

## Comparison of Surgical and Medical Treatment in Patients with Haemorrhagic Stroke

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### ABSTRACT

Optimal management of spontaneous intracerebral haemorrhage (ICH) remains one of the highly debated areas in the fields of neurosurgery. Earlier studies comparing open surgical intervention with best medical management failed to show a clear benefit. More recent experience minimally invasive techniques have shown greater promise. We present our experience of 46 patients who presented to neurosurgery, neurology, Medical, Surgical and allied specialities at SIMS / Services Hospital Lahore with clinical and CT scan Brain based diagnosis of Haemorrhagic Stroke and comparison as per outcome between Surgical and Medically treated patients. This is an ongoing study.

**Objective:** To compare the outcome results of surgical and medical management of the Haemorrhagic Stroke patients.

**Study Design:** A prospective ongoing study.

**Place and Duration of Study:** SIMS / Services Hospital, Lahore December 2013 until July 2015.

**Materials and Methods:** 46 patients who presented to neurosurgery, neurology, Medical, Surgical and allied specialities at SIMS/ Services Hospital Lahore with clinical and CT scan Brain based diagnosis of Haemorrhagic Stroke.

**Results:** Surgical treatment of patients with haemorrhagic Stroke fulfilling the inclusion criteria carries a little Edge over the patients undergoing medical treatment for the haemorrhagic stroke as per our ongoing study.

**Conclusion:** Treatment of spontaneous haemorrhagic stroke although debateable but still the surgical treatment specially minimal invasive techniques have favourable prognosis.

**Key words:** Haemorrhagic Stroke.

**Abbreviations:** AHA (American Heart Society), AVM (ArterioVenous Malformation), GCS (Glasgow Coma Scale), ICH (Intracerebral Haematoma), IVD (Intra-Ventricular Drainage), SAH (Subarachnoid Haemorrhage), HTN (Hypertension), DM (Diabetes Mellitus, STICH (supratentorial intracerebral haemorrhage).

### INTRODUCTION

New guidelines for prevention of stroke were released dated October 28, 2014 by the American Heart Society (AHA). It points out that 76% of the strokes are first events” – emphasizing the importance of primary prevention. 10 potentially risk factors explaining 90% of the risk of stroke.<sup>4</sup>

**Table 1:** Risk Factors for First Stroke.

A	Genetic Factors	1. Physical Inactivity and Dyslipidaemia
B	Diet and Nutrition	1. Hypertension 2. Obesity 3. Diabetes 4. Smoking
C	Cardiac	1. Atrial fibrillation

	Conditions	2. Asymptomatic Carotid Stenosis
D	Haematological Conditions	1. Sickle Cell Disease 2. Hyperhomocystinurea 3. Hypercoagulability 4. Antiplatelet Agents; Aspirin

**MATERIAL AND METHODS**

Out of total number of 46 patient on our ongoing study, these were broadly divided into two groups surgical and medical treated groups (Fig. 1)

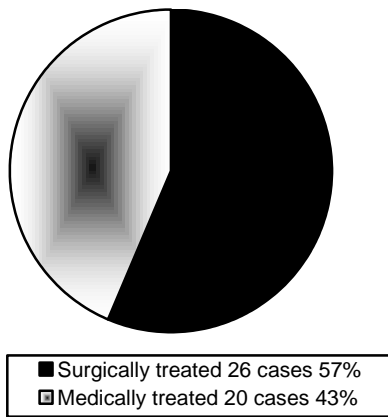


Fig. 1:

These were further discussed under inclusive and exclusive criteria.

- A. Inclusive Criteria.
- B. Exclusive Criteria.

**Inclusive Criteria**

This was further discussed under:

- Age / sex.
- GCS.
- Volume and site of ICH.

**Age / Sex**

**Age**

Age ranged from 28 – 70 year (mean 50.9 years) Fig. 2.

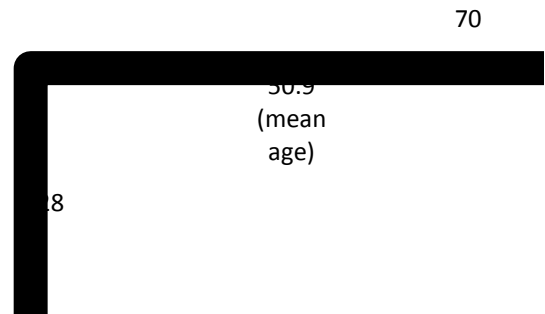


Fig. 2: Age of the patients.

**Sex**

Out of 46 victims fulfilling the inclusion criteria, 28 (39.1%) were male and 18 (6.08%) were female.

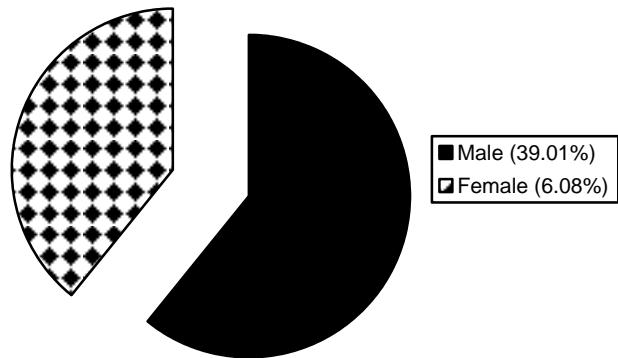


Fig. 3: Sex of Patients.

**GCS**

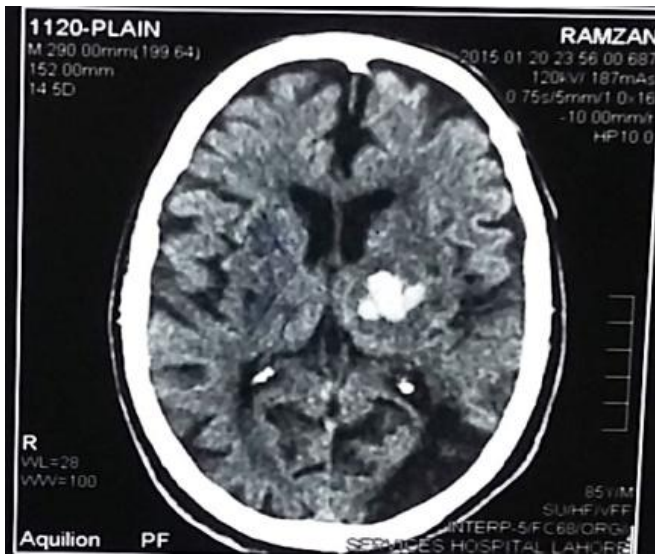
9 out of 26 patients in surgical group presented with GCS less than 8 and 5 in medical group (Table 3), while 17 patients were GCS more then 9 and 15 respectively in surgical and medical group.

Table 2: Glasgow Coma Scale (GCS).

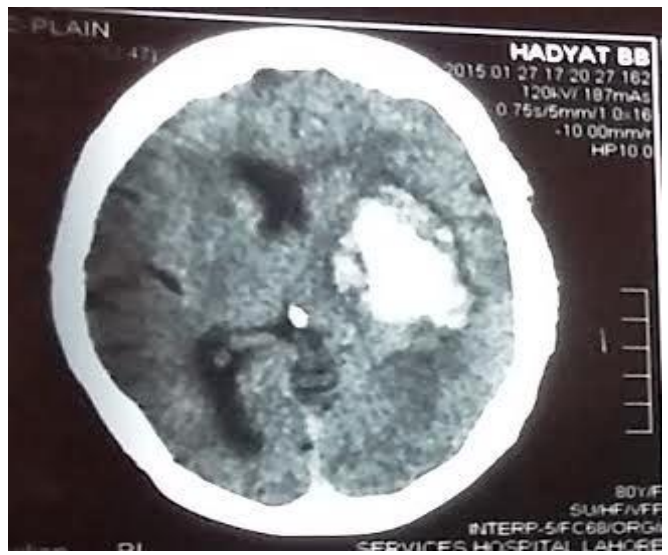
Presenting GCS	No of cases	
	Surgical	Medical
≤ 8	9	5
≥ 9	17	15

**Volume and site of ICH (Cm)<sup>3</sup>**

Regarding volume of ICH, 11 patients in surgical and 17 in medical groups were having between 30 – 60 (Cm)<sup>3</sup> while 15 in surgical and 3 in medical group having > 60 (Cm)<sup>3</sup> (figure 4a,b,c,d).



A



C



B



D

Fig. 4: CT Scan Film of Few Patients of Haemorrhagic Stroke.

**Exclusive Criteria**

- a. Comorbid Conditions like uncontrolled HTN, Coagulopathies, uncontrolled DM, bronchopneumonia. All these patients were excluded for surgical group and were treated medically, but this was not a strict policy as if a medically treated developed progressive neurological deficit, he was supposed to be transferred to the surgical group; although in our ongoing study, still we did not come across such patient but may be in future we can find such a case.

**Complications (Fig. 5)**

**Surgically Treated Patients (26)**

- Mortality 5 (19%).
- Neurological deficit 3 (11.5%).
- Recurrence 2 (7.6%).
- Seizures 1 (3.8%).

**Medically Treated Patients (20)**

- Mortality 6 (30%).
- Neurological deficit 2 (10%).

Recurrence 3 (15%).  
 Seizures 6 (30%).  
 Bronchopneumonia 2 (10%).  
 DVT 1 (5%).

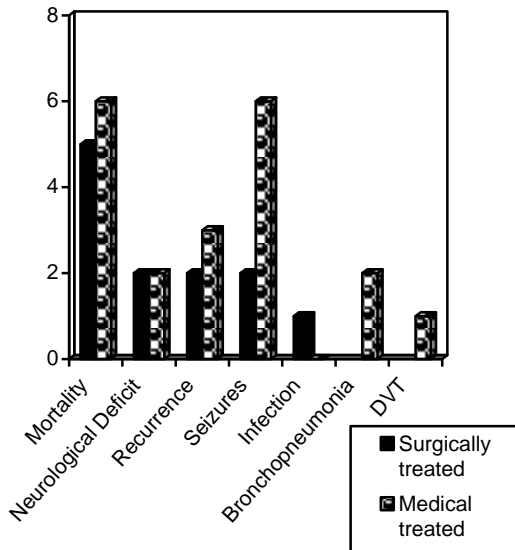


Fig. 5: Complications.

**RESULTS**

46 Adults patients meeting the inclusive criteria were included in our ongoing study, 26 patients in surgical group and 20 patients in medical group (Fig. 1).

5 out of 25 surgically patients were expired and the mortality was 25%.

**Age**

Age of these victims ranged from 28 – 70 years. Mean (50.9 years).

Graph

**Sex**

Out of 46 victims adult fulfilling the inclusion criteria, 28 were male (6.08%), 18 were female (39.1%) (Fig. 3).

**COMPLICATIONS**

**Surgically Treated Patients (26).**

Mortality 5 (19.2%).  
 Neurological deficit 3 (11.5%).  
 Recurrence 2 (7.6%).  
 Seizers 1.

Infection 1 (Fig. 5).

**Medically treated patients (20)**

Mortality 6 (30%).  
 Neurological deficit 2 (10%).  
 Recurrence 3 (15%).  
 Seizers 6.  
 Bronchopneumonia 2.  
 DVT 1 (Fig. 5).

Table 3: Volume of ICH (cm<sup>3</sup>).

Volume of ICH (cm <sup>3</sup> )	No of Patients	
30 – 60	Surgical 11	Medical 17
> 60	Surgical 15	Medical 03

**DISCUSSION**

Intracerebral Haemorrhage (ICH) is more than twice as common as Subarachnoid haemorrhage (SAH) and is much more likely to result in death or major disability than cerebral infarction or SAH.<sup>1</sup>

Out of a number of randomized clinical trials, only the results of 4 small randomized surgical trials (353 total patients) and 4 small medical trials (513 total patients) of ICH had been published.<sup>13</sup>

*B. Decompressive Hemicraniectomy with or without clot evacuation for large spontaneous supratentorial haemorrhage.*

Conclusion was early HC (Hemicraniectomy) with or without clot evacuation is feasible and safe for managing spontaneous ICH (Intracerebral haematoma) and recommendation was for patients with large non-dominant hemisphere ICH who were moribund at presentation.

In one study over 7 years HC was performed in 73 patients with clot evacuation in 86% and HC alone in 14%. The average ICH volume was 81cc and the median HC surface area was 105 cm<sup>2</sup>. 26 comatosed patients at initial presentation three month functional outcomes were favourable in 29%. Unfavourable in 44% and 27% patients expired. Admission GCS, dominant hemisphere ICH location and haematoma volume contributed significantly to the outcome.

*C. Meta-Analysis of randomized studies of surgery for spontaneous supratentorial intracerebral haemorrhage.*

The efficacy of surgical treatment on supratentorial intracerebral haemorrhage (STICH) is not conclusive, although many studies have been performed.<sup>2,3</sup> Relevant factor such as injury inflicted to the brain by different kinds of surgery, degrees of severity and location of intracerebral haemorrhage (UCH) should be taken into consideration for a better appraisal of too efficacy of surgery on STICH.<sup>6</sup>

In this study the appraised primary outcome was death and the secondary outcome was death or dependence.

In one study carried out in Korea, Moon KS et al, showed that craniotomy with removal of hemtoma confirmed good outcome among the 48.65% of victims with intracerebellar hemorrhage.<sup>8</sup>

Management of Hemorrhagic stroke can be carried out medically for selected patients; but surgery needs to be carried out in large number of victims.<sup>9-11</sup>

## RESULTS

Out of 26 patients in surgical group 5 expired (19%), 21 survived (81%) mortality 19% but 21 survived pie diagram 3. In contrast out of 20 patients in medical treated group, 06 expired (30%) while 14 survived (70%) (Fig. 6).

This again indicates a better **outcome** in surgical treated group vs medical treated group.

### No. of Treated Patients = 46

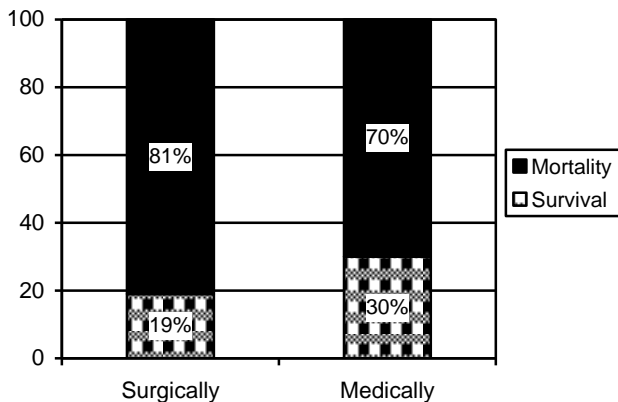


Fig. 6: Mortality.

## CONCLUSION

Optimal cure of spontaneous intracerebral haemorrhage (ICH) is highly debatable neurosurgical problem. Past studies on comparison between surgical inter-

vention with best medical management failed to show a clear improvement. However recent studies of minimally invasive techniques have shown greater promise.<sup>5</sup> As per our ongoing study better outcome in surgical survival group (81%) as compare to (70%) medical treated group also confirms a better outcome in surgical treatment over the medical treatment.

So we still recommend early surgery for the victims of hemorrhagic stroke whether open or minimally invasive particularly in our population.

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## REFERENCES

1. Imran Altaf and Anjum Habib Vohra, Surgical management of spontaneous supratentorial intracerebral hemorrhage. Pak J of Neurol. Surg-Vol 18, No.1, Jan-Jun; 2014; p. 39-43.
2. Youshua Esquenazi, SeanI, Saritz, Ramy ElKhoury, Megan A, Mc tutosh, James C. Grotta, Nitin tendon. Surgical treatment for intracerebral hemorrhage (STITCH): A single – center, randomized clinical trial, clinen – journal, Jan 2015; 128: 117-122.
3. Chih-Dong Yang, Yu-Weichzn, Hui-Chehwu. Meta-Analysis of randomized studies of surgery for spontaneous supratentorial intracerebral haemorrhage. Formoson Journal of Surgery, June 2014; (47), 3: 90-98.
4. Margestern L B, Hemphill III J C, Becherk, Broderick J.P, ConullyJr. E S., Greenberg S.M., Tamargo. R.J. Guidelines for the management of spontaneous intracerebral hemorrhage: A guidelines for healthcare professionals from the American Heart Association/ American stroke Association, 2010 stroke; 41 (9): pp. 2108-2129.
5. Dey, Mahua MD; stodnik, Agnieszka MSc; Awad, Issam A. MD Section Editor(S); Bendok, Bernard R. MD; Levy, Elad I.MD. Spontaneous intracerebral and Intraventricular hemorrhage: Advances Primary Invasive Surgery and Thrombolytic Evacuation, and Lessons Learned in Recent Trials. Neurosurgery, 2014; 74: 142-1501.
6. A Devid Mendelow, Barbara A Gregson, Elise N Rowan, Gordan D Murray, Anil Gholkar, Patrick M Mitchell. Early Surgery Versus initial Conservative Treatment in patients with spontaneous supratentorial lobar intracerebral hematoma (STICH): a randomized trial. The Lancet, 2013; (382) (3): 397-408.
7. Broderick J, Bott T, Tomsick T, Miller R, Huster G, Intra cerebral hemorrhage is more than twice as com-

- mon as subarachnoid hemorrhage. *J Neurosurg.* 1993; 78: 188-191.
8. Broderick J P, Adams H P, barson W etol. Guidelines for the Management of Spontaneous Intracerebral Hemorrhage. *Stroke*, 1999; 30: 905-915.
  9. Moon KS, Park HK, Yoon SM, Bae HG, Yun G, Choi SK. Outcomes in the managenment of spontaneous cerebellar hemorrhage. *J Korean Neurosurg Soc.*, 2006; 40: 234-238.
  10. Hanggi D, Steiger HJ. Spontaneous intracerebral haemorrhage in adults: a literature overview, 2008; 150: 371-379.
  11. Chalela JA, Kidwell CS, Nentwich LM, Luby M, Butman JA, Demchuk AM. Magnetic resonance imaging and computed tomography in emergency assessment of patients with suspected acute stroke: a prospective comparison. *Lancet*, 2007; 369: 293-298.
  12. Yamamoto T, Nakao Y, Mori K, Maeda M. Endoscopic hematoma evacuation for hypertensive cerebellar hemorrhage. *Minim Invasive Neurosurg.* 2006; 49: 173-178.
  13. Guidelines for the Management of Spontaneous Intracerebral hemorrhage in – Mario Zuccarello, Derk Krieger, Marc Meyberg, Lewis Morgenstern, Christopher S. Ogilvy, Paul Vespa, Joseph Broderick, Er Connolly, Edward Feldmann. Daniel Henley, Carlos Kase, Association Stroke Concil, High Blood – 2007.

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