Whiplash Associated Disorder:  
The pathway from acute to chronic pain

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Learning Objectives

• Able to demonstrate:
  • Clinical plan to evaluate and manage a post-traumatic, whiplash type injury  
  • Appropriate interview process to commence differential diagnosis process  
  • Appropriate evaluation process to rule-in and rule-out diagnoses  
  • A differential diagnosis that includes a working diagnosis  
  • A continuum of diagnosis as patient progresses with care  
  • Therapeutic recommendations  
  • Prognosis

Patient Presentation

• 56 y/o male chiropractor, self-employed, multidisciplinary clinic with health and disability insurance.  
• Presenting with an acute, exacerbation of neck pain and unilateral upper extremity paresthesias in the C6 dermatome.  
• Past history of side impact motor vehicle collision (MVC) with whiplash injury some 20 years earlier.  
• Resulted in fractured teeth, spinal and hand strain/sprain injuries, confusion and short-term memory loss.  
• He has experienced daily neck pain and stiffness since the MVC with episodic neck/arm pain with paresthesias.  
• Radiographic and MRI studies demonstrated degenerative disc and joint disease at the levels of C5-6-7.
How Do You Determine the Prognosis With this Whiplash Type Injury?

How Do You Grade the Injury?

Is the Whiplash Type Injury in a Chronic or Acute State?
How Do You Determine if the Patient Will Develop a Chronic Pain Condition?

Differential Diagnosis Process

- Intake form with pertinent data regarding injury
- Medical records from ER or other providers
- Patient interview or history taking
  - Create list of potential diagnoses
- Physical examination
  - Rule in and rule-out diagnoses
- Specialized imaging including MRI and Spinal Motion Studies
- Working diagnosis (es)

Pathoanatomical Lesions in the Whiplash Injury

1. Cervical Facet joints (Zygapophyseal Joints)
2. Dorsal Root Ganglion (DRG) and Nerve Roots
3. Cervical Ligaments
4. Intervertebral Disc Injuries
5. Muscle Injuries
6. Fractures
Persistent Pain: A Chronic Illness

- Acute pain usually goes away after an injury or illness resolves. But when pain persists for months or even years, long after whatever started the pain has gone or because the injury continues, it becomes a chronic condition and illness in its own right.


National Pain Strategy

- **Chronic pain** - Pain that occurs on at least half the days for six months or more.

Facet Joint Injury Model

- Studies employing the cervical facet joint injury model have identified the occurrence of hemarthrosis, capsular damage, joint fractures, and capsular rupture.

Cervical Facet Injury Model

• Clinical support for a facetogenic model of persistent pain generation in whiplash can be found in the literature.


Cervical Facet Injury Model

• As a result of facet joint injury, whiplash patients frequently encounter headaches, back and shoulder pain in addition to neck pain.


Cervical Facet Joint Injury and Referred Pain

• The most common facets to be injured and highest prevalence of joint pain are at C2/C3 and C5/C6 which frequently results in referred pain.

Dorsal Root Ganglion (DRG) Compression and Soft Tissue Changes

- Largely undetected
- May contribute to adaptation in the overall functioning of the cervical DRG
- May predispose an individual to abnormal, centrally mediated pain processing. (5, 6)

Cervical Ligamentous Sprain Injuries

- Possible injury to mechanoreceptive and nociceptive nerve endings leading to pain, inflammation and chronic pain syndrome


Radiographic Examination

- When is it appropriate to order a radiographic cervical spine joint motion study, also known as cervical spinal motion fluoroscopy?
Cervical Spine Motion Fluoroscopy


Cervical Disc Injuries

Present in 25% of subjects post whiplash injury and correlated with radicular symptoms (9, 10)
Cervical Disc Injuries

- C5-6 segmental level was found to be the most common level of disc injury...
- greater risk of low-grade spinal cord injury with pre-existing spinal canal narrowing at C5-6 level


Cervical Spondylotic Myelopathy

Common symptoms
- Clumsy or weak hands
- Leg weakness or stiffness
- Neck stiffness
- Pain in shoulders or arms
- Unsteady gait

Common signs
- Atrophy of the hand musculature
- Hyperreflexia
- Lhermitte's sign (electric shock-like sensation down the center of the back following flexion of the neck)
- Sensory loss

Muscles Strained

- Whiplash has been demonstrated to strain SCM, semispinalis, splenius capitis and upper trapezius with rear-end impacts.

Soft Tissue Injury Grading

- **Grade 1 strain of muscle/tendon** (Mild)
  - Overstretch or tear up to 5%
- **Grade 2 strain of muscle/tendon** (Moderate)
  - Tear up to 50%
- **Grade 3 strain of muscle/tendon** (Severe)
  - Rupture or complete 100% tear
- **Grade 4 strain of muscle/tendon/bone** (Avulsion)
  - Complete tear with avulsion of bone

Post-Traumatic Myofascial Pain Syndrome

When should specific interventions take place and why?

- Medications
- Immobilization
- Spinal manipulation
- Soft tissue treatments
- Ice/Heat/Cryotherapy
- Electrotherapy
- Cold laser therapy
- Traction (intersegmental, long-axis, and non-surgical spinal decompression)
- Rehab exercises
- Behavioral health
Chiropractic Use of Cold Laser for Pain

- https://www.youtube.com/watch?v=IRB9Fmdzmvw&index=9&list=PLUQjApeDORT-F0fAatBmj92kwDILBt_9p

Extentrac and Dr. David F. Cuccia
3 Dimensional non-surgical spinal decompression

Dr. James M. Cox
Conclusions: The evaluation and management of whiplash injuries must attempt to accomplish the following before starting treatments:

- Discover mechanism of injury
- Reveal pain severity (acute and chronic)
- Determine the injured tissues and pain generators
- Understand biopsychosocial factors
- Perform a differential diagnosis
- Provide a reasonable prognosis
- Offer appropriate treatment
- Integrate a health care team of providers

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Engaged Learning Task (25 minutes)

- Form groups of 3-4
- Select a spokesperson who will provide a brief presentation of your SOAP notes
- Determine appropriate evaluation including history and physical examination and chart expected findings
- Perform differential diagnosis
- Recommend treatment plan
- Give prognosis
- Chart with SOAP process
Spokesperson Will Present and Defend Your Work (25 minutes)

- Another group will be selected to question the presentation.
- Do you agree with evaluation?
- Do you agree with list of potential diagnoses and working diagnosis?
- Do you agree with the prognosis and treatment recommendations?

Recommendations prior to treating patients with whiplash injuries.

- Discover mechanism of injury
- Determine history of neck pain prior to whiplash injury
- Reveal pain severity with Numerical Pain Rating Scale (NPRS)
- Identify the injured tissues and pain generators
- Understand biopsychosocial factors
- Perform differential diagnosis
- Determine a reasonable prognosis
- Offer appropriate treatment with the use of a team of health care providers
- Avoid nocebo effect and promote placebo effect...

References

References