

Clinico-Pathological Evaluation of Spinal SOL

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Abstract:

Background: Spinal SOL is a common condition presents to Neuro-spinal surgeon and usually managed by surgical excision. Proper evaluation with knowledge and skill is Key to achieve optimum outcome.

Objectives: Objectives of this study was to asses incidence, pattern of clinical presentation, surgical evaluation and histopathological evaluation of 78 cases of spinal SOL.

Method: The present study was conducted on 78 cases of spinal SOL Presented to author from 2008 to 2014. A total of 78 cases of spinal SOL diagnosed by MRI scan and confirmed by histological reports following surgery were taken as sample. Data were collected with the help of structured questionnaire addressing all variables of interest. Collected data were processed and analyzed .

Results: The result obtained showed that the Age of the patients ranged from 8 to 82 years with mean age of 39 years. The largest age group affected was 41-60 years (39.02%). There was a male preponderance with 48 (61%) patients being males and 30 (39%) patients being females. The most frequently involved spinal level was thoracic 24 (30.78%), followed by lumbar 18 (23.7%), cervical 9(11.54%) and dorsolumbar 11 (14.10%). Most of the SOL were extradural then intra dural extramedullary then intradural intramedullary]. The most common complaint was back pain (80.4%) followed by radicular pain (57%), paraparesis (47%), and paresthesia (43.85%, Myelopathy(30%)), Spasticity , and paraplegia Out of total 78cases tuberculosis was 16(20.51%),Metastases was10(12.82%) Swanoma was 26(33.33%),Followed by ependymoma,8(10.25%), Meningioma 4(5.12%) Astrocytoma 5(6.41%), Lymphoma 3(3.84%), Plasmocytoma 3(3.84%),AVM2(2.56%) and arachnoid cyst 1(1.28%).

Conclusion: Most of the spinal SOL are benign and outcome is fair. Surgery before irreversible neurological deficit provides excellent outcome In the case of primary tumors, the goal is to remove the tumor completely and In the case of metastatic tumors, the goal is almost always palliative, with treatment aimed at providing the patient with an improved quality of life and possibly prolonged life expectancy.

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Introduction:

Spinal SOL is a common condition that presents to Neuro-spinal surgeon in their practice. Spinal SOL are Either primary , secondaries from other tumour or TB The cause of most primary spinal tumors is unknown. Some of them may be attributed to exposure to cancer causing agents. Spinal cord lymphomas,

which are cancers that affect lymphocytes (a type of immune cell), are more common in people with compromised immune systems.^{1,5,6,8} There appears to be a higher incidence of spinal tumors in particular families, so there is most likely a genetic component. In a small number of cases, primary tumors may result from presence of these two genetic diseases: Neurofibromatosis 2 (schwannoma) & Von Hippel-Lindau disease (hemangioblastomas).³ Spinal SOL is classified as extradural, intradural extramedullary (IDEM), and intramedullary spinal cord tumors (IMSCT). Extradural lesions constitute the lesions of the osseous spine, epidural space, and paraspinal soft tissue. IDEM lesions are located under the dura mater but outside the spinal cord, whereas intramedullary lesions are located in the parenchyma of the spinal cord.^{4 13,16,18} Most common spinal Sol are extra dural (55%) then intradural extramedullary (40%) and intradural intramedullary(4%).¹ Clinical presentations of Spinal SOL are Non-mechanical back

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pain is the most frequent symptom of both benign and malignant spinal tumors. This back pain is not specifically attributed to injury, stress or physical activity. However, the pain may increase with activity and is often worse at night. Pain may spread beyond the back to the hips, legs, feet or arms and may worsen over time - even when treated by conservative, nonsurgical methods that can often help alleviate back pain attributed to mechanical causes.^{7,17} Depending on the location and type of tumor, other signs and symptoms can develop, especially as a malignant tumor grows and compresses on the spinal cord, the nerve roots, blood vessels or bones of the spine. Impingement of the tumor on the spinal cord can be life-threatening in itself. Additional symptoms can include the following: Loss of sensation or muscle weakness in the legs, arms or chest Difficulties in walking, which may cause falls Decreased sensitivity to pain, heat and cold Loss of bowel or bladder function Paralysis that may occur in varying degrees and in different parts of the body, depending on which nerves are compressed Scoliosis or other spinal deformity resulting from a large, but benign tumor.^{4,20}

The first step in diagnosing spinal lesions is to define the anatomical location, especially via magnetic resonance tomography, which is also helpful for histopathologists. However, definite diagnosis is based on histologic and examinations.^{2,12,19} Indications for surgery vary depending on the type of SOL. Primary spinal tumors may be removed through complete en bloc resection for a possible cure. In patients with metastatic tumors, treatment is primarily palliative, with

the goal of restoring or preserving neurological function, stabilizing the spine and alleviating pain. Generally, surgery is only considered as an option for patients with metastases when they are expected to live 12 weeks or longer, and the tumor is resistant to radiation or chemotherapy. Indications for surgery include intractable pain, spinal-cord compression and the need for stabilization of impending pathological fractures.^{1,11,18}

Objectives:

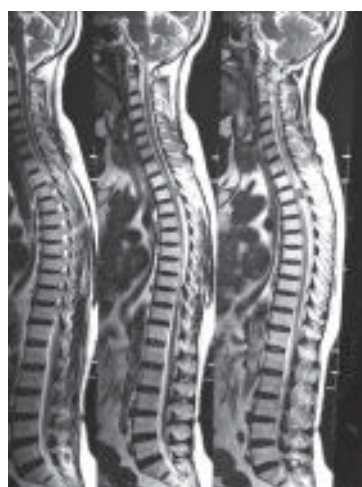
Objectives of this study was to asses incidence, pattern of clinical presentation, surgical evaluation and histopathological evaluation of 78 cases of spinal SOL.

Method:

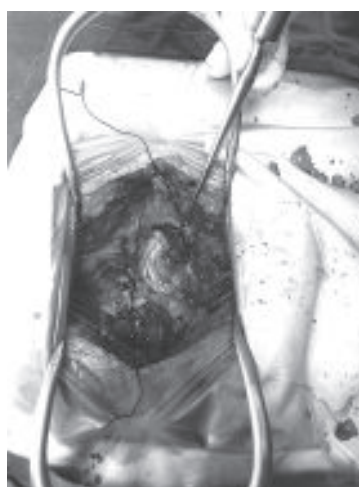
The present study was conducted on 78 cases of spinal SOL Presented to authour from 2008 to 2014. A total of 78 cases of spinal SOL diagnosed by MRI scan and confirmed by histological reports following surgery were taken as sample. Data were collected with the help of structured questionnaire addressing all variables of interest. Collected data were processed and analyzed .

Results:

We studied 78 cases, of spinal space occupying lesion. Age of the patients ranged from 8 to 82 years with mean age of 39 years. The largest age group affected was 41-60 years (39.02%). There was a male preponderance with 48 (61%) patients being males and 30 (39%) patients being females. The most



(a)



(B)

Fig.-1: (a) MRI scan showing spinal SOL, (b) Per operative picture of spinal SOL

frequently involved spinal level was thoracic 24 (30.78%), followed by lumbar 18 (23.7%), cervical 912(15.38%) and dorsolumbar 11 (14.10%), [Table 1]. The most common complaint was back pain (80.4%) followed by radicular pain (57%), paraparesis (47%), and paresthesia (43.85%, Mylopathy(30%)), Spasticity , and 3 patient presented with paraplegia.

There was a wide spectrum of histopathological findings of benign, malignant, inflammatory lesions and vascular malformation. Out of total 78 cases tuberculosis was 16(20.51%), Metastases was 10(12.82%) Schwanoma was 26(33.33%), Followed by ependymoma, 8(10.25%), Meningioma 4(5.12%) Astrocytoma 5(6.41%), Lymphoma 3(3.84%), Plasmocytoma 3(3.84%), AVM2 (2.56%) and arachnoid cyst 1(1.28%) (Table 2). The most common tumour was benign and that was Schwanoma (33%). Mean age of Schwanoma was 35, Male female ratio was 3:2 and most of the schwanomas were located in dorsal region(30%). Tuberculosis was second most common SOL and mean age was 37, male female ratio was 3:1 and common location was dorsolumbar region(43%) (Table3). Common presentation of Spinal TB was Compression fracture of vertebrae and epidural compressing lesion.

Table-I
Site distribution of Spinal SOL

Site	Number	Percentage
Cervical	12	15.38
Cervicothoracic	4	5.12
Dorsal	24	30.78
Dorsolumbar	11	14.10
Lumber	18	23.07
Lumbosacral	9	11.53
Total	78	100

Table-II
Histopathological findings

Histopathology	Number	Percentage
Tuberculosis	16	20.51
Metastases	10	12.82
Schwanoma	26	33.33
Ependymoma	8	10.25
Astrocytoma	5	6.41
Meningioma	4	5.12
Lymphoma	3	3.84
Plasmocytoma	3	3.84
AVM	2	2.56
Arachnoid cyst	1	1.28
Total	78	100

Table-III

Distribution of age ,Sex and location according to histopathology

Histopathology age	Mean female	Male: Location	Common	Percentage
Tuberculosis	37	3:1	Dorsolumbar	43
Metastases	55	3:2	Dorsolumbar	36
Schwanoma	35	3:2	Dorsal	30
Ependymoma	29	3:1	Lumbosacral	38
Astrocytoma	32	2:3	Cervicothoracic	54
Meningioma	42	2:3	Cervical	40
Lymphoma	48	3:1	Dorsal	55
Plasmocytoma	38	3:1	Dorsal	34
AVM & Others	28	2:1	Dorsal	100
Total				

Discussion:

In This study of 78 cases of spinal SOL over 7 years we observed that there is a wide age range, presentation, and histopathological findings. Mean age Was 39 years. Arora et al. Kumar also found similar wide age range in their study.^{1,6,7} The largest age group affected was 41-60 years (35.08%). Male were more commonly affected group in this study. Primary spinal tumors are seen more commonly in females in western population group, whereas in Asia, male preponderance is seen.^{8,9} The percentage of Male and female was 61% and 39%. which is similar to other studies reported from Asia.^{6,7} Reviewing Literature The literature it is suggested that

suggests that 90% of the spinal tumors are extra medullary while only 10% are intramedullary.¹⁰ In our study most of Sol were extramedullary. Our results correlate well with previous studies done in Asia.^{6,8,11,12}

Swanoma was the largest category of tumors 33.33% followed by Tuberculosis 20.51%. Most of the Schwanomas were Intradural extra medullary (IDEM).As a historical note, Sir Victor Horsley in 1888 succeeded for the first time in surgically excising an IDEM tumor located in the thoracic region, and this was 44 years before the invention of myelography. 2) Thereafter, the advancement in radiological examination techniques and the use of surgical microscopes has brought about remarkable improvements in the diagnosis and surgical treatment, but the basic surgical principles have not changed.³ Tuberculosis results from the extension of adjacent tuberculous inflammation from vertebrae, although it can be secondary to tuberculous meningitis. This leads to the destruction of cartilage and collapse of the

intervertebral disc, forming cold abscess leading to pressure effect on dural tube. In the western world tuberculosis is not common but the picture is similar reported in India and some part of Asia.^{6,8,11,12} Metastases were also common in our study (12%) that is consistent with most of the study. Most of our metastatic tumours were metastatic adenocarcinoma. Ependymoma was 10.25% in this study. Most of the ependymoma located in the lumbosacral region and were myxopapillary ependymoma. Ependymomas and Astrocytoma were difficult to resect completely because of involvement of neural structure.^{4,5} Most of our astrocytomas were low grade. In all cases of ependymomas and astrocytomas subtotal resection was done and advised for RT postoperatively.

Meningiomas were not common in this study (5.12%). The mean age was 42 years, and male/female ratio was 2:3 suggesting female preponderance and the most common site was cervical region with most of the lesions being located intradurally. Surgical outcome was fair.

In this study 3 cases were non-Hodgkin's lymphoma and after surgical removal post-operative RT and chemotherapy taken outcome was also fair.

Two cases of spinal AVM were found in this study. One was in Dorsal 8 and one was in conus. Conus AVM presented with acute haemorrhage with paraplegia. After surgery paraplegia was not improved probably because of delayed presentation. Outcome of other patient was fair. One of our cases was spinal extra dural arachnoid cyst. It is less commonly reported in the literature.

Conclusion ::

Most of the spinal SOL are benign and outcome is fair. Surgery before irreversible neurological deficit provides excellent outcome. In the case of primary tumors, the goal is to remove the tumor completely, leading optimally to the potential cure of the malignancy. In the case of metastatic tumors, the goal is almost always palliative, with treatment aimed at providing the patient with an improved quality of life and possibly prolonged life expectancy.

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