Axial Pain

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BACK PAIN (LUMBAGO)

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BACK PAIN (LUMBAGO)

EPIDEMIOLOGY

Back pain is ubiquitous - lifetime PREVALENCE approaches 80% (prevalence increases with advancing age).

• 1% of U.S. population is chronically disabled because of back pain.

ETIOPATHOPHYSIOLOGY

Most causes are benign!

1. Degenerative disorders (disk protrusion, spondylosis, spinal stenosis, scoliosis, spondylolisthesis)
2. Injury (fracture, subluxation, ligamentous sprain, muscular strain, whiplash injury)
3. Inflammatory disease (ankylosing spondylitis, RA, psoriatic arthropathy, ataxoidinitis)
4. Metabolic (Paget’s disease, osteoporosis)
5. Tumors (bone/neural, metastatic, multiple myeloma)
6. Infections (herpes zoster, disk infections, epir- or subdural abscess, meningitis, osteomyelitis)
7. Referred pain (abdominal / pelvic visceral, retroperitoneal processes)
8. Psychogenic pain (chronic anxiety states, depression, conversion reaction, psychosis, litigation-related, malingering, chronic pain syndrome, substance abuse)

ETiological factors:

N.B. any chronic low back pain is colored by psychosocial factors! (sometimes psychosocial factors are more important than anatomic causes)

Back pain pacient 96% have mechanical back pain
4% have inflammatory back pain

CLINICAL FEATURES

MUSCULOSKELETAL pain

1. Back pain is nonradiating; if it radiates it is usually not below knees* - imitates radiculopathic pain (but not burning and not in dermatomal, rather in sclerotomal pattern)

• usually due to hamstring tightness, saccroiliitis / hip disease pain can also radiate but not below knees

2. Restricted range of motion (esp. forward flexion, lateral flexion / rotation; backward extension is normal) - by pain or muscle spasm.
3. Localized tenderness over spinous process (suggests vertebral involvement by tumor or infection)
4. Flattening of lumbar lordosis with asymmetry in appearance of paraspinal muscles – due to muscle spasm.
5. Trigger points may be present (define certain myofascial pain syndromes).
6. Absence of neurological deficits

positive Lhermitte’s sign - suspect spinal cord compression.

• in absence of injury or any significant neurologic findings, detailed investigation is usually unrewarding.

Mechanism:

1) irritation of nerve endings at sites of injury / inflammation (e.g. herniated disc irritating annulus fibrosus & posterior longitudinal ligament)

2) pain of paraspinal muscles.

Paraspinal muscles are pain-sensitive and are probably most common source of neck or back pain!

Pain occurs:

a) typically - after unaccustomed exercise* (esp. when previous conditioned state is lost due to weakened abdominal muscles).

* e.g. lifting heavy object or trying to perform activity that requires use of back muscles that have not been used for some time

b) occasionally - spontaneously (often on awakening in morning).

Mechanical/ back pain

Inflammatory back pain

Mechanical/ back pain exacerbates

Inflammatory back pain relieves

Pain is exacerbated by: stretching or activity

Pain is relieved by: rest

Local pain that does not vary with changes in position suggests tumor, infection, fracture, or referred pain

- SPINAL STENOSIS pain is worse with walking and bending backward and relieved by bending forward
- marked stiffness of all movements may be indicative of ANKYLOSING SPONDYLITIS.

ONCOLOGIC pain

• constant unrelenting, in atypical or multiple sites.

• unrelated to activity or posture!

N.B. pain of vertebral metastases is often aggravated by recumbency (may be relieved by sitting up)

REFERRED pain
MECHANICAL BACK PAIN

Differentiate
N.B. beware

- arises from deep structures (pelvic or abdominal viscera) and is felt at distant site within same spinal segment (i.e. pain is usually described as abdominal or pelvic as well as spinal)
- deep aching quality.
- local signs (pain with spine palpation*, paraspinal muscle spasm) are absent.
- sometimes tenderness at site of referral.
- pain not affected by position of spine!!! (but aggravated by abdominal / pelvic palpation)

RADICULAR pain

see p. FN1 >>

Examination should include maneuvers that stretch different nerve roots!

Quick test for radiculopathy:
- knee-jerk (L4)
- great toe dorsiflexion (L5)
- ankle-jerk (S1).

DIAGNOSIS

Most episodes of acute (< 1-3 month duration) back / neck pain are self-limited and do not require imaging!

American College of Radiology recommendation – do not obtain lumbar spine radiographs for acute low-back pain unless fracture, malignancy, or infection are suspected.

- many asymptomatic middle-aged + elderly subjects have MRI abnormalities of spine, and clinical relevance of any structural abnormalities may therefore be uncertain.
- 85% patients with low back pain cannot be given definitive diagnosis!
- malingering is best diagnosed by close observation of patient outside medical setting by someone other than physician.

“Red-flag” diagnostic approach – certain historical & clinical clues are elicited to assess probability of serious disease – to distinguish patients needing additional tests (X-ray → MRI/CT) from those who may benefit from 6-week trial of conservative care (or at least not be harmed by such trial).

Red flags - symptoms & signs rarely encountered in benign forms of back pain:

1. History
   1) new back pain in young patient (< 20 yrs)
   2) new back pain in older patient (> 50 yrs)
   N.B. most benign back pains initially present in younger patients!
   3) significant trauma (→ fracture)
   4) steroid use (→ osteoporotic collapse)
   5) cancer (→ metastatic disease)
   6) unintended weight loss (→ cancer)
   7) disorder with predilection for infection / hemorrhage
   8) metabolic bone disorder

2. Present complaint
   1) pain that worsens at night or that is not relieved by any position
   2) thoracic pain (dissecting aneurysm)
   3) bilateral radiculopathy
   4) perianal numbness / paresthesia
   5) change in bladder or bowel function
   6) walking pain
   7) significant lower limb weakness not explainable by pain
   8) progressive neurologic deficit

3. Physical examination & laboratory findings
   1) pulsatile abdominal mass (or enlarged aorta shadow on lumbar radiograph)
   2) fever
   3) neurologic deficit not explained by monoradiculopathy
   N.B. monoradiculopathy is common presentation of benign disease (e.g. disk herniation, lateral recess stenosis).
   4) localized tenderness over spine
   5) ESR (most important laboratory test!) – metastases, infection
   6) WBC count!

4. Lack of symptom pattern compatible with benign disease

5. Lack of response to conservative measures

Indications for imaging

1. Red flags
2. Neurologic deficits
3. Pain in uncommon sites (e.g. lower thoracic region)
4. Children
5. Risk factors for fracture (trauma, steroid use, osteoporosis)

Also consider HLA-B27 testing but know its limits!

Choice of tests:

Motor deficits → MR
Cancer or Infection:
known → MR with contrast
suspected → ESR, CRP, XR (if any positive → MR with contrast)
Risk of compression FX → XR (if patient will need treatment - also MR)

TREATMENT

PHILOSOPHY

Caring for patient is exactly that: caring.

Prudent clinician must realize that psychosocial aspect of back pain is as important if not more important than looking for biological cause of pain!

Most acute cases are short lived and respond to symptomatic measures!
- if imaging reveals structural lesion (+ symptoms do not improve / worsen on 4 weeks of conservative treatment), surgical treatment may be necessary
- preoperative psychological assessment - to exclude patients with marked psychological impairment (high risk for poor surgical outcome).

N.B. beware PSEUDO-CORDANCE – imaging finding and unrelated back pain!

Differentiate CHRONIC PAIN SYNDROME vs. MECHANICAL BACK PAIN

MECHANICAL BACK PAIN – Features:
1. Deep and aching pain
2. Worsened by loading
3. Improved by unloading
**CHRONIC PAIN SYNDROMES**

1. Chronic pain (> 3 months)
2. 24/7 pain
3. Non-restorative sleep
4. Low energy level
5. Inactivity
6. Opioids

**NSAIDs**

**muscle relaxants**

**injection**

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**MUSCULOSKELETAL**

- **MUSCLE SPASMS**
  - **Treatment for mechanical back pain** – **lifestyle changes**:
    1. Core strengthening exercises
    2. Flexibility exercises
    3. Smoking cessation
    4. Weight loss

**Test your knowledge**

**Muscle spasm**

- **Traction**
  - **deep heat** may reduce muscle spasm and pain after acute stage.

**Radiculopathy**

- **Injection of steroid or anti-inflammatory drugs**
  - **Corticosteroid**

**Fibromyalgia**

- **Injection**
  - **Corticosteroid**

**Other**

- **Injection**
  - **Corticosteroid**

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**MRC spine stabilization trial** – surgical stabilization vs. intensive rehab for chronic LBP.

- **Back pain**
  - **Hips and knees**
  - **Neck**

**Cervical collar**

- **Flexion**
  - **Cervical collar**

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**Muscle relaxant**

- **Immobilization & bed rest**

- **Local Anesthetic**

- **Opioids**

- **NSAIDs**

- **Myofascial or fibromyalgia syndrome**

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**Comparison**

- **Surgical**
  - **Benefit**
  - **No clear evidence**

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**Exercise programme**

- **Back pain**
  - **Flexion**
  - **Extension**
  - **Rotation**

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**Back Pain**

Spin19 (3)

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**BACK EXERCISES**

Tell patient to repeat each of following exercises twice a day. Rotate from one exercise to other. Do one set of exercises and then rotate to another exercise and do set.
1. **Standing hamstring stretch.** Place heel of your leg on stool or other object about 2 ft high. Keep your leg fully extended and lean forward. You will feel back of your leg begin to stretch (your hamstring muscles). Remember to keep leg straight and not bent and do not bend back. Hold stretch for 15 s. Repeat five times alternating with each leg.

2. **Lying down hamstring stretch.** Lie on your back and raise each leg straight (fully extended) until you feel same stretch in back of your leg. Bend your toes toward you to increase stretch. Hold stretch for 15 s. Repeat five times alternating with each leg.

3. **Pelvic tilt.** Lie on your back with your knees bent about 45° and feet flat on floor. Tighten your abdominal muscles and push your lower back into floor. Hold this position for 5 s. Do three sets of 10.

4. **Partial curl.** Lie on your back with your knees bent 45° and your feet on floor. Tighten your stomach muscles and flatten your back against floor. Place your chin onto your chest. Some individuals find that they need to support their neck with their hands clasped behind neck to decrease discomfort. Start curl by moving upper body toward your knees until your shoulders clear floor. Hold this position for 5 s. Exhale with curl and inhale as you return to starting position. Initially repeat 25 times and then build up to 50 at each setting.

5. **Knee to chest stretch.** Lie on your back with your legs straight out in front of you. Slowly bend one knee and bring it toward you. Clasp both hands around knee and pull it toward your chest. Hold this position for 15 s and return to starting position. Repeat process on other knee, then do both knees together. Repeat each one three times.
6. Sacroiliac joint stretch: Lie on your back with your knees bent to 45° and feet on floor. Place ankle of one leg on knee of other and gradually externally rotate that leg until you feel stretch in your back. Repeat with each leg and hold each external rotation for 15 s. Do each side 5 to 10 times.

**Pelvic tilt** (to flatten lumbar kyphosis)
1. Lie on the back with knees bent and heels on the ground.
2. Place the weight on the heels.
3. Lower the small of the back to touch the ground and roll the bottom of the pelvis upward about 0.5 inches from the ground.
4. Contract the belly muscles.
5. Hold this position for 10 sec and repeat 3 times. Perform this daily.

**Abdominal curls** (to strengthen abdominal muscles)
1. Lie on the back with knees bent.
2. Put the hands across the abdomen.
3. While keeping the shoulders on the ground, slowly raise the head.
4. Slowly raise the shoulders 10 inches from the ground, and then slowly lower them.
5. Perform three sets of 10.
6. When this exercise becomes too easy, wrap a weight in a towel and hold it behind the neck. Increase the weight as strength improves.

**Sitting trunk flexions** (to stretch the lumbar spine)
1. Sit on the floor with knees straight and legs as far apart as possible.
2. Place both hands on the same knee.
3. Slowly move both hands down that leg toward the ankle. Stop if it hurts, and go no further than a position that can be held comfortably for 10 sec.

**Standing**
- Have a place to rest your foot that is 6 in. high; alternate each foot periodically.
- If working while standing, keep work surface near waist level.

**Lifting**
- Fuss or slide heavy objects rather than lift them!
- Stand as close as possible to item you will be lifting.
- Place one foot slightly in front of other.
- Bend your knees and squat down.
- Lift object by pushing up with your feet.
- When returning object to floor reverse procedure.

**Source of picture:** Edward J. Shahady “Primary Care of Musculoskeletal Problems in the Outpatient Setting” (2006); Springer; ISBN-13: 978-0387306469 >
NECK PAIN

Always keep in mind the possibility of spondyloarthropathies or of a severe process, such as tumor, trauma, infection, or rare vascular causes (e.g. vertebral artery dissection)

PATHOPHYSIOLOGY

- multifactorial

DISCO-genic pain

- cervical disc is dorsally innervated by a sinuvertebral nerve plexus and ventrally innervated by the cervical sympathetic trunk; disc degeneration may stimulate these nerves and generate mechanical pain.

FACET-generated pain

The distribution of pain elicited after stimulation of the facet joints in normal subjects:


DIFFERENTIAL

Mechanical neck pain is bilateral (vs. C3-4 radiculopathies – pain may be unilateral).

TREATMENT

SURGERY

Cervical spondylosis with primarily axial neck pain (without radicular symptoms or myelopathy) meeting all criteria:

1) failed to respond to extensive nonoperative treatment.
2) positive cervical discography (confirm a specific level as the pain source and, potentially, which levels to fuse) – only positive discs should be considered for surgical management, max. 1-2 discs.
1) MRI confirmation of spondylosis and no other causes.
2) cleared psychological testing.

- treatment of choice - ACDF (good results in appropriately chosen patients).

BIBLIOGRAPHY for ch. “Spinal Disorders” → follow this LINK >>