Oncologic Emergencies: Spinal Cord Compression

Saturday, April 13 • 9:45–11 am

Note one action you'll take after attending this session: _____

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Key Session Takeaways

1. Describe the most common cancers associated with cord compression.
2. Identify at least two symptoms associated with cord compression.
3. Describe the most appropriate nursing interventions for cord compression.


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Oncologic Emergencies:
Spinal Cord Compression

Disclosures

- No Disclosures

Objectives

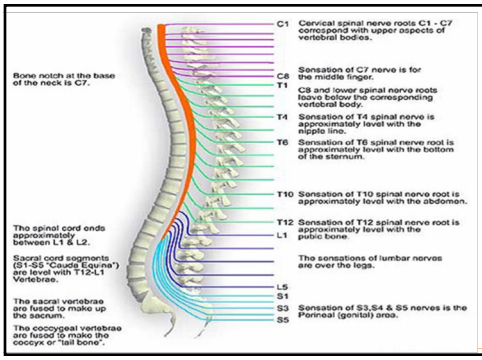
- Describe the most common cancers associated with spinal cord compression
- Identify at least two symptoms associated with spinal cord compression
- Describe the most appropriate nursing interventions for spinal cord compression

Definition

- A mass effect from the tumor with associated edema which results in ischemia and neural damage to the spinal cord
- Cord compression is the initial presentation of a malignancy in 20% - 34% of patients

Epidemiology

- Annual incidence is approximately 3 to 5% of patients with cancer
- Malignancies most commonly associated with spinal cord compression
  - Breast
  - Lung
  - Prostate
  - Multiple myeloma



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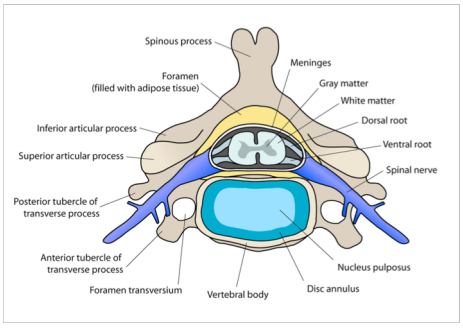
Polite Dissent

Pathophysiology

- Cord compression is a function of spinal anatomy
- Cord is enclosed by a protective ring of bones comprised of the vertebral body anteriorly, the pedicles laterally and the lamina and spinous processes posteriorly.
- Within this ring is the thecal sac , the outermost layer of which is comprised the dura.
- Between the bone and the dura lies the epidural space, which normally contains fat and the venous plexus



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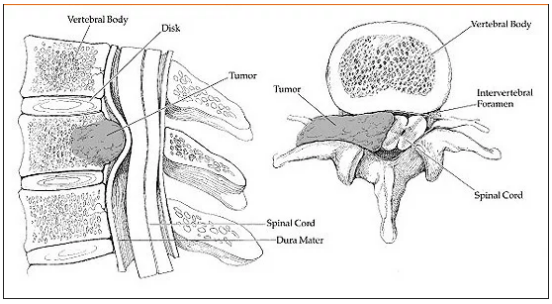
Occurrence

- The most common source of cord compression is metastasis to the epidural space with or without bony involvement
- Tumors can also through the reach the epidural space by direct extension through the intervertebral foramen
- Some tumors occur in the cord itself



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Symptoms

- Early cord compression may be asymptomatic
- Back Pain:
  - First Symptom
  - 80-95% of patients with MSCC will experience it
  - Precedes other neurologic symptoms on average by 7 weeks

Level of Involvement

Spine Level	Percentage
Cervical	10
Thoracic	70
Lumbosacral	20

Symptoms

- Pain is often worse at night due to the diurnal variation levels in in endogenous corticosteroids
- Local pain may be due to disruption of the periosteum or Dural nerves, the spinal cord or the paravertebral soft tissue
- The frequent alleviation of pain with steroids suggest inflammation or neuronal irritation plays a significant role

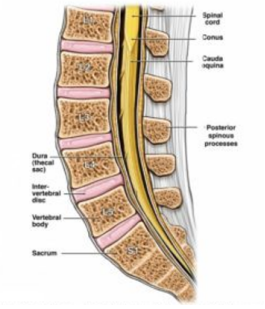
Symptoms

- Pain may develop a radicular quality, it may radiate into a limb with movement of the spine or Valsalva maneuver
- Radicular pain is noted more often in lumbosacral lesions over thoracic lesions

Motor Symptoms

- Represent advanced MSCC
  - Found in 35-75% of patients with MSCC
- Weakness
  - Severity greatest with thoracic involvement
  - Location of involvement impacts patient deficits
- Progressive

Increased weakness → Loss of gait function → Paralysis (unable to ambulate)



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Motor Symptoms

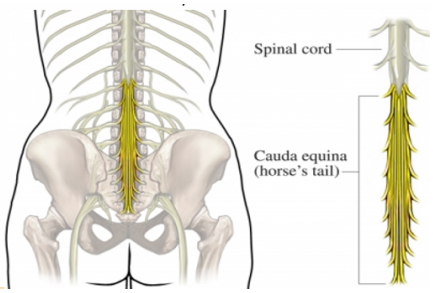
Thoracic spine	Upper extremities	Triceps and wrist extensors
Increasing weakness	Loss of gait function	Paralysis
Advanced stages	Loss of ambulation	

Symptoms

- Ataxia- loss of full control of body movements
- New gait ataxia in setting of back pain should elevate the suspicion of a cord compression
- In the absence of sensory loss
  - Etiology :Spinocerebellar tract dysfunction

Sensory Findings

- Less frequent than motor
- Ascending numbness and paresthesia
- Radicular distribution
  - Lumbar cord compression
- Bilateral leg weakness
  - Thoracic compression



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Cauda Equina Syndrome

- Condition that occurs when the bundle of nerves below the end of the spinal cord known as the cauda equina is damaged
- Symptoms include:
  - Pain that radiates down the leg
  - Low back pain
  - Numbness around anus
  - Loss of bowel or bladder control

Manifestations

- Pain
  - Localized
  - Radicular
  - Severity
  - Position changes
  - Cough
  - Weight bearing
  - Valsalva maneuver

Manifestations

- Sensory loss
  - Bowel dysfunction
    - Constipation
    - Diarrhea
  - Bladder dysfunction
    - Incontinence
    - Foley catheter
- Impotence
- Loss of sexual ability

Manifestations

- Weakness 75-85%
  - May progress rapidly
  - Bilateral
  - Corresponds to the level of cord involvemnent
- Spasticity
- Hyperreflexia
- Abnormal stretch reflexes
- Extensor plantar response

Imaging

- CT scans do NOT demonstrate the spinal cord or epidural space clearly even when IV contrast is used
- Severe osteoporosis by CT can depict metastatic disruption of the bony cortex surrounding the spinal canal
- Highly predictive of epidural tumor extension
- Myelography has largely been replaced by MRI

Diagnostic evaluation

- MRI of entire spine
  - IV contrast
- MRI
  - 20-35% have non-contiguous compression
- MRI
  - Sensitivity- 93%
  - Specificity 97%

Diagnostic evaluation

- For patients unable to undergo MRI
  - CT Myelography
    - Alternative to MRI:
      - Mechanical valves
      - Pacemakers
      - Paramagnetic implants,
      - Embedded metal
      - Severe claustrophobia

Diagnosis

- MRI - (Tool of choice)
  - Determine prevertebral, vertebral, extradural, intradural, extramedullary and intramedullary lesions
  - Anatomic visualization:
    - Sagittal and axial images of the spinal cord
- Fine needle aspiration
  - Tissue confirmation

Treatment

- Glucocorticoids are part of the standard regimen as a bridge to definitive treatment and pain palliation
- High dose steroids in patients with pain and deficits
- Steroids are not routinely started for those with normal neurologic function and small epidural lesions
- Work presumably via an anti-edema effect in steroid responsive malignancies
- Provides analgesia and preserves neurologic function

Treatment

- Pain management
- Bedrest for spinal instability

Venous Thromboembolism Prophylaxis

- Anticoagulation
- IVC filter

Pain Management – Opioids

- Morphine
  - Immediate release
  - Sustained release
- Oxycodone
  - Immediate release
  - Sustained release
- Hydromorphone
  - Immediate release
- Fentanyl
  - Sustained release

Pain Management

- Neuropathic pain adjuvants
  - Dexamethasone
  - Gabapentin
  - Pregabalin
  - Amitriptyline
  - Nortriptyline

Pain Management

- Bone pain adjuvants
  - Zoledronic acid
  - Pamidronate
  - Acetaminophen

Pain Management

- Bowel regimen medications
  - Senna
  - Polyethylene glycol (Miralax)
  - Bisacodyl suppository

Treatment

- Spinal instability is an indicator for surgical stabilization, regardless of grade and radiosensitivity
- Pain from an unstable spine will not be relieved by radiotherapy and there is lack of evidence is an effective technique for reducing pain
- Surgical stabilization has data for reducing pain

Treatment

- Criteria:
  - Primary tumor type
  - Level of myelopathy
  - Degree of spinal block
  - Potential for neurologic reversibility

Treatment - Surgery

- Radical resection if an a candidate
- Complete block
- Single lesion where complete removal is possible
- Diagnosis is uncertain
- Mild deficits
- Data supports surgery over treatment with RT if patient is a good surgical candidate

Treatment - Surgery

- Surgery main goals are:
  - Preservation and restoration of mechanical stability to effectively manage movement-induced pain
  - Circumferential decompression of the spinal cord to preserve neurologic function and allow delivery of adequate doses of radiation to entire tumor volume while avoiding toxicity to the spinal cord

Treatment

- Separation surgery plus stereotactic body radiation therapy
  - Combined therapy provides durable local control and diminishes the need for extensive tumor excision and prolonged postoperative recovery
  - Separation surgery provides for decompression of the cord, then radiation can follow

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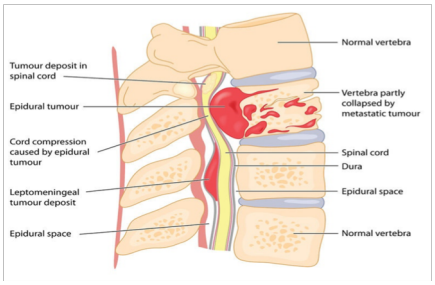

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Treatment

- Stereotactic body radiotherapy
  - Used for patients with radioresistant or recurrent spinal mets that are diagnosed early before high grade cord compression has developed
  - Excellent pain relief and tumor control
  - Risks are 10-15% risk of vertebral compression fracture, along with mucositis, esophagitis, dysphagia, diarrhea and transient radiculitis

Treatment

- Minimally Invasive Procedures
  - Vertebroplasty, Kyphoplasty and percutaneous spinal instrumentation
  - Spinal instability from cord compression are NOT candidates for any minimally invasive intervention
  - For patients with fractures extending into pedicles and extensive lytic destruction who do not require surgical decompression percutaneously placed spinal instrumentation can be used.

Treatment

- Systemic therapy
  - Chemo sensitive tumors, systemic therapy may be used, but most tumors with a cord compression are NOT chemo sensitive therefore it is not the only treatment utilized
  - Systemic therapy usually requires days to weeks to work and those with cord compression require treatment to act more rapidly than systemic therapy provides

Treatment

- Systemic therapy may be considered with
  - Hodgkin lymphoma
  - Non-Hodgkin lymphoma
  - Neuroblastoma
  - Germ cell neoplasms
  - Breast cancer

Treatment

- Rehabilitation Care
  - Inpt –PT and OT
  - Management of bowel and bladder alterations
  - Decubitus ulcer prevention
- Post acute care
  - Can be delivered in home, Rehabilitation facility or skilled nursing facility

Psychological Concerns and Palliative Care

- Coping, family and caregiving needs, advanced care planning
- Social workers to provide therapeutic counseling
- Psychiatric referral for those with significant anxiety or depressive symptoms

Prognosis

- Overall survival is approximately 6 months reported in a large historical series, but a modern series demonstrates survival of several years after treatment
- Outcome is better in ambulatory patients, and approximately one-half of patients surviving one year are ambulatory at that time

Prognosis

- Median survival for ambulatory patients prior to radiation therapy is 8-10 months compared with 2-4 months for those who are non-ambulatory
- For those who remain non-ambulatory at conclusion of radiation survival is only 1 month

Prognosis

- Neurologic function
  - Pretreatment neurologic function is strongest predictor of post-treatment neurologic function
  - Most series have demonstrated 67-82% who are ambulatory when treated remain so at conclusion of therapy
  - Approximately 1/3 of non ambulatory patients due to paraparesis regain the ability to walk with therapy as do 2-6% who are paraplegic. (NB higher rates are noted in radiosensitive neoplasms

Prognosis

- Neurologic function
  - Likelihood of being ambulatory after treatment is higher among patients whose motor deficits developed more slowly over at least 2 weeks versus 1 week prior to therapy and in non-ambulatory patients whose treatment is begun less than 12 hours after loss of ambulation
  - Among patients who require a Foley catheter before therapy 20-40% become catheter free
  - Disease extent also influences outcome
  - Complete subarachnoid block produced by the tumor is a poor prognostic sign

Nursing Interventions

- Thorough assessment and early MD/Provider notification of changes in
  - Pain
  - Sensory function
  - Motor function
  - Urinary function
  - Bowel function

Nursing Interventions

- Maintenance of functional status
  - Bowel program
  - Bladder program
  - Skin care
- Rehabilitation services
  - PT
  - OT

Nursing Interventions

- Education
  - Patient
  - Family
  - Significant others
  - Care givers

Nursing Interventions

- Emotional support
  - Decrease anxiety
- Referrals
  - Social worker
  - Psychologists
  - Psychiatrist
  - Chaplain

Nursing Interventions

- Referrals
  - Care coordination
  - Case manager
  - Home care
  - Rehabilitation center
  - Skilled nursing facility
  - Hospice

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