Facet joint syndrome
The role of the radiologist: From diagnosis to treatment

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Facet Joint Syndrome

- Mechanical
- Inflammatory
- Neuropathic
Role of Facet Joints

- **Guide**
  - Congruence (meshed crests)
  - Contain flexion / extension movement
- **Disc Protector**
  - Stabilize flexion / extension
  - Limit rotation
- **Support**
  - 30% of spine strains absorption
Facet Joints in Motion

Vertebral Body

Disc

Flexion (Bending Forward)  Extension (Bending Backward)
Causes of facet joint disease
Physiopathology

1. Mechanical block on healthy facet -> spasm of deep muscles

2. Combined joint & disc disease

3. Inflammatory rash of osteoarthritis
Mechanical Block & M. Spasm
Psoas Major

- Flexion of hip with Iliacus
- Medial rotation of hip
- Contraction -> flexion of spine
Combined joint and disc disease
MR imaging of facet joint inflammatory rash

- MR represents the best imaging "one stop shop" to diagnose an inflammatory process at the facet joints
- Gadolinium-enhanced T1 fat-suppressed MRI sequences help to differentiate between light / moderate and intense facet enhancement
Inflammatory rash of osteoarthritis: Spect-CT
Symptoms

- Back pain
- Para-spinal
- Extension / Rotation
- Non impulsive
- Without precise radicular extension
- Pseudo-radicular pain
- Typical analgesic positioning
Pseudo-radicular pain
Pseudo-radiculalar pain
Back Pain: Differential Diagnosis

- Disc Disease
- Facet joint disease
- Spondylolysis
- Tumor (I – II)
- Spondylodiscitis
Spondylolysis : common DD
Other common DD

Tumors (I or II)  Spondylodiscitis
Disc Disease = Cause n° 1
Some other-than-spine conditions associated with back pain

<table>
<thead>
<tr>
<th>MSK</th>
<th>Neurologic</th>
<th>Urologic</th>
<th>Gastrointestinal</th>
<th>Extrauterine</th>
<th>Uterine</th>
<th>Psychological</th>
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<tbody>
<tr>
<td>Osteoarthritis</td>
<td>Radiculopathy</td>
<td>Chronic urinary tract infection</td>
<td>Colitis</td>
<td>Endometriosis</td>
<td>Adenomyosis</td>
<td>Bipolar personality disorders</td>
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<td>Muscular strains</td>
<td>Spinal stenosis</td>
<td>Urolithiasis</td>
<td>Chronic constipation</td>
<td>Adhesions</td>
<td>Chronic endometritis</td>
<td>Depression</td>
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<td>Faulty or poor posture</td>
<td>Headaches</td>
<td>Prostatitis</td>
<td>Inflammatory bowel disease</td>
<td>Adnexal cysts</td>
<td>Atypical dysmenorrhea</td>
<td>Porphyria</td>
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<td>Rheumatoid arthritis</td>
<td>Central poststroke pain</td>
<td>Bladder neoplasm</td>
<td>Diverticular disease</td>
<td>Ectopic pregnancy</td>
<td>Cervical stenosis</td>
<td>Sleep disturbances</td>
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<td>Polymyositis</td>
<td>Radiation cystitis</td>
<td>Irritable bowel syndrome</td>
<td>Pelvic congestion syndrome</td>
<td>Cervical polyps</td>
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<td>Systemic psoriasis</td>
<td>Postherpetic neuralgia</td>
<td>Various urethral conditions</td>
<td>Pancreatitis</td>
<td>Endosalpingiosis</td>
<td>Leiomyomata</td>
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<td>Lyme disease</td>
<td>Thoracic outlet syndrome</td>
<td>Testicular torsion</td>
<td>Chronic visceral pain syndrome</td>
<td>Ovarian remnant syndrome</td>
<td>Genital prolapse</td>
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<td>Chronic overuse syndrome</td>
<td>Brachial plexus injury</td>
<td>Other causes of cystitis</td>
<td>Peptic ulcer disease</td>
<td>Ovulatory pain</td>
<td>IUD +/- infectious process</td>
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<td>...</td>
<td>Nerve entrapment in scar tissue,...</td>
<td>...</td>
<td>Gastro-oesophageal reflux,...</td>
<td>Postop peritoneal cyst,...</td>
<td>...</td>
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</tbody>
</table>

Nerve entrapment in scar tissue...
Treatments

- **Conserv°**
  - Painkiller
  - NSAID
  - Osteopathy

- **FJS**
  - Infiltration / Block
  - RF Neurotomy

- **½ invasive**

- **Invasive**

- **Surgery**
Age-related algorithm for suspected facet joint related back pain

- **<30 y**
  - Generally acute onset
  - MRI to rule out spondylolysis
  - Painkiller, NSAID & Physical manipulation

- **30-50 y**
  - Acute
    - MRI to rule out other spine causes of back pain
  - Chronic
    - Painkiller / NSAID / Physical Manipulation
    - Or block / infiltration of painful and adjacent facets
    - Consider RF neurotomy if positive block / infiltration
    - Suggest additional physiotherapy to prevent recurrence

- **> 50 y**
  - Acute
    - Rule out spine and “other-than-spine” causes
    - Painkiller / NSAID / Physical Manipulation
    - Or block / infiltration of painful and adjacent facet
    - Consider RF neurotomy if positive block / infiltration
  - Chronic
    - Multidisciplinary approach:
      - RF neurotomy if positive block / infiltration
      - Drug level adaptation
      - Additional physiotherapy to prevent recurrence
      - Psychological support if depression symptoms or drug addiction
      - Consider surgical fusion if nothing sedates pain
RF treatment of facet joints

- RF Neurotomy
- RF facet denervation
- Percutaneous facet coagulation
- RF facet thermal lesion
- RF facet rhizotomy
- RF articular rhizolysis
RF treatment: Literature review

- Randomized control trials: small groups
- Mostly open studies
  - 60-80% success rate w/o previous surgery
  - 40% if previous back surgery
  - Lasting for 1-3 years
- Patient Selection!
! Patient Selection !

- Proven facet joint Pain
  - Symptoms
  - CT / MRI
  - SPECT

- Positive Block Test at 1 month:
  - Decrease of pain ( -3 on VAS)
  - Improvement of quality of life ( -3 on RMQ)
Patient Selection

Chronic facet joint syndrome

- Chronic disease: expectations +++
- Placebo
- 1 or 2 levels + CT match: CT guided block
- > 2 levels: SPECT-guided CT Block
Patient Selection

• Proven facet joint Pain
  • Symptoms
  • CT / MRI
  • SPECT

• Positive Block Test at 1 month:
  • Decrease of pain ( -3 on VAS )
  • Functional Disability ( -3 on RMQ )
Facet joint blocks

- Facet joint blocks have shown to be valid, safe and reliable as a diagnostic tool for facet joint related pain (Evidence-based level I)
- Pain relief should be of at least 50% and consistent with the duration of action of the local anaesthetic
- The use of CT-fluoroscopy guidance for facet blocks results in greater diagnostic accuracy than using conventional fluoroscopy.
- There is no evidence that intra-articular / or peri-articular facet joint blocks generate a significantly different response.
Infiltration / Block
Roland-Morris Questionnaire

1. I stay at home most of the time because of the pain in my back.
2. I change position frequently to try and make my back comfortable.
3. I walk more slowly than usual because of the pain in my back.
4. Because of the pain in my back, I am not doing any of the jobs that I usually do around the house.
5. Because of the pain in my back, I use a handrail to get upstairs.
6. Because of the pain in my back, I lie down to rest more often.
7. Because of the pain in my back, I have to hold on to something to get out of a reclining chair.
8. Because of the pain in my back, I ask other people to do things for me.
9. I get dressed more slowly than usual because of the pain in my back.
10. I only stand up for short periods of time because of the pain in my back.
11. Because of the pain in my back, I try not to bend or kneel down.
12. I find it difficult to get out of a chair because of the pain in my back.
13. My back hurts most of the time.
14. I find it difficult to turn over in bed because of the pain in my back.
15. My appetite is not very good because of the pain in my back.
16. I have trouble putting on my socks (or stockings) because of the pain in my back.
17. I only walk short distances because of the pain in my back.
18. I sleep less because of the pain in my back.
20. I sit down for most of the day because of the pain in my back.
21. I avoid heavy jobs around the house because of the pain in my back.
22. Because of the pain in my back, I am more irritable and bad tempered with people.
23. Because of the pain in my back, I go upstairs more slowly than usual.
24. I stay in bed most of the time because of the pain in my back.
Principle of RF Neurotomy

Cutting nerve supply to a painful structure

- Alleviates Pain
- Permits return to Function
RF Neurotomy

High frequency current applied to a nerve structure, in order to:

• destroy the nerve (thermal effect)
  → Thermal RF

• modify cellular functioning and transmission of pain impulses
  → Pulsed RF
RF Neurotomy
Facet joint RF target

Medial branch of the distal portion of the spinal posterior rami nerve
Medial branch radiofrequency neurotomy
Technique

After targeting and needle placement:

- **Sensitive** stimulation at 50 Hz
  → local discomfort

- **Motor** stimulation at 2 Hz
  → Local low back muscle contraction

- Local **anesthesia** (1mL Lignocaine)

- Electrode tip raised at 80°C during 60s
Therapeutic effect

• Improvement of pain and function
  – 60 – 80% w/o previous back surgery
  – 40% if previous back surgery

• Lasting 1-3 years (Mean duration 18 m)
Complications

• Local Discomfort: 1-2 weeks
• Local Hematoma
• Transient radicular anaesthesia
Conclusion

1. Facet joint syndrome mostly reflects a combination of mechanical, inflammatory and neuropathic causes.

2. Confirm proper diagnosis:
   • Differentiate facet joint related pain from causes.
   • If imaging is necessary, MRI is the best "one-stop-shop".
   • Facet joint blocks have shown to be valid, safe and reliable as a diagnostic tool for facet joint related pain.
   • Consider multidisciplinary diagnosis if not obvious.

3. An age-related treatment algorithm might be useful.

4. Treat properly and explain expected results of treatments:
   • Use Visual Analogue Scale (VAS) for pain evaluation.
   • Use Roland-Morris Questionnaire (RMQ) for disability.

5. Follow-up visits:
   • Listen to the patient.
   • Use VAS and RMQ.