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Surgical treatment and outcomes for lumbar spinal stenosis in a limited resource setting: A review of 238 cases

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Abstract

Background: One of the common degenerative spinal disorders is lumbar spinal stenosis (LSS). Results after LSS surgery are satisfactory, but complications are not rare. This study aimed to evaluate the surgical treatment and the quality of life of patients after LSS surgery.

Methods: We performed a retrospective, descriptive and transversal study in the neurosurgery unit of Sylvanus Olympio teaching hospital and CHR Lomé commune from January 2015 to December 2020. We analyze patients' demographics, the operative procedure, complications, and outcomes. In addition, the Oswestry Disability Index (ODI) (8) was used to assess the patient's quality of life.

Results: Two hundred and thirty-eight patients underwent surgery for LSS. They were 93 (39,07%) men and 145 (60,92%) women. We performed laminectomy without instrumentation for 163 (68.49%) patients and laminectomy with a spinal fixation on 75 (31.51%) patients. Complications after surgery occurred on 21 (8.82%) patients (table 4). The global mortality rate was 1.26%. One year after surgery, 8.8% had moderate pain (ODI 21 - 40%), and 91.2% (ODI 0 - 20%) had minimal pain.

Conclusion: Surgery improves the physical condition of selected patients operated for LSS. Pedicle screw does not offer additional benefit.

Keywords: degenerative spine disease, lumbar spinal stenosis, lumbar spine decompression

Introduction

Background

Degenerative lumbar spine disease (DLSD) is a common neurological condition in Africa [1-3]. One of the common degenerative spinal disorders is lumbar spinal stenosis (LSS). In Subsaharan Africa, surgical management of LSS is essential in neurosurgical practice [1, 4-6]. Results after LSS surgery are satisfactory, but complications are not rare [5]. The discomfort of LSS added to the burden of healthcare expenses are many factors to hamper patients' quality of life [7]. This study aimed to evaluate the surgical treatment and the quality of life of patients after LSS surgery in a limited resource setting.

Patients and Method

We conducted a retrospective, descriptive and transversal study in the neurosurgery unit of Sylvanus Olympio teaching hospital and CHR Lomé commune from January 2015 to December 2020.

We included all patients who underwent surgical management for LSS. All patients gave oral consent to participate in this study. The ethical committee of the hospital approved the study. The diagnosis of LSS was established by clinical exam and by imaging (CT scan and or MRI).

We used intraoperative C-arm fluoroscopy for procedures with screw placement. We analyze patients' demographics, the operative procedure, complications, and outcomes. We used the Oswestry Disability Index (ODI) [8] to assess the patient's quality of life at three months, six months, nine months, and 12 months.

Statistical Package for Social Sciences (SPSS) version 25 was used for the data analysis. Variables with a p-value < 0.05 were statistically significant.

Table 1: Oswestry disability index Score

Score	Interpretation
0 - 20%	Minimal disability
21 - 40%	Moderate disability
41 - 60%	Severe disability
61 - 80%	Crippled
81 - 100%	Bed-bound or exaggerative patients.

Results

Two hundred thirty-eight patients underwent surgery for LSS during the study period. They were divided in 93 (39,07%) men and 145 (60,92%) women. The mean age of the series was 51.4 ± 15.3 years. At presentation, 158 (66.38%) patients had severe pain on VAS (Table 2), and 172 (72.27%) patients were disabled (ODI 61 - 80%) (Table 3). One year after surgery, 227 (95.37%) patients reported a VAS < 4 (table 2).

We performed laminectomy without instrumentation for 163 (68.49%) patients. In addition, we did arthrodesis, laminectomy with a spinal fixation on 75 (31.51%) patients.

Complications after surgery occurred on 21 (8.82%) patients (table 4).

The global mortality rate was 1.26% (3 patients).

Table 2: Comparison of visual analogue scale pre-op and post-op.

	pre-op	3 months post-op	6 months post-op	9 months post-op	12 months op
mild pain [0 – 4]	0	126	178	178	227
moderate pain [4 – 8]	80	67	40	40	11
severe pain [8 – 10]	158	45	20	20	0

Table 3: Oswestry disability index score evolution pre-op and post-op.

	Pre-op	Three months post-op	6 months post-op	9 months post-op	12 months post-op
		Instrumentation	Instrumentation	Instrumentation	Instrumentation
		No Yes	No Yes	No Yes	No Yes
minimal 0 - 20%	0	8 19	56 32	63 38	149 68
moderate 21 - 40%	0	143 52	96 41	91 37	14 7
severe 41 - 60%	54	7 1	7 0	5 0	0 0
crippled 61 - 80%	172	3 0	3 1	4 0	0 0
Bed bound 81 - 100%	12	2 2	1 1	0 0	0 0
p		*0.06*	*0.18*	*0.04*	*0.21*

Table 4: complications

Complications	N (%)	Treatment	Outcome
pseudomeningocele	2 (0.8)	surgical repair	recovery
dural tear	8 (3.36)	surgical repair	recovery
CSF leak	3 (1.26)	surgical repair	recovery
wound infection	8 (3.36)	Antibiotic, surgical repair	recovery

Discussion

One of the most typical conditions in African neurosurgical practice is lumbar stenosis (1, 4, 5). In our study, we report a female preponderance (sex-ratio = 1.6). Mijiyawa *et al* [9]. Also reported that female preponderance, whereas Levy *et al* [10]. had a male preponderance.

After a failure of conservative measures, LSS is an option in managing lumbar spine disease [11]. Single or multilevel decompressive laminectomy is the standard surgical treatment for degenerative LSS [12]. The other option of posterior surgery is pedicle screw instrumentation in patients with chronic low back pain [13]. There is no consensus in the choice of standalone decompression or combination with pedicle screw [14]. The benefits of single or multilevel decompressive laminectomy have been reported for LSS surgery [12, 15-17]. When there is spinal instability, decompression with fusion is preferable [18, 19].

Institutional surveillance is necessary to keep the surgical standards at a standard level owing to the high incidence of lumbar spine surgeries [20-22].

The health condition of the patient and the problems regarding the operative environment are the two types of surgical morbidity associated with LSS [23, 24]. The rate of postoperative complications varies between 7% to 10.9% [4, 20, 25, 26]. We reported 8.82% of complications in our series (Table 4). The risk of complications may increase with age [27]. The mean age in our series was 51.4 ± 15.3 years. Djientcheu *et al* [4]. Found a mean age of 57.3 years. According to Schoenfield *et al* [25]. mean age was 55.9 ± 14.5 years, and 51.47 ± 17.5 according to Pereira *et al* [28]. Over 75 years of age, the complication rate could rise 18% [27].

Dural tear and wound infection are primarily reported in complications of LSS [26, 28, 29]. The infection rate in our series was 3.36. It is similar to the 3% reported by Fatigba *et al* [26], the 3.9 % reported by Djientcheu *et al* [4]. Our rate of infection is inferior to the 4.9% of infection reported by Smith *et al* [30]. and 7.34% of Pereira *et al* [28]. The rate of dural tear in our study was 3.36%. It is similar to the 3.1% of Fu *et al* [20]. Our dural rate is lower than the 4.9% of Djientcheu *et al* [4]. and the 7.4% of Strömqvis *et al* [31].

Endler *et al* [32]. reported outcomes improved after surgery without statistically significant differences, whether non-instrumented or instrumented surgery. That is similar to our study (Table 3).

The standard tool in assessing patients with low back pain is the ODI [8, 33]. Nevertheless, it should not be used alone in assessing walking limitations in patients with lumbar stenosis [34]. One hundred fifty-eight patients (Table 2) presented with severe pain (VAS 8 - 10). Three months after surgery, 28.15% of patients had moderate pain in our study. This rate is lower than the 59.6% rate of Bello *et al* [7]. The surgery aims to improve the quality of life of patients [35]. At presentation, our study showed that 76.47% were crippled (ODI 61 - 81%) and bed bounded (ODI 81-100%). One year after surgery, 8.8% had moderate pain (ODI 21 - 40%), and 91.2% (ODI 0 - 20%) had minimal pain. Our findings are similar to Louie *et al* [36]. Caralopoulos *et al* [37]. and Atlas *et al* [35].

Conclusion

Some complications can occur after LSS surgery. In our institution, their rates are low. The surgery improves the physical condition of selected patients operated for LSS. Pedicle screw does not offer additional benefit.

Abbreviations

LSS: lumbar spinal stenosis: ODI: Oswestry disability index: VAS: visual analogue scale: CT: Computed tomography: MRI: Magnetic resonance imaging.

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Availability of data and materials

The datasets used/ or analyzd in this study are available from the corresponding author on reasonable request.

Author's contribution

Agbéko Komlan Doléagbénou participated in the data collection, data analysis, and manuscript preparation.

Essossinam Kpélao participated in the study design, data collection, data analysis, and manuscript preparation.

Mensah Kodjo Hobli Ahanogbé participated in the data collection and data analysis.
Komi Egu participated in the data collection and data analysis.
Anthony Katanga Békéti participated in the data collection.
All authors read and approved the final manuscript.

Ethics approval
The current retrospective study was approved by the Sylvanus Olympio Teaching Hospital Ethic committee. The informed consent was obtained from each patient.

Competing interests
There are no conflicts of interst.

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