

# Outcome Evaluation of Surgical Versus Conservative Treatment of Spontaneous Supratentorial Hemorrhage.

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## ABSTRACT

**Background:** Management of spontaneous supratentorial hemorrhage via conservative management is controversial so our study aimed to compare between conservative and surgical treatment of spontaneous supratentorial hemorrhage. **Methods:** 90 patients were selected who were diagnosed with spontaneous supratentorial hemorrhage and had given written consent to participate in the study. Patients were randomly divided into two groups of early surgery group (n=45) and conservative group (n=45). **Results:** 90 patients with spontaneous supratentorial hemorrhage were analysed who fulfill the inclusion criteria. Both the groups were comparable with respect to age, sex, medical comorbidities, Glassgow coma score. The intraventricular hemorrhage were present in 31.1% in conservative group and 26.6% in surgical group (but no significant difference as p value 0.641). Outcome of patients was analyzed by Glasgow outcome score and modified Rankin score. There was also no significant difference in mRS of conservative and surgical group (p value -0.206). Mortality at 3 months was 31.1% in conservative group and 40% in surgical group (p value 0.378). For patients less than and equal to 55 years age group both the groups were comparable and there was no statistically significant difference between conservative and surgical groups as Glassgow outcome scale and Modified rankin score values were comparable. But for patients more than 55 years age group. Good outcome as measured by Glassgow outcome score (p value is 0.037) and Modified Rankin score (p value 0.038) was significantly more in conservative group as compare to surgical group. **Conclusion:** In our study, we found no significant difference in outcome between conservative and surgical management of primary spontaneous supratentorial hemorrhage. But interestingly, for more than 55 age group, outcome of conservative management was better than surgical management. But there is no significant difference in mortality between conservative and surgical management for any age group.

**Keywords:** Supratentorial Hemorrhage, Intraventricular hemorrhage.

## INTRODUCTION

Intracerebral hemorrhage (ICH) is one of the most fatal form of strokes. Intracerebral hemorrhage is the reason for relatively 10% to 15% of all cerebral stroke with fatality between 23-58%; majority of survivors are left with severe disability.<sup>[1-6]</sup>

Outcome in primary ICH depends on haematoma expansion which is the most important determinant of early neurological deterioration and poor outcome in primary ICH.<sup>[7,8]</sup> Intracerebral hemorrhage is identified by its site in the brain tissue. It can be deep or situated in the lobar areas.

Hypertension is the most frequent risk factor for ICH,<sup>[9]</sup> other risk factors include intracranial vascular

malformations (including cavernous hemangioma or arteriovenous malformations), cerebral amyloid angiopathy, bleeding disorders, illicit drug use (amphetamine or cocaine). Age is also a significant risk factor.<sup>[10,11]</sup>

Diagnosis is made by CT scan and clinical assessment. CT Angiography and MR Angiography have proved to be effective in diagnosing intracranial vascular malformation after ICH.

There are two types of treatment modalities: surgical and medications. The role and timing of operative neurosurgical intervention continue contradictory and process and timing of surgery remain to be disorganized.<sup>[12-14]</sup>

It is issue of debate either ICH should be treated surgically or conservatively. Although there have been very important advances in neuroanaesthesia, neurosurgical critical care, and development of microscope guided surgical technique, the efficacy of surgical treatment for primary ICH is still controversial.

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We have done this study to compare whether surgery or conservative treatment is better to improve outcome in patients with ICH.

## MATERIALS AND METHODS

After approval from institutional ethical committee, this prospective study was done in Patients admitted in S.N.medical College and hospital, Agra. All enrolled patients had signed written consent to participate in the study. Ninety patients were selected who were diagnosed to have spontaneous supratentorial hemorrhage. Patients were divided in two groups, first 45 patients were managed conservatively and second group of 45 patients were managed surgically.

### Inclusion criteria

- Spontaneous supratentorial hemorrhage diagnosed on CT brain,
- Age more than 18 years
- Presented within 24 hours from onset of symptoms.

### Exclusion criteria

- Traumatic ICH
- Infratentorial hemorrhage
- ICH due to bleeding disorders
- Patients who had previous history of intracerebral hemorrhage

Patients admitted were evaluated clinically and primary management was done. The clinical diagnosis of spontaneous ICH was made on onset of symptoms and signs and confirmed by NCCT Head. The volume of ICH was measured by Broderick's 5 formula. Clinical evaluation was done using Glasgow coma scale, Glasgow outcome scale was performed at the time of discharge.

### Medical Management

Conservative management includes antihypertensive medications, osmotherapy, seizure prophylaxis, H2 blockers, intravenous fluids and nutrition support. Because the patients were bedridden, deep venous thrombosis prophylaxis should be used.

### Surgical Management

A decompressive craniotomy was done in all surgical patients within 24 hours of onset of condition by the same surgeon.

### Statistical Analysis

Collected data were presented as mean, ranges, numbers and ratios. Pearson chi square was used for comparison. Spearman's correlation for non parametric correlation and chi-square test were also used. P value <0.05 was considered significant.

## RESULTS

There were 90 diagnosed ICH patients fulfilling the inclusion criteria studied and analyzed. Patients were randomized: 45 to early surgery and 45 to

conservative treatment. Details of all patients, age, sex distribution and medical comorbidities are shown in [Table 1]. The group were matched at baseline. More than half patients were men. 55% of conservative patients were males and 49% of surgical group patients were males. Age ranging between 35-80 years with a median age of 58.8+11.3 in conservative group. While age ranging between 39-80 years with a mean of 60.17+11.5 years in surgical group.

Details of medical comorbidities are also shown in [Table 1]. There was no significant difference in patients of conservative and surgical group with respect to hypertension (p value is -0.133) and diabetes mellitus (p value is -0.796). The intraventricular hemorrhage were present in 31.1% in conservative group and 26.6% in surgical group (but no significant difference as p value 0.641). Outcome of patients was analyzed by Glasgow outcome score and modified Rankin score. Patients were classified according to good versus poor clinical outcome (Mrs 0-2 vs. 3-6, GOS 4-5 vs. 1-3) on discharge. There was no significant difference in GOS of conservative and surgical group (p value 0.673). There was also no significant difference in mRS of conservative and surgical group (p value -0.206). Mortality at 3 months was 31.1% in conservative group and 40% in surgical group (p value 0.378).

We have also analyzed the data for less than or equal to 55 age group and more than 55 age group separately. [Table 2] shows 21 patients in conservative group and 18 patients in surgical group were present in less than or equal to 55 age group. Patients were comparable in all parameters (sex, GCS, hematoma location, IVH and medical comorbidities) as P value > 0.05. Good outcome on the basis of GOS for conservative and surgical group were 66.67% and 77.78% respectively (Difference was not significant as P value -0.442). Good outcome on the basis of mRS for conservative and surgical group were 57.14% and 55.55% respectively (Difference was not significant as P value -0.921). Mortality at 3 months for conservative and surgical group were 28.57% and 22.22% respectively (Difference was not significant as P value -0.651).

Table 3 shows 24 patients in conservative group and 27 patients in surgical group were analyzed for more than 55 age group. Patients were comparable in all parameters (sex, GCS, hematoma location, IVH) as P value > 0.05. Good outcome on the basis of GOS for conservative and surgical groups were 62.5% and 33.33% respectively (Difference was significant as P value <0.037). Good outcome on the basis of mRS for conservative and surgical group were 58.33% and 29.63% respectively (Difference was significant as P value -0.038). Mortality for conservative and surgical group were 29.17% and 51.85% respectively (Difference was not significant as P value -0.1)

**Table 1: Parameter.**

	Conservative group (45)	Surgical group(45)	P value
Age	58.8+ 11.3	60.17+ 11.50	0.674
Age <55/>55	21/24	18/27	0.523
Sex(m/f)	25/20	22/23	0.527
Hypertension	41(91.1%)	36(80%)	0.133
Diabetes mellitus	10(22.2%)	9(20%)	0.796
Gcs(<12/>12)	25/20	21/24	0.711
Ich(rt/l)	24/21	22/23	0.673
Ivh	14	12	0.641
Gos(good/poor)	24/21	22/23	0.673
Mrs(good/poor)	25/20	19/26	0.206
Mortality	14(31.1%)	18(40%)	0.378

GOS = glassgow outcome scale  
MRS= modified ranking scale

**Table 2: Comparative Study Of Conservative Management Versus Surgical Management For Less Than 55 Age Group**

	Conservative group (21)	Surgical group (18)	P value
Sex(m/f)	11/10	10/8	0.842
Gcs(<12/>12)	12/9	9/9	0.655
Hypertension	20	18	0.458
Diabetes mellitus	5	5	0.777
Ich(rt/l)	13/8	9/9	0.455
Ivh	7	4	0.442
Gos(good/poor)	14/7	14/4	0.442
Mrs(good/poor)	12/9	10/8	0.921
Mortality	6	4	0.651

**Table 3: Comparative Study Of Conservative Management Versus Surgical Management For More Than 55 Age Group**

	Conservative group (24)	Surgical group (27)	P value
Sex(m/f)	14/10	12/15	0.322
Gcs(<12/>12)	13/11	12/15	0.488
Hypertension	21	20	0.228
Diabetes mellitus	5	4	0.574
Ich(rt/l)	11/13	13/14	0.869
Ivh	7	8	0.971
Gos(good/poor)	15/9	9/18	0.037
Mrs(good/poor)	14/10	8/19	0.038
Mortality	7	14	0.199

## DISCUSSION

In general, the patients with ICH have no significant benefit of surgical evacuation.

Concerning the risk factors, in the present study most common risk factor in both conservative and surgical groups was hypertension. Surgical evacuation of the hematomas is contradictory. Surgical evacuation lowers the mass effect, and may reduce the consecutive destruction of brain tissue and edema formation.<sup>[15]</sup> But the results of conservative and surgical groups showed no significant difference. The prognosis evaluated by mRS also demonstrated no statistical disparities among the conservative and surgical groups.

Right sided ICH (51.1%) was slightly more common than left sided ICH(48.9%). Mortality of

spontaneous supratentorial hemorrhage was 35.55% in our study. There was a difference in mortality in conservative management (31.11%) and surgical management (40%) but this difference was not statistically significant ( p value is 0.199).Our results are comparable with the results of Kim et al.<sup>[16]</sup>

For less than or equal to 55 years age group , outcome of surgical management(77.78%) (14/18) based on glassgow outcome scale was better than conservative management(66.67%)(14/21) but outcome was not statistically significant. Mortality difference of conservative management (28.57%) and surgical management (22.22%) of this group was not statistically significant. The STICH trial which compared early surgery with medical treatment showed that early surgery offer no benefit compared to conservative group which is similar to our study.<sup>[17]</sup> Mourad and his colleagues had investigated forty patients with SSICH and stated that surgical evacuation has a restrictive advantage relative to conservative medical treatment.<sup>[18]</sup>

For more than 55 age group, prognosis which was based on glassgow outcome score showed that 62.5% (15/24) of the patients benefited by conservative treatment while only 33.3%(9/27) of patients benefitted by surgery which was statistically significant (p value is -0.038). Even the mortality was more with surgical management (51.8%) than with conservative.(29.17%)

## CONCLUSION

In our study, we found no significant difference in outcome between conservative and surgical management of primary spontaneous suprtentorial hemorrhage. But interestingly, for more than 55 age group, outcome of conservative management was better than surgical management. But there is no significant difference in mortality between conservative and surgical management for any age group.

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