Original Article ISSN (O):2395-2822; ISSN (P):2395-2814

Clinico-Pathological Profile of Patients with Spinal Cord Lesions.

Krishna Reddy CH[1], V Hari Shanker[2]

[1]Consultant Pathologist, Parkline Diagnostics, Secunderabad, India.

[2]Professor, Department of Pathology, Malla Reddy Institute of Medical Sciences, Hyderabad, India.

ABSTRACT

Background: Spinal cord is the site of variety of lesions and includes both non neoplastic and neoplastic lesions. Common non neoplastic lesions include meningomyeloceles, dermoid cysts, epidermoid cysts, arachnoid cysts and neurenteric cysts whereas neoplastic lesions include astrocytomas, ependymomas, schwannomas, neurofibromas and meningiomas. The aim is to study clinico-pathological profile of patients with spinal cord lesions. **Methods:** This was a prospective study conducted at Department of Pathology, Osmania General Hospital, Secunderabad from June 2010 to May 2013. All specimens received during study period. Only samples related to spinal cord were included. **Results:** Of all, non-neoplastic were 28 cases [43%] and neoplastic were 37 cases [57%]. Males were 30 cases [46%] and females were 35 cases [54%] with slight predominance in females. Of all most common were Meningomyelocele [23%] followed by Schwannomas [19%], Neurofibromas [12%], Lipomeningomyelocele [9%], Ependymomas [6%], Meningiomas [6%], Astrocytomas [5%], Dermoid cyst [5%], Arachnoid cyst [3%], Neurenteric cyst [3%], Teratoma [3%] and others include Paraganglioma, PNET, Oligodendroglioma, Metastatic deposits. Intramedullary lesions constitute 10 cases [19%] with [3 non neoplastic and 7 neoplastic], Intradural extramedullary lesions constitute 24 cases [54%] with [4 non neoplastic and 20 neoplastic], Extradural lesions constitute 31 cases [27%] with [21 non neoplastic and 10 neoplastic]. **Conclusion:** Most non neoplastic lesions in the spinal cord were due to developmental defects and present in younger age group whereas most neoplastic were acquired and occur in adults.

Key words: Clinico-pathological profile, Patients, Spinal cord lesions

INTRODUCTION

Spinal cord is the site of variety of lesions and includes both non neoplastic and neoplastic lesions. Common non neoplastic lesions include meningomyeloceles, dermoid cysts, epidermoid cysts, arachnoid cysts and neurenteric cysts whereas neoplastic lesions include astrocytomas, ependymomas, schwannomas, neurofibromas and meningiomas. Primary spinal cord tumors constitute 10% to 15% of all primary central nervous system tumors. [1] The subtypes of spinal cord lesions are grouped depending on their location. Lesion outside the dura is termed extradural and lesions within dura are called intradural. Intradural lesions are divided into two categories, depending on whether they involve the substance of the spinal cord [intramedullary] or are outside the spinal cord but within the dura [extramedullary].[1] Thus, lesions of the spinal cord can be Intramedullary, Intradural extramedullary and Extradural.

Name & Address of Corresponding Author
Dr. Krishna Reddy CH
Consultant Pathologist,
Park Lane Diagnostics,
Secunderabad, India.
Email: krishnareddy.chr@gmail.com

Non neoplastic lesions are mainly due to developmental defects and present in childhood. Most spinal cord neoplasms are malignant, and 90%–95% are classified as gliomas. Most of these glial neoplasms are either ependymomas or astrocytomas. MRI is the neurobimaging modality of choice in the evaluation of spinal cord tumors. The ability of MRI to depict the extent of the lesion and its specific location in relation to other structures, as well as its definition of cysts associated with tumors, makes it preferable to other techniques.[1,2]

MATERIALS AND METHODS

This Prospective study was conducted in Department of Pathology, Osmania General Hospital, Secunderabad from June 2010 to May 2013.

Only samples related to spinal cord were included. 10% buffered formalin, embedded in paraffin was used to fix the specimen. Before examining under microscope, they were stained with H & E.

RESULTS

In our study, total no of cases were 65, of these 43% were non neoplastic and 57% were neoplastic. Males were 46% and females were 54% with slight female predominance.

Intramedullary lesions constitute 19%, Intra-dural extra-medullary lesions constitute 54% and Extradural lesions 27%. Cervical region constitute 16%, Thoracic region constitute 54%, Lumbosacral region 30%.

Incidence: Of all, non-neoplastic were 28 cases [43%] and neoplastic were 37 cases [57%]. Males were 30 cases [46%] and females were 35 cases [54%] with slight predominance in females.

Table 1: Incidence of lesions

Lesions	Males	Females	Total
Non Neoplastic	12	16	28
Neoplastic	18	19	37
Total	30	35	65

Table 2: Distribution of various lesions

Lesions	Males	Females	Total
Meningomyelocele	7	8	15 [23%]
Lipomeningomyelocele	3	3	6 [9%]
Schwannoma	8	4	12 [19%]
Neurofibroma	5	3	8 [12%]
Ependymoma	1	3	4 [6%]
Meningioma	1	3	4 [6%]
Astrocytoma	0	3	3 [5%]
Dermoid cyst	1	2	3 [5%]
Arachnoid cyst	1	1	2 [3%]
Neurenteric cyst	0	2	2 [3%]
Teratoma	0	2	2 [3%]
Others	3	1	4 [6%]
Total	30	35	65[100%]

Table 3: Age distribution of lesions

Age [Yrs]	Non-Neoplastic	Neoplastic	Total
0-10	20	4	24
11-20	3	4	7
21-30	3	11	14
31-40	2	7	9
41-50	0	7	7
51-60	0	1	1
> 60	0	3	3

Lesions: Of all most common were Meningomyelocele [23%] followed by Schwannomas [19%], Neurofibromas [12%], Lipomeningomyelocele [9%], Ependymomas [6%], Meningiomas [6%], Astrocytomas [5%], Dermoid cyst [5%], Arachnoid cyst [3%], Neurenteric cyst [3%], Teratoma [3%] and others include Paraganglioma, PNET, Oligodendroglioma, Metastatic deposits.

Age: Non neoplastic were common in children with mean age < 10 yrs whereas neoplastic were common in adults with mean age of 21 -30 yrs.

Table 4: Location of lesions

Location	Non Neoplastic	Neoplastic	Total
Extradural	21	10	31
Intradural extramedullary	4	20	24
Intramedullary	3	7	10

Location: Intramedullary lesions constitute 10 cases [19%] with [3 non neoplastic and 7 neoplastic], Intradural extramedullary lesions constitute 24 cases [54%] with [4 non neoplastic and 20 neoplastic], Extradural lesions constitute 31 cases [27%] with [21 non neoplastic and 10 neoplastic].

DISCUSSION

Spinal cord lesions are rare among the CNS lesions and include both non neoplastic and neoplastic lesions. Non neoplastic lesions are mainly due to developmental defects and present in the younger age group whereas neoplastic lesions are acquired and are common in the adults. This study was taken to describe all the lesions involving the spinal cord as such studies were limited in the literature.

In our study, total no of cases were 65 of these 28 cases [43%] were non neoplastic and 37 cases [57%] were neoplastic. Non neoplastic lesions were mostly in the extradural location whereas neoplastic were in intradural extramedullary location. Cervical region include 8 cases, Thoracic region constitute 28 cases, Lumbosacral region constitute 29 cases. Non neoplastic lesions were common in the Lumbosacral region whereas neoplastic were common in the Thoracic region.

In our study total spinal tumors were 37 cases, which constituted 6% of all the CNS tumors. According to the Engelhard et al[2] the most

common tumor types were meningioma [24.4%], ependymoma [23.7%], and schwannoma [21.2%]. In our study most common tumor type include schwannomas [32%] which correlated with the study conducted by Hirano et al [3], Garrido et al[4] and Ferreira et al[5]. Pain, weakness, and sensory disturbances have been found to be the most frequent presenting symptoms and signs in adult and pediatric patients with intra-spinal tumors.[2,6] In our study the most common symptom was motor weakness followed by pain.

Intramedullary tumors mainly include ependymomas followed by astrocytoma.[7-10] Astrocytoma are the most common intramedullary tumor in children.[2,10] The mean age at presentation is 29 years. The most common site of involvement is the thoracic cord followed by the cervical cord.[10] In our study they are second common intramedullary tumors which correlated with study done by Ferreira et al[6] and Gelabert et al.[7] We reported 3 cases of astrocytoma, 2 cases were found in the thoracic region and one case in cervical region, they are common in children with mean age of 22 yrs. They are mostly intramedullary but we reported one case of extramedullary intradural lesion. The tumor is hypo to isointense on T1W images, hyperintense on T2W, with variable contrast enhancement.[8]

Ependymomas are the most common glial tumor in adults, whereas astrocytomas are the most common intramedullary tumor in children.[10-12] Ependymomas tend to manifest in young adulthood, with a mean age at presentation of 38.8 years and are more common in male patients.[6] Cord ependymomas occur most commonly in the cervical region.[10,13] In our study ependymomas were common in adults with mean age of 32 yrs but were common in females in contrast to the study done by Hirano et al[3] and common location in our study was thoracic region. Primary intradural extramedullary ependymomas of the spinal cord are rare.[14] In our study 3 cases were intramedullary and one case was intradural extramedullary Similar lesion was also reported by Graca et al[14] in thoracic region.

The two most common ependymoma subtypes are cellular and myxopapillary ependymomas. Cellular ependymomas can arise anywhere but usually occur in the cervical cord, whereas myxopapillary ependymomas occur almost exclusively in the conus medullaris and filum terminale.[8,13,14] Ependymomas by MRI appear as a focal enlargement of the cord and hyperintense on T2W and hypo or isointense to normal spinal cord on T1W images with heterogeneous contrast enhancement.[8] We reported one case of myxopapillary ependymoma in female in filum terminale but Al Moutaery et al[15] reported similar lesion occurring in both spinal cord and cerebral region.

CONCLUSION

Most non neoplastic lesions in the spinal cord were due to developmental defects and present in younger age group whereas most neoplastic were acquired and occur in adults.

REFERENCES

1. Kufe DW, Pollock RE, Weichselbaum RR. Holland-Frei Cancer Medicine. 6th edition. Hamilton (ON): BC Decker; 2003,pp:234-7.
2. Engelhard HH, Villano JL, Porter KR, Stewart AK, Barua M, Barker FG et al. Clinical presentation, histology, and treatment in 430 patients with primary tumors of the spinal cord, spinal meninges, or cauda equina. J Neurosurg Spine 2010;13(1):67-77.
3. Hirano K, Imagama S, Sato K, Kato F, Yukawa Y, Yoshihara H et al. Primary spinal cord tumors: review of 678 surgically treated patients in Japan A multicenter study. Eur Spine J. 2012;21(10):2019-26.
4. Garrido P, Laher-Mooncey S, Murphree NL, Jonker N, Levy LF, Makarawo S. Neoplasms involving the spinal cord in Zimbabweans: an analysis of 262 cases. Cent Afr J Med. 1994;40(8):201-4.
5. Ferreira NP, Chaves DL, Moraes AC, de Oliveira LM. Spinal tumors: apropos of 100 cases. Arq Neuropsiquiatr 1981;39(1):25-31.
6. Crawford JR, Zaninovic A, Santi M, Rushing EJ, Olsen CH, Keating RF et al. Primary spinal cord tumors of childhood: effects of clinical presentation, radiographic features, and pathology on survival. J Neurooncol. 2009;95(2):259-69.
7. Gelabert-González M. Primary spinal cord tumors. An analysis of a series of 168 patients. Rev Neurol. 2007;44(5):269-74.
8. Chamberlain MC, Tredway TL. Adult primary intradural spinal cord tumors: a review. Curr Neurol Neurosci Rep. 2011;11(3):320-8.
9. Grimm S, Chamberlain MC. Adult primary spinal cord tumors. Expert Rev Neurother. 2009;9(10):1487-95.
10. Kelly KK, Scott R, Alan LM. Neoplasms of the Spinal Cord and Filum Terminale: Radiologic-Pathologic Correlation. Radiographic 2000;20:1721–49.
11. Craciunas SC, Gorgan MR, Carmen MC, Mariana A. Intramedullary Tumors-Clinical, Radiological and Histological Correlations. Romanian Neurosurgery 2011;18(2):156-60..
12. Mumtaz A, Zahid K, Seema S, Khalid MK, Said R, Alamgir. Experience with 349 cases of intradural spinal tumors at Lady Reading Hospital Peshawar. Pak J Surg. 2010;26(3):221-5.
13. Shors SM, Jones TA, Jhaveri MD, Huckman MS. Best cases from the AFIP: myxo-papillary ependymoma of the sacrum. Radiographics 2006;26:1-6.
14. Graca J, Gultasli N, D'Haene N, Brotchi J, Salmon I, Baleriaux D. Cystic extramedullary ependymoma. AJNR Am J Neuroradiol. 2006;27(4):818-21.
15. Al Moutaery K, Aabed MY, Ojeda VJ. Cerebral and spinal cord myxo-papillary ependymomas: a case report. Pathology 1996;28(4):373-6.

How to cite this article: Reddy KCH, Shanker VH. Clinico-Pathological Profile of Patients with Spinal Cord Lesions. Ann. Int. Med. Den. Res. 2016;2(1):227-29.

Source of Support: Nil, **Conflict of Interest:** None declared.