ORIGINAL ARTICLE

Experience with 349 cases of intradural spinal tumors at Lady Reading Hospital Peshawar

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Abstract

Objective: To analyze the variables of patients operated for intradural spinal tumors at Lady Reading Hospital Peshawar.

Study design: An analytical descriptive study

Place and duration of study: Department of Neurosurgery Lady Reading Hospital Peshawar, from April 2003 to March 2010 (7 years).

Materials and methods: Medical record of patients with spinal tumors were revised and patients suffering from intradural spinal tumors were searched. There were total 572 cases of spinal tumors, of which 349 had different intradural lesions. Their clinical features, radiological reports, peroperative findings and histological reports were analyzed in different aspects.

Results: Of the total 349 patients with intradural spinal tumors 201 were males and 148 female, with male to female ratio of almost 1.4:1. Age of the patients ranged between 2 years to 77 years, with median of 39.2 years. The common clinical features were backache, leg weakness, parasthesia and poor sphincters. Magnetic Resonance Imaging of the spine was the main (309 cases) diagnostic tool along with plain x-ray and myelography in limited cases (35 cases). CT myelogram was done only in 5 cases. Dorsal spine was involved in 62.5% cases, lumber and cervical spine in 25.5% and 12% patients respectively. Neurofibroma was the commonest (51%) intradural spinal tumor, we also had meningioma in 30.66%. Other intraspinal lesions were dermoid, lipoma, ependymoma, astrocytoma, tuberculoma, arachnoid and hydatid cysts.

Conclusion: Of all the spinal tumors intradural are more common (61%) than extradural. Neurofibroma and meningioma constituted majority of cases belonging to extramedullary intradural group, while ependymoma and dermoid were common intramedullary tumor. 3rd and 5th decade of life were the common age group for both intramedulary and extramedullary tumors. Intramedullary tumors were common in 3rd decade of life.

Key words: Spinal tumors, neurofibroma, meningioma, spine dermoid

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Introduction:

Spine is a site of various primary and metastatic tumors. Metastatic spinal tumors are mostly extradural while primary spinal lesions are usually intradural[1]. The majority of the intradural spinal tumors respond satisfactorily to surgical excision[2].

There are varieties of primary spinal tumors and constitute almost 15 % of all primary CNS lesions, out of which 65 to 82 % are intradural. Intradural extramedulary tumors are mainly, neurofibroma and meningioma making about 80-90% of these tumors. Lipoma, dermoid, epedermoid and drop metastasis are less common. Only 7-22% are intramedullary either astrocytoma or ependymoma[3]. Neurofibroma may occur as a sporadic solitary lesion or be associated with neurofibromatosis (NF1)[4,5].

The clinical features mimic different neurological disorders like entrapment neuropathy, intercostal neuralgia and referred pain like angina, cholycystitis and renal pain. Sciatica is a

common symptom in tumors at or below conus medularis. Cord compression is leading to long tract signs as quadriplegia. Paraplegia is late neurological dysfunction resulting in significant morbidity, bed sores and sphincteric problems[6].

Material and methods:

This observational study was conducted at the departments of neurosurgery, PGMI, Lady Reading Hospital Peshawar; between April 2003 to march 2010. The source of patients was out patient department and referral from other medical and allied units. The medical record of all patients with spinal tumors was seen and patients with intradural tumors were analyzed in detail. Out of 572 patients admitted as diagnosed cases of spinal tumors, 349 were intradural tumors and operated in the neurosurgery department. All these patients were belonging to different areas of Khyber Pukhtoon Khwa. Apart from the demographic data, clinical, radiological, and histological feature were evaluated. All the patients were operated after establishing a neuroradiological diagnosis. Neuroradiological investigations included X-Ray myelography; CT myelography and MRI of the concerned area was done. Preoperative work up was done. Loop guided localization was done in the cervical, thoracic and thoracolumber area. All the patients under went lamenectomy and microscopic decompression was done. Gross total resection was done in intradural extramedullary tumors. Median myelotomy was performed for intramedullary lesions and far lateral and transspinal approach in cases of dumbbell tumors. For tissue diagnosis, biopsy was taken and preserved in 10% formaline and sent to laboratory. All cases wee reported by one senior pathologist. In cases of doubtfully diagnosis, a second opinion was taken.

Results:

We studied 572 patients with spinal tumors out of which 349 (61%) patients had intradural spinal lesions. Their ages ranged from 2 and half to 77 years, with mean age of 39.5 years. Of the total 349 patients with intradural spinal tumors 201 were males and 148 females, with male to female ratio of almost 1.4:1 (Figure 1).

In 305(87.4%) patients, the onset was insidious and in 44(12.6%) patients, the onset was acute. 284(81.4%) patients were admitted from OPD whilst 65(18.6%) cases were received from medical and neurology units.

The commonest clinical features in our study was backache in 262 (75.1%) patients, leg weakness in 247 (70.77%) cases, parasthesia and poor sphincters were observed in 107 (30.7%) cases. 17.4% patients had Interscapular pain and Sciatica was presenting feature in 7.5 % cases.

MRI spine was the main diagnostic tool and was done in 309 (88.5%) cases. plain x-ray and myelography was done in 35 (10.03%) patients. CT myelographs was done in 5 (1.4%) cases only.

Dorsal spine was involved in 62.5% cases whilst lumber and cervical spine was involved in 25.5% and 12% patients respectively.

Neurofibroma was the commonest (51%) intradural spinal tumor followed by meningioma (30.66%). Incidence of other intraspinal lesions is shown in Table 1.

Discussion:

Spinal canal is a confined space and expanding spinal tumors within this space may have a devastating effect upon the function of spinal cord and nerves. Patients with spinal tumors constitute a large group of patients presenting to neurosurgeons in clinical practice. It is evident from the literature that spinal tumors constitute 15 % of all primary CNS tumors. We had total of 572 patients with spinal tumors of which 61% had intradural tumors. Their age range was 2-77

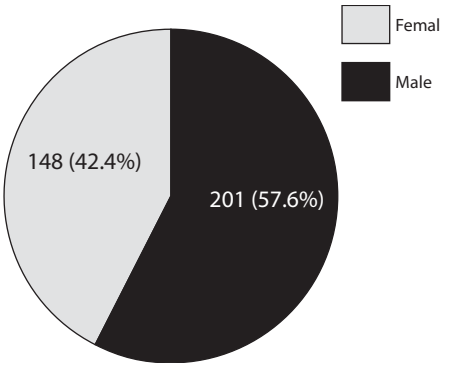

Figure 1: *Gender incidence (n=349)*

Table 1: *Histopathology of lesions (n=349)*

Variables	No. of Patients	Percentage
Neurofibroma	178	51%
Meningioma	107	30.66%
Ependymoma	24	6.9%
Dermoid	15	4.3%
Astrcytoma	10	2.87%
Tuberculoma	5	1.4%
Arachnoid cyst	3	0.86%
Hemangioblatoma	3	0.86%
Lipoma	3	0.86%
Hydatid cyst	1	0.29%

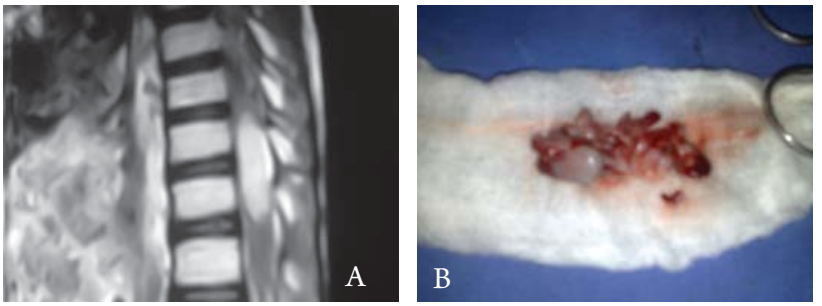

Figure 2: *Dorsal spine intramedularylesion (astrcytoma)*
A = MRI Parasagittal section; B = Tumor excised

years and most of them were in 3rd and 5th decades of life. Studies also reveal that although no age limit is spared but intradural spinal tumors are more common in peoples in 3th to 6th decade of life[7,8].

In our study intradural spinal tumors commonly occurred in males with male to female ratio of 1.4:1, but Nittner[8] have reported that meningiomas are more common in females while incidence of neurofibroma is equal in both men and women.

Intradural extramedullary tumors constitute 50-60% and intramedullary tumors 7-22% of all intraspinal tumors. Meningioma and neurofibroma are the most common, making 80-90% of intradural extramedullary tumors. Others are lipoma, dermoid and epidermoid. Of the intramedullary tumors astrocytoma are 30% and ependymoma are 29%[3]. We have comparable results in our study as meningioma and neurofibroma comprised more than 81% of total intradural extramedullary tumors, while ependymoma and astrcytomas were the commonest intramedullary tumors.

Figure 3: *MRI of patient with intramedulary lesion (Ependymoma) in lumber spine*

We had 107 (30.66%) patients with meningioma, second to neurofibroma (51%). They were common in female and in dorsal spine. These are slow growing benign lesions and accounts for the 25% of intraspinal neoplasm[6]. Peak incidence of meningioma occurs in 5th and 6th decades. It mostly involve thoracic spine region because of its length[7]. Thoracic region is involved in 80%, cervical in 15% and lumber region in 3% cases. Majority (80%) meningioma occurs in females[8].

Neurofibroma may be sporadic or is associated with neurofibromatosis type 1. According to levy[9] and colleagues who studied 66 patients with spinal nerve sheath tumors, 83% neurofibromas were intradural, 10% extradural and 7% both intradural and extradural. Peak age is 40-50 years. It's Incidence in thoracic spine is 39%, lumber 32% and cervical 23%. In our study 178 patients had neurofibroma making 51% of the total.

4-10% of all CNS tumors comprise of intramedullary tumors. They account for about 25% of adult intradural spinal tumors, but in children they account for 50% of intradural spinal tumors. Ependymomas are more common in adults and astrocytoma in children and adolescents. We had comparable results with more cases of ependymoma (24 cases) than astrocytoma (10 cases)[9-13].

Hemangioblastomas account for 3-4% of in-

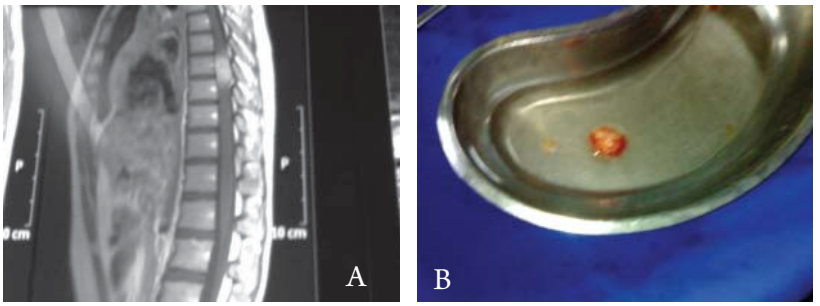

Figure 4: *Dorsal intradural spinal tumor (meningioma)*
A = MRI finding; B = after excision

tramedullary spinal cord tumors. Dermoids are congenital lesions. More common in childerns and usually occur in lumber spine. Epedermoids usually occur in conus or Cauda equine. We had 15 patients with dermoid and epidermoid of the spine and 3 patients with Hemangioblastoma in our study, two of them were in the 1st decade of life and 3rd one was 13 years old.

Multiple cavernous angiomas of the Cauda equine manifest with acute onset of severe low back pain radiating into the bilateral legs[14]. Primary intraspinal peripheral primitive neuroectodermal tumors are extremely rare tumors with only seven reported cases in the literature[15]. Primary intraspinal hemangiopericytoma is a rare malignant mesenchymal tumor with high rate of recurrence and metastasis[16]. We had no patient with multiple cavernous angioma or hemangiopericytoma in our study.

Spinal tumors and damage the spinal cord and nerve roots by compression, ischemia and infiltration of neoplastic cells. The clinical features may be pain, weakness, sensory loss, autonomic dysfunction, gait disturbance and spinal deformity. The patient can present with any combination of the above features. Children may present with delayed developmental milestone, scoliosis, kyphosis, foot deformity, gait disturbance and enuresis.

Back pain is the most common presenting symptom. Motor deficit occurs in 80-90% patients, which is patchy and asymmetrical. Sphincter disturbance may occur in 15 % cases[7]. In our study backache and motor deficit was noted in 75.1% (262) and 70.77% (247) patients, which is comparable to the literature. Sphincteric dysfunction was more prevalent (30.7 %) in our study than the literature (15%); this may be because of late presentation of the patients for treatment.

The differential diagnosis of spinal tumors has been narrowed down by MRI, because it provides crucial information regarding the extent, location and internal structure of tumors, Thus also helps in guiding surgery[3, 17-19]. Because of this reason MRI was the investigation most commonly done in our study (309 cases/ 88.5%).

Indications for surgical removal of intradural spinal tumors are: neurological deficit, intractable pain, tissue diagnosis and spinal deformity. The goals of surgery are; decompression of spinal canal, tumor resection or debulking, tissue diagnosis, correction of spinal deformity and stabilization of the spine.

Minimally invasive approaches to spinal tumors have evolved rapidly over the past 15-20 years as clinicians seek to avoid the morbidity and long-term dysfunction associated with traditional open surgical procedures[20]. Cyber knife radio surgical ablation of such tumors is technically feasible and associated with low morbidity. The outcome of surgery depends upon preoperative neurological status of the patient. Patients with severe neurological dysfunction usually do not recover, whereas patients with mild to moderate dysfunction can often recover in part or completely.

Conclusion:

It is concluded from the study that intradural spinal tumors are more common than extradural lesions. These are more common in men and during 3rd to 5th decades of life. 3rd and 5th decade of life was the common age group for both intramedulary and extramedulary tumors. Intramedulary tumors were common in 3rd decade of life. Neurofibroma and meningioma constituted majority of cases belonging to intradural extramedullary group while Ependymoma and Astrocytoma were common intramedullary tumors. Intradural infections as tuberculosis may present with mass lesion, mimicking tumors.

These tumors can be removed successfully with lamenectomy and microsurgical dissection.

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