Spinal Cord Tumours - Histopathological Study Of 100 Cases

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Abstracts: Background**:** To study the distribution of 100 cases of wide range of spinal cord tumours in relation with their locations, age, sex and compare the obtained data with that of other series by different authors. Spinal cord tumours (SCTs) are mostly benign. Intraspinal tumours form 15 % of all CNS tumours. Primary spinal cord tumours (PSCTs) account for 4% of primary CNS tumours. In tumours of spinal cord are included those arising from within substance of spinal cord, leptomeninges, nerve roots, blood vessels and extradural structures and tissues. Methodology**:** We summarise the data of SCTs encountered over a period of six years received as biopsy from mass or excised mass. The biopsies were studied by paraffin sectioning and routine Hematoxylin-Eosin stain with PAS, Reticulin stains if necessary. Results: Among one hundred cases, 25 were intramedullary, 47 were extra-medullary intradural and 28 were extradural tumours. 85 were primary and 15 were metastatic in nature. Nerve Sheath Tumours (NSTs) 32% and meningioma 22% were most frequent tumours. Conclusion**:** The present study of 100 SCTs over 6 years revealed that meningioma 22 %, neurilemmoma 19 %, neurofibroma 13 %, ependymoma 12 % and astrocytoma 8 % comprised a large majority of Primary SCTs(PSCTs). 47 % of tumours were extramedullary, 28 % extradural and 25 % intramedullary tumours. 51 % of tumours involved dorsal region, 23 % lumbar and 19 % cervical. The study can contribute to epidemiologic knowledge of SCTs. [Jesalpura N NJIRM 2015; 6(5):46-49]

Key Words: Spinal Cord, Histopathology, Tumors

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Introduction: Spinal cord tumours (SCTs) are now recognized with considerable frequency due to advances in diagnostic procedures. Majority are benign and produce effects mainly by compression of cord rather than by invasion[1]. Intraspinal tumours form 15 % of all CNS tumours[2]. PSCTs account for 4% of primary CNS tumours[3]. In tumours of spinal cord are included the tumours arising from within substance of spinal cord, leptomeninges, nerve roots, blood vessels and extradural structures and tissues.

Aims and objectives are (1) To study pathology of wide range tumours of spinal cord. (2) To study the tumours of spinal cord in relation with age, sex (3) To compare the obtained data with that of other series by different authors.

Material and Methods: We summarise the data of SCTs encountered over a period of six years during 1992 to1997. All the specimens analyzed were received as biopsy from mass or excised mass sent from Neurosurgery and orthopedics department to Pathology department of Sheth V.S.General Hospital, Smt N.H.L. Municipal Medical College, Ahmedabad-6.

The gross examination of all specimens was done noting down size, shape, consistency, outer surface and cut surface appearances. The specimens were studied by paraffin sectioning and routine Hematoxylin-Eosin stain was used. In some cases ancillary histochemical stains like PAS, Reticulin were done.

Results: We have analyzed 100 cases of SCTs of which 85 % were primary and 15 % were metastatic. A summary of Histopathological Types with their categorization by transverse location into intradural intramedullary, extramedullary and extradural category is presented in Table – I.

Table 1: Histopathological distribution of cases by Transverse Location

Histopathologic diagnosis	Intradural		Extra-dural	Total	%
	Intra-medullary	Extra-medullary			
Astrocytoma	8	-	-	8	8
Ependymoma	10	2	-	12	12
Neurilemmoma	1	14	4	19	19
Neurofibroma	1	6	6	13	13
Meningioma	-	19	3	22	22
Malformativetumours*	5	6	-	11	11
Metastatic tumours@	-	-	15	15	15
TOTAL	25	47	28	100	100

* Malformative tumours included 5 Dermoid, 3 Epidermoid and 1 each of cystic teratoma, neurenteric cyst and arachnoid cyst.

@ Metastatic tumours included 2 from squamous cell carcinoma, 5 of adeno-carcinoma, 4 of lymphoma, 2 of neuroblastoma and 1 each of multiple myeloma and alveolar rhabdomyosarcoma.

The distribution of SCTs by the vertebral location of SCTs into cervical, dorsal, dorsolumbar, lumbar and lumbosacral category are summarized in Table II.The distribution of SCTs by age and sex are depicted in Table III. Glioma formed 72 % of intramedullary SCTs.

Table 2: Vertebral Location of spinal cord tumours

Histopathologic diagnosis	Cervical	Dorsal	Dorso-lumbar	Lumbar	Lumbo-sacral	Total
Astrocytoma	4	4	-	-	-	8
Ependymoma	1	3	2	6	-	12
Neurilemmoma	7	8	-	4	-	19
Neurofibroma	2	7	2	2	-	13
Meningioma	3	15	-	4	-	22
Malformative tumours	1	3	2	5	-	11
Metastatic tumours	1	11	1	2	-	15
Total	19	51	7	23	1	100

As is evident from above table, highest incidence is seen in dorsal region 51 % followed by lumbar 23% and cervical regions 19 %. Of the primary tumours, highest incidence is seen in dorsal region followed by lumbar and cervical regions. Metastatic tumours are located predominantly (11 out of 15) in dorsal region.

Table 3: Age and Sex Incidence of Spinal cord tumours

Histopathologic diagnosis	Male	Female	Total	Age group (years)					
				0-10	11-20	21-30	31-40	41-50	>50
Astrocytoma	5	3	8	-	1	3	2	1	1
Ependymoma	6	6	12	-	1	3	4	3	1
Neurilemoma	11	8	19	-	4	4	3	6	2
Neorofibroma	6	7	13	1	2	5	3	2	-
Meningioma	6	16	22	-	2	2	4	5	9
Malformati-vetumours	5	6	11	3	2	4	-	2	-
Metastatic tumours	13	2	15	1	2	-	1	2	9
Total	52	48	100	5	14	21	17	21	22

Of 8 cases of astrocytoma (5 male, 3 female) 4 were Grade I including pilocytic type and 1 each of Grade II and of gemistocytic type.

From 12 cases of Ependymoma (6 each in male & female) types reported were 4 myxopapillary, 4 papillary and 4 cellular.
Total 32 NSTs included 19 Neurilemmoma (11 male, 8 female) and 13 Neurofibroma (6 male, 7 female). This formed majority of our caseseries.

22 cases of meningioma (6 male, 16 female) were reported as psammomatous 13, meningothelial 6 and angiomatous 3.

According to vertebral location 51 % were in dorsal, followed by 23 lumbar and 19 cervical regions.
39 cases (45.9%) of PSCTs occurred in male whereas 46 cases (54.1 %) in female.
Majority 13 (of 15)cases of metastatic SCTs were diagnosed in male.

Figure 1: Myxopapillary ependymoma

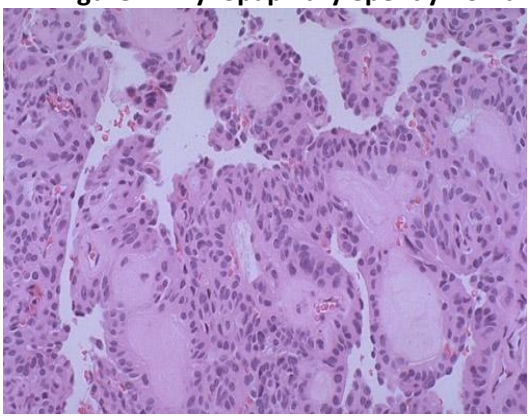
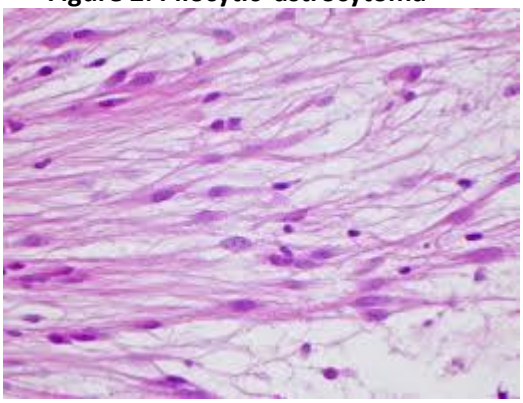


Figure 2: Pilocytic astrocytoma



Discussion - The classificationof CNS tumours[4]is based on their histology findings and SCTs are further categorized according to location with reference to dura into extradural and intradural groups which are further subdivided into

intramedullary and extramedullary. Some tumours may be both inside and outside the dura.

The individual tumours can be further typed histologically and graded.

We evaluated 100 SCTs cases diagnosed during a period of 6 years.

NSTs (32%) and meningioma (22%) were most frequent tumours like what was reported by Kernohan J.W.et al[5], Sloof J.L. et al [2], Banerjee AK [6]and Lalitha V.S.et al[7]. PayamM.et al [3] reported 39 of glioma and 34 cases of NSTs out of 102 cases.

As is evident from Table III, PSCTs had M:F ratio of 1:1.18 which correlates with data of Payam Met al [3]. Meningioma had M:F ratio of 2.7:1, while for metastatic tumours M:F ratio was 6.5:1.

The extramedullary 49% and dorsal 53 % SCTs accounted for majority of tumours in our study. These data is comparable with other series of Oddson B.[8.], Wilson K. [9], Roy R.N.[10]as summarized in Table V and Table VI.which compare the transverse and vertebral category wise distribution of SCTs respectively.

Table 4: Comparative study ofHistopathologic types of SCTs

Authors	Glioma %	Nerve sheath Tumours %	Meningioma %	Malfor-mative tumours %	Meta-static tumours %	Others %	No.of cases
Kernohan J.W .et al [5]	22.5	29.9	25.9	4.6	-	17.1	979
Sloof J.L. et al[2]	22	29	25.5	1.4	-	22.1	1322
Banerjee AK [6]	13.2	32.3	13.3	5.1	16.1	20	136
Lalitha V.S . et al [7]	16	30.5	19.5	6.1	20	7.9	426
Present Study	17	30	20	11	15	7	100

Table 5: Comparative study of SCTs according to transverse location

Author	Intra medullary %	Extra medullary %	Extra dural %	Mixed %
Oddson B.[8]	26	51	18	5
Wilson K.[9]	20	51	29	-
Banerjee AK [6]	33.1	34.6	26.5	5.8
Present study	22	49	29	-

Table 6: Comparative study of SCTs according to vertebral location

Author	Cervical %	Dorsal %	Lumbar %	Mixed %
Kernohan J.W. et al G.P. [5]	19	48.5	25.5	7
Banerjee AK [6]	20.6	61	13.2	5.2
Roy R.N. [10]	12.6	49.7	25.3	12.4
Present study	16	53	24	7ß

The rare SCTs include oligodendrogioma as reported by H. Wen-ging[11], subependymoma as reported by Lee K.S. et al[12], ganglioneuroma as reported by Ng Th et al documented by Ramamurthi B et al [13]and ganglioglioma as Roy[14].

Conclusion: The present study of 100 SCTs over 6 years revealed that meningioma 22 %, neurilemmoma 19 %, neurofibroma 13 %, ependymoma 12 % and astrocytoma 8 % comprised a large majority of PSCTs.

Regarding their transverse and vertebral location, it was observed that 47 % tumours were extramedullary, 28 % extradural and 25 % intramedullary tumours. 51 % tumours involved dorsal region, 23 % lumbar and 19 % cervical.

The study for age group and sex incidence revealed that for Astrocytoma highest age incidence was 21 to 30 yrs, for ependymoma 31-40 yrs, for neurilemmoma 41-50 yrs, for neurofibroma 21 -30 yrs, for meningioms and metastatic tumours more than 50 yrs.

For meningioma M:F ratio is 1:3, for metastatic tumours M:F ratio is 6.5:1 and for astrocytoma M:F ratio is 2:1.

We have focused on intradural as well as extradural SCTs, primary as well as secondary SCTs.

The descriptive and inferential analyses of this study can contribute to epidemiologic knowledge of SCTs.

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