



SURGICAL VERSUS CONSERVATIVE MANAGEMENT IN MILD TO MODERATE HEAD INJURY WITH INTRACRANIAL HEMATOMA AT A TERTIARY CARE CENTRE

General Surgery

Dr. Rakshak V. Ghanathe

Junior Resident, Department of General Surgery, Akash Institute of Medical Sciences and Research Centre, RGUHS, Karnataka, India.

Dr. Murthy Kumar V

Professor and HOD, Department of General Surgery, Akash Institute of Medical Sciences and Research Centre, RGUHS, Karnataka, India.

Dr. Krishna Shah

Consultant neurosurgeon, DrNB Neurosurgery, Department of General Surgery, Akash Institute of Medical Sciences and Research Centre, RGUHS, Karnataka, India.

ABSTRACT

Introduction: Traumatic brain injury (TBI) remains a major cause of mortality, morbidity, and long-term disability worldwide. While surgical intervention is well established in severe head injuries, the optimal management of mild to moderate head injury associated with intracranial hematoma continues to be debated. Patients may present with relatively preserved neurological status despite significant radiological findings, making treatment decisions challenging. **Aim:** To compare clinical and functional outcomes between surgical and conservative management in patients with mild to moderate head injury complicated by intracranial hematoma and to identify factors influencing treatment outcomes. **Materials And Methods:** This retrospective observational study was conducted at a tertiary care teaching hospital over a six-month period. Sixty patients with mild to moderate head injury (Glasgow Coma Scale [GCS] 9–15) and radiologically confirmed intracranial hematoma were included. Patients were divided into surgical (n = 30) and conservative (n = 30) groups. Functional outcomes were assessed using the Glasgow Outcome Score (GOS) at three months. **Results:** Favourable outcomes (GOS 4–5) were observed in 76% of surgically managed patients compared to 60% in the conservatively managed group. Mortality was higher in the conservative group. Surgical intervention was associated with better outcomes in patients with hematoma volume >25 ml or midline shift >5 mm. **Conclusion:** Early surgical intervention improves neurological and functional outcomes in selected patients with mild to moderate head injury and significant intracranial hematoma. Conservative management remains effective in carefully selected, neurologically stable patients with small hematomas under close monitoring.

KEYWORDS

Traumatic brain injury, Intracranial hematoma, Mild head injury, Surgical management, Conservative management, Glasgow Outcome Score

INTRODUCTION

Traumatic brain injury (TBI) is a significant public health problem and a leading cause of trauma-related morbidity and mortality across the world, particularly affecting the young and economically productive population. According to global estimates, TBI contributes substantially to long-term disability, placing a heavy burden on healthcare systems and families. Advances in neuroimaging, critical care, and neurosurgical techniques have improved survival; however, the management of certain subsets of TBI remains controversial.

Intracranial hematomas, including extradural hematoma (EDH), subdural hematoma (SDH), and cerebral contusions, play a crucial role in secondary brain injury. These lesions can cause raised intracranial pressure, cerebral herniation, and ischemia if not addressed promptly. In severe head injuries, surgical evacuation is universally accepted as life-saving. However, in patients with mild to moderate head injury (GCS 9–15), the decision between surgical and conservative management is less straightforward.

Many patients present with good GCS scores despite significant intracranial pathology on computed tomography (CT) scan. Some remain neurologically stable, while others deteriorate due to hematoma expansion or secondary brain injury within the first 24–48 hours. This uncertainty poses a challenge in determining the optimal timing and necessity of surgical intervention.

This study was undertaken to compare surgical and conservative management strategies in mild to moderate head injury with intracranial hematoma at a tertiary care centre and to assess their impact on functional outcomes.

AIM AND OBJECTIVES

AIM

To evaluate and compare the outcomes of surgical versus conservative management in patients with mild to moderate head injury associated with intracranial hematoma.

OBJECTIVES

1. To assess neurological and functional outcomes using the Glasgow Outcome Score (GOS).
2. To compare mortality and morbidity between surgical and conservative treatment groups.

3. To identify radiological and clinical factors influencing treatment outcomes.

MATERIALS AND METHODS

Study Design

This was a retrospective observational study conducted at Akash Institute of Medical Sciences and Research Centre, Karnataka.

Study Period

June 2024 to November 2024 (6 months).

Sample Size

A total of 60 patients were included in the study.

Inclusion Criteria

- Age ≥ 18 years
- Mild to moderate head injury (GCS 9–15)
- CT-confirmed intracranial hematoma (>1 cm), including EDH, SDH, or cerebral contusion

Exclusion Criteria

- Severe head injury (GCS ≤ 8)
- Polytrauma patients
- Penetrating head injuries
- Patients with known bleeding disorders or on anticoagulant therapy

Study Groups

Patients were divided into two groups:

- Surgical Group (n = 30): Patients who underwent operative intervention
- Conservative Group (n = 30): Patients managed non-operatively

Management Protocol

Surgical Management:

Included craniotomy, decompressive craniectomy, or burr hole evacuation depending on hematoma type, volume, and mass effect.

Conservative Management:

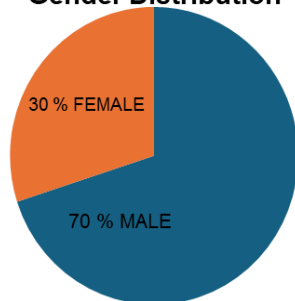
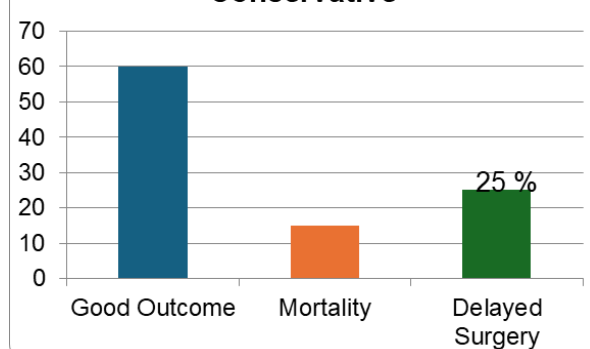
Included close neurological monitoring in ICU, head elevation, osmotic diuretics, seizure prophylaxis, and serial CT scans to detect hematoma progression.

Outcome Measures

- Glasgow Outcome Score (GOS) at 3 months
- GOS 1–3: Poor outcome
- GOS 4–5: Good outcome
- Mortality rate

RESULTS**Demographic Profile**

The majority of patients belonged to the young and middle-aged adult population, with a male predominance, reflecting the typical epidemiology of traumatic head injury.

Gender Distribution**Conservative****Functional Outcomes**

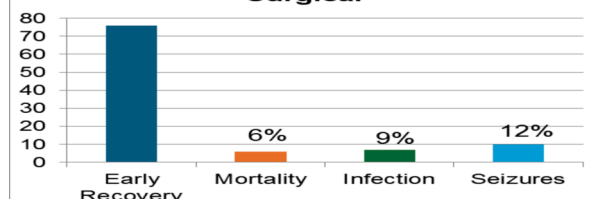
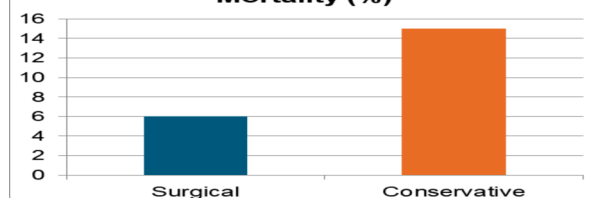
- Surgical Group:
- 76% achieved good outcome (GOS 4–5)
- 24% had poor outcome
- Conservative Group:
- 60% achieved good outcome
- 40% had poor outcome

Mortality

Mortality was higher in the conservatively managed group compared to the surgically treated group.

Radiological Correlation

Patients with hematoma volume >25 ml or midline shift >5 mm showed significantly better outcomes when managed surgically. Conservative management was more effective in patients with hematoma volume <20 ml and stable neurological status.

Surgical**Mortality (%)****DISCUSSION**

The management of mild to moderate head injury with intracranial hematoma remains a gray zone in neurosurgical practice. While some patients benefit from early surgical intervention, others recover well with conservative treatment, emphasizing the importance of individualized decision-making.

In the present study, surgically managed patients demonstrated superior functional outcomes compared to those treated conservatively. Early surgical decompression likely prevents secondary brain injury by reducing intracranial pressure and improving cerebral perfusion. This finding is consistent with previous studies and systematic reviews suggesting improved outcomes with timely surgery in selected patients.

An important observation was that some patients with initially good GCS deteriorated within 24–48 hours due to hematoma expansion. Patients who underwent early surgery before neurological decline had better recovery than those who required delayed surgery. This highlights the importance of vigilant monitoring and early intervention.

Conservative management remains a valid option for patients with small hematomas and stable neurological status. Serial CT imaging plays a critical role in identifying patients who may require delayed surgical intervention.

CONCLUSION

The management of mild to moderate head injury with intracranial hematoma should be individualized based on clinical and radiological parameters. Early surgical intervention provides better neurological and functional outcomes in patients with significant hematoma size or mass effect. Conservative management is safe and effective in carefully selected patients, provided strict monitoring and timely imaging are ensured.

Limitations

- Retrospective design
- Small sample size
- Single-centre study

Further large-scale prospective studies are required to establish definitive management guidelines.

REFERENCES

1. Greenberg MS. Handbook of Neurosurgery, 10th ed. Thieme; 2020.
2. Maas AIR, et al. Traumatic brain injury: Integrated approaches. *Lancet Neurol*. 2017;16:987-1046.
3. Badhiwala JH, et al. Surgery versus conservative care for TBI. *Lancet Neurol*. 2020;19:592-604.
4. Stocchetti N, Zanier ER. Chronic impact of TBI. *Crit Care*. 2016;20:148.
5. Bullock MR, et al. Surgical management of acute SDH. *Neurosurgery*. 2006;58:S16-24.
6. Bullock MR, et al. Management of EDH. *Neurosurgery*. 2006;58:S7-15.
7. Brain Trauma Foundation Guidelines. *J Neurotrauma*. 2017.
8. Marshall LF, et al. CT classification of head injury. *J Neurosurg*. 1991;75:S14-20.
9. Servadei F, et al. Conservative management of SDH. *Br J Neurosurg*. 2000;14:110-116.
10. Kotwica Z, Brzezinski J. Acute SDH management. *Acta Neurochir*. 1993;121:95-99.