Examination of the musculoskeletal system

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Musculoskeletal diseases in the internal medicine

Two groups of musculoskeletal diseases:

1, degenerative problems - arthrosis, osteoporosis

2, inflammatory problems - arthritis, myositis, osteomyelitis

Important questions to be decided:

Firstly: there are two groups of musculoskeletal diseases:

1, degenerative problems - arthrosis, osteoporosis

2, inflammatory problems - arthritis, myositis, osteomyelitis

Secondly: in both two groups there are

a, diseases involving the peripheral parts (joints, muscles)
- rheumatoid arthritis, gout

or b, involving the central part of the musculoskeletal system
- discopathy or spondylarthrosis of the spine

Thirdly: the problem has a sudden onset or developing gradually

- sudden: gout - gradual: rheumatoid arthritis

Fourthly: which component of the motoring system is the point-of-origin?

A musculoskeletal disease can spring from …

Inside of joints (arthritis, arthrosis)

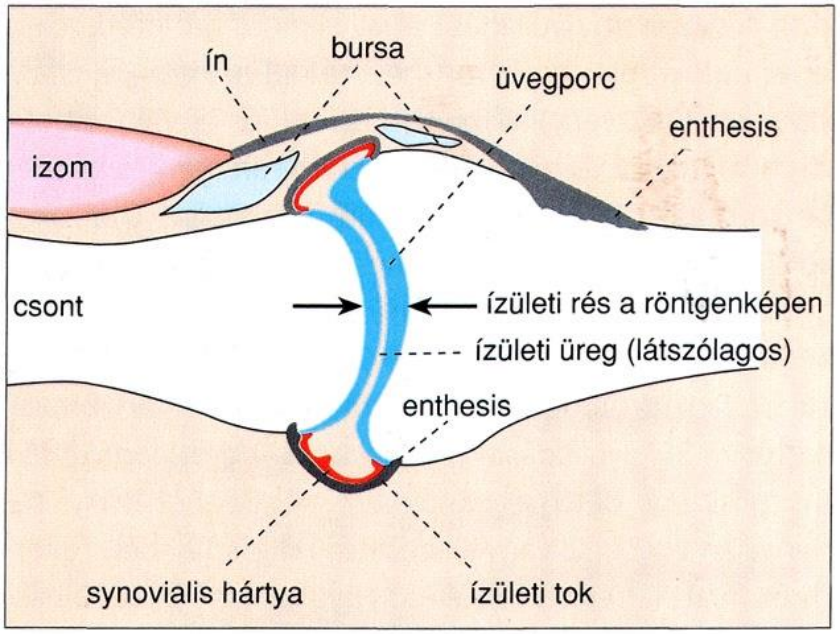
Outside of joints: connecting point of joint tape and bone
(enthesis – enthesopathy)

Bones (osteomyelitis, osteoporosis)

Muscles (myositis)

Surrounding soft tissues (bursa – bursitis)

(tenden, tenden sheath
– tendinitis, tenosynovitis)



Main diseases of musculoskeletal organs - 1

Arthritis - inflammations of the synovium

1, autoimmun origin	- rheumatoid arthritis
2, caused by crystals	- gout
3, direct bacterial infection	- septic arthritis
4, bacterial antigen + antibody	- reactive arthritis

Enthesitis – inflammation of unknown origin in the enthesis

- seronegative spondylarthritis (like: Bechterew's)

Myositis – autoimmun inflammation of the muscles

- polymyositis, dermatomyositis

Main diseases of musculoskeletal organs - 2

Local inflammation in joints and surrounding tissues due to overload

1, mechanically irritated bursa	- bursitis
2, mechanically overloaded enthesis	- tennis elbow
3, overload-provoked inflammation of muscle+tendon+bursa+synovium	- periarthritis coxae - p. humeroscapularis

Arthrosis	- degeneration of joint cartilage	- arthrosis coxae, knee, etc - spondylarthrosis (small joints of spine)
	- degeneration of disk in spine	- vertebral discus herniation

Fibromyalgia – psychogen origin, painful myelogen nodules

Important components of the case history

- Any traumatic event (injury) in the near-past?

- Any surgery in the near-past?

- Presence of another disease which used to associate with musculoskeletal problems?
  (psoriasis, inflammatory bowel disease,
  celiac + rheumatoid arthritis, hyperuricemia + gout)

- Use of a medicine which can provoke muskuloskeletal problems?
  (thiazide diuretics, aspirin, B-blokking agents, antituberculotics, antiepileptics, anticoagulants)

- Is the current problem generally known for the patient?
  Was it diagnosed or treated previously?
  Any hospitalization because of similar complaint?
  Any result of a previous treatment for the same problem?

The two main complaints in musculoskeletal diseases

- **Pain**

- **Loss of a musculoskeletal function**

- Minor or concomittant complaints:
  - swelling
  - tenderness
  - redness
  - fever and/or local warmness
  - unusually increased motility (instability)
  - deformity
  - muscular weakness
  - feeling or palpating crepitation in joints
  - skin or eye problems
  - loss of appetite / loss of weight

Pain

The pain can be

- mechanical pain:

  typically provoked by moving or loading

  attenuated at rest

  (vertebral disk herniation)

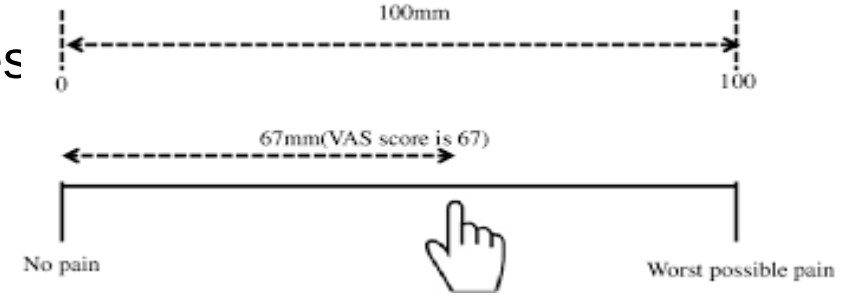
- inflammatory pain:

  presenting at rest, even at night

  (arthritis)

The degree of pain is measurable by the the Visual Analogue Scale (VAS): this is a semi-quantitative toll on which the patients determines the degree of pain from 1 to 10.

Good method for the follow-up, too.



Pain – main questions

- Where it arises exactly?
- Is it localized to a small area or covers a big region of the body?
- Is it radiating to any direction, or into another organ?
  (pain in the leg due to a vertebral disk herniation)
- Is it a superficial pain or comes from the deep tissues?
- Is it attended by numbness or formication, or by loss of sensing?
- Is it one-sided or two-sided? In the last case: is it symmetric?
  (gout: one-sided – rheumatoid arthritis: symmetric)
- In case of joints – 1 = monoarticular (gout, septic), 2-4 = oligoarticular,
  4+ = polyarticular (rheumatoid arthritis)

Pain – changing in time

- Onset - lenght – time-to-peak – finish – recurrence

- sudden onset, quick development to peak	– gout
- gradually develops during 1-2 days	– septic arthritis
- sneaky development during months/years	– rheumatoid arthritis
- migrating: acute onset and rapid peaking followed by rapid finishing in one joint but a rapid onset in another joint	– rheumatic fever
- spontaneous remission and exacerbation intermittently in the same joint	– rheumatoid arthritis

- During the day

- severe pain in morning, later diappears	– arthrosis
- severe in morning, softens very slowly but does not stop after hours	– rheumatoid arthritis
- auroral pain, awaking the patient	– Bechterew's

Pain – effect of moving

Arthrosis
- morning starts with pain
- moving gradually softens
- pain returns afternoon

Spondylarthritis ankylopoetica, Bechterew's disease
- mild physical activity decreases the pain

Rheumatoid arthritis
- morning starts with rigidity of the joints
- at least 30 mins is needed to leave the bed
- moving softening but not stopping the pain

Loss of function

The severity of symptoms – the degree in loss of function

Ask and observe !

- The loss of finger(s) or extremities?
- Mobility impairments or disability?
- Need to use tools for moving?
- Ability to carry out work or normal activities of daily living?
- Being self-supplying in home?

Estimate: - restricted range of motion or over-mobility (instability)
- simple tests: undressing, walking, lying down, sitting down and getting up

Physical examination

Going around in all parts of the musculoskeletal system

Looking and palpating

-the shape and symmetry of the body

- the range of moving

- the inflammation

- the deformations

- the atrophy (skin, muscles)

- the crepitation

- sensitivity in muscles, bones, joints

Details are in handbooks and in practices of rheumatology

Inflammation

Symptoms of inflammation:

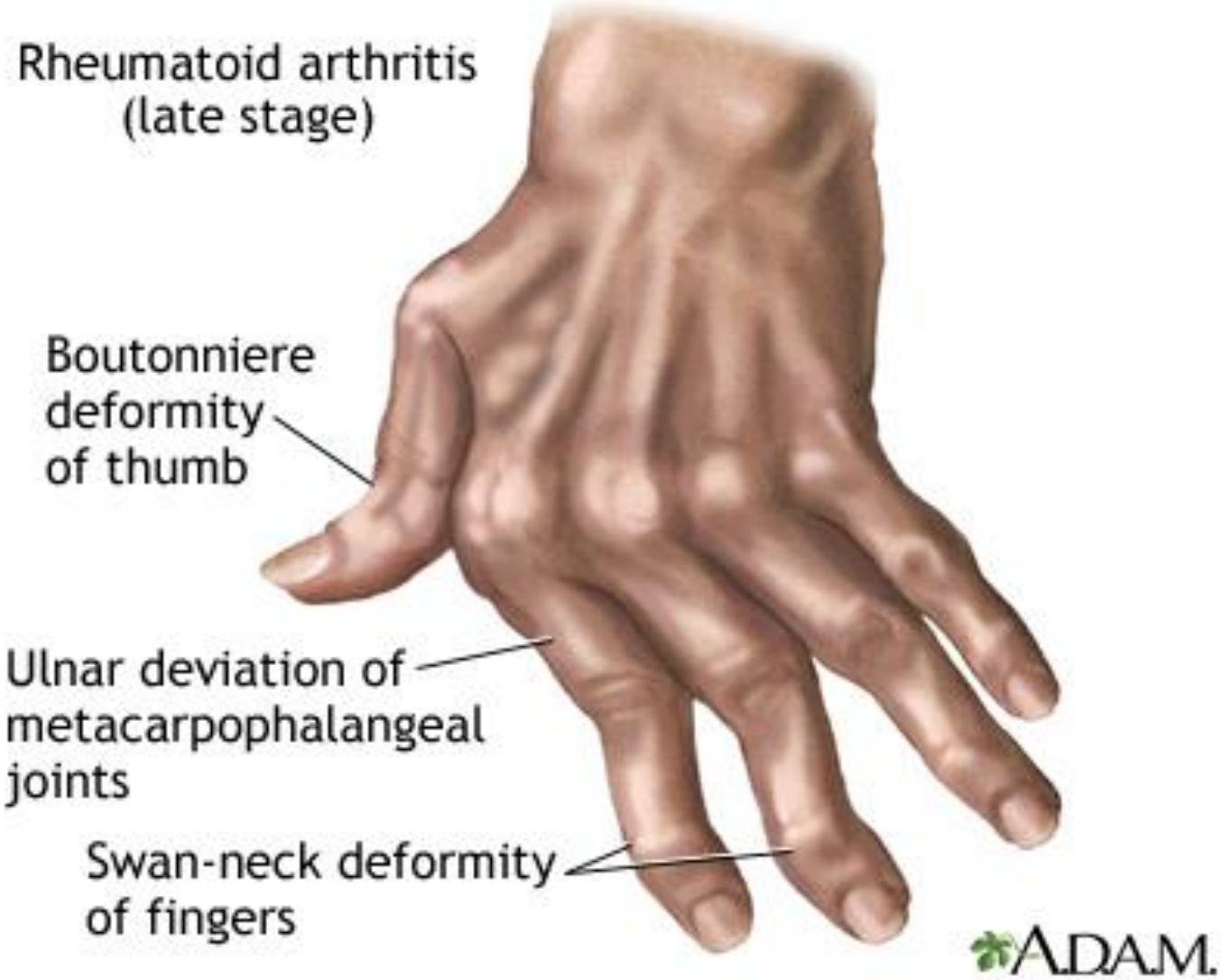
- swelling
- redness
- warmness
- sensitivity (painful)
- loss of function

Laboratory examinations

In the majority of musculoskeletal diseases there is no specific lab sign, except - in gout: high uric acid
- in rheumatoid arthritis: high level of rheuma factor, cyclic citrullinated peptide antibody
- in Bechterew's: HLA-B27
- in hyperparathyroidism: parathormone

Not specific but frequently seen:

- acute inflammation: sedimentation rate, CRP, neutrophils, ferritin, ceruloplasmin, fibrinogen, procalcitonin
- chronic inflammation: anaemia, thrombocytosis, monocytosis, hypoalbuminemia
- microbiological serology: Yersinia, Clamydia, Borrelia, Epstein-Barr, hepatitis B and C, tbc, antistreptolysin titer
- lab tests of calcium metabolism: Ca, P, PTH levels, alkaline phosph, bone turnover markers
- serum proteins: immunglobulins, elfo: monoclonal in myeloma multiplex


Rheumatoid arthritis
(late stage)
Boutonniere
deformity
of thumb
Ulnar deviation of
metacarpophalangeal
joints
Swan-neck deformity
of fingers
A.D.A.M.

Rheumatoid arthritis

Swollen metacarpophalangeal joints

Interosseal muscle atrophy

Ulnar deviation of fingers

Acute gout

Acute inflammation of one or more joints

Mono- or oligoarticular, assymetric, very painful

Need to differentiate from erysipelas

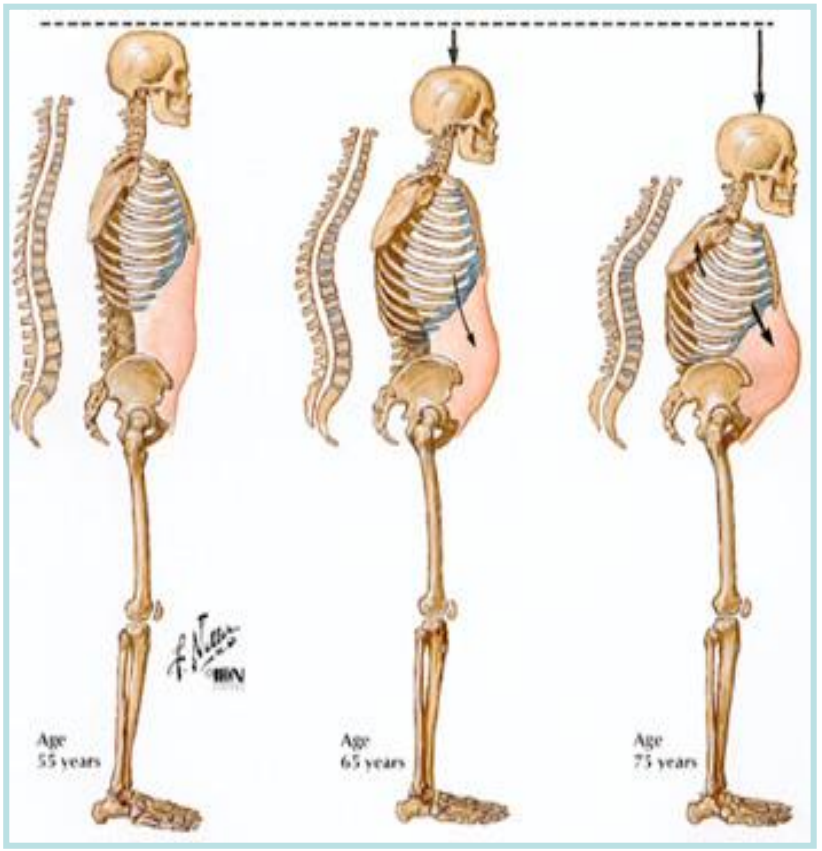
Chronic tophaceous gout

Hard nodes around the joints

Nodes are full with urate chrystals,
and sometimes ulcerate.

Need to differentiate from rheumatoid arthritis – that is round-shaped and symmetric, while the gout is deformated and asymmetric

Osteoporosis



- Increased thoracic kyphosis
- Increased cervical lordosis
- Decreased lumbar lordosis
- Pelvic bone tilting backwards
- Knee joints turn to flexing position
- Total height decreases
- Instable position = risk of falling