Commonly missed diagnosis in musculoskeletal conditions

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Learning objectives

1. To learn about the differential diagnosis between stress injuries, inflammatory processes, necrosis and tumors - exclusive soft tissue tumors
2. To recognise the importance of insufficient consideration of clinical information and symptoms in the interpretation of imaging studies.
3. To recognise the consequences of uncritical imaging requests.
4. To stress the importance of a systematic approach to the interpretation of imaging, particularly radiographs
Main

Part I of this presentation covers stress reactions, repetitive trauma, and arthritis. The majority of the selected cases are from primary imaging centers. Nevertheless, some of these clinical situations are not really common, but may occur all at a sudden to the reporting radiologist.

Case 1: Groin pain in athletes

Case report: adolescent semi-professional male soccer player: during training, groin pain on his right side since a few days, he feels "exhausted" and projection radiographs have been reported as normal (Fig. 1).

Diagnosis: This is a case of pubic osteomyelitis. MRI was proven with blood cultures (results sent a few days after MRI) which were positive for staphylococcus aureus.

Osteomyelitis of the pubis is a rare, but nevertheless classical infective location of bone infection. The most common complaint in both infection and inflammation: pain under load, local or pseudoradicular Biochemistry is characteristically normal or slightly inflammatory in osteitis pubis, frankly inflammatory in osteomyelitis. On conventional radiographs, typical sclerosis and benign periosteal reaction may be observed (Fig. 2, adolescent male, different from patient in Fig. 1).

Differential diagnosis:

Osteitis pubis is a noninfective inflammation of the symphysis pubis. May occur after urological or gynaecological procedures or may be associated with overuse or trauma.

Overuse syndromes in athletes: 5 - 18 % of all athletic injuries, predominantly kicking sports, 1/3 of soccer players will develop groin pain. Main causes are traumatic injury to the adductor and rectus abdominis muscles (Fig. 3, adductor edema due to horse riding), insufficiency fractures of the pelvis, or posterior inguinal wall deficiency, hernias ("sportsman's hernia").

Rheumatic disorder: The best fitting rheumatic disease in such a case would be chronic nonbacterial osteomyelitis (CNO: recurrent multifocal osteomyelitis, CRMO). Average age 8.3 years (range, 2.5-24 ys). Principally in every bone. Soft tissue involvement in this case does not fit to this diagnosis.

Case 2: Wrist pain

Case report: 60 ys old female with left-sided wrist pain, no trauma (Fig. 4).
Diagnosis: De Quervain's tendovaginitis (synonyms: housewife's thumb, oarsman's wrist, washer woman's sprain): Overuse of the tendons of the first dorsal compartment of the wrist due to repetitive activities with increased tendon friction. Gender: female : male = 8-10 : 1 diagnosed by a specific provocative test (Finkelstein test). On projection radiograph a typical soft tissue thickening is visible (Fig. 5). With US, tendon thickening and peritendinous fluid is visible (Fig. 6).

Differential Diagnosis:

Rheumatoid arthritis and related diseases are most commonly located on the ulnar aspect of the wrist.

Psoriatic arthropathy: may involve only the wrist, but typically has a longitudinal or transverse spread.

Case 3: Atlantodental destruction

Case report: 66 ys male with marked restriction of neck motion and radiological report (MRI) of rheumatoid arthritis (Fig. 6). All other joints were normal. No trauma.

Diagnosis: Pyrophosphate arthropathy (synonyms: CPPD - calcium pyrophosphate deposition disease, chondrocalcinosis). With CT, the typical appearance of the "crowned dens" is observed (Fig. 7).

Differential Diagnosis:

Rheumatoid Arthritis: destruction of dens without other joint involvement is unusual CPPD is a typical DDx of rheumatic diseases as the synonyms of this disease are pseudo-gout or pseudo-RA.

Ankylosing spondylitis: Dens destruction in this case is extremely rare

Case 4: Specific low back pain

Case report: 33 ys female after breast carcinoma a few years ago. Now low back pain with bilateral extension. A previous MRI 6 months before was normal (Fig. 8).

Diagnosis: Sacral stress fracture. Recently, the patient had bought a puppy-dog carrying it regularly up and down from her 4th floor appartment (without lift). MRI of this lady one year later was normal (Fig. 10)

30 - 40 casuistic publications exist about this entity, females mostly involved: extensive running, basket & volley ball, aerobics. Another form of stress in this anatomic area is SI-joint overuse which is often combined with leg-length differences and/or piriformis syndrome: rowers, cross-country skiers
Differential diagnosis:

**Sacral insufficiency fracture** due to osteoporosis and/or osteomalacia: common in older patients with low bone mineral density and/or after irradiation.

**Sacroiliitis**: typical finding is the "varigated picture" (Dihlmann) which includes erosion + sclerosis + ankylosis occurring synchronously.

**Conclusion**

The presented cases need, if to be solved correctly, a detailed patient's history and close collaboration between referring physician and radiologist.
Fig. 1

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