Original Article

Presentation, Management and Short-Term Outcomes of Extradural Spinal Tumours at The University Teaching Hospital in Lusaka, Zambia

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ABSTRACT

Objectives: To investigate the clinical presentation of patients with extradural spinal tumours and establish the factors that determined the treatment they received and outline the outcomes of that treatment at the University Teaching Hospital between January 2013 and December 2016.

Material and Methods: This was a retrospective study of the presentation, management and short-term outcome of extradural spinal tumours at the University Teaching Hospital. A questionnaire was used to obtain data from patients' hospital records. Data was analysed using Microsoft Excel and the Statistical Package for Social Sciences version 25 software.

Results: Of the 62 patients in the study,34 were female and 28 male. The age range was 14 to 87 years, with a mean of 55.03. Backache (93.8%), Limb weakness (91.9%), loss of sensation (50%), urine and stool incontinence (43.5% and 41.9% respectively), back deformity (11.3%), night pain (85.5%), weight loss(67.7%), poor appetite (61.3%), fever (35.5%) and night sweats(29%) were common symptoms. Sixty-eight percent of patients were bedridden. Visual Analogue Scale scores were greater than 5 in 84% of patients. A muscle power grade of 3 or less (n=48), impaired muscle tone (n=38), abnormal reflexes (n=52), presence of a sensory level(n=37) and back deformity (n=17) were common signs. Plain radiography, Computed Tomography Scans, Magnetic Resonance Scans and Tecnetium Bone scans were done in 60, 35, 17 and 2 patients respectively. The commonest surgical host category was A (64%). Secondary Extradural Spinal Tumours comprised 82% while 18% were primary. Surgery was done in 14 patients with 1 failing to afford implants. Forty-eight received nonsurgical treatment. Nineteen percent of patients had improved pain scores but the rest remained the same or worsened after treatment. Complications included decubitus ulcers, Urinary Tract Infection, Deep Veinous Thrombosis, pneumonia, sepsis and joint stiffness. Fourty patients died and eighteen patients were lost to follow-up.

Conclusions: The ages of patients followed normal distribution with female to male ratio of 1.2 to 1. Most patients presented with symptoms and signs of advanced disease. The type of extradural spinal tumour, stage of disease, completeness of diagnostic workup, availability of implants, need for tissue diagnosis, type of surgical host and availability of nonsurgical treatment modality determined the choice of treatment. Poor outcomes in quantity and quality of life are a reflection of the late presentation, delayed diagnosis, lack of resources and difficulty of

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treating these tumours. Extradural spinal tumours are not uncommon and cause significant morbidity and mortality in those affected.

INTRODUCTION

Spinal tumours are abnormal new growths arising in tissues in the spine. They may also be secondary deposits (metastases) to these tissues. They are classified anatomically as extradural or intradural. Studies have shown that extradural spinal tumours are more common and that the metastatic types occur more frequently.

The disease burden from these tumours is not known or documented at our institution. Anecdotal observation show general difficulty with distinguishing tumours from the commoner infective processes or degenerative conditions of the spine in our setup. This contributes to late or incorrect diagnosis and late institution of treatment or institution of incorrect treatment leading to poor outcomes. Patients present late when the disease is advanced or when they have developed complications. This is attributed to lack of knowledge about spinal tumours as patients may trivialise early symptoms. The poor health-seeking behaviour of our population may becontributory.

METHODS

This was a retrospective study conducted at the University Teaching Hospital in Lusaka, Zambia. It involved collection of data using a predetermined questionnaire from hospital records of patients who presented with extradural spinal tumours from 1st January 2013 to 31st December 2016.

The study population comprised male and female patients diagnosed with extradural spinal tumours. Any patient with an intradural spinal tumour, concurrent injury, infection or degenerative condition of the spine was excluded.

A pilot study was conducted to answer the question of availability of patients' files for data retrieval and whether the files would contain data needed for this study.

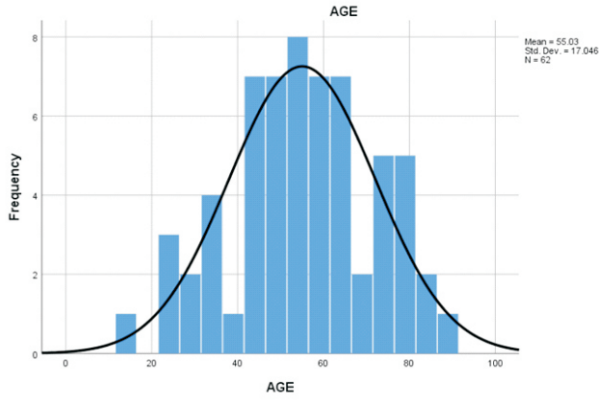
Analysis of data was done using the Statistical Package for Social Sciences (SPSS) version 25 and Microsoft Excel software.

RESULTS

Background Characteristics

Sixty-two patients' files were included in the study. Out of these, 34 patients were female and 28 male. The age ranged from 14 to 87 years. Thirty-three patients came from urban while 29 came from rural areas. Forty-seven patients were married while 15 were single. Only 15 patients were in employment and 47 were not.

Figure 1: Age Distribution of patients



Symptomatology

Patients presented with symptoms that included backache (93.5%), weakness in limbs (91.9%), sensory loss (50%), loss of urine (43.5%) and stool (41.9%) control, back deformity (11.3%), abnormal gait 8.1%), poor appetite (22%), weight loss (24%), night pain (31%), night sweats (10%) and fever (13%). Others were lower urinary tract symptoms(32.3%), breast lump (24.2%), mass in the neck (9.8%), cough(32.3%), shortness of breath (9.7%) and abdominal mass(14.7%).

Examination Findings

Forty-two patients were bedridden, 17 were ambulating normally while 3 were wheel-chairbound at presentation. Visual Analogue Scale scores of 5 or more were noted in 57 patients, three

patients scored 5 and only two patients scored less than 5. Muscle tone was reduced in 38 patients, normal in 6 and increased in 20.

Muscle power was graded 0 in twenty-four, 2 in two, 3 in seventeen, 4 in thirteen and 5 in six patients respectively. Deep tendon reflexes were absent in 10, reduced in 26, normal in 8 and increased in 18 patients. A sensory level was present in 37 patients but only 17 patients had back deformity. Findings of digital rectal examination for perianal sensation and anal sphincter tone were increased in 3 and 6 patients, normal in 24 and 22 patients, and reduced or absent in 35 and 34 patients respectively. Sixty-four percent of the patients were category A, 26% were category B and 10% were category C surgical hosts.

Radiological Studies

Plain radiography, Computed Tomography Scans, Magnetic Resonance Imaging and Technetium Bone scans were done in 60, 35, 17 and two patients respectively.

Reasons for not doing advanced radiological scans were lack of funds (CT Scan n=5, MRI n = 6 and Bone scan n =6) and scan not requested (CT Scan n=20, MRI n=37 and Bone Scan n= 54).

Types of Extradural tumours

The tumours were primary in 18% and secondary in 82% of the patients. Out of 11 patients below the age of 40 years only two had primary tumours.

The primary tumours included Kaposi's Sarcoma (n=1), Lymphoma (n = 3), plasmacytoma (n=1), Multiple Myeloma (n=2), peripheral Nerve Sheath tumour (n=1) and undiagnosed (n=3).

Breast and prostate cancers were the commonest cause of secondary tumours affecting 18 patients each. Two were from thyroid and 13 were undiagnosed or indeterminate.

Treatment

Fourteen patients received surgical treatment while 48 were treated nonoperatively. Indications for surgery were biopsy only (n=3), biopsy and decompression (n=2) and biopsy, decompression and spinal stabilisation (n=9). Twelve of the 14 surgically treated patients required implants which they needed to buy and one patient was unable to afford implants.

Reasons for nonoperative treatment were advanced disease (n=43) and availability of nonsurgical treatment modality(n=5).

Neoadjuvant therapy was given to 18 with secondary extradural spinal tumours while the rest were not given either because of lack of tissue diagnosis (69%) or no indication (2%).

Adjuvant therapy was given to 25 patients. Reasons for not giving adjuvant therapy were delayed tissue diagnosis (n=9), no tissue diagnosis (n=13), death before treatment could be commenced (n=5), lost to follow up (n=4), inability to afford further tests at Cancer Diseases Hospital after being referred (n=3), unfit for therapy (n=2) and patient not referred (n=1).

Outcomes

Improvement was noted in Visual Analogue Scale scores for backache in 12 patients. Mobility, muscle tone, deep tendon reflexes, muscle power grade, Frankel grade and back deformity improved in only two patients. The majority of patients either remained the same or worsened clinically.

Complications included superficial wound infection (n=2), decubitus ulcers (n=32), urinary tract infection (n=30), pneumonia (n=25), sepsis (n=25), joint stiffness (n=9) and deep veinous thrombosis (n=2).

Forty patients died, 18 patients were untraceable or lost to follow-up and only four were alive. The causes of death were advanced disease (n=20), sepsis (n=15), severe anaemia (n=3) and renal failure (n=2). Eighteen deaths occurred in the first four weeks and 7 occurred after more than 24 weeks of presenting to hospital.

DISCUSSION

Background Characteristics

Extradural spinal tumours followed normal distribution with regard to age at presentation. The age range was 73 years and the standard deviation was 17.046. The mean age was 55.03, the standard deviation was 17.046, the mode was 42 and the Median was 56 years. The results indicate a female: male ratio of 1.2: 1 but this was not a statistically significant difference (p-value of 0.523).

More married people (47) presented to hospital than those without spouses (15), reflecting the importance of family support in the health-seeking behaviour of the population. This is important considering that most patients (bedridden or wheel-chair bound, n=45) needed support to get to hospital.

There were over three times more unemployed people (n = 47) than employed people (n = 15). This reflected in the inability of some to afford certain special tests, radiological studies and surgical implants.

Symptomatology and Examination Findings

Backache (93.5%) and weakness in lower limbs (91.9%) were the most frequent symptoms and this is in agreement with Bach (1) and Clarke *et al*. (2). Patients presented to hospital much earlier when they started having difficulties with control of urine and stool and were unable to walk than when they developed backache alone. However the former are late symptoms of a serious surgical condition that has truly advanced. Night pain, poor appetite and weight loss were the most common constitutional symptoms. Night sweats and fever were not as common. The presence of these symptoms is in agreement with various studies (3, 4, 5 and 6) on the subject.

With 42 out of 62 patients being bedridden at presentation, this study is in agreement with Mwang'ombe and Ouma (7) whose series showed 83% of their patients were unable to walk at presentation. Unless the tumour is rapidly expanding, the inability to walk is indicative of long standing illness and reflects a delay in seeking medical help.

There was significant correlation between VAS scores at presentation and VAS scores at last follow-up, indicating adequate pain management of these patients.

Muscle power was graded 3 or less in 43 patients. Muscle tone and deep tendon reflexes were abnormal in 56 and 54 patients respectively. A sensory level or back deformity was present in 37 and 17 patients respectively. On digital rectal examination, findings were altered in a significantly high number of patients. There was no study in the literature that looked at these parameters to compare with but they are indicative of advanced disease.

Treatment

The type of extradural spinal tumour was taken into consideration when deciding the treatment approach as evidenced by the significant correlation between provisional diagnosis and treatment plan. For secondary EDSTs, the stage of disease was a key factor in deciding the type and timing of treatment.

Surgery was mainly done to obtain tissue for histopathological diagnostic purposes, decompress neural elements, stabilise the spine or for a combination of these. This is in agreement with Spacca *et al* (8).

Initial clinical diagnosis and the completeness of a diagnostic work-up were key in selection of either surgical or nonsurgical treatment. Van Goethem *et al* (9) and Clarke *et al.*(2) agree that MRI scans are key in the clinical evaluation of these patients. It is therefore surprising to note that in only 17 patients was MRI done. The major reason for not requesting MRI scans was that they were not going to change the course of management in patients who were terminally ill. Knowingly or unknowingly, the clinicians, particularly those attending to patients with secondary EDSTs, were using some prognostic tool to determine the treatment a particular patient would receive as guided by Tomita *et al.,* (10).

However, Guzilik (11) has indicated that imaging examinations, magnetic resonance scanning in particular, are crucial for the proper planning of spinal surgery in consequence of metastatic lesions. Further, Kim *et al*., (12) indicated that the surgical management of metastatic disease of the spine continues to evolve and that studies have now yielded level-I evidence on the efficacy of surgery for metastatic disease of the spine in improving quality of life and outcomes.

It is difficult to a make treatment decision based on an indeterminate clinical diagnosis or incomplete diagnostic workup. To this effect, some patients with suspected renal or pulmonary tumours metastatic to the spine never had complete workups because of difficulty with obtaining tissue for histopathological diagnosis in these highly vascular tumours. As a result, these patients were managed without surgery. Kim *et al*., (2012) support the consideration that tumour type and biology, extent of disease, neurological status, patient's expectations, quality of life and life expectancy were key determinants of what treatment a patient would receive.

In our study, tissue diagnosis was critical in deciding whether a patient would benefit from neoadjuvant or adjuvant therapy.

Although the type of surgical host was considered before treatment, there was lack of significant correlation between this and treatment given.

The availability of implants for surgical stabilisation was also key in determining the type of treatment and also the type and extent of surgery to be done on a particular patient.

The availability of a nonsurgical treatment option as standard treatment of choice for a particular condition determined which treatment option to offer the patient. This was largely dependent on the tissue diagnosis either from a biopsy of affected tissue (bone marrow, breast, thyroid, lymph node, skin and prostate) or the spine itself.

Outcomes

Symptomatic relief, presence of complications and mortality were key post-treatment outcome measures. Most patients either remained the same or deteriorated symptomatically. Improvement was seen in terms of relief of backache in 19% of patients as evidenced by the significant correlation between VAS scores at initial presentation and those at last follow-up.

Pearson Correlation coefficients were -0.39, 0.186, 0.59, 0.194 and -0.157 between Frankel grade at presentation and DVT, pneumonia, UTI, sepsis, joint stiffness and death respectively, indicating no significant correlation at the two-tailed 0.01 or 0.05 level between Frankel grade and the indicated complications. However, there was significant correlation at the two-tailed 0.01 level between decubitus ulcers and sepsis, between UTI and sepsis and between pneumonia and sepsis, indicating a vicious circle for each of these complications. There was also significant correlation at the two-tailed 0.05 level between death and sepsis, death and pneumonia, decubitus ulcers and UTI, decubitus ulcers and joint stiffness and decubitus ulcers and pneumonia.

Mortality was high with a death-to-case ratio of 64.5. Advanced disease and sepsis accounted for more than 56% of deaths. The cause-specific death rate was 0.3 per 100,000 population. These rates could be higher if it is to be assumed that those patients who left hospital against medical advice, absconded from hospital or did not return for their scheduled reviews, may have died at home.

There was no significant correlation between death and age, death and sex, death and treatment plan or death and final diagnosis. The common denominator to all deaths was constellation of factors including type and biology of tumour, late presentation, delayed diagnosis, delayed treatment and difficulties with treatment. This is in agreement with the findings of Mwang'ombe and Ouma (2000).

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