



Research Article

Report on Neurosurgical Activity in the Surgical Emergency Department of the Bogodogo University Hospital Center in Ouagadougou From 2024 to 2025

Henri Lankoande^{1,*} , Ouedraogo Narcisse Wendpui Mike¹,
Bonkian Gnounsiniyapoue¹, Haro Yacouba², Inoussa Zoungna², Tall Mohamed¹,
Denlewende Sylvain Zabsonre²

¹Orthopedics Traumatology and Neurosurgery Department, Bogodogo Teaching Hospital, Ouagadougou, Burkina Faso

²Neurosurgery Department, Yalgado Ouedraogo Teaching Hospital, Ouagadougou, Burkina Faso

Abstract

Objective. The objective of our work was to present the results of neurosurgical activity in the surgical emergency department of the Bogodogo University Hospital Center in Ouagadougou over two years. **Patients and methods.** We conducted a retrospective descriptive cross-sectional study from January 1, 2024, to December 31, 2025. All patients diagnosed based on clinical and/or paraclinical data during the study period were included. The parameters studied were epidemiological, diagnostic, surgical and evolutionary. **Results.** A total of 1097 patients were included in the study. The mean age of our patients was 29.67 years, with a range from 4 months to 70 years. The sex ratio was 2.04. Tradespeople and students were the most represented socio-professional categories, with 403 cases (36.73%) and 375 cases (34.18%), respectively. Traumatic pathology was the most frequent in surgical emergencies and concerned 657 patients (59.90%) followed by degenerative pathology of the spine which was found in 209 patients (19.05%). The circumstances surrounding the occurrence of the head injuries were dominated by road traffic accidents and falls from height, respectively present in 401 patients (61.03%) and 111 patients (16.89%). Surgical treatment was performed in 12.67% of patients. The pathologies operated on were predominantly cases of head trauma, with 46 patients (33.09%). After an average follow-up of 12 months, the post-operative outcome was favorable with no sequelae in 62.58%, 7.91% neurological sequelae and 5.03% death. **Conclusion.** Neurosurgical activity in the surgical emergency department of Bogodogo University Hospital plays a significant role in the provision of specialized care, with nearly one in five patients admitted for a neurosurgical condition. Head injuries are the most common ailment, and road traffic accidents remain the leading cause. Strengthening human, material and organizational capacities appears essential in order to further improve neurosurgical care at the Bogodogo University Hospital and in Burkina Faso.

Keywords

Neurosurgical Activity, Trauma, Emergency, Bogodogo

*Correspondence: Henri Lankoande (lankoandehenri83@gmail.com)

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1. Introduction

Neurosurgery is a specialty whose development requires the use of essential diagnostic tools, including computed tomography (CT) and magnetic resonance imaging (MRI), as well as a team of anesthesiologists and intensivists skilled in the management of neurosurgical conditions [1]. The conditions for neurosurgical practice are far from ideal in most developing countries, due to limited access to healthcare, a shortage of neurosurgeons, and inadequate technical infrastructure [2]. In sub-Saharan Africa, approximately 5 million people per year whose health requires neurosurgical interventions do not have access to them due to a lack of neurosurgeons and insufficient technical infrastructure [3]. Sub-Saharan Africa has less than 1% of the world's neurosurgeons. In several African countries, there is 1 neurosurgeon for every 1 to 10 million inhabitants compared to about 1 for every 80,000 to 100,000 inhabitants in developed countries [4].

Most sub-Saharan countries, including Burkina Faso, are affected by this shortage of human and technological resources to meet neurosurgical care needs. It was only in July 2023 that a neurosurgeon was assigned to the Bogodogo University Hospital in Ouagadougou, and we considered it crucial to assess neurosurgical activities in the surgical emergency department. The objective of this study was to examine the various neurosurgical pathologies recorded in the Surgical Emergency Department of the Bogodogo University Hospital in Ouagadougou, focusing on their epidemiological, diagnostic, surgical, and prognostic aspects.

2. Patients and Methods

The study took place in the Surgical Emergency Department of the Bogodogo University Hospital in Ouagadougou. This department included a unit that served as the referral center for orthopedic and trauma, maxillofacial, neurosurgical, urological, and digestive surgery emergencies for the hospital's catchment area. Two neurosurgeons were assigned to this unit and worked closely with other specialists (anesthesiologists and other surgeons). The neurosurgery team did not have its own department or operating room. It should also be noted that we shared our operating room with the maxillofacial surgery and orthopedic and trauma departments. Neurosurgery patients were primarily accommodated in the orthopedic and trauma department.

This was a retrospective, descriptive, cross-sectional study of patients admitted to the surgical emergency department for neurosurgical conditions between January 1, 2024, and December 31, 2025. All patients diagnosed based on clinical and/or paraclinical data during the study period were included. Cases with missing or unusable medical records were excluded. Data were collected from patient medical records and surgical emergency department registers. The variables studied related to epidemiological, diagnostic, surgical, and outcome data.

3. Results

3.1. Epidemiological Data

During the study period, 5,710 patients were admitted to the surgical emergency department. Of these, 1,113 patients (19.49%) were registered with the Neurosurgery department, and 1,097 patients met our inclusion criteria (440 for 2024 and 657 for 2025). The average number of patient admissions per month was 46.

The average age of our patients was 29.67 years, with a range from 4 months to 70 years. The sex ratio was 2.04.

Traders and students were the most represented socio-professional categories, with 403 cases (36.73%) and 375 cases (34.18%) respectively (Table 1). Regarding place of residence, 617 patients (56.24%) came from the urban area.

Table 1. Distribution of patients according to their profession.

Occupation	Frequency	Percentage
Pupil/Student	375	34.18
Merchant	403	36.73
Farmer	79	07.20
Breeder	28	02.55
Gold prospector	8	0.73
Housewife	61	05.56
Employee	72	06.56
Retirement	29	2.64
Other	42	03.85
Total	1097	100%

3.2. Clinical Data

Traumatic pathology was the most frequent in surgical emergencies and concerned 657 patients (59.90%) followed by degenerative pathology of the spine which was found in 209 patients (19.05%) (Table 2).

Table 2. Distribution of patients according to the type of pathology.

Pathology	Frequency	Percentage
Head trauma	657	59.90
Spinal trauma	11	01
Degenerated spine	209	19.05
Hydrocephalus	63	05.74
Brain tumor	19	01.73

Pathology	Frequency	Percentage
Spinal tumor	09	0.82
Intracranial suppuration	27	02.46
Chronic subdural hematoma	62	05.65
Spontaneous intracerebral hematoma	40	03.65
Total	1097	100

The circumstances of the occurrence of head injuries were dominated by road traffic accidents and falls from height, respectively present in 401 patients (61.03%) and 111 patients (16.89%) (Table 3).

Table 3. Distribution of head trauma cases according to the circumstances of occurrence.

Circumstances of occurrence	Effective	Percentage
Head trauma		
AVP	401	61.03
Fall from height	111	16.89
Landslide	71	10.80
Brawl	24	03.65
Domestic accidents	31	04.72
Not specified	19	2.91
Total	657	100

3.3. Therapeutic Data

Of the registered patients, 139 (12.67%) underwent surgery. The time to surgery (between admission and surgery) was less than 24 hours in 11 patients (7.91%) and within 72 hours in 24 patients (17.26%) (Table 4).

Table 4. Distribution of patients according to the time operated.

Surgery wait time	Effective	Percentage
0 to 24h	11	07.91
24 to 72 hours	24	17.26
>72h	104	74.83
Total	139	100

The pathologies operated on were mostly cases of head trauma with 46 patients (33.09%) and acute hydrocephalus

with 42 patients (30.21%) (Table 5).

Table 5. Distribution of patients according to the pathology operated on.

Surgical pathology	Effective	Percentage
Head trauma	46	33.09
Hydrocephalus	42	30.21
Brain tumor	12	08.63
Intracranial suppuration	6	04.31
Chronic subdural hematoma	27	19.45
Spontaneous intracerebral hematoma	6	04.31
Total	139	100

The surgical procedures performed represented successively in 48 cases of evacuation of intracranial hematomas (34.53%), 19 patients (13.67%) had benefited from a depressed denture (Table 6).

Table 6. Distribution of patients according to surgical procedure.

Surgical procedures	Effective	Percentage
Hematoma evacuation	48	34.53
Lifting of the berth	19	13.67
Scalp wound debridement	6	04.31
Drainage lavage puncture	6	04.31
Ventriculoperitoneal shunt	42	30.24
External ventricle bypass	6	04.31
Tumor excision	12	08.63
Total	139	100

3.4. Evolving Data

In our study, we found an average post-operative stay of 6.30 days. After a mean follow-up of 12 months, the postoperative course was favorable without sequelae in 87 patients (62.58%). Neurological sequelae consisted of hemiparesis in 11 patients (7.91%) and speech impairment in 4 patients (2.87%). Postoperative mortality was observed in 7 patients (5.03%).

4. Discussion

Neurosurgical activity accounted for 19.49% of all admissions to the surgical emergency department at Bogodogo University

Hospital. This proportion reflects the growing importance of neurosurgery in referral hospitals in low-income countries. In sub-Saharan Africa, the increase in road traffic injuries, improved access to medical imaging, and the gradual development of neurosurgical services explain the steady rise in demand for neurosurgical care. Several authors report that the need for neurosurgery remains far greater than the supply of care, despite recent capacity-building efforts on the continent [5-7].

In our study, 1097 patients were included over two years, representing an average of 46 admissions per month. This activity is similar to that of Ouattara et al. [8] in Bobo-Dioulasso, who found an average of 54 patient admissions per month in their study. However, this is higher than that reported by several recently established African centers, but remains lower than that of major university centers with an independent neurosurgery department. This difference is mainly explained by the age of the facilities, their level of equipment, their healthcare coverage area, and the continuous availability of neurosurgeons [5, 7].

The average age of 29.67 years confirms that neurosurgical conditions primarily affect a young and active population. This finding is comparable to series published in Senegal, Ethiopia, Cameroon, and Nigeria, where the average age ranges from 28 to 35 years [6, 7, 9]. This predominance of young individuals constitutes a significant public health problem, as it affects the economically productive population and leads to substantial social and economic consequences for families and healthcare systems [6, 10].

The observed male predominance (sex ratio = 2.04) is consistent with international literature. Men are more exposed to trauma due to their professional activities, more frequent travel, and greater involvement in traffic accidents. Similar results have been reported in several African series on neurosurgical emergencies [6, 7, 9, 10].

Traders (36.73%) and pupils or students (34.18%) constituted the main socio-professional categories. Holden [11] in Benin reported a predominance of farmers/ herders with 16.70% of cases. In low-income countries, this situation represents a significant source of lost productivity and increased healthcare expenditure [6, 10].

Head injuries accounted for 59.90% of admissions and were by far the most common neurosurgical condition encountered. This finding is comparable to those reported by teams in Senegal, Ethiopia, Cameroon, Nigeria, and Ghana, where head injuries represent between 50% and 70% of emergency neurosurgical activity [6, 7, 12]. According to the Lancet Commission on Global Neurosurgery, head injuries remain the leading indication for neurosurgical management in low- and middle-income countries [6].

Road traffic accidents accounted for 61.03% of head injuries. This proportion is close to those reported in most recent African studies, where motorcycle accidents are the leading cause of serious injuries [7, 9, 13]. This situation is explained by the rapid increase in the number of motorcycles, failure to wear helmets, speeding, and insufficient road safety measures

in Burkina Faso. The World Health Organization notes that Africa has the highest road traffic fatality rate in the world [14].

Degenerative spinal conditions accounted for 19.05% of admissions, making them the second most common neurosurgical condition after head trauma. This frequency reflects the progressive evolution of the epidemiological profile of African neurosurgery departments, where non-traumatic conditions are now playing an increasingly important role. Improved life expectancy, the rise in age-related degenerative diseases, and wider access to computed tomography (CT) and magnetic resonance imaging (MRI) are contributing to this trend. Several recent African studies report a steady increase in consultations for degenerative lumboradiculalgia and cervicalgia, even though their surgical management remains limited by the cost of implants and the lack of specialized equipment [8, 9, 15].

Hydrocephalus accounted for 5.74% of admissions and was the second most common indication for surgery (30.21%). This observation is similar to those reported in several African centers where ventriculoperitoneal shunts are among the most frequent neurosurgical procedures. Despite progress made, management still faces challenges related to access to valves, the cost of medical devices, and infectious complications. International guidelines emphasize the importance of early diagnosis, improved availability of implants, and postoperative follow-up to reduce morbidity and reoperations [6, 8, 16].

Chronic subdural hematomas accounted for 5.65% of cases and nearly one-fifth of surgical interventions. Their increasing frequency is reported in numerous international series due to the aging population, the use of anticoagulant therapy, and the improved diagnostic performance of computed tomography. In our setting, the predominance of relatively young patients suggests that head trauma remains the primary etiological factor. Surgical evacuation remains the standard treatment, with generally satisfactory results when performed early [17].

Intracranial suppurations (2.46%) and brain tumors (1.73%) were relatively infrequent. This low proportion likely does not reflect their true incidence, but rather reflects diagnostic difficulties, delays in consultation, the high cost of brain imaging, and limited access to specialized neurosurgical care. Several African authors emphasize that many patients are referred late or never receive surgical treatment due to financial and technical constraints [8, 10, 15].

Only 12.67% of patients underwent surgery. This relatively low rate is comparable to that observed in several sub-Saharan African countries where a significant proportion of head injuries are treated conservatively and where limitations in available technology reduce the indications for surgery. Insufficient human resources, limited access to operating rooms, the cost of implants and consumables, and patients' financial difficulties constitute the main obstacles to accessing neurosurgical care [6, 8, 9].

Our study shows that 74.83% of procedures were performed after a delay of more than 72 hours. This delay is con-

cerning because several studies have demonstrated that delayed surgical intervention increases the risk of neurological complications, functional sequelae, and mortality, particularly in patients with compressive intracranial lesions. The main factors responsible for these delays in resource-limited countries are financial difficulties, equipment shortages, insufficient availability of operating rooms, and delayed patient referrals [6, 10, 18].

Evacuation of intracranial hematomas was the most frequent surgical procedure (34.53%), followed by ventriculoperitoneal shunting (30.24%). This distribution reflects the predominance of head trauma and hydrocephalus in our surgical practice. Similar observations have been reported in several African centers where these two procedures represent the majority of emergency neurosurgical interventions [17].

The mean postoperative stay was 6.3 days, and the outcome was favorable in 62.58% of patients after a mean follow-up of twelve months. The main neurological sequelae were hemiparesis and speech disorders. Our postoperative mortality rate (5.03%) remains comparable to that reported in several African series despite technical and organizational constraints. However, centers with specialized neuro-intensive care units generally obtain better results, highlighting the importance of strengthening neurosurgical intensive care [7].

Finally, this study highlights the positive impact of the recent establishment of a neurosurgical unit at Bogodogo University Hospital. The increase in admissions between 2024 and 2025 suggests a gradual improvement in access to specialized care. Nevertheless, considerable needs remain, particularly in terms of human resources, neurosurgical equipment, specialized intensive care, and dedicated infrastructure.

5. Conclusion

Neurosurgical activity in the surgical emergency department of Bogodogo University Hospital plays a significant role in the provision of specialized care, with nearly one in five patients admitted for a neurosurgical condition. Head injuries are the most common ailment, and road traffic accidents remain the leading cause. Surgical interventions are primarily focused on the evacuation of intracranial hematomas and the management of hydrocephalus.

Despite generally satisfactory postoperative results, significant delays in surgery reflect the inadequacies of the technical infrastructure and difficulties in accessing specialized care. Strengthening human, material, and organizational capacities appears essential to further improve neurosurgical care at the Bogodogo University Hospital and throughout Burkina Faso.

6. Recommendations

6.1. To the Health Authorities

Increase the number of neurosurgeons in referral hospitals.

Equip the Bogodogo University Hospital with an operating theatre and a hospitalization unit dedicated to neurosurgery.

Improve financial accessibility to neuroradiological examinations and neurosurgical implants.

Develop a specialized neurosurgical intensive care unit.

6.2. To Healthcare Professionals

Improve early triage of neurosurgical emergencies.

Reduce diagnostic and therapeutic delays.

Strengthen multidisciplinary collaboration between neurosurgeons, anesthesiologists and emergency physicians.

6.3. To the Road Safety Authorities

Intensify campaigns to prevent road traffic accidents.

Strengthen the enforcement of road safety measures, including helmet use and adherence to speed limits.

6.4. To Researchers

Conduct national multicenter studies to assess the actual needs for neurosurgical care in Burkina Faso.

Develop a national registry of head injuries and neurosurgical emergencies.

Abbreviations

CHU	University Hospital Center
MRI	Magnetic Resonance Imaging
RTA	Road Traffic Accident

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Author Contributions

Henri Lankoande: Conceptualization, Investigation, Resources, Writing – original draft

Ouedraogo Narcisse Wendpui Mike: Data curation, Formal Analysis, Methodology, Supervision, Writing – review & editing

Bonkian Gnounsiniyapoue: Data curation, Investigation, Validation

Haro Yacouba: Investigation, Resources, Validation

Inoussa Zoungrna: Supervision, Validation, Writing – review & editing

Tall Mohamed: Project administration, Supervision, Validation

Denlewende Sylvain Zabsonre: Project administration, Supervision, Validation, Writing – review & editing

Conflicts of Interest

The authors declare no conflicts of interest.

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