

Epidemiological, clinical and therapeutic profile of patients operated for lumbar spinal stenosis: experience from the Neurosurgery Department of the National Hospital of Niamey

Abstract

Objective: To describe the epidemiological, clinical and therapeutic aspects of patients operated on for lumbar spinal stenosis at the National Hospital of Niamey.

Methods: This was a retrospective, descriptive and analytical study conducted in the neurosurgery department over a four-year period from January 1, 2021, to December 31, 2024. All patients with complete records who underwent surgery for lumbar spinal stenosis were included. The variables studied included demographic characteristics, clinical signs, imaging findings, treatment modalities and postoperative outcomes.

Results: A total of 107 cases were included, accounting for 11.6% of all surgical procedures in the department. The average age was 57.57 ± 11.58 years, and males predominated (73%). Manual workers were the most represented category (42.06%). The most frequent symptom was low back pain (88.79%), followed by Lasègue's sign (17%), mostly bilateral (78%). Imaging included CT (61%) and MRI (56%). NSAIDs and analgesics were administered in over 80% of cases. The most common surgical procedure was simple decompressive laminectomy (98.13%). Outcomes were favorable in most cases with few complications.

Conclusion: This study highlights the typical profile of patients undergoing surgery for lumbar spinal stenosis in Niamey: active males with chronic lumbar pain. Simple decompression proved effective with a low complication rate. These findings underscore the need for standardized and accessible treatment protocols in resource-limited settings.

Keywords: Lumbar spinal stenosis, decompression surgery, low back pain, neurosurgery, Niger, National Hospital of Niamey

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Introduction

Lumbar spinal stenosis (LSS) is a degenerative condition characterized by a reduction in the diameter of the lumbar spinal canal, leading to medullary or radicular compression. It is often responsible for chronic low back pain, neurogenic claudication, and neurological deficits.^{1,2}

Although this pathology is common in industrialized countries, it remains poorly documented in low-income countries, particularly in sub-Saharan Africa.^{3,4} With the increasing aging of the population and the prevalence of intense physical activity in rural areas, LSS is being diagnosed more frequently in Niger. This study aims to describe the epidemiological, clinical, and therapeutic profile of patients operated on for LSS in a reference neurosurgery department.

Méthodology

A retrospective, descriptive, and analytical study was conducted in the Neurosurgery Department of the National Hospital of Niamey between January 2021 and December 2024. Inclusion criteria covered all patients operated on for lumbar spinal stenosis (LSS) who had complete medical records. The analyzed data included:

- Socio-demographic characteristics,
- Medical history,
- Clinical symptoms,

- Imaging findings,
- Type of treatment received,
- Postoperative outcomes.
- Data were entered and analyzed using simple descriptive statistics.

Results

A total of 107 patient records were included, representing 11.6% of all surgical procedures performed in the department during the study period.

- Age and sex: The mean age was 57.6 ± 11.6 years, with a male predominance (73%).
- Occupation: Manual laborers accounted for 42.1% of the cases.

Symptoms:

(Table 1)

Low back pain was present in 88.8% of patients. The Lasègue's sign was observed in 17% of cases, with bilateral involvement in 78% of them.

Imaging

Computed tomography (CT) was performed in 61% of patients, and magnetic resonance imaging (MRI) in 56%. These examinations

confirmed a predominant canal narrowing at the L4–L5 level (Table 2 & 3,).

Table 1 Distribution according to functional signs at consultati

Signs	Number of employees (n)	Percentage (%)
Cramps	8	7,48
Genitourinary and sphincter dysfunction	12	11,21
Paresthesia	22	20,56
Neurogenic claudication	57	53,27
Weakness of the lower limb	59	55,14
Radiculalgia of the lower limb	68	63,55
Low back pain	95	88,79

Table 2 Distribution of cases according to CT scan findings

Signs	Number of employees (n)	Percentage (%)
Protrusion discale	2	3,08
Ligament hypertrophies	6	9,23
List thesis	9	13,85
Hypertrophy of the articular processes	17	26,15
Osteophytes	31	47,69
Total	65	100

Osteophytes were found in 47.69% of cases (n=31).

Table 3 Distribution of cases according to MRI findings

Signs (n=60)	Number of employees (n)	Percentage (%)
Spinal cord compression	5	8,33
Degenerative disc disease	10	16,67
Foraminal or lateral stenosis	13	21,67
Herniated disc	21	35
Ligamentum flavum hypertrophy	45	75
Lumbar spinal stenosis	60	100

Lumbar canal stenosis was found in 100% of patients (n=60), followed by hypertrophy of the ligamentum flavum in 75% of cases (n=45).

Medical treatment

Before surgery, 83.2% of patients had received medication-based therapy, mainly consisting of nonsteroidal anti-inflammatory drugs (NSAIDs) and analgesics.

Surgery

Table 4 Distribution of cases according to surgical procedures performed

Gestures	Number of employees (n)	Percentage (%)
Simple recalibration + Osteosynthesis	3	2,80
Simple recalibration + Lumbar discectomy	12	11,21
Recalibrage simple (Laminectomie + Foraminotomie)	105	98,13

Simple lumbar decompression was the most frequently performed surgical procedure, accounting for 98.1% of cases (n = 105). Spinal fusion (arthrodesis) was performed only in rare cases.

Postoperative outcome

Table 5 Distribution of cases according to clinical outcome

Complication on day 7	Number of employees (n)	Percentage (%)
Persistent paraplegia	1	0,93
Complication of decubitus	1	0,93
Infectious complication	3	2,80
- Neurological signs	3	2,80
- Improved	1	0,93
- Stationary	2	1,87
Persistent pain	10	9,35
None	89	83,18
Total	107	100

In the majority of cases, no complications were recorded in 83.18% of patients (n = 89), while 9.35% (n = 10) experienced persistent pain.

Overall, the postoperative outcome was favorable, with a low rate of complications.⁷⁻⁹

Discussion

During the study period, the frequency of lumbar spinal stenosis (LSS) accounted for 11.6% of all surgical procedures in the department. Our result is higher than those reported by:

- Khalid¹⁰ at CHU Hassan II in Fès in 2010, with 0.6% of operated patients,
- Hajar¹¹ in 2022 at the Military Hospital of Meknes, with 1.41%.

This difference may be attributed to geographical and institutional factors, or variations in surgical practices and patient volume. Indeed, centers with a higher number of spinal pathology cases may observe a higher frequency of surgical interventions for lumbar stenosis.

In our series, there was a clear male predominance (73%), similar to Onambany et al.¹² in Douala in 2010, who reported 73.8% male patients. However, this contrasts with some studies showing a female predominance:

- Traoré S in Mali in 2015: 58%,
- El Hilali¹³ at CHU Hassan II in Fès: 54%,
- Ben Karbach R in Marrakech in 2009: 56%.

The male predominance reported in the literature is often explained by men's greater exposure to lumbar microtraumas due to occupational activities. Differences between studies could also reflect cultural factors, lifestyle variations, or disparities in clinical management.

The mean age of patients was 57.57 ± 11.58 years (range 24–86 years). Our result is comparable to those reported by:

- Djientcheu et al.¹⁴ in Yaoundé, Cameroon, 2010: 57.3 years,
- El Hilali¹³ at CHU Hassan II in Fès: 53 years,
- Fatigba et al.¹⁵ in Benin, 2015: 58.44 years, but higher than Hamidou et al. (11) in Mali, 2020: 49.58 years.

The 60–69 age group was the most represented, accounting for 42.06% of cases (n = 45). Occupational distribution: Manual laborers were the most represented (42.06%, n = 45), followed by unemployed individuals (14.95%, n = 16). This aligns with the findings of Onambany et al.¹² in Douala, 2010, where manual workers accounted

for 20% of cases. This suggests that professions requiring intense physical effort are at higher risk of developing degenerative spinal pathologies such as lumbar stenosis (Figures 1-3).¹⁶



Figure 1 Sagittal section scan of the lumbar spine showing canal narrowing L2-L3, L3-L4, L4-L5 (Neurosurgery Department of HNN).



Figure 2 Sagittal section MRI of the lumbar spine showing L4-L5 lumbar canal stenosis (Neurosurgery Department of HNN).

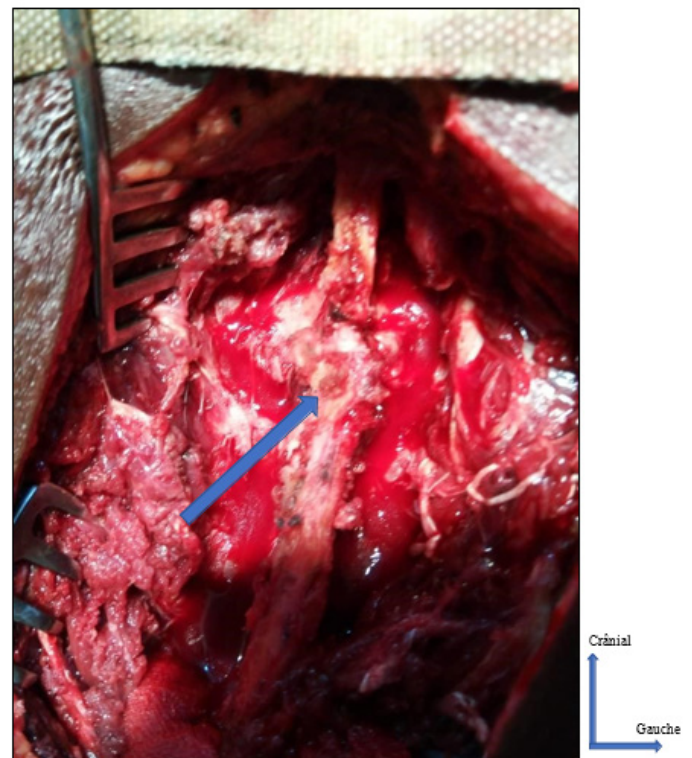


Figure 3 Intraoperative image of a spinous process ablation showing the hypertrophied ligamentum flavum (blue arrow) (Neurosurgery operating room of the HNN).

With 88.79% of cases, low back pain was the predominant functional symptom. This is consistent with several studies, including Khalid (5) at CHU Hassan II in Fès, 2010, and Hajar¹¹ in 2022 at the Military Hospital of Meknes, reporting 70.2% and 82%, respectively. This confirms that low back pain remains the main clinical symptom in lumbar stenosis, highlighting the importance of pain management in the treatment of this condition.

The “bell” sign was observed in 43% of cases, which is similar to the 40% frequency reported by Postacchini et al.¹⁷ Similarly, the Lasègue’s sign was positive in 17% of patients, with bilateral involvement in 78% of these cases. Vanti et al.¹⁸ reported a prevalence of 30–40% among patients with lumbar pathologies, though this variability may reflect differences in sample populations. Additionally, a study by Lombafit¹⁹ reported the Lasègue’s sign in 25% of patients with lumbar stenosis, slightly higher than in our series. Differences in prevalence can be attributed to exam techniques, patient selection, and diagnostic criteria used in each study.

Gait analysis showed that 43.93% of patients required assistance to walk, while 33.64% were unable to walk independently. In the literature, Katz et al.²⁰ in 2008 reported that nearly 50% of patients with lumbar stenosis exhibit marked limitations in walking, consistent

with our findings. However, some studies report a lower rate of patients needing walking assistance, around 30%,²¹ which may reflect differences in patient management or selection criteria.

In our study, MRI was performed in 60 patients (56% of cases). Lumbar canal narrowing was observed in all patients who underwent this exam (100%), while ligamentum flavum hypertrophy was found in 75% of cases. Our results align with the literature: Lurie et al.²² in the United States reported that lumbar canal narrowing is an almost constant finding in patients with symptomatic lumbar stenosis, with detection rates around 95–100%. Another study in Japan by Matsumoto et al.²³ found ligamentum flavum hypertrophy in 70–80% of patients.

Simple lumbar decompression was the most frequently performed surgical procedure, with a rate of 98.13%. This predominance is consistent with published data. A literature review in the United States by Weinstein et al.²⁴ reported that surgical decompression without fusion is the most commonly used technique for lumbar stenosis, with rates ranging from 85–95% of cases. Our results confirm this trend, suggesting a conservative surgical approach primarily aimed at restoring the canal diameter without additional stabilization.

At postoperative day 7 (J7), outcomes were favorable in the majority of cases, with no complications in 83.18% of patients. However, 9.35% of patients still experienced persistent pain. These findings are consistent with data from Finland by Malmivaara et al.,²⁵ which reported persistent pain after lumbar decompression in about 10% of cases in the immediate postoperative period. Nevertheless, this pain generally diminishes over time with rehabilitation and adapted analgesic treatment.²⁶ These results highlight that, although most patients experience favorable outcomes, postoperative pain remains an issue that requires monitoring, particularly during the first weeks after surgery.

Conclusion

Lumbar spinal stenosis is a common condition, often underdiagnosed in African settings. Analysis of our series shows that decompression surgery is effective and well tolerated. Improving access to imaging and surgical infrastructure is crucial to optimize the management of patients with LSS in developing countries.

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Conflicts of interest

The authors declare that there are no conflicts of interest.

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