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## Study Of Clinical Presentation And Outcome Of Head Injury Patients Undergoing Surgical Management.

Abhinav Mittal<sup>1\*</sup>, Shahrukh Raj<sup>2</sup>, Sanya Bhushan<sup>3</sup>, Anushka Pariya<sup>4</sup>, and Suhail Akhtar<sup>5</sup>.

<sup>1</sup>Associate Professor General Surgery, FH Medical College, Agra, Uttar Pradesh, India.

<sup>2</sup>Senior Resident General Surgery, FH Medical College, Agra, Uttar Pradesh, India.

<sup>3</sup>Junior Resident 3rd Year General Surgery, FH Medical College, Agra, Uttar Pradesh, India.

<sup>4,5</sup> Junior Resident 2rd Yr General Surgery, FH Medical College, Agra, Uttar Pradesh, India.

### ABSTRACT

Traumatic head injuries pose a substantial global health burden, necessitating effective surgical interventions. Our retrospective cohort study investigated the clinical presentation and outcomes of 60 head injury patients undergoing surgical management. Demographic, preoperative, surgical, and postoperative data were collected and analyzed. Variables included age, gender, Glasgow Coma Scale (GCS) scores, pupillary reactivity, surgical interventions, and postoperative outcomes. Statistical analyses, including chi-square tests and t-tests, were employed for robust data interpretation. The cohort exhibited a mean age of 42.5 years, with a predominance of males (75%). Motor vehicle accidents (41.7%) and falls (33.3%) were the primary injury mechanisms. Preoperatively, a mean GCS score of 8.2 and predominantly reactive pupils (83.3%) indicated severe injuries. Decompressive craniectomy (66.7%) was the primary surgical intervention. Complications included infection (8.3%) and hemorrhage (13.3%), yielding an overall complication rate of 33.3%. Postoperatively, a mean length of hospital stay was 14.6 days, with 75% of patients exhibiting no neurological sequelae. Surgical management, primarily through decompressive craniectomy, demonstrated positive outcomes in the majority of cases. Complications necessitate ongoing scrutiny, emphasizing the importance of tailored interventions and continuous refinement of surgical protocols.

**Keywords:** Traumatic head injury, surgical management, decompressive craniectomy

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*\*Corresponding author*

## INTRODUCTION

Traumatic head injuries represent a significant global health burden, necessitating prompt intervention to mitigate morbidity and mortality [1]. Our research study aims to comprehensively investigate the clinical presentation and outcomes of head injury patients undergoing surgical management. Understanding the nuanced manifestations of head injuries is pivotal for optimizing therapeutic strategies and improving patient prognosis.

The introduction of surgical interventions, including decompressive craniectomy and intracranial pressure monitoring, has revolutionized the management of severe head trauma [2, 3]. This study seeks to elucidate the correlation between preoperative clinical features, such as Glasgow Coma Scale scores and pupillary reactivity, and postoperative outcomes. By analyzing a cohort of surgically managed head injury cases, we aim to identify prognostic indicators that can guide treatment decisions and enhance overall patient care. Ultimately, this research work contributes to the ongoing efforts to refine surgical protocols and enhance the quality of life for individuals grappling with traumatic head injuries [4-6].

## METHODOLOGY

Our study employed a retrospective cohort design, spanning a period of six months, to investigate the clinical presentation and outcomes of head injury patients undergoing surgical management. The sample comprised 60 patients who met the inclusion criteria of having undergone surgical interventions for traumatic head injuries. Patient data, including demographic information, preoperative clinical features, and postoperative outcomes, were meticulously extracted from electronic health records, surgical logs, and imaging reports.

The primary variables of interest encompassed preoperative factors such as Glasgow Coma Scale (GCS) scores, pupillary reactivity, and injury mechanisms.

Additionally, postoperative outcomes, including complications, length of hospital stay, and neurological sequelae, were meticulously recorded.

To ascertain the robustness of our findings, statistical analyses were conducted using appropriate tests, such as chi-square tests for categorical variables and t-tests for continuous variables.

Furthermore, subgroup analyses were performed to explore potential associations between specific preoperative factors and distinct postoperative outcomes. Sensitivity analyses were also conducted to assess the impact of variations in surgical approaches on patient outcomes. The meticulous methodology and statistical rigor employed in this study aimed to provide a comprehensive understanding of the clinical dynamics and surgical outcomes in head injury patients, thus contributing valuable insights to the field of neurotrauma management.

## RESULTS

**Table 1: Demographic Characteristics of Head Injury Patients (n=60)**

Variable	Mean (SD) or n (%)
Age (years)	42.5 (15.2)
Gender (Male/Female)	45/15 (75%/25%)
Mechanism of Injury	
- Falls	20 (33.3%)
- Motor Vehicle Accidents	25 (41.7%)
- Other	15 (25.0%)

**Table 2: Preoperative Clinical Features (n=60)**

Variable	Mean (SD) or n (%)
Glasgow Coma Scale	
- Mean (SD)	8.2 (2.5)
Pupillary Reactivity	
- Reactive	50 (83.3%)
- Non-reactive	10 (16.7%)

**Table 3: Surgical Interventions and Intraoperative Details (n=60)**

Variable	n (%)
Decompressive Craniectomy	40 (66.7%)
Intracranial Pressure Monitoring	60 (100%)
Surgical Complications	
- Infection	5 (8.3%)
- Hemorrhage	8 (13.3%)

**Table 4: Postoperative Outcomes (n=60)**

Variable	Mean (SD) or n (%)
Length of Hospital Stay (days)	14.6 (5.3)
Neurological Sequelae	
- Present	15 (25.0%)
- Absent	45 (75.0%)
Overall Complication Rate	20 (33.3%)

### DISCUSSION

The comprehensive analysis of demographic characteristics, preoperative clinical features, surgical interventions, and postoperative outcomes sheds light on the complexities of managing head injury patients through surgical means [7]. Demographically, the cohort of 60 head injury patients exhibited a mean age of 42.5 years, with a predominance of males (75%). Mechanisms of injury varied, with motor vehicle accidents being the leading cause (41.7%), followed by falls (33.3%) and other causes (25.0%). These findings align with existing literature, highlighting the predominance of traumatic head injuries in specific age groups and associated injury mechanisms. The predominance of males is also consistent with epidemiological trends in trauma [8].

The preoperative clinical features presented critical insights into the severity of head injuries. The mean Glasgow Coma Scale (GCS) score of 8.2 indicated a substantial impairment in consciousness, emphasizing the gravity of the cases included in the study. Pupillary reactivity, a crucial neurological indicator, revealed that the majority of patients (83.3%) had reactive pupils, signifying intact neurological pathways. These preoperative indicators are fundamental in risk stratification and guiding surgical decision-making [9].

Surgical interventions played a pivotal role in the management of these head injury cases. Decompressive craniectomy was the most frequently performed procedure, accounting for 66.7% of cases. This aligns with established protocols for severe traumatic brain injury, emphasizing the role of decompression in mitigating intracranial pressure. Additionally, the universal implementation of intracranial pressure monitoring (100%) underscores the importance of real-time monitoring to guide therapeutic interventions [10, 11].

However, the occurrence of surgical complications, such as infection (8.3%) and hemorrhage (13.3%), warrants careful consideration. While the overall complication rate was 33.3%, it is crucial to analyze these complications in the context of the potential benefits conferred by surgical interventions. Infection rates, though present, are within an acceptable range, and efforts to minimize these risks should be continually emphasized. Hemorrhagic complications, while not uncommon, may necessitate further investigation into factors influencing bleeding tendencies and refining surgical techniques.

Postoperative outcomes provide a comprehensive view of the effectiveness of surgical management in this cohort. The mean length of hospital stay was 14.6 days, reflecting the intricate postoperative care required for head injury patients. Notably, 75% of patients showed an absence of neurological sequelae, highlighting the success of surgical interventions in preserving neurological function. However, 25% of patients experienced neurological sequelae, indicating the need for ongoing research to identify factors contributing to less favorable outcomes.

Exploring the overall complication rate, it is essential to acknowledge that a subset of patients faced postoperative challenges. These complications may result from a combination of surgical factors, patient-specific characteristics, and postoperative care. A nuanced understanding of these complications is imperative for refining surgical protocols and optimizing patient outcomes.

In comparing these results with existing literature, the study contributes valuable insights into the nuances of surgical management for head injuries. The demographic profile and injury mechanisms align with global trends, emphasizing the need for tailored interventions based on patient characteristics. The preoperative clinical features, particularly GCS scores and pupillary reactivity, serve as reliable indicators for prognostication and treatment planning.

The predominance of decompressive craniectomy as the primary surgical intervention reflects the established role of this procedure in managing elevated intracranial pressure. However, the occurrence of complications necessitates ongoing scrutiny and efforts to minimize associated risks. The universal adoption of intracranial pressure monitoring is commendable, providing a data-driven approach to guide therapeutic decisions.

The length of hospital stay serves as a practical metric for resource allocation and healthcare planning. The absence of neurological sequelae in the majority of patients underscores the success of surgical interventions in preserving neurological function. However, the subset of patients with sequelae prompts further investigation into factors influencing postoperative outcomes.

Several limitations should be acknowledged when interpreting these results. The retrospective nature of the study introduces inherent biases, and the reliance on electronic health records may result in incomplete or variable data. Additionally, the generalizability of findings may be limited by the single-center design. Future research endeavours should consider multi-center collaborations to enhance the external validity of the results.

## CONCLUSION

In conclusion, our study provides a comprehensive exploration of the clinical presentation and outcomes of head injury patients undergoing surgical management. The findings contribute valuable insights into demographic trends, preoperative indicators, surgical interventions, and postoperative outcomes. While the majority of patients experienced positive outcomes, the occurrence of complications warrants careful consideration. Our research work serves as a foundation for future studies, guiding the refinement of surgical protocols and the optimization of patient care for those grappling with traumatic head injuries.

## REFERENCES

- [1] Dash HH, Chavali S. Management of traumatic brain injury patients. *Korean J Anesthesiol* 2018 ;71(1):12-21
- [2] Castillo M, Harris JH. Skull and brain. In: Harris JH, Harris WH, Novelline AR, editors. *The radiology of emergency medicine*. Baltimore: Williams and Wilkins; 1993.
- [3] McClennan S, Snider C. Head injuries in Kathmandu, Nepal. *McMaster Univ Med J* 2003; 1: 10-14.
- [4] Bhagat H, Narang R, Sharma D, Dash HH, Chauhan H. ST elevation--an indication of reversible neurogenic myocardial dysfunction in patients with head injury. *Ann Card Anaesth* 2009; 12:149-151.
- [5] Davison DL, Terek M, Chawla LS. Neurogenic pulmonary edema. *Crit Care* 2012; 16:212
- [6] Jennett Brian, Teasdale G, Braakman R, et al. Predicting outcome in individual patients after severe head injury. *Lancet* 1976; 1:1031-4.



- [7] Gomez PA, Lobato RD, Boto GR et al. Age and outcome after severe head injury. *Acta Neurochir* 2000;142: 373–81.
- [8] Murray LS, Teasdale GM, Murray GD et al. Does prediction of outcome alter patient management? *Lancet* 1993; 34:1487–91.
- [9] Fakhry SM, Trask AL, Waller MA, Watts DD. Management of braininjured patients by an evidence-based medicine protocol improves outcomes and decreases hospital charges. *J Trauma* 2004;56: 492-9.
- [10] Marshall LF, Gattille T, Klaube P, et al. The outcome of severe closed head injury. *J Neurosurg* 1991;75(5):S28-S36.
- [11] Ahmed S, Khan S, Agrawal D, Sharma BS. Out come in Head Injured patients: Experience at a level 1 Trauma Centre. In *J Neurotrauma* 2009;6(2):119-22.