Low back pain and disc herniation

Importance

- one of the most common diseases resulting in decreased work-capabality
- unfavorable economic effect,
- serious neurological consequences may occur
- important differential diagnostic aspects

Risk factors

- age: 30-50 y
- Fitness level „weekend warriors”
- Pregnancy
- Weight gain
- Genetics
- Occupation: inadequat back support, heavy lifting, twisting
- Backpack overload in children

Spinal disc

- **Flexible**: adapting the spine to carry out movements in different directions
- **Resistant to compression**: maintaining strength and pliability of the spine

Diagnosis

1. **Pain, numbness, sensation abnormalities**

- **Localization-radiation of the pain-character- time- how it started (suddenly, movement, injury…)**
- **progression-did the pain increase/decrease increases for abdominal pressure**
- **sensation abnormalities (numbness, pins and needles, lack of cold/warm sensation…)**
- **painful- antalgic positure- paravertebral muscles -**
- **lumbar lordosis**
- **Lasegue, inverse Lasegue, palpation of the Valleix points**
- **Hip painful e.g. for rotation**

Diagnosis

2. Paresis/paralysis of the limbs

- **problems with buttoning/lifting the arm/staggering/lifting the foot?-**
- **unwanted muscles movements (i.e. fasciculation)?**

3. Vegetative symptoms

- **Signs of incontinency-**
- **problems with stools**
- **impotency-sexual dysfunction**

Imaging

X-ray

CT

MRI

myelo-CT, myeolography

Electrophysiology

- **Electroneurography**:

  F-wave, H-reflex

- **Electromyography:** myogen/neurogen

- **SSEP, MEP:** spinal cord is affected

Herniated disc

- towards the midline it might cause cauda-syndrome,
- towards the radix-radicular lesion

Cervical division

Causes: spondylosis, osteochondrosis, spondylarthorsis, herniation

Cervicocephalic –syndrome: occipital headache (cervical plexus)

Cervicobrachialgia: the pain radiates to the arm.

Vertebrogen cervical myelopathy: gradually progressing spinal cord lesion due to narrow spinal canal, spondylosis, osteochondrosis, vascular factors

Symptoms: pain (torticollis even), paraparesis in the lower limbs, tetraparesis, brisk deep tendon reflexes and pyramidal signs.

Cervical division

Spurling maneuver: turn the neck to the affected side, hyperxtend the arm pressing the vertex at the same time.

IN CASE OF TRAUMA FORBIDDEN TO CARRY OUT!!

Imaging: X ray from 4 directions, MRI, if needed myelography

Differential diagnosis: e.g. brachial plexus lesion, Pancoast tumor, spinal tumors, periarthritis humeroscapularis, cervical myelopathy, anterior spinal artery syndrome

Thoracic division

Causes: space-occupying procedures: trauma, tumor, epidural bleeding)

Symptoms: Th5-12 is affected the umbilical reflex is absent or diminished.

Differential diagnosis : e.g. intercostal neuralgia, tumor, shingles, fracture of the vertebra, aorta dissection, multiple sclerosis, abscess, inflammation.

Lumbar division

Causes: Herniation and radiculopathy (LIV/V, LV/SI)

Stenosis of the spinal canal

spondylosis

The severity of the X-ray findings do not always correlate with the severity of the complaints.

Lumbago: local lumbar pain, if there is no sign of radiating pain, reflex abnormalities, vegetative disturbance.

Herniation: radiating pain wich is strengthened with imaging techniques.

Symptoms: lumbar pain radiating to the different dermatomes

lumbar lordosis flat, defense in the paravertebral muscles, antalgic positure

paresis, vegetative syndromes can accompany

Lumbar division diagnostics

Lasegue sign: (stretching the ischiadic nerve) the patient is lying on his back, and his stretched lower limb is lifted until he feels pain in his lower back. The angel between the lower limb and the bed is given. Positive in L4, L5, S1 radiculopathy.

Bragard sign: like Lasegue sign but with the hallux dorsalflected.

Inverse Lasegue sign: (stretching of the femoral nerve) the patient is lying on the abdomen and the lower limb is lifted stretched. The pain will be localized in the middle part of the lumbar division and inguinal region. Positive in L3, L4 radiculopathies.

Crossed Lasegue sign:lifting the not-affected limb the patient will localize pain on the affected side. Positive in herniation.

Valleix points: the ischiadic nerve is painful on palpation in the gluteo-femoral region.

Schober-index: the patient leans forward with stretched knees. The distance between the processus spinosus of the LV vertebra and the point above it 10 cm must be measured after leaning (normal: 10/15)

Imaging: as given before plus abdominal and pelvic ultrasonography

Differential diagnosis: e.g. retroperitoneal abscess or bleeding, degenerative hip disorders, coxarthrosis, sacroiletitis, tumor, adnexitis, extrauterine gravidity, renal calculus, cystitis.

Cauda-syndrome:

Cause: The damage of the radices running in the spinal canal

Symptoms:

- sensation disturbances in S3-S4 coccygeal dermatomes
- paraesthesia, hypaesthesia in the anal region.
- absent reflexes in the lower limbs, anal and cremaster reflex are absent as well
- urinary retention with overflow, problems with stools.

Conus-syndrome

Cause: the lesion is in the altitude of L1, both the **medullar cone and the cauda equina is affected.**

Symptoms:

-sensation disturbances in S3-S4 coccygeal dermatomes,
- paraesthesia, hypaesthesia in the anal region

-L3-S2 radiculopathy can occur

-urinary bladder and anal sphincter paralysis

-absent reflexes in the lower limbs

In case of anal region sensation disturbances, urinary or anal retention operation is needed in 24 hours!!

Stenosis of the spinal canal

Cause: bony narrowing of the spinal canal, usually seen in the cervical and lumbar divisions.

Symptoms:

Cervical: spastic tetraparesis can occur, with ascending sensation disturbances

Lumbar: (neurogen claudication) the pain increases with strain.

Running up the steps will not cause severe pain in neurogen claudication, while downwards-due to the stretching of the radices-the patient will complain about pronounced pain. If it compresses the radicals it can even cause paralysis.

Diagnostics:

CT/MRI (the cross diameter is <10 mm absolute stenosis, 10-12mm relative stenosis)

Therapy: -operation on more segments of the spine

-according to the radiculopathy proper treatment

Treatment

- team work: rheumatologist, orthopedist , neurologist, GP and physiotherapist

Treatment

Acute pain (<4 weeks)

Medication: **- muscle relaxants, non-steroid anti-inflammatory drugs (gel, supp., oinment, tbl.)**

-carbamazepine, oxcarbazepine

-in sever cases epidural steroids and opioids

Physiotherapy and rest:

-it must be carried out very carefully, because if the patient does not feel the pain might strain the spine improperly leading to further damages.

-must emphasize the stability of the spine

-TENS (transcutan electrical nerve stimulation)

-Guidelines from the USA emphasize early physiotherapy and mobilization.

Treatment

Chronic pain (>3 months)

Medication: - as in chronic pain tricyclic antidepressants, SSRI, valproate, carbamazepine, oxcarbazepine

Medical aids: - eg. Schantz collar, flexible girdle

Physiotherapy:

- stretching and underwater exercises to learn the proper posiure
- pain relief can be achieved with TENS diadinamic electric therapy, sonotherapy, galvan therapy.
- muscle relaxation can be achieved with massage, sonopheresis (iontophoresis=transdermal medication+ultrasound), sonodynator (Ultrasound+diadinamic electric therapy)
- USA guidelines mention the role of cognitive therapy and yoga

Nerve block therapies: anaesthetics, steroids

Epidural steroid injections: only temporary pain relief and long-term outcomes were worse

Transcutaneous electrical nerve stimulation: questionable effectiveness

Surgery

Absolute indication: paresis/paralysis-vegetative symptoms-cauda or conus syndrome

Relative indication: no regression in 4-6 weeks with conservative therapy.

failed back surgery syndrome: inappropiate wound heeling, rehabilitation or indication.

Surgery

Vertebroplasty, kyphoplasty: compression fractures of the vertebrae (bone like cement, balloon)

Spinal laminectomy/decompression: remove pressure of the nerves-the bony wall of the vertebra is removed

Discectomy/microdiscectomy/: the disc is removed (often combines with laminectomy /small hole/

Surgery

Foraminotomy: enlarges the bony hole-relieve pressure

Nucleoplasty (plasma disc decompression):

plasma laser vaporizes the tissue of the –releives pressure

Spinal fusion: removal of the spinal disc two vertebrae are fused

Arteficial disc replacement

Differential diagnosis

- aortic aneurysm
- osteoarthritis, rheumatoid arthritis
- Infection of the spine (osteomyelitis, discitis, abscess)
- kidney infection or kidney stones
- problems related to pregnancy
- medical conditions that affect the female reproductive organs, including endometriosis, ovarian cysts, ovarian cancer, or uterine fibroids