, Hung LC, Wang KC, Chung HH. Factors influencing the functional outcome of patients with acute epidural hematomas: analysis of 200 patients undergoing surgery. *J Trauma.* 1998;45(5):946–52.
- Cheung PS, Lam JM, Yeung JH, Graham CA, Rainer T. Outcome of traumatic extradural hematoma in Hong Kong. *Outcome of traumatic.* 1998;45(5):946–52.
- Özkan Ü, Kemaloglu S, Özates M, Güzel A, That M, Analyzing.
- Araujo JLV, Aguiar UP, Todeschini AB, Saade N, Veiga JC. Epidemiological analysis of 210 cases of surgically treated traumatic extradural hematoma. *Rev Col Bras Cir.* 2012;39(4):268–71.
- Cheung PS, Lam JM, Yeung JH, Graham CA, Rainer TH. Outcome of traumatic extradural haematoma in Hong Kong. *Injury.* 2007;38(1):76–80.
- Rehman L, Khaleeq S, Zaman KU. Association of outcome of traumatic EDH and Glasgow Coma Scale and hematoma size. *Ann Pak Inst Med Sci.* 2010;6(3):133–41.

## Author biography

**Bhavuk Kapoor**, Lecturer

**Mayank Kapoor**, Senior Resident

**Parul Vaid**, Senior Resident

**Cite this article:** Kapoor B, Kapoor M, Vaid P. Assessment of outcome in surgically treated traumatic extradural haematoma patients. *IP Indian J Anat Surg Head, Neck Brain* 2022;8(3):89-91.