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CLINICAL OUTCOMES OF SURGICAL INTERVENTION IN SPONTANEOUS SUPRATENTORIAL INTRACEREBRAL HEMORRHAGE: A SINGLE-CENTER EXPERIENCE FROM A TERTIARY NEUROSURGICAL UNIT

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ABSTRACT **Background:** Spontaneous intracerebral hemorrhage (ICH) remains one of the most devastating subtypes of stroke, associated with high mortality and long-term disability. Despite numerous trials, the optimal role of surgical intervention continues to be debated. This study aims to evaluate the clinical outcomes of surgically managed patients with spontaneous supratentorial ICH admitted to a tertiary neurosurgical center. **Methods:** A descriptive cross-sectional study was conducted among patients with spontaneous supratentorial ICH admitted between January 2024 and September 2025. Clinical data, radiological characteristics, and surgical methods were analyzed. Functional outcomes were assessed using the Glasgow Outcome Scale (GOS) at discharge and at 3-month follow-up. **Results:** Of 221 patients with spontaneous supratentorial ICH, 115 (52.0%) underwent surgical management. The mean age was 54.6 ± 13.4 years, with a male predominance (69.6%). Hypertension was the most common comorbidity (55.7%), and 57.8% of these patients were noncompliant with medication. Craniotomy was the most frequent procedure (89.6%), followed by stereotactic aspiration (10.4%). At 3 months, 60% achieved a favorable outcome (GOS >3), with an in-hospital mortality rate of 20%. **Conclusion:** Surgical intervention for spontaneous supratentorial ICH yielded favorable outcomes in selected patients, particularly those with superficial hematomas and preserved neurological function. Early diagnosis and aggressive management of hypertension remain critical in reducing disease burden.

KEYWORDS : Intracerebral Hemorrhage, Surgical Management, Supratentorial, Outcome, Hypertension

INTRODUCTION

Spontaneous intracerebral hemorrhage (ICH) represents approximately 10–15% of all strokes but accounts for a disproportionately high mortality and morbidity rate. Despite advances in neurocritical care and imaging, the role of surgery remains controversial. Large randomized trials such as STICH and STICH II failed to demonstrate definitive survival benefits, although subgroup analyses suggested better outcomes for selected patients, especially those with lobar hemorrhages and moderate neurological deficits.

In resource-limited settings, the prevalence of surgically managed ICH is variable and often influenced by the availability of expertise, imaging, and operative infrastructure. This study was conducted to assess the clinical outcomes and patterns of surgical management for spontaneous supratentorial ICH in a tertiary care neurosurgical center.

MATERIALS AND METHODS

This was a descriptive cross-sectional study performed from January 2024 to September 2025. Data were retrospectively retrieved from medical records of patients admitted with spontaneous supratentorial ICH.

Inclusion criteria were adult patients (≥18 years) diagnosed with spontaneous supratentorial ICH with Glasgow Coma Scale (GCS) ≥4 who underwent surgical management. Patients with traumatic hemorrhage, vascular malformations, infratentorial bleeds, or pure intraventricular hemorrhage were excluded.

Demographic details, comorbidities, clinical presentation, radiological parameters, and type of surgery were recorded. Functional outcomes were assessed using the Glasgow Outcome Scale (GOS) at discharge and 3-month follow-up. Data analysis was conducted using IBM SPSS Statistics version 20. Descriptive statistics were presented as frequencies, percentages, and means ± standard deviation.

RESULTS

Among 221 cases of spontaneous supratentorial ICH, 115 (52.0%) underwent surgical intervention. The mean age was 54.6 ± 13.4 years, and males comprised 69.6% of the cohort. Hypertension was present in 55.7% of patients, while 57.8% of them were noncompliant with antihypertensive medication.

Table 1. Demographic and Clinical Profile of Patients Undergoing Surgical Management for Supratentorial ICH.

Variable	n (%)
Male	80 (69.6)
Female	35 (30.4)
Hypertension	64 (55.7)
Diabetes Mellitus	9 (7.8)
Alcohol Use	37 (32.2)
Smoking	32 (27.8)

CT findings are summarized below (Table 2).

Table 2. Radiological Characteristics Among Surgically Treated ICH Patients.

CT Finding	n (%)
Putaminal location	74 (64.3)
Parietal location	21 (18.3)
Thalamic	9 (7.8)
Perilesional edema	90 (78.3)
Intraventricular extension	54 (46.9)
Midline shift	54 (46.9)

DISCUSSION

This study demonstrated a 52% prevalence of surgical intervention among spontaneous supratentorial ICH cases, higher than rates reported in developed nations (typically 10–20%). This may reflect differences in patient selection, healthcare accessibility, and institutional protocols. Mortality (20%) and good functional outcomes at 3 months (60%) are comparable with international data.

Surgical evacuation aims to reduce mass effect, intracranial pressure, and secondary brain injury while optimizing cerebral perfusion. Minimally invasive techniques such as stereotactic aspiration have gained traction but remain resource-dependent. Our findings reaffirm that early surgical intervention in selected cases, particularly lobar and superficial hemorrhages, can improve recovery and quality of life.

Hypertension remains the leading modifiable risk factor, yet noncompliance was observed in more than half of hypertensive patients. Community-level interventions, patient education, and long-term follow-up are necessary to mitigate recurrence and improve outcomes.

CONCLUSION

Surgical management of spontaneous supratentorial ICH can yield favorable functional outcomes when performed in selected patients. Optimizing perioperative care and hypertension control are vital in reducing morbidity and mortality. Larger multicenter prospective studies are needed to standardize surgical guidelines for spontaneous ICH.

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