Neuroscience & Medicine, 2024, 15, 23-38
https://www.scirp.org/journal/nm
ISSN Online: 2158-2947
ISSN Print: 2158-2912

# Management of Spontaneous Intracerebral Haemorrhage (sICH) at the University Hospital of Brazzaville (CONGO)

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**How to cite this paper:** Brieux, E.M.H., Exaucée, N.N.L., Euberma, D.J., Gerald, B.K.R., Brice, N.O., Armel, M.G., Léon, B. and Macaire, O.-N.P. (2024) Management of Spontaneous Intracerebral Haemorrhage (sICH) at the University Hospital of Brazzaville (CONGO). *Neuroscience & Medicine*, **15**, 23-38.
https://doi.org/10.4236/nm.2024.151002

**Received:** November 22, 2023
**Accepted:** February 2, 2024
**Published:** February 5, 2024



## Abstract

Spontaneous intracerebral haemorrhage (sICH) is characterised by bleeding within the brain parenchyma, without any accompanying vascular malformation, parenchymal abnormality or coagulation disorder. The study aimed to depict the management of sICH at the University Hospital of Brazzaville (UHB). It was an observational, descriptive, and cross-sectional analysis. Data collection was conducted retrospectively, covering the period from January 1, 2020 to August 31, 2022, spanning two years and eight months. The study examined socio-demographic, diagnostic, therapeutic, and evolutionary variables. We included 274 cases. We observed 160 men (58.4%) and 114 women (41.6%), resulting in a sex ratio of 1.4. The mean age was 55.3 ± 11.4 years, with ages ranging from 31 to 93 years. The detection of sICH was typically a result of experiencing motor deficits (59.5%) or disorders of consciousness (37.2%). The weightiness of one half of the body was the most common reason for seeking medical advice. Hematoma was capsulo-lenticular in 159 cases (58%) and capsulo-thalamic in 63 cases (23%). Hematomas were <30 ml in 162 cases (59.1%) and >30 ml in 112 cases (40.9%), and associated with hydrocephalus in 11.7% of cases. Conservative medical treatment was administered in 257 cases (94.2%) while surgical treatment was performed in 16 cases (5.8%). The surgical techniques used were external ventricular drainage (EVD) in 2 cases, ventriculo-peritoneal shunt in 5 cases, and hematoma evacuation in 10 cases. Death occurred before the 7th day of hospitalisation in 73 cases (57.8%) and after in 46 cases (42.2%). The median time to death was four days (Q1 = 2 days; Q3 = 7 days), with extremes of 0 and 216

days.

## Keywords

Spontaneous Intracerebral haemorrhage, Management, Brazzaville

## 1. Introduction

Spontaneous intracerebral haemorrhage (sICH) is defined as bleeding within brain tissue, occurring without the presence of vascular malformation, parenchymal abnormality or coagulation disease. Post-traumatic intracerebral hematoma, cerebral infarction with hemorrhagic transformation, and venous thromboses with hemorrhagic softening do not meet this definition. Hypertension-associated morbidity is a frequent occurrence [1]. Population registers should, in principle, allow epidemiological analysis and assessment of the incidence of sICH. However, majority include sICH and secondary intracerebral hematomas. The incidence is between 9 and 76 new cases per 100,000 inhabitants per year. The incidence is higher in the male population, with a peak in the 60 - 80 age group. There are also ethnic differences, with higher incidence in black, Asian and Hispanic populations [2] [3] [4]. The evolution of sICH is unpredictable. Early treatment improves both functional and vital prognosis [1]. The 30-day mortality rate is estimated to average 41% - 51%, with half of deaths occurring within the first 48 hours. This mortality tends to decrease as medical care improves. This reduction is also explained by easier access to imaging, which allows early diagnosis. Long-term mortality is estimated to be between 20% and 40%. Beyond the first three months, there is excess mortality among survivors, with an annual risk of death that varies from 5.6% to 8%, depending on the work. The risk of death is all the higher when the sequelae of hematomas are significant [5] [6] [7] [8] [9]. In Congo, the incidence of sICH was 37% in 2015. The case fatality rate was 36.5% in 2019 [10]. The management of sICH is in line with international recommendations and has improved since the establishment of the neurovascular intensive care unit [11]. Considering these aspects and the insufficient data available on the conditions of management of sICH in our context, we undertook this study with the aim of contributing to the reduction of morbidity and mortality associated with sICH. The aim of the study was to describe the management of sICH at the University Hospital of Brazzaville (UHB).

## 2. Methods

We conducted an observational, descriptive, and cross-sectional study. Data collection was retrospective. The study period was from 1 January 2020 to 31 August 2022, or two years and eight months.

The study was conducted at the UHB, in the neurology, multi-purpose sur-

gery and multi-purpose intensive care units. The neurology department comprises two units: the routine inpatient unit and the neurovascular intensive care unit (NICU), which has 11 inpatient beds for the acute management of stroke. The multi-purpose surgery unit combines the activities of neurosurgery, thoracic surgery and cardiovascular surgery. It has five neurosurgeons. It has an operating theatre equipped with a programmed surgery box and emergency cranial surgery. It also has bipolar coagulation. The existing operating microscope does not allow visual access for more than one operator at a time (lack of visual aids). There is no equipment for stereotaxy or neuroendoscopy.

In the case of sICH, the criteria for surgical indication were as follows: age less than 70 years, time to onset of symptoms less than 72 hours (except in cases of distant hydrocephalus), compressive cerebellar hematoma (volume greater than or equal to 15 ml), superficial supratentorial hematoma with a volume greater than 30 ml, ventricular flooding with or without hydrocephalus. External ventricular drainage was performed for intraventricular haemorrhage. A craniotomy was conducted for the surgical evacuation of a supratentorial hematoma. In the case of cerebellar hematoma, a decompressive craniectomy with evacuation of the hematoma was performed. Ventriculoperitoneal shunting was indicated for chronic hydrocephalus.

We included all adults hospitalised for sICH. Cases with insufficient data were excluded. Sampling was exhaustive. Data were collected from service registers and patients' medical records. An individual survey form was used to collect these data (See Appendix). Patients were recruited from hospitalisation registers. The medical records of the selected patients were studied to verify the inclusion criteria for the study and to collect data on identity, diagnosis (clinical and paraclinical) and therapeutic modalities (medical and conservative treatment). The variables studied were socio-demographic, diagnostic, therapeutic and evolutionary.

Data were processed using Epi Info 7.2.2.6 software. Quantitative variables were expressed as mean and standard deviation. Qualitative variables were expressed as frequencies and proportions.

The study was conducted with respect for patient anonymity and confidentiality of information. Research approval was obtained from the relevant authorities of the Faculties of Health Sciences and the management of the UHB. The research protocol was submitted to the Committee for Ethics and Research in Health Sciences for approval and ethical clearance.

## 3. Results

### 3.1. Frequency and Socio-Demographic Profile of the Population Studied

During the study period, 729 patients were hospitalized for stroke, of which and 323 cases (44.3%) were hemorrhagic. Of these, 299 (92.6%) were related to sICH, accounting for 41% of strokes, and 24 (7.4%) to secondary hematomas. Of these

299 cases of sICH, 25 (8.4%) were excluded due to insufficient data available in the medical file. Our work focused on 274 cases of sICH.

Table 1 represents the socio-demographic characteristics of the population studied.

### 3.2. Patient Care

Patients were cared for in the neurology department and neurovascular intensive care unit n = 268 (92.7%), in the multipurpose surgical unit n = 11 (4%) and in the multipurpose intensive care unit n = 9 (3.3%).

The circumstances of sICH diagnosis were motor deficit n = 163 (59.5%), disturbance of consciousness n = 102 (37.2%), seizure n = 37 (13.5%), unusual headache n = 32 (11.2%) and blurred vision n = 2 (0.7%). Arterial hypertension was diagnosed in 92.7% of patients, followed by diabetes mellitus in 9.5%, smoking in 5.5% and drug addiction in 4%. Hypertension was reported as a history in first-degree relatives n = 61 (22.3%), diabetes mellitus n = 9 (3.3%) and stroke n = 6 (2.2%). Table 2 shows the distribution of patients according to general assessment on admission. The level of consciousness on the Glasgow scale was normal in 41.3%. Drowsiness was present in 35.4%, moderate coma in 19.7% and deep coma in 3.6% of cases. Blood pressure was normal in 20 cases (7.3%), arterial hypertension was mild in 49 cases (17.9%), moderate in 71 cases

Table 1. Socio-demographic characteristics.

| | Details | Results |
|---|---|---|
| **Sex ratio** | 160 men and 114 women | 1.4 |
| **Average age (years)** | extremes of 31 and 93 | 55.3 ± 11.4 years |
| **Health Insurance** | None | 0 |
| **Source of financing for care** | Family: 274 cases | 78.1% |
| | Patient himself: 54 cases | 19.7% |
| | Spouse: 5 cases | 1.8% |
| | Association: 1 case | 0.4% |

Table 2. Distribution of patients according to the parameters for assessing general condition on admission.

| | Average | Standard deviation | Minimum | Maximum |
|---|---|---|---|---|
| Glasgow coma scale | 12 | 2.9 | 5 | 15 |
| Score NIHSS | 13.7 | 7 | 1 | 22 |
| SBP (mmHg) | 163.8 | 28 | 100 | 280 |
| DBP (mmHg) | 96.8 | 18 | 60 | 160 |
| Temperature (˚C) | 37 | 0.7 | 36 | 40 |
| $SpO_2$ (%) | 95.5 | 3.7 | 70 | 99 |

NIHSS: National Institutes of Health Stroke Scale; SBP: systolic blood pressure; DBP: diastolic blood pressure; $SpO_2$: oxygen saturation.

(25.8%) and severe in 134 cases (49%). Eighteen (6.6%) patients had an oxygen saturation ≤ 90% and 256 (93.4%) patients had an oxygen saturation ≥ 90%. Median blood glucose was 1.20 g/dl (Q1 = 0.90; Q2 = 1.55 g/dl). According to the National Institutes of Health (NIH) severity of stroke, 13.5% had mild stroke, 42% had moderate stroke, 25.5% had severe stroke, and 19% had serious stroke.

Neurological signs were balance problems in 0.7%, neck stiffness in 1.5%, visual problems in 3.7%, sensory problems in 14.6%, speech (aphasia) in 36.1% and motor deficits in 86.9%.

Radiologically, 264 cases (96.3%) had a CT scan and 10 (3.7%) had a magnetic resonance imaging (MRI). The median time for brain imaging was 24 hours (Q1 = 12 hours; Q3 = 72 hours) with extremes of 2 and 264 hours (11 days). Nineteen patients (6.9%) had imaging within the first six hours, 104 (37.9%) between 7 and 24 hours, and 151 (55.2%) after 24 hours.

The location of the hematoma was lobar in 26 cases (9.5%), capsulo-lenticular in 159 cases (58%), capsulo-thalamic in 63 cases (23%), thalamic in 12 cases (4.8%), infratentorial in 14 cases (5.1%), with cerebellar (9 cases), midbrain (2 cases), medulla oblongata (2 cases) and protuberance (1 case). The mean maximum transverse diameter was 4.69 ± 2 cm, with extremes of 1 and 12 cm. The volume of the hematoma was <30 ml in 162 cases (59.1%) and >30 ml in 112 cases (40.9%). The hematoma was associated with hydrocephalus in 11.7% of cases, signs of cerebral involvement in 15%, and ventricular haemorrhage in 35.1%. Figure 1 shows a brain CT-scan in axial section, without injection of contrast product, with a hyperdense, rounded lesion occupying the pons area and the 4th ventricle.

The recommended treatment was conservative in 224 cases (81.8%) and surgical in 50 cases (18.2%).

In practice, medical treatment alone was administered in 257 cases (94.2%). In these cases, it was antiepileptic treatment in 6.9%, antidiabetic in 14.2%, anti-osmotic (mannitol) in 77.3% and antihypertensive in 88.6%.

Surgery was performed in 16 cases (5.8%). The other patients were not operated on either due to parental refusal, insufficient financial means or even death occurring before the conditions were met for surgery. The median time from symptom onset to surgery was 48 hours (Q1 = 142; Q3 = 384) with ranges of 14 and 84 hours. The surgical techniques performed were external ventricular drainage (EVD) in 2 cases, ventriculoperitoneal shunt in 5 cases and hematoma evacuation in 10 cases.

In 8 cases (3%), resuscitation was carried out, with ventilatory assistance by intubation.

The Hemphill intracerebral hemorrhage (ICH) score, a predictor of 1-month mortality in our patients, is presented in Figure 2.

In our series, 26 patients (9.4%) had complications. Complications were: rebleeding in n = 5, recumbency in n = 21, cardiovascular and/or renal decompensation in n = 8.

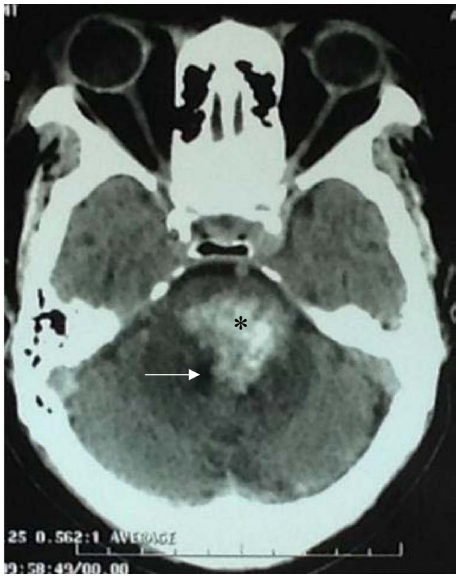

Figure 1. Brain CT showing a bulbopontine hematoma (asterisk) with mass effect on the fourth ventricle (arrow).

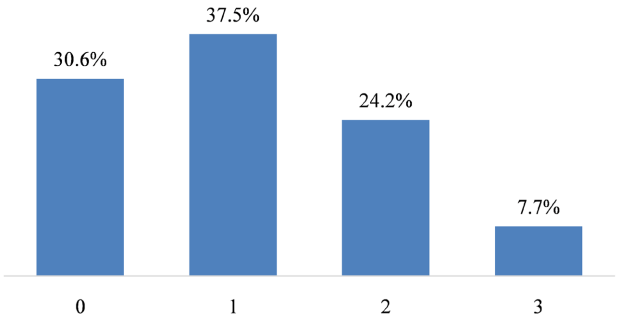


Figure 2. Distribution of patients according by ICH score.

The median time before complication was three days (T1 = 20 days; T3 = 4 days) with extremes of one and nine days. Of the 274 patients, 168 (61.3%) were able to return home and 106 (38.7%) died. Death occurred before the 7th day of hospitalization in 73 cases (57.8%) and after the 7th day in 46 cases (42.2%). The median time before death was 4 days (Q1 = 2 days; Q3 = 7 days) with extremes of 0 and 216 days.

Table 3 represents the univariate and multivariate analyzes of factors associated with patient outcomes.

## 4. Discussion

The study aimed to describe the management of patients with sICH. The retrospective nature of the study made it possible to focus on a large sample size, although this type of survey is subject to information bias. This study made it possible to identify the profile of patients suffering from sICH and to describe their management. However, the diagnostic criteria were insufficient in our context, because all the explorations necessary to formally rule out a secondary

**Table 3.** Factors having a statistical link (associated) with the evolution of patients.

| | Patient outcome n (%) | | Chi-2 | p-Value |
|---|---|---|---|---|
| | Death | Exit | | |
| **Univariate Analysis** | | | | |
| ***Glasgow score*** | | | 78.4645 | **<0.0001** |
| **3~6** | 9 (90) | 1 (10) | | |
| **7~9** | 43 (79.62) | 11 (20.38) | | |
| **10~13** | 43 (44.32) | 54 (65.68) | | |
| **14~15** | 11 (9.73) | 102 (90.27) | | |
| ***Pulsed oxygen saturation*** | | | 20.3956 | **<0.0001** |
| **<90%** | 16 (88.89) | 2 (11.11) | | |
| **>90%** | 90 (35.16) | 166 (64.84) | | |
| ***Hematoma volume*** | | | 107.2333 | **<0.0001** |
| **>30 mL** | 78 (79.59) | 20 (20.41) | | |
| **<30 mL** | 28 (15.91) | 148 (84.09) | | |
| **Multivariate analysis** | **OR** | | **CI à 95%** | **p-Value** |
| ***Glasgow score*** | | | | |
| **7~9** | 30.49 | | [9.79~94.97] | **<0.0001** |
| **10~13** | 7.30 | | [2.83~18.79] | **<0.0001** |
| ***Hematoma volume*** | | | | |
| **>30 mL** | 15.06 | | [6.76~33.52] | **<0.0001** |
| **<30 mL** | 1 | | 1 | |

OR: odds ratio; CI: confidence interval.

hematoma are not available, such as cerebral angiography. Furthermore, not all patients had the means to do a complete MRI in case of doubt. Thus, the diagnosis was mainly based on sets of clinical arguments (cardiovascular history and mode of onset of symptoms) and analysis of the lesion on brain scan (including the site of the hematoma).

sICH accounted for 41% of strokes. Ossou-Nguiet *et al.* [10] in Congo and Akani *et al.* [12] in Ivory Coast reported 36.6 and 37% respectively. The high incidence found in African studies could be explained by the early onset and severity of hypertension in the black population [1]. As elsewhere, a history of hypertension was found in 92% of our patients [12] [13] [14].

The average age of the patients in our study was around 55 years, with a male predominance. In the African literature, the average age of onset of sICH is between 55.5 and 57 years [12]. In developed countries, the onset of sICH is later, around 70 to 80 years of age. In addition, male predominance is common in both African and Western studies [15].

In our series, the heaviness of a hemibody was the most common reason for

consultation. A similar observation has been reported elsewhere [13] [15] [16]. This high frequency of motor deficit can be explained by the predominance of damage to the middle cerebral artery, which is the origin of the main small perforating arteries involved in the perfusion of the basal ganglia and internal capsule. This explains the high incidence of capsulo-lenticular hematomas. In hypertensive patients, vascular changes predominate in the small arteries, which are subjected to a particularly high-pressure regime, causing lipohyalinosis [17].

The median time to imaging was 24 hours for the majority of patients. Shaya *et al.* [18] in the United States and Savalti *et al.* [19] in Italy reported a shorter delay of 12 and 13 hours, respectively, due to faster access and better management of emergency department admission and health insurance.

The location of the hematoma was supratentorial in the majority of patients, in agreement with most observations in the literature [16] [20]. The volume of the hematoma was less than 30 ml in most patients in our study, as in the study by Lim *et al.* in South Korea [21]. This result can be superimposed on the NIHSS score found in most of our patients.

Similarly, the ICH score was between 0 and 2 in the majority of cases. Akani *et al.* [12] found an ICH score between 0 and 2 in 87.7% of cases.

The frequency of operated patients was 5.8%. Ndubuisi *et al.* [22] reported a significantly higher frequency of about 40.9%. This could be explained by the fact that their study population mainly included patients with severe sICH who were candidates for surgery. However, it should be remembered that the choice of surgical intervention for sICH remains controversial, despite numerous studies [11] [17] [23].

Many studies have focused on 30-day mortality in sICH at place of SHIELD. There are fewer studies on the functional assessment of survivors. In the literature, the average 30-day mortality rate is estimated to be 41% to 51%, with half of the deaths occurring within the first 48 hours. We see that this mortality tends to decrease with better medical care. This reduction is also explained by easier access to imaging, which allows early diagnosis. Long-term mortality is estimated to be between 20% and 40%. Beyond the first three months, there is excess mortality among survivors, with an annual risk of death that varies from 5.6% to 8%, depending on the work. The risk of death is all the higher when the sequelae of the hematoma are significant, with pneumonia being the main cause of death [7] [24].

The complication rate in our study was 80.7%, mainly represented by infection linked to decubitus. Similar observations were reported by Akani *et al.* [12] who recorded 91% of decubitus infections. Death was recorded in 65.4%. Other complications recorded were mass effect, ventricular flooding, engagement and hydrocephalus. Wasay *et al.* [16] and Lim *et al.* [21] also reported mass effect and ventricular flooding as complications.

The frequency of death was 38.6%. Similar rates were reported by Akani *et al.* [12] and Sounga *et al.* [20] respectively 36.5% and 39.2%. Factors associated with death: a low Glasgow score, a hematoma volume greater than 30 ml. These dif-

ferent factors are recognized as a source of poor prognosis [10] [25].

## 5. Conclusion

Spontaneous intracerebral hematomas are found in 41% of strokes. It occurs around the fifth decade of life with a male predominance. Hypertension is the main cause. The most common clinical presentation is hemi-corporeal motor deficit. CT shows supratentorial topography in the majority of cases. Medical treatment alone is the most common therapeutic modality. Surgery is performed in only 5.8% of cases, and involves CSF drainage and/or evacuation of the haematoma. The mortality rate is 38.7%.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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# Appendix

## Survey Sheet

Identification number: /__:_ _:__/

File number: /__:__:__/Date: /___:___/ / /___:___/ //___:___:___:___/

### I. Identity and Sociodemographic Data

1. **Gender:** Male ☐ Female ☐
2. **Age: /__:___/ years**
3. **Laterality:** Left ☐ Right ☐ Ambidextrous ☐
4. **Usual Residence (district):** ……
5. **Level of education:** None ☐ Primary ☐ Secondary ☐ Higher ☐
6. **Marital Status:**

Single ☐ Married ☐ Widowed Cohabiting ☐ Divorced _ ☐_☐

7. **Professional Status:**

- **Employment Sector**

Public ☐ Private formal ☐ Private informal ☐ Unemployed ☐

- If employed, specify Job title**:** ……

8. **Socio-economic level:** Low ☐ Medium ☐ High ☐
9. **Main source of funding for care**

Sick ☐ Spouse ☐ Family ☐ Association ☐

### II. Hospitalization

#### II.1. Support Route

10. **Origin:** Home ☐ Transfer ☐ Reference ☐
    Outpatient consultation ☐

- If transfer specify the service of origin…..…….
- If reference, specify: reference hospital ☐ private hospital structure ☐

11. **Service in charge**

- Unit neurology hospitalization _ ☐
- Neurovascular Intensive Care Unit (NICU) ☐
- Neurosurgery unit _ ☐
- Resuscitation versatile ☐

12. **Type of course:**

- Medical emergencies - NICU - Neurology hospitalization unit ☐
- Medical emergencies - NICU - Neurosurgery unit ☐
- Medical emergencies - resuscitation versatile ☐
- Medical emergencies - NICU - Neurosurgery unit - Multipurpose intensive care unit ☐
- Other service – NICU - Neurology unit ☐
- Other service - NICU - Neurosurgery unit ☐
- Other service - Neurology unit ☐
- Other service - resuscitation versatile ☐

**13.** Length of stay per unit:

- A V: ……. hours
- Resuscitation versatile: …….. hours

## II.2. Diagnostic Information

### II.2.1. Clinical information

**14. Reason for hospitalisation:**

Motor deficit ☐ Consciousness disorder ☐ Speech disorder ☐
Headache ☐ Visual disturbances ☐ Sudden convulsive seizures ☐
Status epilepticus ☐ Others ☐
If other, specify: .....

**15. Occurrence context:**

Rest ☐ Physical/household activity ☐ Coitus ☐ Upon awakening ☐
Major stress ☐

**16.** Delay of admission to CHUB in relation to the start of symptoms: /___:___:___:___/ hours

### II.2.2. Clinical information

**17. Comorbidities (personal history, cardiovascular risk factors)**

HTA ☐ Diabetes Mellitus ☐ Smoking ☐
Excessive alcohol consumption ☐ Stigma/systemic illness ☐
Taking toxic drugs ☐ Taking anticoagulants ☐ HIV infection Blood ☐
disease ☐ Stroke I ☐ Stroke ☐

- If toxic, specify the nature:

Crack ☐ cocaine ☐ Amphetamines ☐ heroin ☐
Nasal decongestants ☐ sildenafil ☐

- If illness systemic , specify:

Sarcoidosis ☐ Lupus ☐ Horton's disease ☐ Talayasu's disease ☐

- If hemopathy , specify:

Hemophilia ☐ Willebrand disease ☐ sickle cell anemia ☐
Myeloma ☐ Vaquez disease ☐ Other☐
If other, specify: …….

**18. Background famil:**

Stroke ☐ Diabetes mellitus ☐ Hypertension ☐
Systemic disease ☐ Others ☐
If other, specify: …….

**19. General condition on admission:**

- Glasgow score /__ _: ___/
- NIHSS score /__ _: ___/
- Temperature /___:_ __/°C
- Systolic BP: /___:_ __:___/ mmHg
- Diastolic BP /___:_ __:___/ mm Hg
- Pulsed oxygen saturation: /___:_ __/ %
- Weight: /___:_ __:___/Kg;
- Size: /___:_ __:___/cm;

- BMI: /___:_ __/kg/m$^2$
- Perimeter abdominal: /___:___:___/cm
- Blood sugar: /___/, ___:___/g/L

**20. Neurological disorders on examination**

- Balance disorder ☐
- Phasic disorders ☐
- Motor deficit (Central facial paralysis, Monoplegia / Paraplegia / Hemiplegia) ☐
- Visual disorders (HLH, Alexie, prosopagnosia) ☐
- Sensory disorders (hypo/hyper esthesia) ☐
- Other ☐

To specify: ……..

**II.2.3. Paraclinical Information**

**II.2.3.1. Brain imaging**

⇒ **Purpose: diagnostic**

**21.** Neuro imaging: CT ☐ and MRI ☐

**22.** Completion time relative to the start of symptoms: /___//___//___//___/ hours

**23. Location of the lesion:** Sustentorial ☐ Infratentorial ☐

- If supratentorial, specify: deep ☐ lobar ☐
- If Deep: Capsulo-lenticular ☐ thalamic ☐ Capsulo-thalamic ☐
- If Lobar: frontal ☐ Parietal ☐ temporal ☐ occipital ☐

*If infratentorial*, specify: mesencephalic ☐ protuberant ☐ bulbar ☐ cerebellar ☐ Extended ☐

If extensive, specify: …….

**24.** Largest diameter of the lesion: /___//___//___/ cm

**25.** Volume:

**26. Imaging Complications**:

Ventricular flooding/rupture ☐ Axial engagement ☐ Hydrocephalus ☐ Mass effect ☐ None ☐

**27. Others lesions: Yes** ☐ **No** ☐

If yes, specify: Leukoariasis ☐ microbleeds ☐ cortical atrophy ☐

⇒ **Aimed _ etiological**

Brain MRI cerebral ☐ Arteriography cerebral ☐ CT angiogram ☐

**II.2.3.2. Biology for etiological and impact purposes**

**28. Platelet count** /_ _: ___:___/ 10$^3$/mm$^3$

**29. TP** /_ _: ___/ %

**30. TCA:** /__:___/ seconds

**31. Bleeding time** /_ _: ___/ minutes

**32.** Fibrinogen /__/ g/l

**33.** ANCA: Positive ☐ negative ☐

**34.** Anti-nuclear antibodies: Positive ☐ negative ☐

**35.** Blood sugar /___//___/ g/l;

**36.** Urea /___/. /___/___/g/l;

**37.** Serum creatinine /___//___//___/mg/l

**38.** ASAT /___//___/UI/l ;

**39.** ALAT /___//___/ IU/l;

**40.** GGT /___//___//___/UI/l

**41.** PAL /___//___//___/UI/l ;

**42.** SRV: *positive.* ☐ *negative* ☐

**43.** Natremia: ……

**44.** Kaliemia: …….

**45.** If other examinations, specify the examination and the results: .....

**II.3. Treatment** received during hospitalization

**46.** General resuscitation measures: yes ☐ no ☐

**47.** Specific treatment: Medical ☐ Surgical ☐ Both ☐

**48.** Medical treatment:

*Anti-edematous* ☐ Anti-hypertension ☐ Antidiabetic ☐

Antiepileptic: ☐

**49. Surgical treatment:**

- **Indications:**

Topography of the hematoma ☐ Diameter greater than 3 cm ☐ Glasgow score between 7 and 14 ☐ existence of underlying vascular encephalopathy ☐ Hydrocephalus ☐ Other ☐ None ☐

If other, specify: …….

- **Techniques**

Craniectomy ☐ External ventricular drainage ☐ Endoscopy ☐

Internal ventricular drainage ☐ Hematoma evacuation ☐

- Time taken for treatment relative to the start of symptoms: /___/__:___/ hours
- Delivery time in relation to the diagnostic date: /___/__:___/ hours
- **Contraindication:**

Treatment time greater than 96 hours ☐ Existence of a comorbidity ☐

Other ☐

If other , specify: ……

**50.** Re-education functional: Yes ☐ No ☐

**51.** Re-education speech therapy: Yes ☐ No ☐

## III. Evolution and Prognosis

**52.** ICH score: /__/

**53. Complications: Yes ☐ No ☐**

If yes, specify: Infectious decubitus ☐ Post-operative suppuration ☐

Re-bleeding ☐ Device decompensation ☐ Pneumocephaly ☐

Thrombophlebitis ☐ Post-operative Meningitis ☐ Other ☐

If other, specify: …….

**54.** Time for complications to occur: …….

First 7 days. At 1 month

**55. Patient outcome:** Return home ☐ Death ☐ Medical evacuation ☐

**56.** If death,

- time of onset relative to start of treatment /___:___:___:___ / days
- Reason for death:… ……

**57.** If medical evacuation, specify the reason:

Insufficient technical platform ☐ Request from third parties ☐ Others ☐

If other, specify: ……

Rankin score at discharge and at 1 month