# SPINAL TUMORS

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# General Considerations

- Spinal tumors fall into two groups primary and secondary, the latter being the commonest
- Intraspinal tumors form around 15% of all primary CNS tumors
- Most of these primary intraspinal tumors are benign
- Compression of the spinal cord by tumors is a serious problem that requires quick action.

# Acute and Chronic Cord Compression

- Compression could be acute or chronic.
- The acute compression (e.g. when a vertebra which has been destroyed by a metastatic tumor collapses) will lead to immediate paralysis below the level of the compression. If this compression is not relieved within a short period of time the neurological damage most likely will be permanent.
- In contradiction to this, if a limb has been weak due to chronic compression even for a long period of time; removal of the compression is expected to be followed by recovery

# Acute Cord Compression

- ***Acute compression*** from a lesion outside the cord leads to flaccid paralysis and sensory loss BELOW THE LEVEL of the compression with absent reflexes and a mute plantar response.

# Chronic Cord Compression

- ***Chronic compression*** produces signs of sensory loss and an upper motor lesion BELOW THE LEVEL of compression, so that there is increased tone and exaggerated reflexes and a Babinski response.

# Clinical Presentation

Spinal tumors present clinically through:

- **Pain**
- **Neurological deficits:**
  - **Motor**.
  - **Sensory.**
  - **Autonomic dysfunction**

# Types of Pain

There are different types of pain associated with different types of tumors.

- Metastases involving the vertebrae and compressing the cord will cause severe pain, which is usually nocturnal. The tumor tends to swell during the night due to the fall of cortisol levels and the increase and retention of CO2.
- Whereas, tumors abutting on nerve roots will produce electrical pain radiating along the course of the involved root.
- Pain from cord lesions is dull aching.

# Investigations

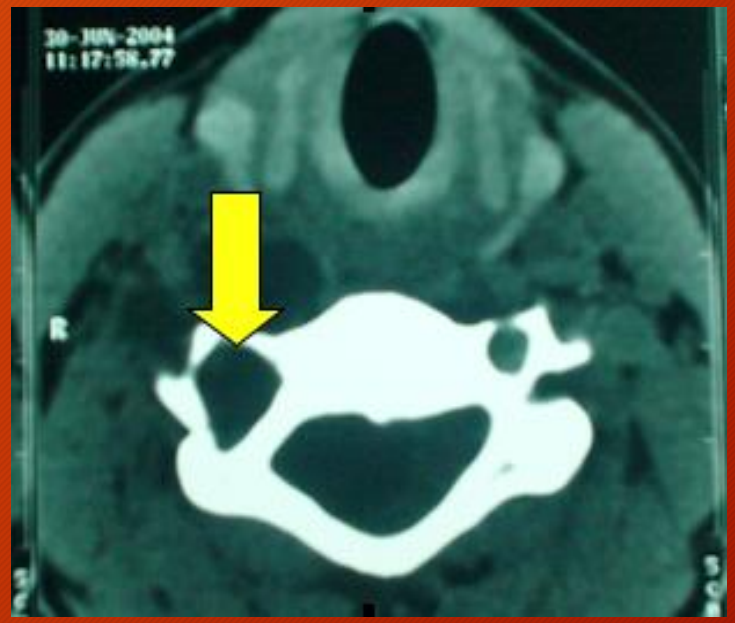
**PLAIN X-RAYS:**

- These are very important tools in the diagnosis and should be performed in every case. They may help in confirming the level of the pathology and/or indicate the type of pathology. The following are some of the changes the may be detected:
- A collapsed vertebra (metastatic lesion or osteoporosis).
- An osteolytic or osteoblastic lesion in a body or lamina or pedicle (metastatic lesion)
- A scalloped vertebral body (indicate long standing pressure)
- A widened intervertebral foramen (neurofibroma)
- A widened canal, as indicated by increased inter-pedicular distance (long standing pressure).
- An abnormal calcification.
- Scoliosis.
- Paravertebral mass shadows

# Investigations

**CT SCANS**

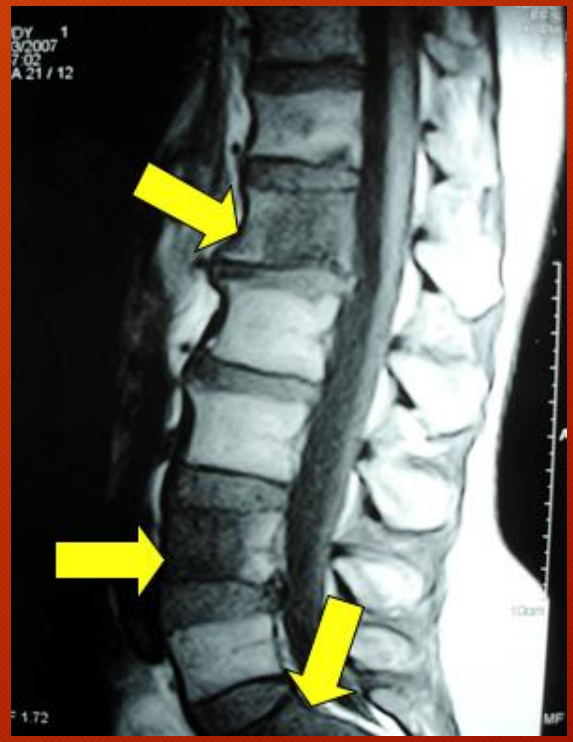
- These are of value to demonstrate erosion of bone in case of destructive lesions. It may also show widening of the vertebral canal or foramina (Figures 59, 60). Calcifications are well demonstrated by this method. They are not helpful in soft tissue diagnosis.



# Investigations

**MRI**

- This is the investigation of choice in demonstrating spinal tumors. In many cases it is also helpful in giving an idea about the pathology of many tumors (Figure 61). Sagittal and axial views in both T1 and T2 weighted formats are routine. Other views could be requested as required including coronal views (MRI myelogram), or other formats for specific pathology like fat suppression



# Classification of Spinal Tumors

- These tumors could be classified anatomically into:
- **Extradural** which form about 60% of the total. They occur outside the dura; in the extradural space (Soft tissue + nerves + lymphs + neurofibroma 'benign') or vertebral body.
- Most of these tumors are metastatic which start primarily in a pedicle of a vertebra, having arrived via the blood stream. But some are primary malignant, and some are benign, but they are uncommon.
- **Intradural** which form about 40% of the total, these could be either:
  - ***Extramedullary*** are those which arise from the roots or coverings (meninges) and form around 35%, or,
  - ***Intramedullary***, arise from the cord itself and form around 5%.

# Extradural Tumors

**MALIGNANT**

- These tumors form about 50% of all spinal tumors and occur mainly in older people. They are **mostly metastatic tumors** with their primary somewhere else in the body.
- They have in most cases started in a part of the vertebra (body, pedicle) and extended into the extradural space compressing the cord or roots.
- These tumors arise from primary tumors of the breast, lung, kidney and prostate. Most of these metastatic tumors are osteolytic in nature, but some like the prostate, are osteoblastic. Both types may show abnormality on plain x-rays.
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# Extradural Tumors

**BENIGN**

- These tumors occur in the extradural space, either in the bone as in hemangioma or in the nerves as they course through the epidural space; nerve sheath tumors (NST) like schwannomas and neurofibromas, or from the dura (meningioma). Other tumors which occur in this space are lipomas, however they form a smaller portion of all spinal tumors.

# Intradural Tumors

**EXTRAMEDULLARY**

- They are slowly growing tumors hence they lead in addition to the compression, to changes in the adjacent bone.
- They could be either:
  - Meningiomas (extra axial)
  - Nerve Sheath Tumors

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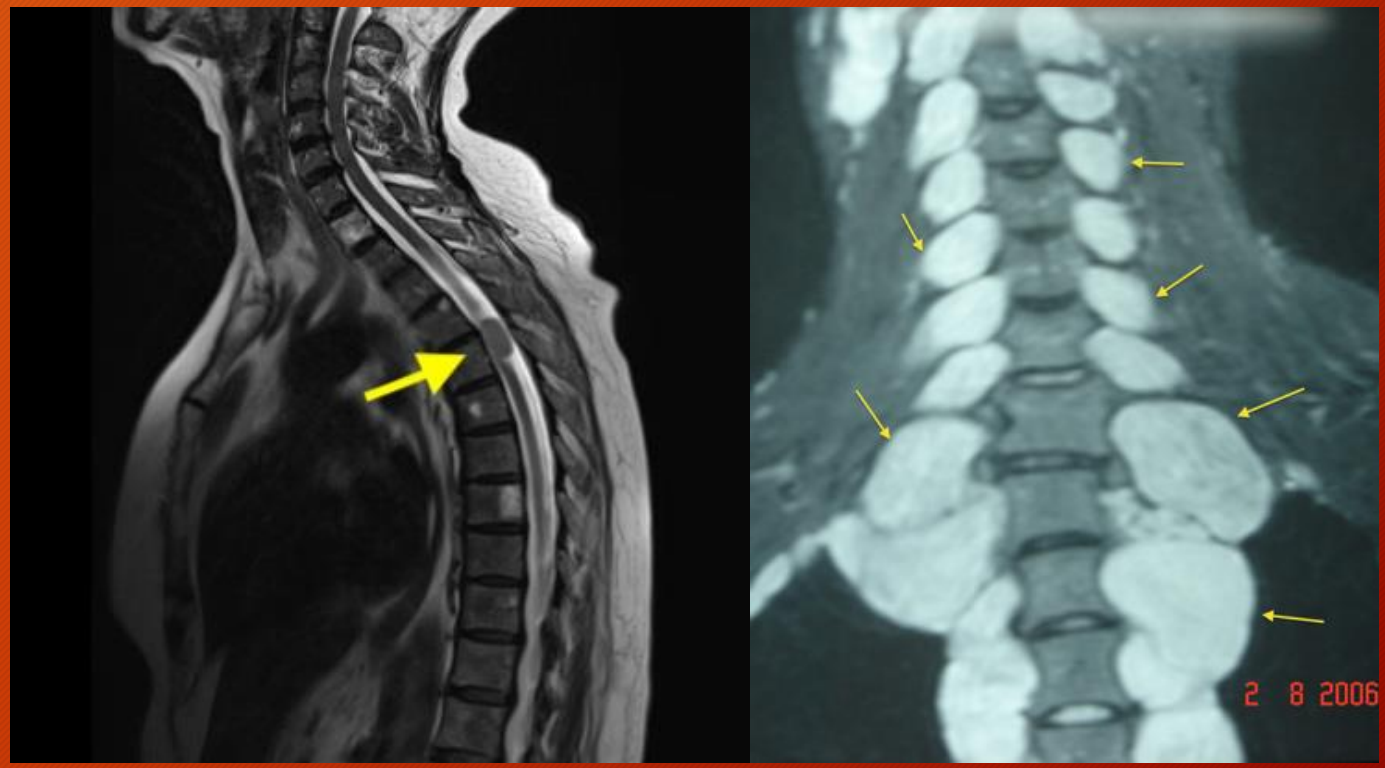

# Intradural Tumors

**INTRAMEDULLARY**

- They are mostly benign and could be either .
- They could be either:
  - Astrocytomas (child)
  - Ependymomas (adults)
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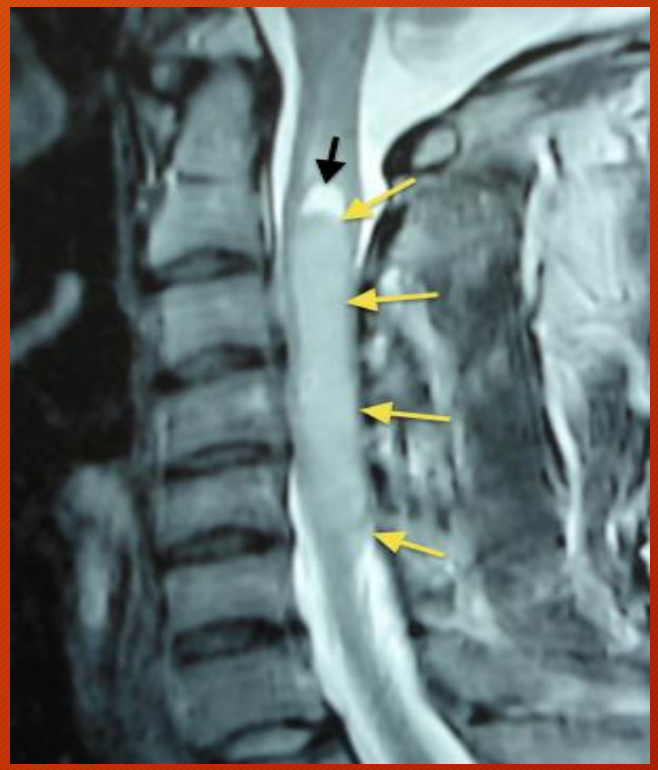

# Management

- Spinal cord tumors are usually treated by **surgery** aiming for excision and relief of compression. Excision can be achieved in most benign tumors; however, some tumors are difficult to excise completely and therefore are usually debulked. In metastatic tumors, the aim of surgery is usually decompression.

# Management

- **Metastases**: If situated posterior or postero-lateral to the cord, a decompressive laminectomy followed by radiotherapy (RT) is the usual course of action. However, if situated anterior to the cord then an anterior approach with corpectomy and fusion should be performed, to be followed by RT. **Lymphomas respond well to steroids.**

# Management

- **Meningiomas, Schwannomas and Neurofibromas are usually treated with excision via a laminectomy.** The **dural attachment** in meningiomas must be removed to prevent regrowth of the tumor.
- Schwannomas can be shaved off nerve roots.
- Neurofibromas are difficult to excise completely, so the course of action depends on whether the nerve root could be sacrificed or not. If so the tumor can be removed with its nerve root, otherwise a partial resection is the only course of action [2, 29]. Since the tumor grows slowly a second operation could be done after many years. Dumb-bell tumors require 2 stage operations. There is no place for RT in these types of tumors except in rare cases of pathological change.

# Management

- **Ependymomas and Astrocytomas** are dealt with surgically via a laminectomy and myelotomy. Cord ependymomas could be shelled out, especially if associated with a syrinx (Figures 65,66). Filum terminale ependymomas are removed with the filum itself, which should be sectioned from the top end first to avoid retraction of the tumor and the cord upwards. There is usually ne need for RT, but there may be a place in some types of astrocytoma.
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# Prognostic Factors

- Age of patient
- Duration of symptoms and compression
- Ambulatory status of the patient
- Histopathology of the tumor