

## Outcome of Spontaneous Intracranial Haemorrhage with Different Operative Techniques – Retrospective Study in Tertiary Care Center

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### ABSTRACT:

**BACKGROUND:** Spontaneous non-traumatic intracerebral hemorrhage (ICH) is the second most prevalent subtype of stroke and is associated with high mortality and morbidity throughout the world.

### AIM:

To study the role of various surgical procedures in the form of evaluation of the surgical treatment and post-operative outcome of spontaneous intracranial bleeds.

### MATERIAL AND METHODS:

45 patients attending the Neurosurgical Emergency at GGH, Kakinada; who underwent surgery for spontaneous intracranial bleed during the period of 19 months( AUGUST 2017 to AUGUST 2019) were included.

### RESULTS:

Of the total 45 patients attending emergency department, 9(20%) patients recovered and were discharged the rest 36(80%) patients expired after undergone different types of surgeries for spontaneous intracranial bleeds.

### CONCLUSION:

Spontaneous intracranial hemorrhage remains a serious condition for which early aggressive care is warranted and is associated with high mortality and morbidity rate.

### KEY WORDS:

Blood pressure, Intra cerebral hemorrhage, Hypertension, Glasgow coma scale, Intraventricular hemorrhage ,Decompressive craniectomy, Mortality, Outcome

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## I. Introduction

Spontaneous, nontraumatic intracerebral hemorrhage (ICH) remains a significant cause of morbidity and mortality throughout the world. Although ICH has traditionally lagged behind ischemic stroke and aneurysmal subarachnoid hemorrhage in terms of evidence from clinical trials to guide management, the past decade has seen a dramatic increase in studies of ICH intervention.

Spontaneous non-traumatic intracerebral hemorrhage (ICH) is the second most prevalent subtype of stroke and is associated with high mortality and morbidity throughout the world.<sup>1-3</sup> Various clinical trials related to the medical and surgical management of ICH have been conducted to overcome its devastating clinical course. Despite these efforts in the past decades, there have been no dramatic advances in the development of interventions to improve the functional outcomes after ICH<sup>4</sup>. In terms of the pathogenesis, ICH resulting from bursting of intracerebral arteries, a majority of fatalities occur in the first two days of the onset of symptoms.<sup>5,6</sup> Furthermore, nearly one-fifth of the patients with ICH experience neurological deterioration in the pre-hospitalization period,<sup>7</sup> and one-fourth of the patients in the hospitalization period.<sup>8</sup> Rapid initial diagnosis and concentrated management are crucial in the early management of ICH. When a patient presents with focal neurological deficits, severe headache, vomiting, high systolic blood pressure (SBP) greater than 220 mmHg, and decreased consciousness with a sudden onset, ICH should be the first condition considered in the

diagnosis. In addition to clinical presentation, a brief medical history including hypertension, prior stroke, recent head trauma, and prior use of antithrombotic drugs including anticoagulants, should also be recorded. After a quick assessment of the medical history and presentation, neuroimaging should be performed to confirm the diagnosis.

Rapid initial diagnosis and concentrated management are crucial in the early management of ICH. Brain computed tomography (CT) is the gold standard for identifying acute hemorrhage; magnetic resonance imaging (MRI) can be an alternative with an advantage of

being able to differentiate between the acute and chronic stages of hemorrhage.<sup>9,10</sup> Various grading scales are used for predicting the prognosis in the early stages of ICH.<sup>5,11-15</sup> The ICH score is the mostly commonly used scale and can be easily calculated based on neurological examination and CT findings (Table 1).<sup>5</sup> In prospective observational cohort studies, the ICH score could be a valid clinical grading scale for the 30-day mortality and 12-month functional outcome.<sup>13</sup>

**Table 1. Determination of the ICH score**

Component	ICH Score Points
<b>GCS Score</b>	2
3-4	1
5-12	0
13-15	
<b>ICH Volume (cm 3)</b>	
≥ 30	1
<30	0
<b>IVH</b>	
Yes	1
No	0
<b>Infratentorial origin of ICH</b>	1
Yes	0
No	
<b>Age(Years)</b>	
≥ 80	1
<80	0
<b>Total score</b>	0-6

The GCS score refers to the GCS score at initial presentation (or after resuscitation);

ICH volume, volume on initial CT calculated using the ABC/2 method; IVH, presence of any IVH on the initial CT.

GCS, Glasgow coma scale; ICH, intracerebral hemorrhage; CT, computed tomography; IVH, intraventricular hemorrhage

## II. Materials And Methods

This is a retrospective study carried out on 50 patients attending the Neurosurgical Emergency at GGH, Kakinada; who underwent surgery for spontaneous intracranial bleed during the period of 24 months (AUGUST 2017 to AUGUST 2019). The parameters that were considered are:

1. Clinical Neurological Status at admission
2. Radiological Findings
3. Predisposing factors
4. Pre operative GCS
5. Post-operative outcome

## III. Results

The median age was 55 years (for the age range of 35-70 yrs) of the 50 patients considered in the study.

Predisposing factors were present in 28(62.22%) patients and no predisposing factors in 17(37.77%) patients. Hypertension was the most common predisposing factor which was present in 26(57.77%) patients while 2(4.44%) patients had both hypertension and diabetes, diabetes and chronic kidney disease alone were present in one patient each. 15(30%) patients were female and 35(70%) patients were male. 30 patients presented to neurosurgery emergency after 4-5 days of onset of symptoms and were initially admitted in medical ward.

The median GCS at presentation was 8 (for the range of 5 – 14). 28 patients had GCS ≤ 8 , 16 patients had GCS 9 -12 and 6 patients had GCS ≥ 12.

Of the total 10(20%) patients recovered and were discharged, the rest 40(80%) expired.

16(32%) patients had Right side bleed(3 had intraventricular extension), 3(6%) patients had cerebellar haemorrhage and 23(46%) patients had left side bleed(9 with intraventricular extension) 1(2%) patient had midbrain bleed with IVH & rest had intraventricular haemorrhage.

17(34%) patients underwent External ventricular drainage of which 2(11.76%) survived, 2 (4%) patients underwent Endoscopic evacuation of which 1(50%) survived, 7(14%) patients underwent Burrhole evacuation of which 1(14.28%) survived, 3(6%) patients underwent Suboccipital craniectomy of which

1(33.33%) survived, 22(44%) underwent Decompressive craniectomy of which 6(27.27%) survived & 2(4%) patients underwent Decompressive craniectomy with EVD of which none survived.

**Table:2. Patients with associated predisposing factors**

PREDISPOSING FACTORS	NUMBER OF PATIENTS	PERCENTAGE
HTN	29	58%
HTN,DM	2	4%
DM	1	2%
CKD	1	2%
NIL	17	34%

**Table:3 Sex of the patient**

GENDER	NUMBER OF PATIENTS	PERCENTAGE
MALE	35	70%
FEMALE	15	30%

**Table:4 Presenting GCS to the hospital**

GCS AT PRESENTATION	NUMBER OF PATIENTS	PERCENTAGE
≤ 8	28	56%
9 -12	16	32%
≥ 12	6	12%

**Table:5 Outcome of patients**

OUTCOME	NUMBER OF PATIENTS	PERCENTAGE
EXPIRED	40	80%
DISCHARGED	10	20%

**Table: 6 Different operative techniques performed and outcome**

LOCATION OF BLEED	NO. OF CASES	PERCENTAGE	DECOMPRESSIVE CRANIECTOMY		DECOMPRESSIVE CRANIECTOMY+ EVD		EVD		ENDOSCOPIC		BURR HOLE EVACUATION	
			EXPIRED	DISCHARGED	EXPIRED	DISCHARGED	EXPIRED	DISCHARGED	EXPIRED	DISCHARGED	EXPIRED	DISCHARGED
RT. PARENCHYMAL BLEED	1	2%	1									
LT. PARENCHYMAL BLEED	3	6%	1	2								
RT. CAPSULOGAN GLIIONIC BLEED	11	22%	7								3	1
LT. CAPSULOGAN GLIIONIC BLEED	11	22%	5	3							3	
RT. CAPSULOGAN GLIIONIC BLEED + IVH	4	8%			1		3					
LT. CAPSULOGAN GLIIONIC BLEED + IVH	9	18%			1		5	1	1	1		
IVH	7	14%					6	1				
CEREBELLAR HAEMATOMA	3	6%	2	1								
BRAINSTEM HAEMORRHAGE WITH IVH	1	2%					1					

**Table:7 Presenting GCS and final outcome**

GCS	NUMBER OF PATIENTS	EXPIRED	DISCHARGED
≤ 8	28	23(82.14%)	5(17.85%)
9 -12	16	13(81.25%)	3(18.75%)
≥ 12	6	4(66.66%)	2(33.33%)

#### IV. Discussion

Intracranial haemorrhage (ICH) accounts for 10–30% of all stroke admissions to hospital, and leads to catastrophic disability, morbidity and a 6 month mortality of 30–50%.<sup>30</sup> Long-term outcomes are poor; only 20% of patients regain functional independence at 6 months.<sup>16</sup>

Our study was aimed to study the role of various surgical procedures for evaluation of the surgical treatment and post-operative outcome of spontaneous intracranial bleeds of 50 patients presented with different GCS to our hospital.

On the basis of the results of the first STICH trial, several authors have suggested that outcomes could potentially be improved with Decompressive Craniectomy for selected patients with high ICP and mass effect related to ICH.<sup>17-20</sup>

Of all the surgical therapies described for treating ICH, craniotomy has been the most extensively studied with 7 of the 9 randomised controlled surgical trials reporting results with craniotomy either primarily or exclusively.<sup>21,22</sup> The International Surgical Trial in Intracerebral Haemorrhage (STICH) randomized 1,033 patients from 107 centres over an 8-year period, beginning in 1995.<sup>23</sup>

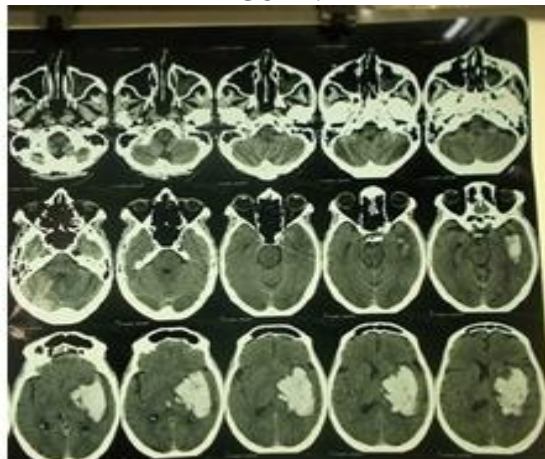
In our study a total of 50 patients with spontaneous intracranial hemorrhage were evaluated of which 62.22% with different predisposing factors and hypertension as majority predisposing factor and remaining without any predisposing factors.

Median GCS was 8 with a range of 5-14. Out of 50 patients, 16 (32%) had right sided hemorrhage, 23(46%) had left sided hemorrhage, 3(6%) had cerebellar hemorrhage, 1(2%) had midbrain hemorrhage and remaining cases withintra ventricular hemorrhage.

Out of 50 patients who underwent different surgical techniques for spontaneous ICH, 17(34%) patients underwent External ventricular drainage of which 2(11.76%) survived, 2 (4%) patients underwent Endoscopic evacuation of which 1(50%) survived, 7(14%) patients underwent Burrhole evacuation of which 1(14.28%) survived, 3(6%) patients underwent Suboccipital craniectomy of which 1(33.33%) survived, 22(44%) underwent Decompressive craniectomy of which 6(27.27%) survived & 2(4%) patients underwent Decompressive craniectomy with EVD of which none survived.

Out of the total 50 patients presented, 10(20%) patients recovered and were discharged, the rest 40(80%) were expired.

**FIGURE: 1**



**FIGURE:2**



## V. Conclusion

In conclusion, in order to overcome the high mortality and morbidity, it is recommended that patients with spontaneous ICH should be taken care of in well-organized specialized stroke care facilities with a multidisciplinary team approach. All the management principles including the close monitoring of vital signs and neurological status, rapid and adequate BP correction, proper ICP control and timely surgical management of selected patients, prevention of complications, and early rehabilitation are important for better clinical outcomes. Spontaneous intracranial hemorrhage remains a serious condition for which early aggressive care is warranted and is associated with high mortality and morbidity rate.

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