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Clinicopathological Study of Intradural Extramedullary Spinal Cord Tumors

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Abstract: Intradural-Extramedullary (inside the durra) tumors grow within the spinal canal (under the membrane that covers the spinal cord) but outside of the nerves. Usually these tumors are benign and slow growing. However, they can cause symptoms of pain and weakness. The present study was to review the various intradural extramedullary lesions of the spine, with pathologic correlation. During April 2011 to March 2013, 52 spinal tumors cases were diagnosed at Department of Neurosurgery and Department of Medicine, Mamata Medical College General Hospital Khammam. The youngest patient in this series was 21 years old girl and the oldest patient was 60 yrs old female. Most of the patients were 30-40 yrs age group i.e., 12 patient (37.5%). There were Male: 13 (40.6%) and Female: 19 (59.4%), Slight female predominance is seen in occurrence of intradural extramedullary tumors. The duration of symptoms varies from 2 months to 5 years with a mean of 2 years 2 months. Nerve sheath tumor was the common histopatholigical type. In the present series among all the spinal tumors the incidence of intradural ectramedullary spinal tumors is 57.14%. Mean age of presentation for meningioma is 36 yrs and for nerve sheath tumors id 39.5 years. Most of the tumors were located in thoracic region (56%) followed by cervical (22%) and lumber (22%).
Keywords: Tumars, extramedullary lesions, spinal tumors, meningioma.

INTRODUCTION

Primary tumors of the spinal cord are ten to 15 times less common than primary intracranial tumors and overall represent 2% to 4% of all primary tumors of the central nervous system. The majority of primary spinal cord tumors are classified as low grade (grades I and II) according to the World Health Organization (WHO) pathology classification. Primary spinal cord tumors are divided into three categories based upon anatomic location: intramedullary, intradural extramedullary, and extradural [1]. In contrast to the histologic variety of spinal cord tumors, intradural extramedullary spinal cord tumors (IESCT) are predominantly either meningiomas (50%) or peripheral nerve sheath tumors (50%) [1-3]. The most commonly encountered types of IESCT are schwannomas and meningiomas, with myxopapillary ependymomas encountered less frequently. Intradural extramedullary tumours of the spine are the commonest intradual tumours of the spine and are common in middle age group. The early diagnosis and surgical removal and relieving pressure on the cord along with an intensive rehabilitation given excellent results with best outcome. The aim of this study is to analyze the incidence of different types of tumours and clinical presentation of intradural extramedually spinal tumors.

MATERIALS AND METHODS

The patient population included in this study was adult aged 18 years and above who had been admitted in the department of neurosurgery and department of General Medicine of our hospital due to intradural extramedullary spinal tumors during two years period from April 2011 to March 2013 by the institutional ethical approval.

Data collection: According to standardized procedure, we recorded the following information prospectively with prior written consent from the patients: (1) demographics (2) co morbidities; (3) presenting complaints at admission (including systemic, respiratory, gastrointestinal, and neurological symptoms) (5) Neurological findings and (6) Imageological evaluation (7) Histopathology

Ambulatory status was classified on admission by using Nurick grading scheme.

- Normal walk.
- Slight difficulty in walking.
- Disability limiting normal walk.
- Required assistance in walk.
- Bed ridden.

RESULTS

During April 2011 to March 2013, fifty two spinal tumors cases were diagnosed at Department of

Neurosurgery and Department of Medicine, Mamata Medical College General Hospital Khammam. Out of which 32 cases were intradural extramedullary tumors i.e. 61.5%

1. AGE INCIDENCE: The youngest patient in this series was 21 years old girl and the oldest patient was 60 yrs old female. Most of the patients were 30-40 yrs age group i.e., 12 patient (37.5%). (Table-1)

Table-1: Age wise presentation of various tumors.

Age	Nerve sheath tumors	Meningioma
0-10	-	-
11-20	-	-
21-30	1	3
31-40	6	3
41-50	2	2
51-60	2	1

2. SEX INCIDENCE: In the present study, Male: 13 (40.6%) and Female: 19 (59.4%), Slight female predominance is seen in occurrence of intradural extramedullary tumors (Table 2).

Table-2: Sex incidence of intradural extramedullary tumours

Sex	Nerve sheath tumors	Meningioma
Male	8 (72.7%)	0
Female	3 (27.3%)	9 (100%)

3. Clinical features: The duration of symptoms varies from 2 months to 5 years with a mean of 2 years 2 months (Table 3).

Table-3: Presenting complaints

Symptoms	Total	Nerve sheath tumors	Meningioma
Neck pain/ Radicular pain	15	5	8
Paraeshesia	20	7	8
Weakness of limbs	30	8	9
Bladder & bowel symptoms	12	3	4

Ambulatory status was classified on admission by using Nurick grading scheme. Nine patients were ambulatory on admission and exhibits nurick grade 1 and 2 status. Five patients were in Grade 1 and 4 in Grade 2. The mean duration of gait difficulty was 6 months. Nine patients were in grade 3, 7 patients in grade 4 and 7 patients were bed ridden i.e., with grade 5 (Table 4).

Table-4: Nuricks grading of patients

Nurick Grade	Total	Nerve sheath tumors	Meningioma
Grade - 1	5	2	-
Grade - 2	4	3	-
Grade - 3	9	3	2
Grade - 4	7	2	4
Grade - 5	7	1	3

All patients were investigated with plain X-ray Ap and lateral view of the appropriate region and by MRI study. And other investigations for surgical fitness like CXR, EGG, Blood urea, blood sugar, serum creatinine and blood grouping Rh typing were done.

4. Tumor Location: The tumor location was noted be thoracic in 18 (56.25%) patients, lumbar in 7 (21.9%) and cervical in 7(21.9%) patients. In 80% of cases the tumors were located posteriorly and 20% were located posterolaterally. (Table 5).

Table-5: Distribution of tumours at various levels of spinal cord

Tumor Location	Total	Nerve sheath tumors	Meningioma
Cervical	7 (21.9%)	2 (18%)	1 (11%)
Throacic	18 (56.25%)	7 (64%)	8 (89%)
Lumbar	7 (21.9%)	2 (18%)	0 (0%)

5. Surgery: all the patients underwent surgery, 28 patients were operated through the posterior approach, liminectomy was performed and in 4 patients laminectomy was extended laterally to remove the tumor completely. Total excision was achieved in 28 cases. Near total excision was done in 4 cases.

6. Complications: The postoperative period was smooth in all patients. No postoperative neurological deterioration was found. CSF leak occurred in 2 patients (6%) which was treated with repeated lumbar punctures and actezolamide. One patients (3%) developed wound infection and one patient (3%) developed meningitis in postoperative period, who responded to the appropriate antibiotics. Overall morbidity was 12% (4 patients). 26 cases were followed up. Mean follow up period was 11 months. No recurrence was noted clinically.

7. Histopathology: Nerve sheath tumor was the common histopatholigical type (11) followed by meningiomas (9), out of these 9 cases, 5 were psammomatous, 4 were meningothelial meningiomas. (Table 6).

No post operative neurological deterioration was noted.Immediate improvement seen in 20 patients (62.5%) and gradual improvement over a period of six moths seen in 10 patients (31.25%) and no improvement seen in 2 patients (6.25%) who presented very lately (2yrs) with flaccid paralysis and cord shown myelomalacial changes on MRI. (Table 7).

Table-6: Histopathological classification

Observation	**N=32**	**%**
Nerve sheath tumours	11	35%
Meningioma	9	28%
Dermoid	2	6%
Lipoma	1	3%
Granulomatous lesions (TB)	4	13%
Actinomycosis	1	3%
Cavernous hemangioma	2	6%
Arachniod cyst	2	6%

Table-7: Post operative Nuricks grading scale of patients

Nurick grade	**At presentation**		**After surgery**	
	No. of Cases	Percentage	No. of cases	Percentage
Normal walk	5	15.6%	7	21.9%
Slight difficulty in walking	4	12.5%	9	28%
Disabilioty limiting normal walk	9	28%	10	31.25%
Required assistance in walk	7	21.9%	4	12.5%
Bed ridden	7	21.9%	2	6.25%

DISCUSSION

Intradural or primary spinal cord tumors (neoplasms) are uncommon lesions and are much less common than brain tumors and are thought to account for only 2-4% of all intrinsic tumors of the central nervous system. In children, astrocytomas are the most common tumor type, accounting for around 60% of all intramedullary spinal tumors, and the mean age of presentation is 5-10 years [4]. However, when lesions grow, they result in compression of the spinal cord, which can cause limb dysfunction, motor and sensation loss, and, possibly, lead to death. Spinal tumors are classified based on their anatomic location as related to the dura mater (lining around the spinal cord) and spinal cord (medullary) as epidural, intradural extramedullary, or intradural intramedullary. Primary spinal tumors are typically intradural in location, where extradural spinal tumors are typically due to metastatic disease.

This is a prospective study of 32 cases of intradural extramedullary tumors carried out at Mamata General Hospital, Khammam from April 2011 to March 2013. All the cases were operated by a single surgeon to avoid the surgeon variability. An analysis of clinical features and surgical outcome is discussed. Out of 56 cases of spinal cord tumors operated during the period. 32 tumors were located in the intradural extramedually comprartment. The demographics in this series are similar to those in previous studies [2,3]. We found that the incidence in our series being 53.14%. There were Reported frequencies of 11 cases of nerve sheath tumors (35%) and 9 cases of meningiomas (28%) and 2 case of dermoid tumors (6%) among IESCT. Majority of the nerve sheath tumors were present in 3rd decade and female preponderance. The current series are in agreement with earlier studies, that mostly Excellent or Good results were achieved with few complications. In this series, patients with meningiomas were older than those with nerve sheath tumor. Findings in this series agree with the literature in that meningiomas are the second most common IESCT, Thoracic spine was common site of occurrence which is corresponding with the literature reported by Sridhar et al [5]. Consistent with previous reports, we found meningiomas to be more common in younger patients, with the higher incidence of myelopathy likely due to predilection of meningiomas for the thoracic region [6]. Others describe higher operative morbidity associated with IESCT located in the thoracic region [7].

CONCLUSION

To conclude, in the present series among all the spinal tumors the incidence of intradural ectramedullary spinal tumors is 57.14%. Mean age of presentation for meningioma is 36 yrs and for nerve sheath tumors id 39.5 years. Most of the tumors were

located in thoracic region (56%) followed by cervical (22%) and lumber (22%).

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