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Management of Spinal Injuries at the University Hospital Center of Brazzaville (UHCB)

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ABSTRACT

Overall objective: *To describe the diagnostic and therapeutic aspects of spinal trauma at the University Hospital Center of Brazzaville (UHCB)*

Patients and Methods: *We conducted a descriptive cross-sectional study with retrospective data collection from July 2022 to June 2025, covering a period of 36 months. The study was carried out in the UHCB's general surgery department. All patients with spinal trauma confirmed by imaging were included. The variables analyzed included sociodemographic, diagnostic, therapeutic, and outcome data.*

Results: *We included 79 patients, with a mean age of 39.5 ± 16.80 years and a male-to-female ratio of 3.9:1. Road traffic accidents were the main cause of injury (57.3%). At initial examination, 41.8% and 10.1% of patients were classified as ASIA A and ASIA B, respectively; head injury was associated with cervical spine trauma in 30.4% of cases. CT scans were performed in 80% of patients; they revealed discoligamentous lesions in the cervical spine in 39.2% of cases, simple fractures in the thoracolumbar spine in 42.9% and fracture-dislocations in 50%. Twenty-eight patients (35.4%) underwent surgery, after a mean delay of 21.6 days. All operated patients underwent neural decompression with osteosynthesis, via an anterior approach to the cervical spine and a posterior approach to the thoracolumbar segment. Short-term outcomes were favorable in two patients; the complications encountered in operated patients were mainly pressure sores (42.9%) and urinary tract infections (21.4%), and the in-hospital mortality rate was 7.6%.*

Conclusion: *Spinal injuries represent a significant public health problem. They primarily affect young and active populations and occur mainly during traffic accidents.*

Keywords
Spinal injury, Road traffic accident, Brazzaville, Surgical management.

Introduction
Spinal injuries (SI) encompass all osteo-disc-ligamentous lesions of the spine, whether or not associated with radiculo-medullary involvement, resulting from external force. These are common and serious conditions due to their functional and life-threatening consequences, especially when there is radiculo-medullary involvement, which can lead to severe sequelae and difficulties in social and professional integration for the victims [1].

Affecting a highly active segment of the population and often caused by road traffic accidents, spinal injuries represent a significant public health issue, particularly in sub-Saharan Africa where healthcare infrastructure and accident prevention measures remain inadequate [2].

Research conducted in many sub-Saharan African countries raises certain challenges related to prehospital, perihospital, and posthospital care. The improvement of care protocols, which can stem from the analysis of these challenges, can help improve patient outcomes and thus approach the result achieved in developed countries.

It is in this context that the present study is situated, aiming to describe the diagnostic, therapeutic, and short-term evolutionary aspects of spinal injuries managed at the University Hospital Center of Brazzaville (UHCB), in order to highlight the particularities observed in our working context.

Materials and Methods

We conducted a descriptive cross-sectional study with retrospective data collection from July 2022 to June 2025, covering a period of 36 months. The study, which was carried out in the Neurosurgery unit of the General Surgery department at UHCB, included all patients hospitalized for spinal trauma who had undergone at least one medical imaging examination. Incomplete records were excluded. The variables studied were epidemiological, clinical, paraclinical, therapeutic and evolutionary.

The data were recorded and processed using Epi Info software (version 7.2.5.0). Excel software version 2016 was used for creating the charts.

Results

During the study period, we recorded 1,627 patients hospitalized for neurosurgical conditions. Ninety-six patients suffered spinal trauma, representing a hospital frequency of 11.6%. Of this group, 17 had incomplete records, which led us to retain 79 patients based on our selection criteria.

The median age of the studied population was 39.475 ± 16.80 years, with a range of 11 to 80 years. Of these 79 cases, 63 were male and 16 were female (sex ratio : 3.9).

These traumas were caused by road traffic accidents in 57.3%, domestic accidents in 25%, recreational accidents in 10% of cases, and other causes (work accidents, sports, and assaults) in 7.7%.

The collection and transport to the first hospital center were non-medicalized for all patients.

All patients (79 cases) had back pain, the location of which depended on the injured spinal segment. The latter was deformed in 61 cases, or 77.5%. Neuralgia was present in 12 cases (15%). The affected segment was cervical in 51 cases (65%), thoracic in 16 cases (20%), and lumbar in 12 cases (15%). The clinical status of the patients according to the ASIA score is given in Table 1.

Orthopedic treatment was used for 9 patients (11.4%), and surgical was indicated for 70 patients (88,6%). The orthopedic treatment concerned cervical injuries, namely 8 disco-ligamentous lesions (4 herniated discs, 4 sprains) and a non-displaced odontoid fracture. Of the 70 patients (88.6%) who were to undergo surgical treatment, only 28 (35.4%) were operated on. This included 10/46 (21.7%) in the cervical region, 18/24 (75%) in the thoraco-lumbar region. The average time to surgery was 21.57 days, with a range of 3 to 73 days. The procedures performed according to the injuries and the surgical approach are shown in Table 4.

Table 1: Distribution of patients according to the ASIA score.

Spinal segment	ASIA A	ASIA B	ASIA C	ASIA D	ASIA E
Cervical (51)	15	5	4	10	17
Thoracic (16)	14	0	0	0	2
Lumbar (12)	4	3	0	0	5
Total	**33**	**8**	**4**	**10**	**24**

Spinal cord and nerve root trauma was part of polytrauma in 31 cases, or 40.5%, as reported in Table 2.

Table 2: Distribution of cases according to associated injuries.

Associated injuries	Cervical spine	Thoracic spine	Lombar spine
Head trauma	24	6	2
Chest trauma	6	10	4
Limb trauma	0	4	2
Abdominal trauma	2	0	0

The medical imaging assessment was primarily represented by computed tomography (CT), which was performed on 63 patients (80%), radiography was done on 4 patients (5%), and magnetic resonance imaging (MRI) on 8 patients (10%). It made it possible to identify the lesions, which are recorded in Table 3.

Table 3: Distribution of lesions in the spine.

Type of lesion	Cervical spine	Thoracic spine	Lumbar spine
Disco-ligamentous lesion *	20	2	0
Fracture	14	6	6
Fracture dislocation	6	8	6
Décompensation of arthritic lesions	11	0	0
Total	**51**	**16**	**12**

* Disco-ligamentous injuries : 3 herniated discs, 5 sprains, 12 dislocations.

Commentary

As expected, the difficulties inherent to retrospective studies were found in ours. Nevertheless, it allowed us to obtain certain data, the comments of which will form the continuation of our discussion.

The median age of the study population was 39.475 years ± 16.80 years, with extremes of 6 and 78 years, and the sex ratio was 4/1. Age and male predominance are regularly reported in the literature [3-5]. The victims were often involved in traffic accidents (57.5% of cases), as in the studies of Kambale et al. [6], Obame et al. [7], and Doumbia et al. [8], with 63.2%, 63.7%, and 75%, respectively. However, Mulumba et al. [3] and Bramo et al. [5] report traffic accidents as the second cause after falls. The increase in traffic, especially in large urban areas, is one explanation. All these data make spinal trauma an important public health issue in our

countries [5,9].

Table 4: Type de geste, voie d'abord selon les lésions.

Site of lesion	Operated patients	Surgical procedure
Cervical spine	10/46	Anterior approach
Cervical spondylotic myelopathy	6	Corpectomy+Graft+Osteosynthesis
Bodily fracture	2	Corpectomy+Graft+Osteosynthesis
Dislocation	2	Reduction+Graft+Osteosynthesis
Thoraco-lumbar spine	18/24	Posterior approach
Fracture	8	Laminectomy+Osteosynthesis
Fracture-Dislocation	8	Laminectomy+Reduction+Osteo-synthesis
Dislocation	2	Reduction+Graft+Osteosynthesis

The predominance of cervical spine injuries (65% of cases), also noted by authors such as Cissé Dramane, is thought to be related to its very cranial position, the small size of its vertebrae, and its high mobility. Making a connection between the etiology of the injury and its location, Cissé Dramane [4] observes an association of cervical injuries with road traffic accidents, dorsolumbar injuries with falls from tall trees, while lumbar injuries were mostly due to collapses in mining tunnels. The association of spinal injuries with craniofacial traumas in 46.6% of cases supports the assertion, every craniofacial trauma patient has a cervical spine injury until proven otherwise [10]. The significant proportion of other associated injuries also observed in other studies [11,12] brings us back to the fundamentals of the general examination of any patient in general, and of trauma patients in particular.

The ASIA A and E scores were the most represented, respectively with 40.25% and 30%.
The predominance of patients in these two groups was also noted by Mulumba [3]. Drame Cissé [4], using the Frankel classification, reports a slightly different predominance with 51% of patients classified as Frankel A, followed by 23.8% of patients classified as Frankel B. These observations remind us of the severity of spinal injuries within a population that is unfortunately young.

CT scans were the most frequently performed examination (80% of cases), as in the series by Cissé Dramane and Doumbia [4,8], with 97.6% and 98% of cases, respectively. This is the result of the widespread use of this examination in our countries. Its importance in exploring the nervous system and its contents is undeniable [10]. MRI, another examination in this context, serves to complement the CT scan in traumatic situations [10]. Standard radiography, although less used in our series, remains very useful in the assessment of spinal injuries, especially in the absence of CT. These examinations allowed us to observe the predominance of disco-ligamentous lesions (38.5%), which may be related to its hypermobility [13-15]. A significant portion of cervical spondylotic myelopathy decompensated by trauma (23.1%) requires investigation in elderly patients with direct or indirect cervical spinal injuries, who are increasingly numerous due to the progressive increase in life expectancy in our countries. This is one of the indications for MRI in spinal trauma. At the thoracolumbar level, the most frequent injuries are simple fractures or fractures associated with dislocation. The fall mechanism seems to explain the predominance of these injuries at this level. In addition to symptomatic medical treatment, five patients received orthopedic treatment. Surgery was indicated for 70 patients, or 88.6%, a higher number than reported by Cissé Dramane [4] (78.57%). Only 35.4% were operated on. The average time to surgery in our series was approximately 21.57 days. This delay is longer than that reported by Mulumba [3] (12.7 ± 7 days) and that of the Malagasy [5]. The low rate of operated patients and the long delay between trauma and surgery are linked to the overall high burden of management, most often borne entirely by the patient [13-15]. The vertebro-medullary injured patient remains a patient whose management must be urgent in order to hope for neurological recovery [16]. At the cervical level, the anterior approach allowed either a corpectomy + graft + osteosynthesis (cervical spondylotic myelopathy and vertebral body fracture) or a reduction + graft + osteosynthesis (dislocation). The anterior approach has been systematically used for cervical lesions by Ekouele Mbaki et al. [14], Mulumba et al. [3]. Since the compressive forces are most often anterior (vertebral body fracture, disc herniation, or dislocation), this easily performed approach seems more appropriate to us, despite the risks of injury to vascular, nervous, and digestive structures. This approach can be combined with the posterior approach in cases of entrapments that do not reduce with the anterior approach. Other authors prefer the posterior approach [17].

At the thoracolumbar level, patients were operated on via the posterior route. This is an easier approach for these recent lesions. The significant morbidity associated with ventral or anterior approaches at these two segments makes their use exceptional.

Short-term improvements were noted only in a few ASIA B and C patients, as in the series by Mulumba et al. [3]. However, Ekouele Mbaki et al. [14] report an absence of postoperative neurological improvement in patients who had an ASIA A and B score, as was already observed by Loembé [18] in his series. These results highlight the prognostic significance of the severity of the patients' initial neurological injuries, as well as the importance of improving pre-hospital care to prevent neurological deterioration related to improper handling of these accident victims.

The majority of complications are related to the bed rest imposed on patients by these lesions. These include pressure sores, infectious complications (urinary and pulmonary infections), which are described as much in our setting as by other authors (Mulumba) [3]. Hospital deaths in our series were 7.5%.

Conclusion

Spinal injuries are a public health issue because they mainly affect young and active individuals, often during road traffic accidents. The cervical spine is the most affected spinal segment, frequently associated with head trauma. CT scans of the spine have become the primary paraclinical examination for exploring this pathology. In our practice, surgery, which remains the treatment of choice for severe injuries, is carried out with a delay, compromising the

functional and/or vital prognosis of these patients.

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