

Epidemiological Profile of Neurochirurgical Diseases in the General Hospital of Loandjili, Pointe-Noire: Review of 18 Months of Activity

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ABSTRACT

Objective: To define the epidemiological profile of the neurosurgical activity of hospitalized patients.

Patients and methods: We conducted a descriptive retrospective study from January 2018 to August 2019 (18 months) in the neurosurgery department of the Loandjili General Hospital in Pointe Noire, including patients hospitalized for a neurosurgical condition. The parameters evaluated were epidemiological, diagnostic, therapeutic and progressive.

Results: 214 patients were hospitalized during the study period of which 143 cases were included in our study. The average age of our patients was 37.9 years with a sex ratio of 1.8 and a mortality of 28.85%. Traumatic pathology accounted for 81.11% of cases.

Conclusion: Neurosurgical conditions remain a major public health problem. Neuro-traumatic emergencies remain the main activity of our service. There is an interest in setting up teams that are competent and equipped to improve the management of patients.

Keywords: Epidemiology, Neurosurgery, Loandjili, Pointe Noire

INTRODUCTION

The exercise of neurosurgery requires a team and a technical platform adequate and competent [1]. In sub-Saharan Africa, the conditions of practice of neurosurgery are insufficient, marked by the difficulties of access to care of the populations, the lack of neurosurgeons and especially the insufficiency of the technical plateau [2]. Few studies have made it possible to assess the qualitative and quantitative needs for defining epidemiology in neurosurgery. In the Republic of Congo, there are two treatment centers for neurosurgical pathologies. It is the multipurpose surgery department of the University Hospital of Brazzaville with 4 neurosurgeons and the neurosurgery department of the General Hospital of Loandjili in Pointe Noire with only 1 neurosurgeon. An overview of the epidemiology of neurosurgical diseases has already been reported on Brazzaville. However, although being in the same country with almost identical socio-economic realities, no study has been conducted on Pointe Noire to define a profile of neurosurgical pathologies.

OBJECTIVE

This study has been to define the epidemiological profile of the neurosurgical activity of hospitalized patients.

PATIENTS AND METHODS

We conducted a descriptive retrospective study from January 2018 to August 2019. This study was conducted in the only Neurosurgery Department in the city of Pointe-Noire. This city is the second of the country (coastal city) after Brazzaville, economic capital, located in the extreme south of the country. Its population is 1 100 000 inhabitants with

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an area of 43.7 km². This service has a capacity of 6 beds. Its staff is composed of a neurosurgeon, a general practitioner and 04 nurses. Surgical management is performed in an operating room shared with other specialties including ORL, orthopedics, ophthalmology and stomatology.

The intensive care unit is a polyvalent reanimation with 4 beds.

We included all inpatients in the neurosurgery department during the study period and excluded all incomplete and unusable record.

Data collection was based on the hospital records of the department as well as the operating and reanimation rooms and the patients' clinical records. All data was saved in a

database and then analyzed using Epi info version 7.2.2.2 and processed using the office 2010.

The studied parameters are the epidemiological, diagnostic, therapeutic and evolutionary aspects.

RESULTS

During the study period, 214 patients were hospitalized for neurosurgical pathology. We selected 143 incoming patients in our selection criteria.

The average age of our patients was 37.9 years $\pm$ 20.36 with extremes of 8 months to 82 years. The sex ration male/female was 1.48. The distribution of patients by age group is shown in **Figure 1**.

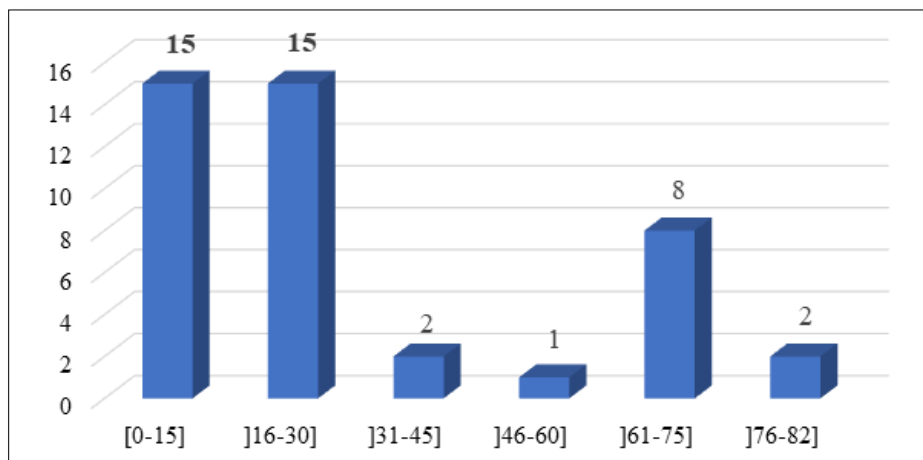


Figure 1. Distribution of patients by age group.

Figure 2 shows the distribution of patients by origin.

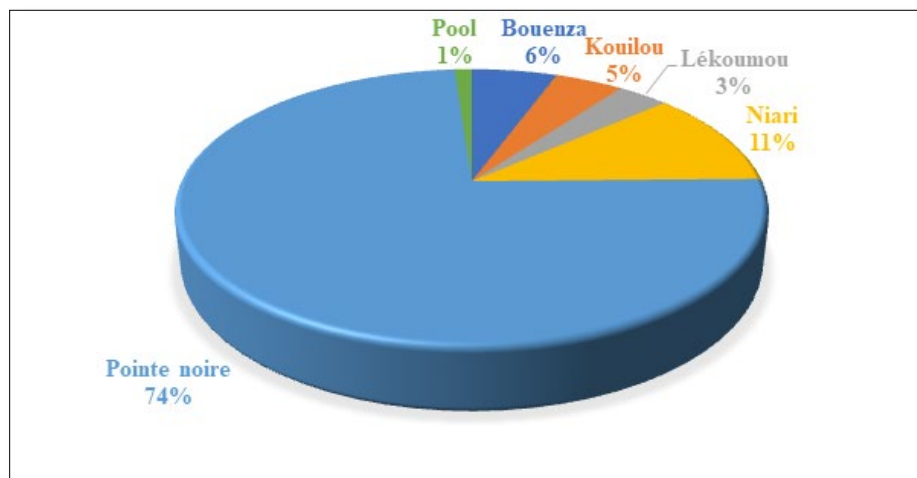


Figure 2. Distribution of patients by origin distance between reference center and Loandjili hospital: Pointe Noire<10 km; Kouilou<40 km; Niari: 160 km; Bouenza: 239 km; Lékoumou: 287 km; Pool: 437 km.

Table 1 represents the distribution of patients by condition. The mean duration of hospitalization was 7.29 days $\pm$ 5.71 with extremes of 1 to 32 days.

Table 1. Distribution of patients by pathology.

Pathology	Value	Frequency (%)
Degenerative Pathology		
Lumbar spinal stenosis	2	1.4
Lumbar disc herniation	4	2.8
Lomboradiculalgia	3	2.1
Tumor Pathology		
Brain tumor	9	6.3
Spinal tumor	4	2.3
Spinal Injury		
Cervical	11	7.7
Dorsal	5	3.5
Lumbar	6	4.2
Many levels	1	0.7
Infectious Pathology		
Brain abscess	2	1.4
Empyema	2	1.4
Hydrocephalus	1	0.7
Traumatic brain injury		
Parenchymal Contusion	28	19.5
Embarrure	7	4.7
Embarrure + hemorrhagic contusion	4	2.8
Fracture of the skull base	3	2.1
HED	9	6.3
Acute HSD	5	3.5
Chronic HSD	13	9.1
Parenchymal and bone lesion	5	3.5
Isolated bone lesions excluding embarrasment	3	2.1
Normale	7	4.7
Benign TCE without imaging	9	6.3
Total	143	100

CT was the first-line test in 95.5% of cases, followed by standard radiography. **Table 2** shows the distribution of patients according to the radiological examinations carried out. Mean time to diagnosis was 1 day $\pm$ 0 to 14 days.

Table 2. Distribution of patients by radiological examination.

Radiological	Value	Frequency (%)
TDM	115	89.85
Rx standard	12	9.37
IRM	1	0.78
Total	128	100

30 were operated patients with a mean management time of 4.6 days $\pm$ 9.3 with extremes of 3 to 60 days.

The overall favorable outcome of patients was favorable in 78.69% of cases. **Table 3** shows the distribution of patients by diagnosis and evolution.

Table 3. Distribution of patients by diagnosis and evolution.

	Value	Age	Sex ratio	Lenght of hospitalization	Time of surgical management	Mortality
Traumatic Pathology						
TCE	93	32.39	3	3.89	9.04	4.4
Spinal traumatic	23	40.2	2.6	6.62	9.66	26.08
Degenerative Pathology	9	54.55	0.8	6.1	-	-
Tumor Pathology						
Brain	9	51	0.5	6.6	-	44.4
Spinal	4	50.75	1	12.5	-	25
Malformative pathology	1	4	-	6	-	-
Infectious pathology	4	32.5	1	9.33	-	44.4
Total	143	37.91	1.48	7.29	9.35	28.85

DISCUSSION

We conducted a retrospective descriptive study over 18 months. This study reflects a global aspect without specific clinical description.

The interest of this study is to report the general neurosurgical profile and to evaluate the results taking into account the conditions of management. This knowledge of the profile of patients to be treated in neurosurgery in a context of recent practice makes it possible to prepare practitioners for equipment and an attitude adapted to the needs of populations [3].

Unlike some services [4,5] which are coexisting with other surgical services, the independence of the service promotes a better quality of care but also, adequate training of the nursing staff. However, there is still some delay in the management of emergencies, in connection with the operation of the operating room. Indeed, it is not totally dedicated to neurosurgery. It is shared with other specialties (ORL, Orthopedics, Ophthalmology, Stomatology).

The exercise of neurosurgery imposes material means of diagnosis and therapeutics namely CT and MRI [1]. These two feasible tests on Pointe Noire, facilitated the diagnosis and treatment. However, these remain virtually inaccessible to the population that makes up the majority of patients in care. Indeed, in the general hospital of Loandjili, only CT is feasible for 121.95 euros and 152.44 euros respectively for a CT without injection and injection of contrast. In addition to this reference center, the scanner can also be performed in private centers where it ranges from 137.2 euros to 182.93 euros. These different centers facilitate availability, but its accessibility is still a hindrance to its implementation. In addition, the MRI has since been considered a luxury for its realization first of all because it is available only in a single private center but also related to its cost that remains inaccessible to all. Indeed, its cost varies between 381.12 euros and 411.61 euros, respectively, for an MRI with and without injection of contrast medium. The systematic reduction of the cost of these examinations and the installation of the MRI in the general hospital of Loandjili

would allow a better management of the patients. In addition, a free system should be set up in agreement with the social services for the most disadvantaged patients. Also, the equipment of general hospitals (public hospitals) in scanner at affordable cost, will contribute to optimize the quality of care of the patients.

One of the brakes in the care of patients remains the accessibility of the consumable for surgical interventions. Indeed, the operative prescription (surgery and anesthesia) is the responsibility of the patient, who in turn is forced to visit different pharmacies in search of the desired product, because of the unavailability of many consumables within the pharmacy of the hospital. The manufacture of low cost surgical kit would be a major asset to facilitate the exercise of neurosurgery.

It should also be noted that the origin of patients is a brake on the care. In fact, 74% of our patients come from health centers near our health center. However, this frequency remains overestimated because many of them do not live close to these centers of reference. They were mostly referred to peripheral centers, the first of which is 160km from Pointe Noire. This relates to their place of residence and their profession. Thus, the financial means are never available immediately and the care agreement remains dependent on the head of the family not always present or available. This partly explains the delays in management that we have observed in neurotraumatological emergencies.

Traumatic pathology (skull and spine) was the main reason for hospitalization of our patients, 81.11%. Ekouélé, Doléagbanou and Rabiou found similar results [4-6]. The difference in frequency is related to the fact that many patients are initially referred to the Adolphe Sicé hospital which is the second general hospital in the city and where patients are wrongly hospitalized in a maxillofacial surgery department where they are either referred to our service for patients deemed to be serious or released for their home with or without neurosurgical advice. Cranioencephalic trauma is a global public health problem in terms of mortality, morbidity and socio-economic impact [7]. Only 10% of the population has access to basic neurosurgical management in developing countries [8]. The mortality rate in relation to head trauma varies from one series to another, but is still considerable. Indeed, in the same country and comparatively between Brazzaville and Pointe Noire, this rate is respectively 10% [5] and 4.4%. These results reflect the realities of many African countries whose mortality rate varies between 5 and 25% [3,9-11].

Craniocephalic traumas are often characteristic of young people [12]. The average age of traumatic brain injury in our study was 32.39 years old with male predominance. Our results are similar to those found in the literature [4,10,13]. Different facts can explain these results. This young age is one where our patients are in both social and professional activities. Most often they are young men with dangerous

activities such as driving and breaking the rules of the road. In addition the increase in recent years of the fleet of two-wheeled vehicle which almost all patients do not respect the rules of use that is already wearing protective helmet. These last facts explain just as well the place occupied by the accidents of the public way like first cause of TCE in our series all for Coulibaly, Doléagbenou, Ekoulé Mbaki, Motah which found, respectively 80%, 92,36%, 93,6% and 91.35% [3,13,14].

Spinal injuries accounted for 16.08% of hospitalized patients with an average age of 40.2 years. Doléagbenou and Motah found an average age of 32.4 years and 37 respectively [4,14]. The mortality of 26.08% of our series is superimposable to that found in the literature which is between 5 and 35% [4,5,9,11,15].

The delay in taking care of patients in traumatic emergencies remains considerable. Indeed, this delay is 9.04 days and 9.66 days, respectively for TCE and spinal trauma. This could be mainly related to the low income of patients who do not always have health insurance or the resources needed to cope with a medical and surgical emergency. The payment of the consumable necessary for the surgery is made by family contribution following a consultation.

The tumoral pathology represents the second reason for hospitalization in front of the degenerative affections. The tumors recorded a significant mortality rate of 3.49%. Our results are superimposable to some authors who find, respectively 5.56% and 4.58% [4,5].

The degenerative pathology came third (6.29% of patients). This difference with some authors of the literature could be related to the small size of our sample but also to the duration of the study [16-18]. No patient had to be operated on. On the one hand, it was a painful spine whose drug treatment had been able to improve the symptomatology. On the other hand, for lack of means, some patients where he had been indicated a surgical gesture, came out against medical advice.

Postoperatively, the evolution was rather favorable for our patients. Postoperative mortality is 3.33% for an overall mortality of 13.81%. It was a patient admitted for cervical spine injury. Also, there is a patient who has worsened clinically postoperatively operated for cervical spine trauma. Our results are below those of some authors who found an overall mortality of 8.9% to 37.4% [2,16-20]. This could be related to the size of the sample. Nevertheless, these figures are still considerable. Road traffic awareness should be conducted to reduce road accidents, which are the leading cause of spinal trauma that is frequently life-threatening and/or functional depending on the severity of the initial lesions.

CONCLUSION

Neurosurgical conditions remain a major public health problem. The neuro-traumatological emergencies remain the main activity of our service followed of the tumoral affections and the pathology of the degenerative rachis.

The postoperative complications and the mortality rate are identical to those of many sub-Saharan African countries. The results are significant for TCEs, hence the interest to reflect on the best equipment for diagnosis, surgery and resuscitation to significantly reduce the time of care and diagnosis time.

It would therefore be appropriate to expand the human resource and reception capacity service, to create a neuro-resuscitation service and a neurosurgical emergency center.

ICONOGRAPHY

Case 1: 28 year old patient admitted for right frontal cranio-cerebral injury with frontal contusion and underlying acute dural hematoma following a brawl. Operated at J2 craniotomy and drainage drainage of his hematoma (**Figure 3**).

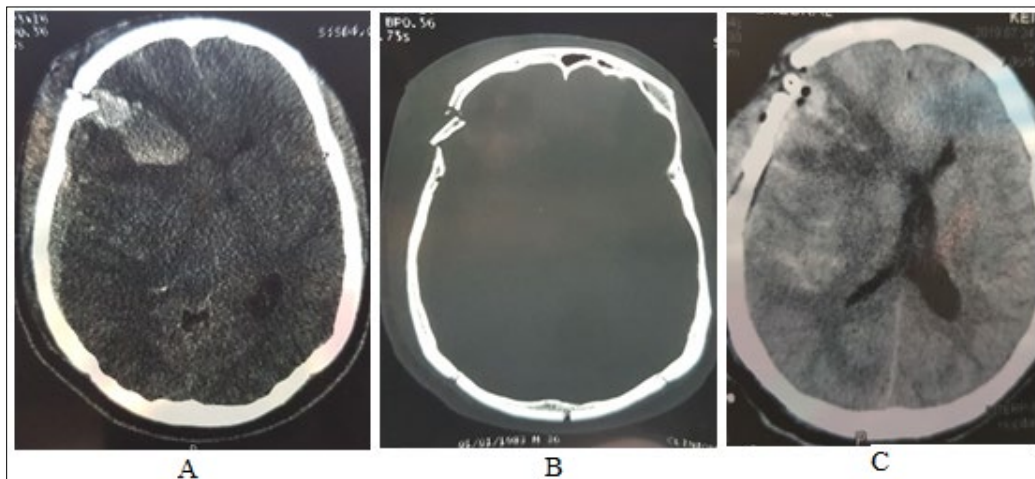


Figure 3. Cranio-encephalic CT: a) Parenchymal window: right frontal contusion with hematoma under dural acute; b) Bone window: frontal embarrure; c) Postoperative control.

Case 2: 22 year old patient admitted for left fronto-temporal empyema with oral starting point. It has been indicated and

carried out an evacuation by fronto pterional approach (**Figure 4**).

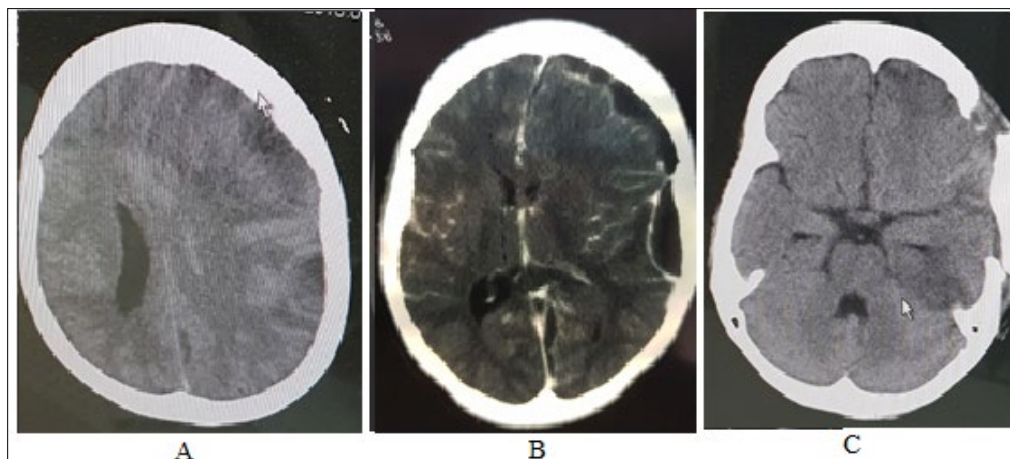


Figure 4. CT cranioccephalic: a) Parenchymal window without injection: hypo-dense left fronto-temporal band; b) Parenchymal window with injection of contractile product: hypo dense collection under durum: empyema; c) Postoperative control: evacuation of the empyema.

CONFLICT OF INTEREST

None.

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