Spondylarthropathies

Pánczél Pál dr.
Heterogeneous group of disorders

- How can we determine the place of spondylarthropathies among the other diseases of the musculoskeletal system?
Bursae = sacks of the synovial membrane fulfilled with synovium. Localised between the skin and the convex surface of the bone, or tendons and muscles and bones and ligaments.

**Synovitis:** autoimmune=RA, crystal induced=gout, bacterial=septic arthritis, antigen/antibody complex induced=reactive arthritis

**Enthesis:** autoimmune, immunocomplex mediated=spondylarthritis ankylopoetica, Bechterew’s disease, reactive arthritides

**Cartilage:** degeneration=osteoarthritis,
The following characteristics are shared in this group of diseases

• Inflammatory involvement of the axial skeleton.
• Enthesitis – enthesopathy.
• Peripheral arthritis.
• The course of inflammation is chronic-subacute with acute exacerbations.
• Extraarticular manifestations.
• Association with HLA B27 histocompatibility antigen.
• Rheumatoid factor (gamma latex and Waaler-Rose test) negativity.
The following diseases belong to this group of diseases

- Ankylosing spondylitis (spondylarthritis ankylopoetica, Bechterew’s disease, Marie-Strümpfel’s disease)
- Reactive arthritides (Reiter’s disease, SARA, post dysenteric reactive arthritis)
- Enteropathic arthritis (ulcerative colitis and Crohn’s disease)
- Psoriatic arthritis
Inflammatory involvement of the axial skeleton

- **Sacroiliitis** – inflammation of the syndesmosis between os ilii et the sacrum. It can be monolateral or bilateral, if bilateral symmetric or asymmetric.
- **Spondylodiscitis** – destructive lesions of the intervertebral discs and adjoining vertebral bodies. Characteristically these are observed in the lower dorsal and upper lumbar segments of the spine. Erosion of the adjacent margins of two vertebral bodies with condensation of the subchondral bone.
- **Squaring of the vertebral bodies** – the usual anterior concavity of the vertebral bodies is lost and the anterosuperior and anteroinferior corners of the bodies appear as though eroded away. This is also a variety of spondylodiscitis.
- **Bony demineralization** of the vertebral bodies.
- **Synovitis** of the spinal synovial joints (apophyseal joints, no x-ray sign at the beginning of the disease)
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Enthesitis – enthesopathy

- Enthesis = transition of a tendon, or a joint capsule to the bone.
- Histologically the collagen fibers of the tendon or capsule transform to unmineralized followed by mineralized fibrocartilage (dens collagen fibers with chondrocytes followed by Calcium deposition). The mineralized fibrocartilage transforms to bone.
- The main forms of enthesitis – *sydesmophyte formation* (at the attachment of the superficial layer of the intervertebral disc, the anterior ligament and the vertebral body), *inflammation* of the attachment of Achilles tendon to the os calcanei, attachment of the tendons of adductor muscles to the os pubis (spur formation, whiskering).
INFLAMMATORY ENTHESOPATHY OF A TENDON ATTACHMENT

| Normal attachment of tendon fiber to bone | Inflammation and erosion in inflammatory enthesopathy |

[Diagram showing normal attachment and inflammation of tendon to bone with a radiographic image of an ankle.]
Peripheral arthritis

- The pattern of involvement is mostly asymmetric oligoarthritis with involvement of the knee joint, ankle joint, radiocarpal joint, hip joint.
Association with HLA B27 histocompatibility antigen

• The association with this histocompatibility antigen of MHC class one is known from 1973.
• From the seven HLA B27 subtypes five give a genetic susceptibility to spondylarthropathies (HLA B 2701, 02, 04, 05 and 07).
• The so called HLA B27 cross-reactive antigens (B7, Bw22, B40, B42 and B60) are frequently present in HLA B27 negative patients with spondylarthropathies.
• Molecular mimicry between HLA B27 and Klebsiella antigens?
Extraarticular manifestations

• Eyes – uveitis
• Genitourinary tract – urethritis
• Heart – aortitis, heart block
• Skin – keratoderma blenorrhagicum, onycholysis
Seronegativity

- It means that no rheumatoid factor (IgM, IgA, IgG type autoantibodies against the Fc portion of IgG) is found in the sera of the patients with spondylarthropathies.
Ankylosing spondylitis
• The prototype of spondylarthropathies.
• The prevalence of AS in a Caucasian population is 0.02 – 0.23%.
• The male/female ratio 2.2-5:1.
• AS often begins in young adulthood.
• About 15% of all children with juvenile chronic arthritis are classified as juvenile spondylitis. These children between 9-16 are often HLA B27 positive, manifest low back pain and/or asymmetrical oligoarthritis and later on AS will develop in them.
• Late onset spondylarthropathy has been described in patients over 50 with HLA B27 positivity, sacroiliitis, oligoarticular arthritis and elevated ESR and evidence of skeletal hyperostosis.
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- Molecular mimicry between HLA B27 and Klebsiella antigens?
- Frequency of occurrence of HLA B27 in the general population (Caucasians) is ~ 8%.
- The risk of developing ankylosing spondylitis in a person with HLA B27 is ~1-2%.
- The risk of developing ankylosing spondylitis in a HLA B27 positive first degree relative of a patient with HLA B27 positive ankylosing spondylitis is ~20%.
# Occurrence of Ankylosing Spondylitis Among Individuals with HLA-B27

<table>
<thead>
<tr>
<th>Author</th>
<th>Number of subjects studied</th>
<th>Prevalence of AS (%)</th>
<th>B27+</th>
<th>B27-</th>
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<tr>
<td></td>
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<td>Johnsen 543</td>
<td>–</td>
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</table>

(1) Males only
(2) Based on population frequency of AS of about 4.00%.
(3) Figures based on a population frequency of AS of 7.80% and the findings of three B27+ and four B27− cases of AS.
(4) Based on a prevalence of AS and B27 in the general population of 1.10% and 15.90%, respectively.
(5) Based on a prevalence of AS and B27 in the general population of 1.30% and 26.60% respectively.
<table>
<thead>
<tr>
<th>Region</th>
<th>Prevalence of AS (%)</th>
<th>Number of AS found</th>
<th>Number of persons studied</th>
<th>HLA-B27 in the population (%)</th>
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<td>Norway (Lapps) 20</td>
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</table>
Clinical picture

- The onset is insidious in 80% of the cases.
- The initial symptoms are referred to the lower back.
- Intermittent episodes of aching pain associated with a sense of stiffness, lasting for a period of days or weeks and then subsiding are the most frequent early complaint.
- AS should be considered in any young men with complaints of low back pain.
- The aching and stiffness are most pronounced in the morning on arising, are accentuated by physical inactivity and ameliorated by mild exercise.
- Later the aching and stiffness tend to be more persistent and tend to associate with a constant, dull discomfort described as a deep ache.
- Commonly the discomfort is worse during the early morning hours and the patient may be awakened about 3 – 4 o’clock in the morning and lies in discomfort unless he (she) takes a hot bath or gets up and moves around.
- Pain referred down the sciatic distribution is not uncommon. But!: this type of pain is rarely severe, rarely extends below the knee, is seldom accompanied by neurological findings and frequently is found to alternate from side to side, or is bilateral.
- Peripheral joint involvement may be the initial manifestation of the disease in 20% of cases. Most commonly the knee joints and ankle joints are involved.
Findings

Sacroiliac joint involvement

• Tenderness over the sacroiliac joints.
• Orthopedic maneuvers which produce sacroiliac movement tend to aggravate the pain.

Lumbar involvement

• Limitation of motion of the lumbar spine in all direction (ante- and retroflexion, lateral flexion).
• Paravertebral muscle spasm.
• Straightening of the lumbar spine.
• Tenderness to percussion and deep palpation of the lumbar spine.
• Muscle atrophy of the lumbar segment (combining with straightening of the lumbar spine will give the ironed out appearance of the lower back).

Thoracic involvement

• Thoracic girdle pain.
• Chest pain on deep inspiration.
• Diminished chest expansion.
• Thoracolumbar kyphosis.
Application of direct pressure by thumbs over the SI joints to elicit tenderness. The figure also illustrates the patient's inability to touch the floor. The decrease in spinal mobility is often more readily recognized on hyperextension (dorsiflexion) or lateral flexion of the spine.
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Two procedures that may cause pain in the sacroiliac area in patients with sacroiliitis. Application of direct pressure on the anterior superior iliac spines, along with attempts to force the iliac spines laterally apart (1); and forced flexion of one hip maximally towards the opposite shoulder, with hyperextension of the contralateral hip joint (2).
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SCHÖBER TEST

L4  L5

10 cm

15 cm
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Posture in advanced long-term ankylosing spondylitis. Progressive flattening of lumbar spine and forward stooping of the thoracic and cervical spine, along with prominence of the abdomen, mild flexion contracture of the hip joints, and diminution of vertical height after many years of the disease process.
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Cervical involvement

- Forward protrusion of the head and neck.
- Movements in all directions become markedly impaired.
- Spasm and atrophy of the cervical muscles.
- The rigid cervical spine is particularly prone to injury.

Peripheral joint involvement

- It is the initial manifestation in ~20% of cases.
- Knees, ankles, hips, elbows, wrists are mainly involved in an asymmetrical manner.
- Flexion contracture at the hips is not uncommon necessitating flexion at the knees to maintain an erect posture and giving rise to a characteristic rigid gait.

Non-articular involvement

- Heart involvement (10% after 30 years of spondylitis): aortic insufficiency with diastolic murmur is the most frequent.
- Eye involvement (20% of patients): iritis, iridocyclitis
- Amyloidosis (8% of cases) in the later stages.
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Fixed flexion deformity of the hip joint can be revealed as the contralateral hip joint is maximally flexed to obliterate the exaggerated compensatory lumbar lordosis.
Relatively subtle limitation of motion of the shoulder joint can easily be detected. The patient is asked to bring the arm behind the waist (to test internal rotation) and reach up along the spine as high as possible, then to bring the arm behind the neck and reach down along the spine as far as possible (to test external rotation). In individuals with the normal range of motion of the shoulder joints, these reaches overlap, but in patients with limited range of motion there is a gap between these reaches.
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Uveitis in spondyloarthritis This patient’s eye disease is unilateral. The redness and miosis suggest the acute onset of an anterior process. This appearance is characteristic of HLA-B27-associated uveitis.
General symptoms

• Weakness, weight loss. Fever is uncommon.

Laboratory findings

• Elevated ESR.
• Rheumatoid factor negativity.
Roentgenographic findings

- The x-ray finding in AS are characteristic.

**Squaring of the vertebral bodies** is often present in the lateral view: anterior concavity of the vertebral bodies is lost; the anterosuperior and anteroinferior corners of the bodies appear as though eroded away.

**Sacroiliac joints**
- The normal sacroiliac joints have fairly clearly defined margins.
- The abnormalities observed in the SI joints in AS are characteristically bilateral.
- Sclerosis of the subchondral bone often with spotty rarefaction, located in the juxtaarticular portion of the ileum, especially in the anterior and lower portion of the joint.
- Later juxtaarticular portion of the sacrum shows similar changes.
- The outlines of the sacroiliac joints tend to become hazy and indistinct with loss of definition of the articular margins.
- Areas of bony erosions may give an impression of irregular widening and narrowing of the joint space.
- As healing ensues, ossification takes place and bony trabeculae may be seen transversing the articular space.
- Bony ankylosis is the end stage. When ankylosis is complete the pain often disappears.
Apophyseal and costovertebral joint changes

- The apophyseal joint changes are best observed in the lumbar and cervical segment of the spine on semilateral view. Often only a few scattered joints are abnormal while intervening ones appear normal.

- The involved joints are hazy and indistinct with irregular sclerosis and erosion of the articular surfaces.

- The final event is bony fusion.
Changes in the paraspinal ligaments

• The syndesmophytes are caused by the inflammation and calcification of the superficial layer of the annulus fibrosus of the intervertebral disc. The process starts at the attachment of the vertebral body and the intervertebral disc (enthesitis).
• The longitudinal ligaments become involved in advanced cases.
• The sydesmophyte is always looks like a longitudinal, linear, poorly defined calcification adjacent to the margins of the vertebral bodies, while osteophytes of the degenerative disease of the spine have a horizontal starting part at the margin of the vertebral body and is roughly calcified and is much larger compared to syndesmophytes.
• The end stage is the bamboo spine.
Evolution of syndesmophytes, lateral view of the spine. Osteitis of the corners of the vertebral bodies anteriorly, causing reactive sclerosis (‘shiny corners’) leads to subsequent erosions and resultant ‘squared’ vertebral bodies. This is followed by vertical bony ‘bridges’ (syndesmophytes) between vertebral bodies, resulting from ossification of the superficial layers of the annulus fibrosus.
Ankylosing spondylitis. A radiograph of a macerated specimen demonstrate a typical syndesmophyte bridging the intervertebral disc space. It is thin, vertically oriented and originates from the margins of vertebral bodies.
Bony changes observed in degenerative disc disease (osteophytes), AS (syndesmophytes), and psoriatic spondylitis (non-marginal syndesmophytes and paraspinal ossification).
Spondylodiscitis

- Destructive, erosive lesions of the intervertebral disc and adjoining vertebral bodies.
- Erosion of the adjacent margins of two vertebral bodies with condensation of the subchondral bone followed by the destruction of the intervertebral disc and the adjacent vertebral bodies.
Other changes

- Irregular new bone formation may be evident at the ischial tuberosities, iliac crest, inferior margin of os pubis, posterior cortex of os calcis.
- Enthesitis is in the background of these characteristics.
Diagnosis

The so called Rome Criteria for Ankylosing Spondylitis (1961):

1. Low back pain and stiffness >3 months, not relieved by rest.
2. Pain and stiffness in the thoracic region.
3. Limited motion of the lumbar spine
4. Limited chest expansion
5. History of iritis
6. Radiographic evidence of bilateral sacroiliitis

Diagnosis requires 4 of the first five criteria or sacroiliitis plus one of the clinical criteria.
### TABLE 238-2. DIAGNOSTIC CRITERIA FOR THE SPONDYLYARTHROPATHIES

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<tbody>
<tr>
<td>1. Low back pain and stiffness &gt; 3 months, not relieved by rest</td>
<td>Peripheral arthritis &gt; 1 month, in association with:</td>
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<tr>
<td>2. Pain and stiffness in the thoracic region</td>
<td>Urethritis and/or cervicitis</td>
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<tr>
<td>3. Limited motion of the lumbar spine</td>
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<td>4. Limited chest expansion</td>
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<td>5. History of iritis</td>
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<td>6. Radiographic evidence of bilateral sacroiliitis</td>
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</table>

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<table>
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<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Inflammatory spinal pain or peripheral synovitis (asymmetrical or lower limbs) Plus one or more of the following: Alternate buttock pain Sacroiliitis Enthesopathy Positive family history Psoriasis Inflammatory bowel disease Urethritis, cervicitis, or acute diarrhea occurring within 1 month of the onset of arthritis</td>
<td>Lumbar pain at night or morning stiffness Asymmetrical oligoarthritis Buttock pain (or bilateral or alternating buttock pain) Sausage-like toe or digit(s) Heel pain or enthesitis Iritis Nongonococcal urethritis/cervicitis within 1 month of onset Psoriasis, balanitis, or inflammatory bowel disease Sacroiliitis (bilateral grade 2 or unilateral grade 3) HLA-B27(+) or (+) family history of a spondyloarthropathy Rapid (&lt; 48 hours) response to NSAID’s</td>
</tr>
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</table>

**Score**

1, 2, 2, 2, 1, 1, 1

**Note:** Older criteria (top) are being replaced by newer, more liberal criteria (bottom) for the spondylarthropathies.
Differential diagnosis

- Other spondylarthropathies.
- Osteitis condensas ilei.
- DISH (diffuse idiopathic skeletal hyperostosis).
- Other causes of skeletal hyperostosis (vitamin A intoxication, retinoid therapy; hypoparathyreoidism; familial hyperphosphataemia; synovitis, acne, pustulosis, hyperostosis, osteitis –SAPHO-syndrome; hypertrophic osteoarthropathy; fluorosis).
Treatment

- Education, physical exercise (gymnastotherapy), swimming, ultrasound (micromassage).
- NSAID therapy
- Steroid treatment (mainly local infiltrations)
- Sulfasalazine (2-4 g/day), methotrexate (7.5-15 mg/week)
- Orthopedic surgery
Bone

Cartilage

Muscle

Synovial membrane

Tendon

Enthesis

Joint space in the x-ray picture

Joint space (virtual)

Synovitis: autoimmune=RA, crystal induced=gout, bacterial=septic arthritis, antigen/antibody complex induced=reactive arthritis

Enthesis: autoimmune, immunocomplex mediated=spondylarthritis ankylopoetica, Bechterew’s disease, reactive arthritides

Cartilage: degeneration=osteoarthritis,
Reiter’s syndrome and reactive arthritides
• In 1916 Hans Reiter described a patient who developed **non-gonococcal urethritis, arthritis** and **conjunctivitis** following an episode of bloody diarrhea. It happened during the First World War. It was a Shigella induced reactive arthritis.

• The classic Reiter’s syndrome is a postdysenteric reactive arthritis with extraarticular manifestations.

• No viable bacteria can be isolated from the patient: the synovitis, urethritis and conjunctivitis are caused by deposition of immunocomplexes (bacterial antigen+antibody complex) inside the synovial membrane, urethral mucosa and conjunctival mucosa. This process is followed by the inflammation.

• Acute, sterile, nonsuppurative, asymmetric oligoarthritis arising after an infectious process, with extraarticular manifestations.

• Young men are most commonly affected. The male predominance is often overestimated because Reiter’s syndrome in females may be associated with asymptomatic genitourinary disease and milder disease expression.
• Incidence: 4 cases/ 1000 dysenteric subjects/year.

• If the dysentery epidemic is induced by arthritogenic bacteria, arthritis is developed in about 2-3% of infected individuals, and 20% in infected and HLA B27 positive individuals.

• Not only Shigella can induce Reiter’s syndrome and reactive arthritides. The following bacteria can be also in the background of the mentioned diseases:
Enteric pathogens

- Shigella flexneri (serotypes 2a, 1b)
- Salmonella typhimurium
- Salmonella enteritidis
- Salmonella paratyphi
- Salmonella heidelberg
- Yersinia enterocolitica (serotypes 0:3, 0:8, 0:9)
- Yersinia pseudotuberculosis
- Campylobacter jejuni
- Campylobacter fetus
Urogenital pathogens (SARA)

- Chlamydia trachomatis
- Chlamydia psittaci
- Ureaplasma urealyticum
Clinical picture

Acute, additive, lower extremity oligoarthritis with extraarticular symptoms.

Extraarticular symptoms:
• Enthesitis (most commonly Achilles tendonitis)
• Genitourinary involvement (mucopurulent urethral discharge, urethritis, circinate balanitis, cervicitis/vaginitis).
• Keratoderma blenorrhagicum (purulent inflammation of the skin in the palmar and plantar region)
• Ocular manifestations (conjunctivitis, uveitis, keratitis).
• Uncommon features: prolonged PR, complete heart block, aortitis, aortic regurgitation, amyloidosis, serositis, CNS involvement, pulmonary infiltrates.
Clinical course

• Mostly self limited, but chronic peripheral arthropathy is observed in 20-50% of patients. The letter cases are susceptible for axial progression (spondylarthritis).
Treatment

- Antibiotic treatment has been debated but Chlamydia, Yersinia and Salmonella microbial antigens have been identified at sites of tissue inflammation.
- According to our practice: it seems to be worthwhile to administer macrolide antibiotics (erythromycin group) in Chlamydia infection and trimethoprim+sulfamethoxazol in Yersinia infection induced reactive arthritis.
- NSAID treatment
- Steroid treatment
- Metothrexate (7,5-15 mg/week) and/or sulfasalazine (2-4 g/day) treatment
Case report

• 41 years old male patient.

History:

• In the middle of December 1996, the patient took part in a pig-killing feast. He ate large amount of meat, partly not fully fried and drank wine and brandy.
• One-week later high-grade fever, chills, periumbilical and right lower quadrant abdominal pain developed.
• Another four days later the MTP joints, ankle joint on the right side, the knee joint on the left side became red, warm, swollen and effused.
• The complaints and symptoms persisted with the exception of the abdominal pain. The latter relieved gradually.
• The patient was admitted in an other hospital and underwent a screening for malignancy and autoimmune disease: ESR 120 mm/hour, gamma latex test ++, Waaler-Rose test negative, serum uric acid level normal. The patient was unable to walk.
Consultation in our clinic:

- asymmetric oligoarthritis with fever.
- With respect to the history of the patient, the possibilities were the following (differential diagnosis): arthritis urica, reactive arthritis (Yersinia?), septic arthritis.
- Puncture of the left knee.
• 10 ml of not-fully-clear, yellowish fluid.
• No urate crystal in the sediment of the fluid was found.
• Leukocyte count was 5400/cubic millimeter, 92% of them were granulocytes.
• The fluid was sterile on culture.
• The patient serum contained antibodies against Yersinia enterocolitica O3 strain in a titer of 1:320.
• Diagnosis: reactive arthritis induced by Yersinia enterocolitica O3.
• Treatment: trimethoprim + sulfametoxazol (Sumetrolim), NSAID.
• The patient fully recovered in 3 weeks.
• Note: Yersinia enterocolitica can grow on even +4 °C.
Immune response in Yersinia-triggered reactive arthritis

Initially, weak IgM-class antibody production
Later, strong and persisting IgG and especially IgA antibody production
IgA antibodies increase in avidity with time
Antibodies are directed against several antigenic epitopes of Yersinia
Nonspecific immune complexes are always found in serum
Specific immune complexes containing Yersinia and anti-Yersinia antibody may be found in serum and in synovial fluid
Peripheral blood T cells show weak response to Yersinia
T cells in the synovial fluid show vigorous but somewhat nonspecific response to Yersinia (or other arthritis-triggering microorganism)
Microbial material in synovial fluid cells of a patient with Yersinia-triggered reactive arthritis (a) and a patient with chronic Yersinia-triggered reactive arthritis (b). There is positive immunofluorescence staining by an antiserum obtained by immunizing a rabbit with live Yersinia. Most of the cells are polymorphonuclear granulocytes and, in the chronic case, nearly all are strongly positive.
## Reactive arthritis induced by chlamydia infection

<table>
<thead>
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<th>Name</th>
<th>sex</th>
<th>duration (years) of the disease</th>
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<th>primary infection</th>
<th>complications</th>
<th>sacro ilitis</th>
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</table>

23 patients; 5 females, 18 males; 2 females and 7 males were HLA B27+
It seems to be worthwhile to screen all patients with acute-subacute oligoarthritis for the above mentioned pathogens (supplemented with Borrelia burgdorferi)
Psoriatic arthritis
Psoriasis is a genetically determined, chronic, epidermal proliferative disease.

The skin lesions appear as erythematous papules and plaques surmounted by silvery, thick scales that resemble mica and that are easily removed and may accumulate in the patient clothing or bed. Classically the lesions are distributed symmetrically over bony prominence, such as extensor surfaces of the elbow, knee, over the sacrum and so on. Nail involvement occurs in up to 50% of patients.

The basic alteration represents an accelerated cell cycle, culminating in rapid epidermal cell (keratinocyte) proliferation. Hyperuricaemia is caused by the increased cell turnover.

HLA Bw17, B13, Bw37, Cw6 are associated with psoriasis, HLA B39 and B27 with axial involvement while DR4 and DR7 with peripheral arthritis.
• The prevalence of psoriasis in Caucasians is about 1,2%.
• The prevalence of arthropathy among psoriatic patients is about 5 - 7%.
• Sacroiliitis can be observed in 20% of all patients with arthropathy.
• HLA B27 positivity can be found in 15% of cases with peripheral arthropathy and in 40% of patients with spondylitis.
• In some patients the arthropathy can manifest before the onset of the skin diseases.
• The age of onset of arthritis psoriatica is between 30 and 50 years of age. The arthritis affects men and women equally. Psoriatic spondylitis, however has a male/female ratio of 2,3:1.
• No etiologic agent is proven (Staphylococcus, Streptococcus infection, stress, trauma???).
• Pathology: chronic synovitis without intrasynovial immunoglobulin and rheumatoid factor synthesis and with a greater propensity for fibrous ankylosis, osseous resorption and heterotopic bone formation.
• Rheumatoid nodules are always lacking.
Variants of psoriatic arthritis

- Asymmetrical oligoarthritis (30-50%)
- Arthritis of the DIP joints (10-15%)
- Rheumatoid arthritis like polyarthritis without Rf and rheumatic nodules.
- Psoriatic spondylitis (20% of all cases but 50% of all HLA B27 positive cases)
- Arthritis mutilans (5%)
Physical finding

• Involvement of the DIP joints, sausage like digits (flexor tendonitis plus interphalangeal joint inflammation),
Monoarthropathy associated with psoriasis vulgaris
Radiographic changes

- Soft tissue swelling (sausage digits), erosions, periostitis, asymmetrical sacroiliitis, para- (nonmarginal)-syndesmophyte formation, pencil-in-cup deformity in arthritis mutilans.
Treatment

• NSAID, steroid, metothrexate
Enteropathic arthropathy
• Arthropathy associated with Crohn’s disease and ulcerative colitis.
• Prevalence: peripheral arthritis can be observed in \(~20\%\), axial arthritis in \(~10\%\) of all inflammatory bowel disease patients.
• **Peripheral arthropathy** is associated with other extraintestinal manifestations, for example erythema nodosum. Male/female ratio is 1. Peripheral arthropathy usually is manifested as an inflammatory, nonerosive, asymmetrical mono-oligoarthritis affecting large joints (knees, ankles, elbows).

• The **axial disease** is more frequent in men compared to women. HLA B27 positivity is found in 50% of all patients with spondylitic colitis. The axial disease is indistinguishable from ankylosing spondylitis.

• **Therapy**: NSAID, steroid, sulfasalazine, metothrexate.
Case report

• Male, born in 1953.

History:

• Rheumatic fever in the childhood.
• In 1980 abdominal cramps, constipation, weight loss developed.
• Tumor was found on the right lower quadrant of the abdomen (ileocecal region).
• Barium meal examination showed characteristics of Crohn’s disease. The patient underwent a surgical intervention (ileotransversostomia was made) and Chron’s disease was proven histologically, too.
• In 1984 low back pain with insidious onset.
• X-ray examination.
• Diagnosis: enteropathic arthritis associated with Crohn’s disease.
• Later on malabsorption syndrome developed, followed by pulmonary tuberculosis.
• The patient recovered.
• Later on, gallstones and pancreatitis developed and the patient underwent cholecystectomy and pancreateo-cysto-Wirsungo-gastrostomy.
• The patient recovered again.
• About 4 years ago, CML developed and the patient died last year.
<table>
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<th>Ankylosing Spondylitis</th>
<th>Posturethral Reactive Arthritis</th>
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Osteoarthritis

Degenerative joint disease

Osteoarthrose
Degeneration of the articular cartilage especially in weight bearing joints:

- The cartilage becomes thinner, softer than normal
- The integrity of the surface is breached and vertical clefts develop (fibrillation)
- Deep cartilage ulcers extending to bone appear
- Areas of fibro cartilaginous repair may develop, but this repair tissue is inferior to pristine hyaline articular cartilage.
- This process is associated with remodeling and hypertrophy of bones: subchondral sclerosis (appositional bone growth in the subchondral regions); growth of cartilage and bone at the joint margins lead to osteophytes and spurs.
- The above mentioned process can be associated with inflammation (chronic or acute synovitis), too.
Pathogenesis

- The biomaterial properties of the articular cartilage and subchondral bone are normal (surface is smooth with the lubricant synovial fluid, the cartilage is strong, hard, but rubber, as the bone is), but extensive loads applied to the joint cause the tissues to fail.
- The applied load is physiologically reasonable, but the material properties of the cartilage or bone are inferior (genetic causes, infectious origin, metabolic abnormalities)
Classification of osteoarthritis

**Idiopathic, localized**
- Hands: Heberden’s and Bouchard’s nodes; erosive interphalangeal osteoarthritis (non-nodal); carpal-first metacarpal joint
- Feet: hallux valgus, hallux rigidus, hammer toes, talonavicular joint degeneration
- Knee: medial-, lateral-, patellofemoral compartment (genua vara and genua valga)
- Hip: eccentric, concentric, diffuse (senilis)
- Spine: apophyseal joints, intervertebral joints (discus intervertebralis degeneration), spondylosis (osteophytes), ligamentous (hyperostosis, DISH, Forestier’s disease)
- Other single sites (temporomandibular joint)

**Idiopathic generalized**
- Includes three or more areas listed above (Kellgren)
Classification of osteoarthritis

Secondary

- Trauma: acute or chronic (occupational, sports)
- Congenital or developmental: congenital hip dislocation, hypermobility syndromes (Marfan’s, etc), valgus-varus deformity, bone dysplasias
- Metabolic: ochronosis (alcaptonuria), haemochromatosis, Wilson’s disease (coeruloplasmin), Gaucher’s disease (polysaccharid storage).
- Endocrine: acromegaly, hyperparathyroidism, diabetes mellitus, obesity, hypothyroidism
- CPPD arthropathy
- Other bone and joint diseases: gout, Paget’s, avascular bone necrosis
- Neuropathic: Charcot’s joint
- Endemic: Kashin-Beck (Eastern Siberia, fungus?), mseleni disease (in zululand)
- Other: frostbite, haemoglobinopathies, caisson
Risk factors of osteoarthritis

- Sex: male sex for hip, female sex for knee and hand
- Race: south African blacks – hip joint osteoarthritis – less common
- Genetic factors: Heberden’s nodes
- Ageing: the most powerful
- Major joint trauma
- Repetitive stress: ballet dancer – ankle
- Obesity: hip and knee
Clinical features of osteoarthritis

- Joint pain: causes are synovitis, medullary hypertension and micro fractures of subchondral bone, stretching of periosteal nerve endings by osteophytes, stretching of ligaments distension of joint capsule, muscle spasm
- Localized tenderness
- Bony or soft tissue swelling
- Crepitus over the joint
- Joint effusion
- Loss of joint motion
- Deformities
Radiographic features

- Joint space narrowing
- Subchondral bone sclerosis
- Subchondral cyst formation
- Marginal osteophytes
Therapy of osteoarthritis

- Symptomatic drug therapy (NSAIDs)
- Reduction of joint loading
- Physical therapies (TENS, ultrasound, balneotherapy, gymnastotherapy)
- Orthopedic surgery
Marfan’s syndrome
Major abnormalities

- Dislocation of the lenses (eyes)
- Excessive length of the extremities, loosjointedness, kyphoscoliosis, anterior chest deformitis (skeletal system)
- Aortic aneurysm, mitral valve redundancy and regurgitation (cardiovascular system)
- Steinberg thumb sign, wrist sign, low upper segment/lower segment ratio

- Heritable disorder of the connective tissue
- Single mutant gene (fibrillin 1, transforming growth factor beta receptor 2)