Cervical Spondyloptic Myelopathy

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Neurosurgeon
Disclosures

• I have nothing to disclose
Objectives

- At the end of this talk the participant will be able to:
  - Define cervical myelopathy
  - Name etiologic factors
  - Describe the natural history
  - Name the components of the clinical evaluation
Myelopathy

- Symptomatic spinal cord dysfunction due to a decrease in the spinal canal diameter
- Associated with a constellation of signs and symptoms
- Generally a “cervical” and “degenerative” condition
Etiologies of Myelopathy

- Degenerative spondylotic disease
  - Disc/osteophytes complex
  - Facet hypertrophy
  - Thickened ligamentum flavum
  - Deformity – kyphosis
  - Subluxation/ spondylolisthesis
- OPLL (Ossified posterior longitudinal ligament)
- Trauma, tumor, syringomyelia, other
- Congenital spinal stenosis
The course of CSM is mixed and variable

- Generally a slow stepwise deterioration (Class III)
- Long periods of quiescence are not uncommon (Class III)
- Acute deteriorations are less common
- Longstanding stenosis can be associated with demyelination and potential irreversible deficit (Class III)
The onset of symptoms may be acute or insidious
- Depending on the spinal cord’s ability to adapt to compression
- Longstanding stenosis can be associated with impressive radiographic findings without neurology
  - Acute deterioration in such cases can occur following trivial injuries
52 y.o. man whiplash accident 10y follow-up
Presented acutely with CCS following a fall
Evaluation

Clinical Findings:

- Gait instability and loss of balance
- Inability to manipulate small objects
  - Loss of hand dexterity
  - Handwriting, buttons, eating, recognizing coins
- Numbness
  - None-dermatomal
- Weakness
- Bowel and bladder dysfunction
Evaluation

• Sensory “Level”
  – Last normal level of sensation
  – Generally approximates the level of compression

• Long-Tract Findings
  – Occur below the level of compression
Evaluation

• Long-TRACT FINDINGS:
  - Hyperreflexia in the UL and/or LL
    - Spasticity
  - Weakness in multiple myotomes
  - Sensory loss
    - Light touch, vibration, proprioception, sharp/dull, pain

• Specific Signs:
  - Clonus, Babinski, Hoffman’s, Romberg, L’Hermitte’s
Algorithm for Cervical Myelopathy

Mohan Radhakrishna MD, FRCPC
Jean Ouellet, MD, FRCSC, Peter Jarzem MD, FRCSC, Jeff Golan MD, FRCSC
Disclosures

Pfizer
Objectives

• To develop an organized approach to cervical myelopathy
Disclaimer: Red Flag Conditions
Red Flag conditions

Trauma
– Tumor
– Infection
– Severe loss of function: Rapidly progressive deterioration, loss of gait, loss of use of hands, loss of bowel, bladder function and eventually loss of respiratory function are all late manifestations of severe spinal cord compromise
Symptoms and Signs

Symptoms

- Upper extremities
  - Numb, clumsy fingers
  - Decreased dexterity of hands
  - Difficulty with buttons, hand writing
  - Loss of strength, wasting of hand muscles
- Lower extremities
  - Numbness, clumsy gait, falls
  - Weakness

Signs

- Hyperreflexia, increased tone, spread of reflexes
- Positive Hoffman, acromion reflex, Babinski
- Decreased rapid alternating movements
- Decreased fine motor (finger nose)
- Poor tandem gait
- Scissor (crouched) gait
- Diminished sensation
- Decreased power (prox>dist)
How do you diagnose cervical myelopathy?
Literature Review

- Search for physical exam and cervical myelopathy.
- Found 500 abstracts.
-Parsed to 36 papers
- Downs and Black on these 36 papers
What physical maneuver has the highest sensitivity for detecting cervical myelopathy?
Myelopathic signs more common in true cervical myelopathy group but...

High prevalence in neck pain only group
<table>
<thead>
<tr>
<th></th>
<th>CM</th>
<th>Control</th>
<th>$p^*$</th>
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<tbody>
<tr>
<td><strong>n = 39</strong></td>
<td></td>
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<tr>
<td>Any (≥ 1) myelopathic sign</td>
<td>79%</td>
<td>57%</td>
<td>0.05†</td>
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<tr>
<td>Any (≥ 1) provocative sign</td>
<td>69%</td>
<td>32%</td>
<td>0.003†</td>
</tr>
<tr>
<td>- Hoffmann</td>
<td>59%</td>
<td>16%</td>
<td>0.0001†</td>
</tr>
<tr>
<td>- IBR</td>
<td>51%</td>
<td>19%</td>
<td>0.004†</td>
</tr>
<tr>
<td>- Babinski</td>
<td>13%</td>
<td>0%</td>
<td>0.05†</td>
</tr>
<tr>
<td>- Clonus</td>
<td>13%</td>
<td>0%</td>
<td>0.05†</td>
</tr>
<tr>
<td>Any (≥ 1) hyperreflexia</td>
<td>72%</td>
<td>57%</td>
<td>0.2</td>
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</table>
What historical feature is most sensitive for cervical myelopathy?
• Loss of manual dexterity
• Concomitant cervical radiculopathy often present

• Gait unsteadiness
• Loss of balance
Level affected

- Both arms and legs, cervical--MRI cervical spine
- Legs only, low cervical, thoracic
A good neurologic exam

- Begins in the waiting room
- Includes functional tasks e.g. crouching, repetitive hand opening
- Is comprehensive: motor, sensory, reflex
- Is reliable
When cervical myelopathy is suspected in the office...
Imaging

- MRI imaging should be obtained quickly in patients with suspected myelopathy.
- If the MRI is normal, the patient can be managed conservatively but consider work-up/referral for other diagnoses.
<table>
<thead>
<tr>
<th>Status</th>
<th>Action</th>
<th>Referral Time</th>
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</thead>
<tbody>
<tr>
<td>Ambulatory Patient, Non-progressive myelopathy</td>
<td>Investigate, Refer to surgeon</td>
<td>High priority</td>
</tr>
<tr>
<td>Ambulatory Patient, progressive myelopathy</td>
<td>Investigate, Refer to surgeon</td>
<td>Urgent (weeks)</td>
</tr>
<tr>
<td>Non-Ambulatory Patient, rapidly progressive myelopathy</td>
<td>Refer to surgeon for urgent transfer</td>
<td>Immediate, emergent, referral</td>
</tr>
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</table>
Management (non-emergent)

- Educate patient: Risky activities
Pain Management

- Neck pain variable present with cervical myelopathy.
- Manage similarly to McGill Low Back Pain algorithm.
Therapy

Physiotherapy
Occupational Therapy
MRI findings

• Variable terminology used by radiologists

• Some words to look out for: severe central stenosis, cord effacement, spinal cord deformity, spinal cord signal change
Summary

• Cervical myelopathy is not easy to diagnose
• No one symptom, sign correlates perfectly.

http://www.mcgill.ca/spineprogram/