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Original Article

Spinal Tumors: Local Experience

Ashraf Mahmood, Yasir Shehzad, Soban Sarwar
Department of Neurosurgery, District Head Quarters teaching Hospital Rawalpindi
Rawalpindi Medical College, Rawalpindi

Abstract

Background: Delay in presentation, diagnosis and management contributes significantly in morbidity (Quadriplegic and Paraplegic Injuries) and mortality of patients of Spinal tumours.

Objective: To assess the outcome of various modalities and treatment related to prevention of permanent disability among these patients based on a local experience.

Material and methods: 40 patients with spinal tumours who were treated surgically at a tertiary care centre of Rawalpindi Medical College & its allied hospitals from February 2010 to February 2012. Frankel grade scale was used to categorize and assess the patients before and after treatment.

Results: There were 23 males and 17 female patients with an average age of 40 years. 15 of the spinal tumours were benign, another 15 were primary malignant and remaining 10 were metastatic tumours from various organs of the body including thyroid, prostate, lungs and the ovaries and the unknown primary. Weakness of the limbs was the most common symptoms followed by spasticity and pain. The average duration of systems was 5 months MRI was the modality used for the diagnosis of these tumours. Plain radiographs of the spine revealed bony changes in 50% of the patients. Histopathology revealed that the primary malignant spinal tumours were mostly lymphomas followed by myelomas and sarcomas.

Conclusion: Overall neurological improvement occurred in 75% of the patients, 2 patients expired after surgery although the mortality was not directly related to the procedure.

Key Words: Spinal Tumours, surgical treatment and outcome.

Introduction

The spinal tumors comprise 15% of the CNS tumors and 2% of all the tumors of body.[1] Three fourths of these are first recognized only in an advanced stage.[2] Less than 10% of the malignant tumors arising from the bone involve axial skeleton (ribs, spine and pelvis). In most series, the most common neoplasm of the spine are metastasis and myelomas and the primary osseous neoplasms generally rank a distant third.

Diagnosis of spinal tumor is usually delayed because the clinical features usually mimic the disc disease. As a result, most patients present with compression of spinal cord when first seen by neurosurgeons. The latest technical improvements in surgical removal of intraspinal tumors include bipolar coagulation, the use of operating microscope, laser excision of intramedullary tumors, intraoperative ultrasonography and ultrasonic cavitation and aspiration for debulking spinal cord lesions.[3]

Correspondence:
Dr. Ashraf Mahmood.
drashraf1964@yahoo.com

Patients and Methods

All patients with spinal tumors (both primary and secondary) who were admitted in neurosurgical unit at DHQ hospital for surgical treatment between Feburary 2010 to 2012 were included in the study. On a predesigned performa the information regarding clinical, neurological, laboratory, radiological and histopathological features were recorded. Every effort was made to search for the primary in patients with metastatic epidural spinal cord compression. MRI was the main modality used to diagnose these cases.[3] Other neuroradiological investigations like CT scan, Radioisotope bone scan and ultrasonography was used in selected cases. Plain x-rays were done routinely in all cases. Patient with known primary lesions with flaccid paraplegia, those with multiple metastases with or without neurological deficit and the moribund patients that were unfit for surgery were

excluded from the study. Forty patients finally included in the study were graded after neurological assessment before and after surgery according to the Frankel grade as follows:

Grade 4: Patients were capable of unassisted ambulation and might have pain and/or difficulty in micturation.

Grade 3: Patients could walk with assistance only.

Grade 2: Patients had trace movements.

Grade0: Patients had a complete motor and sensory loss.

Frankel grade is the latest system (**table IV)**

The treatment consisted of laminectomy and excision of tumor, decompressive laminectomy, and anterior decompression in some of cervical tumors, limited exposure biopsy, radiation therapy, chemotherapy and hormonal therapy either alone or in combination.

The indications for surgery included:

a. Symptomatic patients with benign lesions.
b. Neurologic deficit from mass lesion or vertebral collapse.
c. Intractable pain from spinal tumor.
d. Patients presenting with a recurrence.
e. Biopsy in patients with inoperable lesions to establish a histological diagnosis.
f. Doubtful diagnosis in spite of all available investigations.

Results

Twenty three out of 40 patients were male and 17 females. Male to female ratio being 5:3 (table ll). The age range was 3 -70 years with maximum patients in the age group 3-60 years. The incidence of various tumors is shown in table ll. There were 15 benign and 25 malignant tumors. Spinal metastasis were found to have the highest incidence (25%) followed by spinal meningiomas (22.5%), lymphomas (17.5%), neurilemomas (12.5%), myelomas (7.5%) and sarcomas (5%). Metastatic lesions were mostly seen in lower thoracic and lumbar regions; meningiomas in upper and lower thoracic regions, lymphomas in thoracic and thoracolumbar regions and neurilemomas in cervical and cervicothoracic regions.

Symptomatology: The duration of symptoms at the time of presentation ranged approximately between 14 days to 3 years with an average of 5 months. The most common presenting symptom was weakness of the limbs (36 cases) followed by backache, sensory disturbances, inability to walk and urinary and bowel disturbances, in that order (table lll). At the time of admission, 25 patients were non ambulatory because of motor impairment or severe spinal pain. Posture was abnormal (kyphotic or scoliotic) in 9 patients. The muscle power was reduced in 37 patients.

Investigations: Plain x-rays were done in all the cases and in 20 patients (50%) they were suggestive of disease process (fig1).MRI was done in 37 cases and positive findings were found in most of the patients(fig 2). CT scanning of the spine was done in 3 patients. Raised ESR (more than 25mm after first hour) was found in 70% of the cases with malignant tumors.

29 of 37 patients with a pre-treatment grade of 0-3 improved with treatment, 10 of them up to grade 4. Out of 3 patients in pre-treatment grade 4 , 2 became symptom free after the treatment while one persisted with urinary sphincter problems. Spasticity was the complaint most frequently relieved followed by spinal pain. Approximately 42% (6 out of 13 cases) of grade 0 patients became ambulatory after the surgical decompression and medical therapy. The improvement occurred over a period of approximately 2 years. It was remarkable in patients with benign lesions as compared to those with malignant lesions. With regards to malignant tumors, out of 7 patients with pre-treatment grade 0, only 2 improved. However in most of these patients' intractable spinal pain and spasticity was relieved, this correlate well with study conducted and published in 2009. [9] Out of 34 patients who presented with backache, the symptom were either relieved or its intensity decreased in 30 patients. There were 15 patients who presented with autonomic dysfunction, and improvement occurred in only 5 patients. Four patients were lost in the long term follow up three months after surgery.

Complications: Four patients developed acute postoperative pain, while 2 patients developed wound infection. In one patient with metastatic lesion neurologic status deteriorated to flaccid paraplegia. Progressive kyphosis was seen in another 2 patients.

Mortality: No operative mortality was observed in patients with benign spinal tumors. Two patients (5%) died on 12th and 30th post-op days .Causes of death were post-operative wound infection leading to meningitis in one patient and septicaemia in one with lymphoma and postoperative pneumonia in the other patient with broncogenic carcinoma.

Discussion

The true incidence of spinal tumors is unknown. Estimates based on population studies vary from 1 – 13 per 100,000 population. In most of the series, the most common neoplasm of the spine are metastasis and myelomas, and primary osseous neoplasms generally rank a distant third. In our study, metastases

Table 1—Breakdown of management

Tumor	No of cases	Complete excision	Decomp laminectomy and subtotal excision	Biopsy	Radiotherapy	Chemotherapy	Other
Metastatic	10	-	05	05	10	04	05
Meningioma	09	07	02	-	-	-	-
Malignant Lymphoma	07	-	06	01	07	07	-
Neurolemoma	05	04	01	-	-	-	-
Myeloma	03	-	02	01	03	03	-
Sarcoma	02	-	01	01	02	01	01
Chondroma	01	01	-	-	-	-	-
Giantcell tumor	01	-	01	-	01	-	-
Astrocytoma	01	-	01	-	01	-	-
Ependymoma	01	01	-	-	01	-	-
Total	40	13	19	08	25	15	06

were found to be the most common spinal neoplasms, but the malignant epidural lymphomas outnumbered the other primary malignant tumors. The patients with spinal lymphomas responded very well to surgery in combination with post-operative radiotherapy and chemotherapy. In our study, intramedullary tumors were relatively uncommon (12.5% of primary intradural tumors).

A vast variety of intramedulary neoplasm including astrocytomas, oligoderogliomas, ependymomas and primitive neuroectodermal tumors (PNET) can occur in spinal cord.[4] Spinal metastasis were the single most common neoplasms in our series (10 out of 40 cases). However if combined together, the primary malignant (11 cases) and intradural benign neoplasms (14 cases) had a higher incidence. Shaheen et al at AKUH found 33 patients with malignancy induced extradural spinal cord compression. In our series 23 patients presented with malignancy induced spinal cord compression. In majority of the patients, the earliest symptom of the spinal cord compression (SCC) was backpain.[5] In our study, backache was observed in 85% of the cases more prominent among patients with malignant disease. Weakness was observed in 90% of our case .it had been reported almost equal frequent in AKUH series (97%).[5] In our series only 33% of patients with autonomic dysfunction improved. This compares favorably with the studies reported by others.[6]

Hence autonomic dysfunction is a poor prognostic factor in the management of spinal tumors. As already reported intact bony changes in plain films are found in approximately 50% of cases of spinal tumors[5]. In our series a similar incidence was observed. Ct scanning provided better resolution in demonstrating the tumor invasion. (fig 2) Surgery is still the treatment of choice for benign and most of the malignant spinal tumors. The goal of surgical treatment for metastatic spinal tumors is to maintain neurological function without pain for the remaining life.[7] The median survival of surgically treated patients with metastatic disease has been reported to be 13 months, compared to 3 months for those treated by radiation alone.

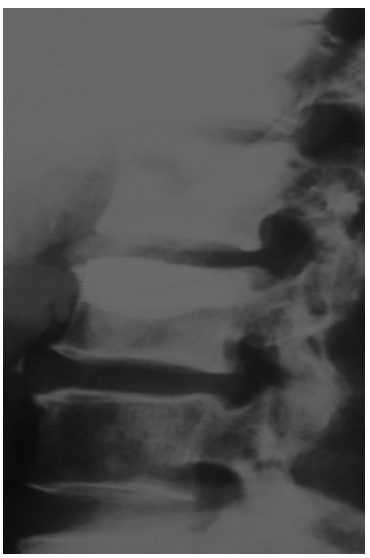

Fig I. Plain x-rays showing metastatic involvement of spine

More and more authors are recommending the use of posterior spinal stabilization at the time of laminectomy, the most popular being Harrington distraction rods with or without segmental wiring and pedicle screw fixation. Age is not the contraindication to spinal surgery in elderly. Some of our cases were more than 60 years of age and they did fairly well after the surgery. [6]

In our series no mortality was observed in patients with benign lesions. Solero et al reported an operative mortality of less than 1% in patients with spinal meningiomas.[8] New modalities are emerging in recent years and better outcome is expected. [9-11]

Table-II Gender distribution of spinal tumors

Tumor type	**No of cases**	**Male**	**Female**
Intradural			
Meningioma	09	01	08
Neurolemmoma	05	04	01
Astrocytoma	01	01	
Ependymoma	01	01	
Extradural			
Metastatic	10	06	04
Thyroid	03		
Prostate	03		
Ovary	01		
Lung	01		
Adenocarcinoma (Unknown primary)	02		
Non metastatic	14	10	04
Malignant lymphoma	07		
Myeloma	03		
Sarcoma	02		
Chondroma	01		
Giant cell tumor	01		
Total	40	23	17

Table –III clinical presentation n=40

Symptoms	**No of cases**	**%**
Weakness	36	90%
Backache	34	85%
Sensory disturbance	26	65%
Inability to walk	25	65%
Urinary problems	15	37%
Altered bowel habits	10	25%

Table IV. Frankel Classification of grading Acute spinal cord injury

Grade A	Complete neurological injury - no motor or sensory function clinically detected below the level of the injury.
Grade B	Preserved sensation only - no motor function clinically detected below the level of the injury; sensory function remains below the level of the injurybut may include only partial function (sacral sparing qualifies as preserved sensation).
Grade C	Preserved motor non-functional - some motor function observed below the level of the injury, but is of no practical use to the patient.
Grade D	Preserved motor function - useful motor function below the level of the injury; patient can move lower limbs and walk with or without aid, but does not have a normal gait or strength in all motor groups.
Grade E	Normal motor - no clinically detected abnormality in motor or sensory function with normal sphincter function; abnormal reflexes and subjective sensory abnormalities may be present.

Fig ll MRI appearance of extradural meningioma

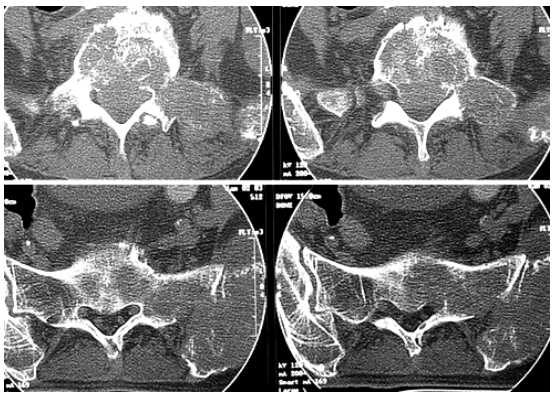

Fig. III CT scan of spine showing vertebral destruction

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Corrigendum

The article "spectrum of renal stone composition “published in the previous issue of IJP (International Journal of Pathology; 2011; 9(2): 63-66) the 2nd Author’s correct name is Umme Farwa Shigri and not Farwa Shigri. Please note the correction.