Features and Outcome of Surgical Management of Spinal Tumors in a Cohort of Nigerian Patients

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■ OBJECTIVE: **There is a dearth of information on operated cases of spinal tumors in patients in sub-Saharan Africa. The objective of this study was to evaluate the histologic pattern, anatomic distribution, and extent and outcome of surgery of Nigerian patients with spinal tumors.**

■ METHODS: **This retrospective study comprised a cohort of Nigerians who underwent surgery for spinal tumors. Data obtained included patient demographics, duration of symptoms, anatomic location, imaging findings, Frankel grading before and after surgery, and type and outcome of surgery. Univariate analysis was performed, and results were compared with results from other parts of the world.**

■ RESULTS: **There were 59 patients (male-to-female ratio 1:1.1) with a bimodal age distribution. The highest (20.34%) incidence was seen in the 20–29 age group. More than half (58.06%) of the patients presented with a duration of symptoms of at least 6 months (duration of symptoms was >12 months in 35.48%). Motor deficit was present in 97.73% of patients at presentation. Functional grading was Frankel A in 38.10% of patients, Frankel C in 26.19%, Frankel B in 16.67%, Frankel D in 16.67%, and Frankel E in 2.38%. The tumors were mostly in the thoracic region (65.45%), and 58% were extradural in location. Gross total tumor excision was performed in 50.88% of the cases, and subtotal resection was performed in 24.56%. Spinal stabilization was performed in 17.86% with spinous process wiring and vertical strut being the most common method of stabilization (80%) among this group. Metastasis was the most common histologic tumor type (23.21%). Meningioma accounted for 12.50% of tumors, and ependymoma, astrocytoma, and hemangioma each accounted for 7.14%. The most common source of metastasis was the prostate (38.46%). Postoperatively, 45% of patients improved neurologically, 52.5% remained the same, and 2.5% deteriorated. There was no perioperative mortality.**

■ CONCLUSIONS: **Metastasis was the most common histologic type of spinal tumor in this study, and the most common location was extradural. The outcome was satisfactory in most cases with neurologic function remaining the same or improving after surgery in most patients.**

INTRODUCTION

Spinal tumors are commonly encountered in neurosurgical practice. The spine is the third most common site of abnormal cell proliferation (18). Tumors can arise from the spinal cord or its surrounding structures or occur as metastasis from other locations in the body. They cause significant morbidity with patients having poor neurologic status (3, 20). Spinal tumors can be classified as extradural or intradural; the latter tumors are further classified as extramedullary or intramedullary. The clinical presentation is usually related to the location and nature of the lesions. They may progress slowly or sometimes develop rapidly, especially malignant and aggressive neoplasms. Treatment of spinal tumors is complex, and a multidisciplinary approach is required (2). Contemporary treatments include surgery, radiation therapy, and chemotherapy (2, 6, 8, 9, 19). Surgery for spinal tumors is particularly challenging in view of the delicate nature of the surrounding structures. There is a dearth of information on

Key words
- Nigerians
- Outcome
- Spinal tumor
- Surgery

Abbreviations and Acronyms
FNAC: Fine-needle aspiration cytology

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operated cases of spinal tumors in patients in sub-Saharan Africa. Little is known about the clinicoradiologic features and outcome of surgery for these lesions in this part of the world. The objective of this study was designed to evaluate the clinical features, anatomic distribution, histologic pattern, and extent and outcome of surgery in a cohort of Nigerians with spinal tumors who presented to our service.

MATERIALS AND METHODS

This is a retrospective study of all the patients who presented to our service and subsequently underwent surgery for spinal tumors between January 2004 and September 2013. Data were collected from hospital case notes and operation and pathology registers. We obtained data on the age and sex of patients, duration of symptoms before presentation, presenting symptoms, anatomic location of the tumors, imaging findings, preoperative and postoperative Frankel grading, histology and type of tumors, outcome of surgeries, and duration of follow-up. Univariate analysis was performed and results were compared with results from other parts of the world.

RESULTS

The study population comprised 28 male and 31 female patients, with a male-to-female ratio of 1:1.1. There was a bimodal age distribution with the highest incidence seen in the 10–29 and 40–59 age groups (Figure 1). The mean age of patients was 43.49 years ± 19.72.

Data on clinical presentation were available for 39 patients. Among these, motor deficit was present in 97.73% of patients at presentation; only 1 patient (2.27%) presented with pain only. More than half (58.06%) of the patients presented with symptoms of at least 6 months' duration with 35.48% presenting with symptoms lasting >1 year. Preoperative functional grading was Frankel A in 38.10%, Frankel C in 26.19%, Frankel B in 16.67%, Frankel D in 16.67%, and Frankel E in 2.38%.

Of the tumors, 65% were in the thoracic region, and 16.36% were in the cervical region (Table 1). Extradural location was the most common accounting for 58% of the cases; 22% were intradural-intramedullary, 18% were intradural-extramedullary, and the remaining 2% spanned extradural and intradural anatomic regions. Gross total tumor excision was performed in 50.88% of the cases, and subtotal resection was performed in 24.56% (Table 2). Spinal stabilization was performed in 10 patients; 8 of these had spinous process wiring and vertical strut (Adeolu et al. technique) (1); 1 patient each had pedicle screws with rod and spinous process wiring (Rogers' wiring technique) (16).

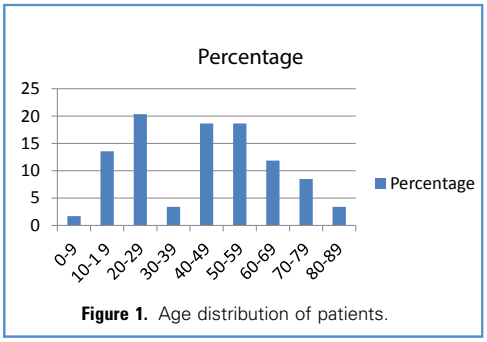

Figure 1. Age distribution of patients.

Table 1. Regional Distribution of Spinal Tumors

Region	Frequency	Percentage
Cervical	9	16.36
Thoracic	36	65.45
Lumbar	3	5.45
Craniocervical	2	3.64
Cervicothoracic	3	5.45
Thoracolumbar	2	3.64
Total	50	100

Histology was available for 56 patients; metastasis was the most common histologic tumor type accounting for 23.21%, followed by meningioma in 12.5% of cases, and ependymoma and astrocytoma each accounted for 7.14%. Further histologic types are as shown in Table 3. Astrocytoma was the most common tumor type in patients <30 years old accounting for 20%, whereas hemangioblastoma and lipoma accounted for 15% and 10%, respectively, in this population. The prostate was the most common source of metastasis in this population (38.46%).

Information on postoperative status was available in 40 patients. Neurologic status improved in 45% (18 of 40) of patients postoperatively. Neurologic status improved by 2 or more Frankel grades in 12 (66.66%) patients, and it improved by a single Frankel grade in 6 (33.33%) patients. Of 40 patients whose preoperative and postoperative Frankel grades were available, 14 (35%) had Frankel A. Of these patients, 6 (42.86%) improved, all by 2 or more Frankel grades. Of 6 patients, 5 (83.33%) improved from Frankel A to Frankel D; 1 patient (16.66%) improved from Frankel A to Frankel C. Table 4 summarizes the postoperative outcome. The mortality rate was 10.52% in this series. None of the deaths occurred within 30 days of surgery. Only 48.48% of the patients were followed for >6 months. Illustrative images of some of the patients in the series are shown in Figures 2–4.

Table 2. Extent of Surgical Resection

Extent of Resection	Frequency	Percentage
Gross total resection	29	50.88
Subtotal resection	14	24.56
Open tumor biopsy	2	3.51
FNAC	3	5.26
Extent of resection not otherwise stated	9	15.79
Total	57	100

FNAC, fine-needle aspiration cytology.