

A Clinical Study of Spinal Cord Tumours.

P. John Paul¹, R. Renganathan², Heber Anandan³

¹Assistant Professor, Department of Neuro Surgery, Madras Medical College, Chennai, Tamil Nadu, India,

²Assistant Professor, Department of Neuro Surgery, Tirunelveli Medical College, Tirunelveli, Tamil Nadu, India,

³Senior Clinical Scientist, Department of Clinical research, Dr.Agarwal's Healthcare Limited, Tirunelveli, Tamil Nadu, India.

Received: August 2017

Accepted: August 2017

Copyright:© the author(s), publisher. It is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Primary CNS spinal tumors constitute 15 % of all primary CNS tumors. Unlike intracranial tumors most primary spinal tumors are benign. Most spinal cord tumors present by compression rather than invasion. Aim : To study the correlation between clinical presentation and radiological level of lesion, the correlation between radiological features and histopathology of spinal cord tumors, the correlation between clinical presentation and histopathology of spinal cord tumors. **Methods:** 78 patients with spinal cord tumors who were treated in Madras Institute of Neurology, Government General Hospital, Chennai. **Results and Conclusion:** Clinical and radiological correlation in assessing the level, plane and pathology of lesions was better in adults than in children and old age people. Clinical and radiological correlation for assessing the level and plane of lesions was better with cervical lesions followed by lumbar and thoracic cord lesions in this study. For assessing the plane of lesion radiological examination had a better correlation than clinical evaluation.

Keywords: Primary CNS spinal tumors, Spinal Cord tumors, compressive myelopathy.

INTRODUCTION

Primary CNS spinal tumors constitute 15 % of all primary CNS tumors. Unlike intracranial tumors most primary spinal tumors are benign. Most spinal cord tumors present by compression rather than invasion.^[1]

Spinal cord tumors may be extradural or intradural. Intradural tumors can be further classified as extramedullary or intramedullary. The ratio of intradural to extradural tumors is 3:2. The ratio of intramedullary tumors is high in children which are up to 50 %. It is 30 % among the adult population.^[1] Spinal cord tumors mostly occur in the middle age group. Except for the female preponderance in case of meningiomas, the sex ratio is almost equal. Spinal cord tumors most commonly occur in the thoracic region. Next comes cervical region.^[2] Tumors in the lumbosacral region are rare. Nerve sheath tumors are the common intradural extramedullary tumors and they constitute 30 % of cases. Meningiomas account for nearly 25 %. The most common intramedullary tumors are astrocytomas and ependymomas. Other intramedullary tumors are hemangioblastoma,

Dermoid, epidermoid, lipomas and secondaries. Ependymomas apart from intramedullary location can present at the conus medullaris. Here it can be both extra and intramedullary with an exophytic component extending into cauda equina.

Spinal cord tumors produce a spectrum of signs and symptoms based on the level and plane of lesion which aid in the clinical localization.^[3,4] Surprisingly this hard done precise clinical localization few times does not exactly correlate with the radiological findings including the one obtained from various MRI sequences available at present. Also there are variations in the findings observed intraoperatively and in the histopathology.^[5]

AIM

To study the correlation between clinical presentation and radiological level of lesion, the correlation between radiological features and histopathology of spinal cord tumors, the correlation between clinical presentation and histopathology of spinal cord tumors.

MATERIALS AND METHODS

This prospective study was conducted in Madras Institute of Neurology, Government General Hospital, Chennai. Inclusion criteria: All cases of spinal cord tumors, all spinal compressive myelopathy patients with suspected spinal malignancy. Exclusion criteria: Disc disease related spinal cord compressive lesions, Post traumatic

Name & Address of Corresponding Author

Dr. R. Renganathan
Assistant Professor,
Department of Neuro Surgery,
Tirunelveli Medical College,
Tirunelveli,
Tamil Nadu, India.

spinal cord compressive lesions, Post inflammatory spinal cord compressive lesions. After thorough clinical examination including a detailed history the motor, sensory and reflex level were found. The highest level was taken into account as the level of spinal cord tumor location and its corresponding vertebral level was also noted.

RESULTS & DISCUSSION

78 cases of spinal cord tumors were included. Spinal cord tumors presented mostly in the age group 31 to 45 years and the least in the age group more than 60 years, in this study. Sex distribution showed female preponderance in this study. Both male and female preponderance for spinal cord tumors was in the age group of 31 to 45 years. In the age group <15 years the sex distribution was almost equal.

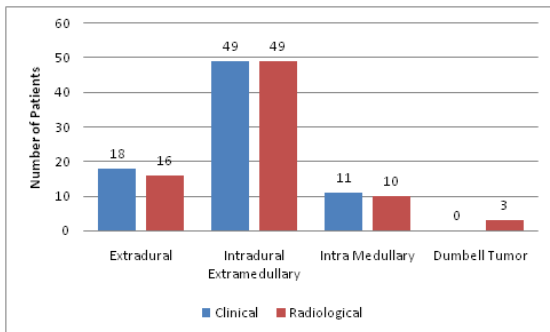


Figure 1: Clinical And Radiological Correlation Plane Of Tumors

Clinical and radiological correlation was maximum with intradural extramedullary tumors. Clinical and radiological correlation was minimum with intradural extramedullary tumors presenting as dumb bell tumors. Clinical and radiological correlation was to acceptable limits in intramedullary tumors. [Figure 1]

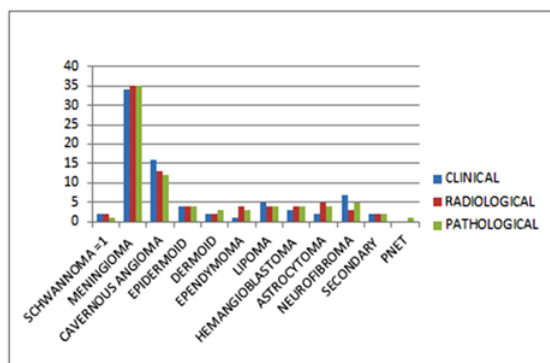


Figure 2: Clinical, Pathological And Radiological Correlation

Clinical correlation for schwannomas and meningiomas was having complete agreement which is statistically significant. Clinically differentiation between schwannomas and meningiomas was

difficult. Clinical correlation for hemangioblastoma and lipomas was having less agreement. [Figure 2] Age Group Less than 15 years: In clinical and radiological correlation of level of lesion 92 % of them are completely in agreement, P value <0.0001.^[5,6] Primitive Neuroectodermal Tumour 6 year female Child. [Figure 3]

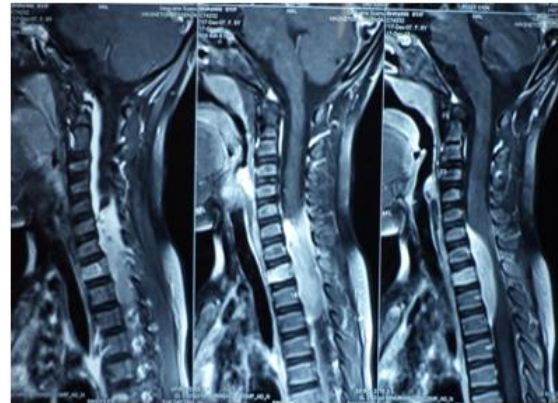


Figure 3: Extra Dural Tumor.

In clinical and radiological of plane of lesion 98% of them are completely in agreement, P value = 0.002. In clinical and HPE correlation 60% of them are completely in agreement. In radiological and HPE correlation 75 % of them are completely in agreement, P value = 0.001.^[7]

Age group between 16 to 30 years: In clinical and radiological correlation of level of lesion 86 % of them are completely in agreement, P value <0.0001. In clinical and radiological correlation of plane of lesion 74 % of them are completely in agreement.^[9] 28 year female – Hemangioblastoma. In this type of tumors, Clinical radiological correlation 96% Clinical pathological correlation 96% Radiological pathological correlation 98%. [Figure 4]

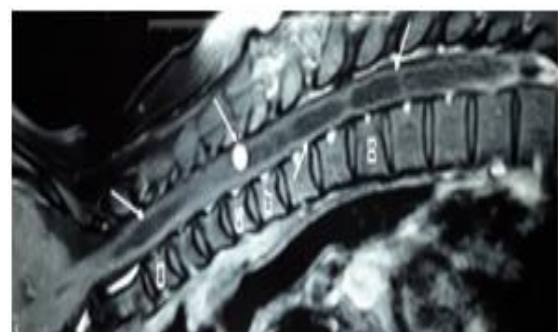


Figure 4: Intramedullary Tumor

In clinical and HPE correlation 86 % of them are completely in agreement, P value = 0.005. In radiological and HPE correlation 96 % of them are completely in agreement.¹⁰

Age group between 31 to 45 years: In clinical and radiological correlation of level of lesion 91 % of them are completely in agreement, P value <0.0001.^[11]

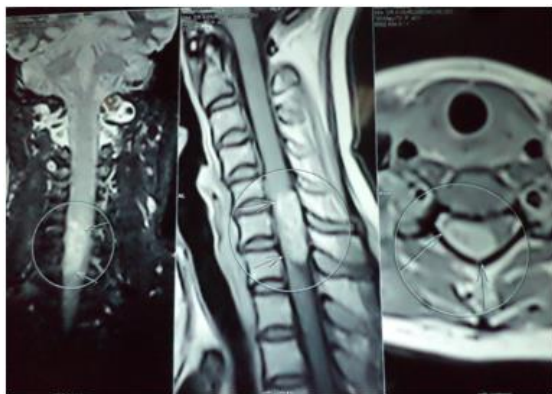


Figure 5: Intra Dural Extramedullary Tumor

In clinical and radiological correlation of plane of lesion 92 % of them are completely in agreement, P value = 0.002.^{12,13} In clinical and HPE correlation 84 % of them are completely in agreement. In radiological and HPE correlation 88 % of them are completely in agreement, P value < 0.0001. 40 years female, Schwannoma type of tumors, Clinical radiological correlation 95%, Clinical Pathological correlation 93 %, Radiological Pathological correlation 95%. [Figure 5] 38 years old female, meningioma. [Figure 6]



Figure 6: Intradural Extramedullary Tumor

Age group between 46 to 60 years: In clinical and radiological correlation of level of lesion 90 % of them are completely in agreement. In clinical and radiological correlation of plane of lesion 92 % of them are completely in agreement.^[14,15]

In clinical and HPE correlation 90% of them are completely in agreement, P value < 0.0001. In radiological and HPE correlation 94 % of them are completely in agreement.

Age group more than 60 years: In clinical and radiological correlation of level of lesion 88% of them are completely in agreement. In clinical and radiological correlation of plane 87 % of them are completely in agreement. In radiological and HPE correlation 89 % of them are completely in agreement.

Dorsal - Level: In clinical and radiological correlation of plane 86 % of them are in complete agreement, P value < 0.0001. In clinical and histopathological examination (HPE) correlation 88% of them are in complete agreement. In radiological and HPE correlation 87 % of them are in complete agreement.

Cervical-Level: In clinical and radiological correlation of plane 90 % of them are in complete

agreement. In clinical and HPE correlation 90% of them are in complete agreement, P value = 0.002. In radiological and HPE correlation 92 % of them are in complete agreement, P value = 0.002.

Lumbar - Level: In clinical and HPE correlation 90% of them are in complete agreement. In radiological and HPE correlation 91 % of them are in complete agreement.

In spinal cord tumors even after a thorough clinical examination and radiological investigations the surgeon many a times finds surprises in the operative field . An attempt has been made in this study to find the correlation between clinical , radiological, and pathological diagnosis of spinal cord tumors. 95% of clinical diagnosis correlated with the radiological findings for all types of tumors. With regards to schwannomas the clinical and radiological correlation was more than 92 % . On analysing the correlation with regard to different levels, the correlation of level of lesion in the age group of 30 to 45 years was more than 90 % . This was possible due to predominantly the nerve root involvement in these tumors which helped to locate the correct level of these tumors. Among the different age groups, the 45 to 60 age group showed the least correlation for the level of tumor, which was also true with the less than 15 years age group .86 % of lesions correlated clinically with radiological findings in case of diagnosis of level of intradural extramedullary tumors. But in cases of intra medullary tumors, the clinical and radiological correlation was low. In this situation the advantage of MRI in locating the plane of lesion is well established .With regard to the pathology of the tumors, the clinical and histopathological (HPE) correlation was around 90 % . In this study the radiological and HPE correlation was, less than that obtained by clinical examination, which clearly brings out the superiority of clinical examination for diagnosis of spinal cord tumors .Intramedullary tumors showed less than 90 % clinical and radiological correlation with regards to the level of the lesions. Surprisingly the clinical level of lesion fairly correlated with the pathology of lesion in intramedullary tumors. This study included only 10 cases of intramedullary tumors. So a study with more number of patients will be able to conclude better in this group. Also literature reveals only few similar studies and further experience is needed in this group of tumors. In this study osteoarthritis, degenerative disc diseases, spondylolisthesis etc were not taken into consideration .The signs and symptoms pertaining to these diseases form the part of compounding factors in clinical assessment of the spinal cord tumors. Younger age group patients could not co-operate to the fullest level during the clinical examination. Secondary deposits in the spinal cord with primary elsewhere could have influenced the patients' clinical examination.

CONCLUSION

Clinical and radiological correlation in assessing the level, plane and pathology of lesions was better in adults than in children and old age people. Clinical and radiological correlation for assessing the level and plane of lesions was better with cervical lesions followed by lumbar and thoracic cord lesions in this study. For assessing the plane of lesion radiological examination had a better correlation than clinical evaluation. In clinical and radiological correlation for assessing the level of lesion males had better correlation than females. Clinical and radiological correlation for assessing the pathology of tumors has revealed the fact that clinical examination is superior in assessing the pathology of spinal cord tumors. This factor can be explained by the fact that the detailed clinical examination which is preceded by a detailed history has brought out the natural course of the tumors which has greatly helped in predicting the pathology of the suspected tumor even before radiological investigations. To conclude, clinical examination still holds a pivotal role in the diagnosis of spinal cord tumors even in this era of sophisticated investigations.

REFERENCES

- Greenberg M. Handbook of neurosurgery. 7th ed. New York: Thieme Publishers; 2010.
- Youmans J, Winn H. Youmans neurological surgery. 6th ed. Philadelphia, PA: Saunders/Elsevier; 2011.
- William Campbell. DeJong's The Neurological Examination. 6th ed. Philadelphia: Lippincott Williams & Wilkins; 2005.
- Paul W. Brazis. Localisation in Clinical Neurology. 6th ed. Philadelphia: Lippincott Williams And Wilkins; 2015.
- Koeller K, Rosenblum R, Morrison A. Neoplasms of the Spinal Cord and Filum Terminale: Radiologic-Pathologic Correlation. *RadioGraphics*. 2000;20(6):1721-1749.
- Huisman TAGM. Pediatric tumors of the spine. *Cancer Imaging*. 2009;9(Special issue A):S45-S48. doi:10.1102/1470-7330.2009.9012.
- Smith A, Soderlund K, Rushing E, Smirniotopoulos J. Radiologic-Pathologic Correlation of Pediatric and Adolescent Spinal Neoplasms: Part I, Intramedullary Spinal Neoplasms. *American Journal of Roentgenology*. 2012;198(1):34-43.
- Bradley J. Carra, Paul M. Sherman. Intradural Spinal Neoplasms: A Case Based Review. *J Am Osteopath Coll Radiol*. 2013;2(3).
- Crawford JR, Zaninovic A, Santi M, et al. Primary spinal cord tumors of childhood: effects of clinical presentation, radiographic features, and pathology on survival. *Journal of Neuro-Oncology*. 2009;95(2):259-269. doi:10.1007/s11060-009-9925-1.
- Dickman C, Fehlings M, Gokaslan Z. Spinal cord and spinal column tumors. New York: Thieme; 2006.
- Minesh P. Mehta. Principles and Practice of Neuro-Oncology: A Multidisciplinary Approach. 1st ed. New York: Demos Medical Publishing; 2010.
- Cooper PR. Outcome after operative treatment of intramedullary spinal cord tumors in adults: Intermediate and long-term results in 51 patients. *Neurosurgery*. 1989;25:855-859.
- Chandy M J, Babu S. Management of intramedullary spinal cord tumours : review of 68 patients. *Neurol India* 1999;47:224.
- Zozulya YP, Slynko YI, Al-Qashqish II. Surgical treatment of ventral and ventrolateral intradural extramedullary tumors of craniovertebral and upper-cervical localization. *Asian Journal of Neurosurgery*. 2010;5(2):35-45.
- Segal D, Lidar Z, Corn A, Constantini S. Delay in diagnosis of primary intradural spinal cord tumors. *Surgical Neurology International*. 2012;3:52. doi:10.4103/2152-7806.96075.

How to cite this article: Paul PJ, Renganathan R, Anandan H. A Clinical Study of Spinal Cord Tumours. *Ann. Int. Med. Den. Res.* 2017; 3(5):SG18-SG21.

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