

# New Concepts for Surgical Management of Spontaneous Intra-Cerebral Hematomas

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## ABSTRACT

**Background:** Spontaneous intracerebral hemorrhage (ICH) represents cerebral parenchymal bleeding that may also extend into ventricular, and rarely, subarachnoid space. ICH, as a stroke subtype, is associated with poor neurological outcome as well as high mortality (about 40% per month). ICH can be classified as either primary or secondary, depending on the underlying cause of bleeding. **Objective:** This study was aimed to represent criteria for surgical management for spontaneous intracerebral hematomas. **Patients and Methods:** This study included a total of 30 subjects, both sexes, aged 19-80 years with variable sizes and sites of spontaneous intracerebral hematomas. Conscious level and functional disabilities were measured by the neurological examination, Radiological evaluation was done pre, early post-operative and a month later to evaluate: the evacuation of the hematoma, monitoring the hemostatic measures done intraoperative to prevent re-collection of the hematoma in presence of different co- morbidities like HTN, coagulopathy, ... etc. **Results:** Statistics revealed significant improvement in subjects operated with GCS  $\geq$  8, with motor power deficit G 0 , clear chest , age below 60 years old ( $P > 0.001$ ).

**Conclusion:** Patients with spontaneous intracerebral hematomas showing good prognosis in patients below 60 years old, with clear chest complaining of motor power deficit G 0 , with GCS  $\geq$  8.

**Keywords:** Surgical Management, Spontaneous Intra-Cerebral Hematomas.

## INTRODUCTION

Spontaneous intracerebral hemorrhage (ICH) represents cerebral parenchymal bleeding that may also extend into ventricular, and rarely, subarachnoid space. ICH, as a stroke subtype, is associated with poor neurological outcome as well as high mortality (about 40% per month)<sup>(1)</sup>. ICH represents around 10–15% of all strokes in Europe, USA and Australia, while in Asia it accounts for about 20–30%. It has been reported that every year 2 million people worldwide have ICH<sup>(1)</sup>. ICH can be classified as either primary or secondary, depending on the underlying cause of bleeding<sup>(2)</sup>. Primary ICH is more common (78–88% of cases) and has

its origin from chronic hypertension or amyloid angiopathy<sup>(3)</sup>. Secondary ICH is less common, and it is associated with vascular abnormalities (e.g. arterio-venous-malformations and aneurysms), impaired coagulation or tumors. Even though hypertensive ICH is the most frequent type of ICH, vascular abnormalities should always be considered in these circumstances because of high risk of recurrent hemorrhage and also regarding the choice of the right therapy. Also, it should always be kept in mind that nowadays ICH as a consequence of the use of anticoagulant therapy is becoming increasingly frequent, and it occurs in almost 20% of cases in the USA<sup>(4)</sup>.

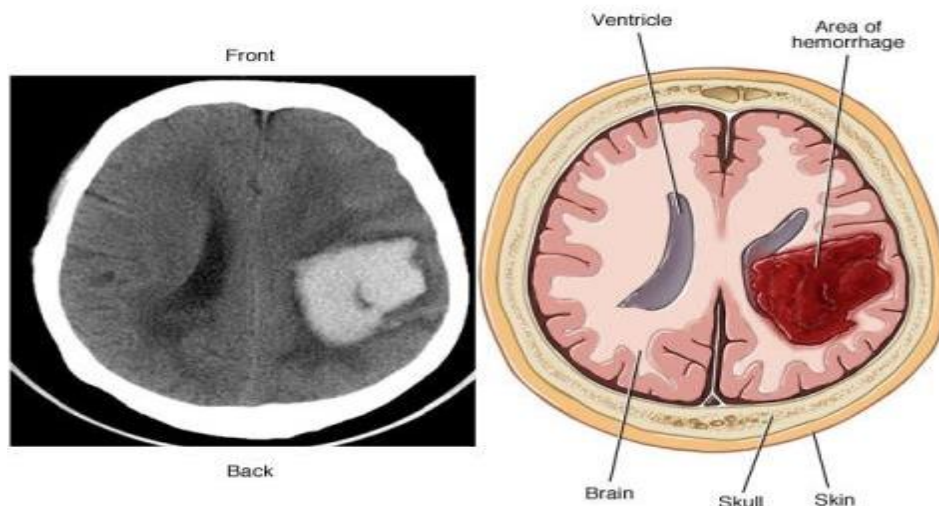


Fig. (1): CT brain showing left intracerebral hematoma<sup>(4)</sup>.

**AIM OF THE WORK**

This study was aimed to represent criteria and prognosis for variable surgical managements for spontaneous intracerebral hematomas.

**PATIENTS AND METHODS**

This study included a total of 30 subjects, both sexes, aged 19-80 years with variable sizes and sites of spontaneous intracerebral hematomas, attending at Al-Azhar University Hospitals.

**Approval of the ethical committee and a written informed consent from all the subjects were obtained. This study was conducted between.**

*Inclusion criteria*

- Age range 19 to 80 years.
- GCS 8 /15 or above.
- Clear chest.
- Motor power grade 0 /5.
- HTN.
- Liver impairment.
- Fits.
- Fit for surgery regarding to anesthesia
- Normal coagulation profile

*Exclusion criteria*

- Age above 80 years.
- GCS less than 8/15.
- Bad chest condition.
- Motor power grade 2 or above.
- Site of HGE deep thalamic.
- Uncontrolled HTN.
- Uncorrectable bleeding profile.

*Techniques:*

**Preoperative preparation:**

- Good control of blood pressure to be 160/90 or less
- Dehydrating measures to be received
- Good control of bleeding profile
- Antiepileptics to be received

**Anesthesia**

General anesthesia

• **Open surgery:**

**First stage**

*Under hypotensive conditions:*

- Under good sterilization the craniotomy approach is determined according to the site of hematoma
- Skin incision and bone flap achieved by performing burr holes
- Elevation of the bone flap with the base towards the base of the skull
- Dural insision

- Devascularization of the cortical incision prior to incision using the bipolar cautary
- Dissection of the cortical matter bluntly using the dissector.
- Making the track down to the site of hematoma (some times guided by brain needle first for confirmation).
- Evacuation of the hematoma side by side and placing patties over the evacuated areas
- After complete evacuation waiting for hemostasis for 10 minutes

**2<sup>nd</sup> stage:**

Removal of the placed patties, and placing absorbable hemostate (surgical of fibrillar)

And placing patties over them and waiting for 10 minutes for good hemostasis

**3<sup>rd</sup> stage**

Elevating the blood pressure to be normal or even slight elevated but not more than 160/90. And waiting for 10 minutes to confirm good hemostasis obtained

- Then closure in layer with under suction drain

**Endoscopic surgery:**

**First stage:**

*Under hypotensive conditions*

- Burr hole is determined to be at the center of the hematoma
- Linear dural incision is performed
- Devascularization of the site of the cortical incision by cautary of bipolar
- Introducing the endoscope trocher through the cortical incision using straight lens 30 and evacuation of the hematoma side by side and placing patties over the evacuated areas
- After complete evacuation waiting for hemostasis for 10 minutes

**2<sup>nd</sup> stage:**

Removal of the placed patties, and placing absorbable hemostate (surgical of fibrillar).

And placing patties over them and waiting for 10 minutes for good hemostasis.

**3<sup>rd</sup> stage**

Elevating the blood pressure to be normal or even slight elevated but not more than 160/90.

And waiting for 10 minutes to confirm good hemostasis obtained.

- Then closure in layer.

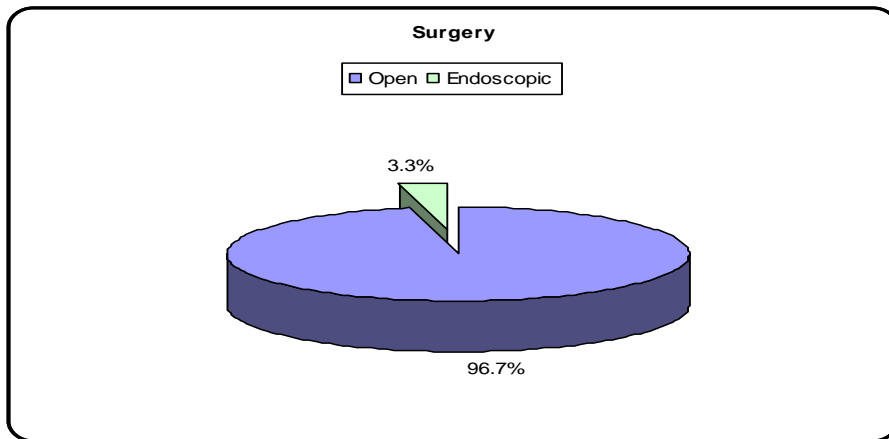
**Postoperative follow up:**

The response for surgical intervention done regarding conscious level and motor power was recorded. Also the suspected complications were recorded in-details such as recollection of hematoma, deterioration of the conscious level.

**RESULTS**

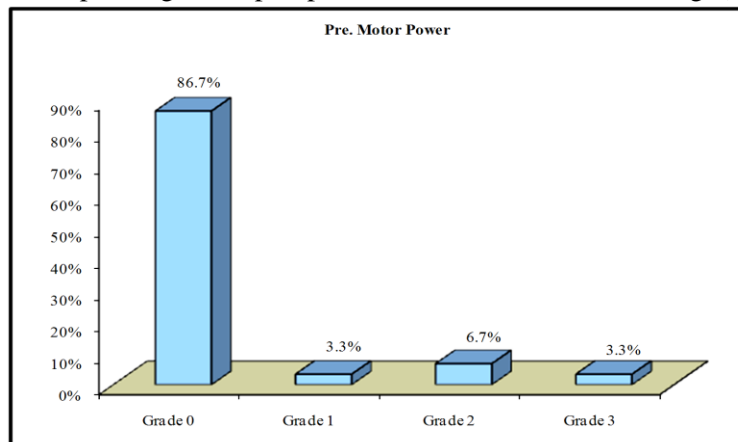
The study was performed on 30 patients to demonstrating the criteria for surgical option of the spontaneous intracerebral hematomas.

The performed techniques included open and endoscopic options. The cases underwent open surgery were 96.7 % , and cases underwent endoscopic surgery were 3.3%.

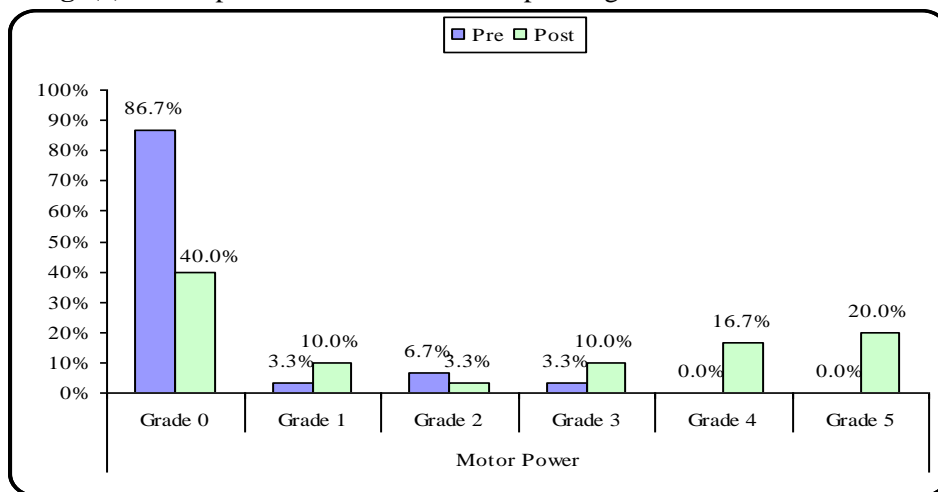


**Fig. (2):** The ratio of cases underwent open surgery 96.7 versus endoscopic surgery 3.3.

In the study, Patients with motor power grade 0 preoperative were 86.7 % of cases Fig. (3).



**Fig. (3):** Post-operative cases with motor power grade 0 reduced to be 40 %

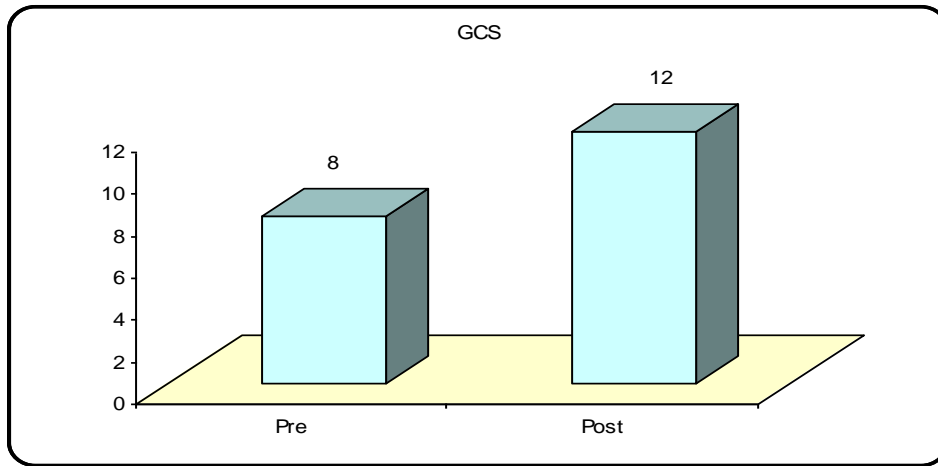


**Fig. (4):** Motor power grade pre and post treatment with reduction of cases with motor power G 0 from 86.7 to 40.

**Table (1):** The study showed improvement in GCS for patients underwent surgery with median GCS 8 / 15

		Pre	Post	Test value	P-value	Sig.
		No. = 30	No. = 30			
GCS	Median (IQR) Range	8 (7 – 11) 5 – 15	12 (3 – 15) 3 – 15	2.280•	0.028	S

The previous table shows that there was statistically significant increase in GCS post than pre with p-value. 0.028



**Fig. (5):** GCS score pre and post treatment with improvement from 8 to 12.

Study also showed that good results in surgical option could be achieved in patients less than 62 years.

**DISCUSSION**

The study is based on inclusion criteria that suppose good prognosis for patients with spontaneous intracerebral hematomas.

One of these criteria is the pre-operative GCS which is above 8/15 in the study. The same result was in harmony with the American academy of neurology article published at 2006<sup>(5)</sup>.

**CONCLUSION**

Patients with spontaneous intracerebral hematomas showing good prognosis in patients below 60 years old, with clear chest complaining of motor power deficit G 0 , with GCS ≥ 8.

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