Radiologic findings in patients with rapidly destructive osteoarthritis of the hip.

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Learning objectives

- To describe radiologic and MRI findings in patients with rapidly destructive osteoarthritis of the hip.

- To make the differential diagnosis with other entities that may course with hip destruction.

Background

The term "rapidly destructive hip osteoarthritis" was coined in 1970 by Lequesne and Postel.

The etiology of this rare disease remains unknown. Various pathogenic mechanisms have been proposed, such as direct drug toxicity, insufficiency fracture of the femoral head, or subchondral bone ischemia.

Clinically, patients present with hip pain of several months of duration.

This entity has more prevalence in women, with an average age of 65-70 years.

Diagnostic criteria for rapidly destructive osteoarthritis include:
- clinical course: rapid progression of hip pain (average 12-18 months)
- radiologic course: rapid joint destruction within 1 year (seen on radiologic follow-up)
- exclusion of other arthropathies that can cause hip destruction.

The histologic findings are those of osteoarthritis, with severe destructive changes in articular cartilage, but usually without osteophytes.

Treatment consists in total hip replacement. A significant loss of acetabular bone leads to intraoperative technical difficulty and is also associated with compromised outcome. Therefore, an early diagnosis is desirable.
Imaging findings OR Procedure details

- Radiography is a very important part in the evaluation of patients with hip pain.

A lot of articular diseases have characteristic radiographic appearances that, joined with an adequate clinical evaluation, allows a definitive diagnosis.

In patients with continued severe hip pain without an apparent cause it is mandatory to repeat radiographs.

In the clinical setting of chronic hip pain, MRI allows to demonstrate the presence of joint effusion, subchondral bone lesions and articular cartilage defects.

The most typical manifestation of rapidly destructive osteoarthritis of the hip is the rapid chondrolysis, that is defined as:

- Chondrolysis > 2mm in 1 year

- Or 50% joint space narrowing in 1 year.

Serial radiographs show progressive loss of superolateral joint space.

Initially, a normal hip or mild osteoarthritic changes are seen.

Follow-up films demonstrate destruction of the femoral head and acetabulum, usually associated with subchondral cysts.

**MRI findings:**

- Bone marrow edema in the femoral head and acetabulum (fig. 1). on page 6
- Hip joint effusion and synovitis (fig. 2) on page 6
- Flattening of the femoral head (fig. 3) on page 7
- Superolateral subluxation of the femoral head/intrusion deformity within the ilium (fig. 4 and 5) on page 8
- Subchondral changes (fig. 6) on page 9

- Subchondral fractures
- subchondral cysts: in femoral head (weight bearing surfaces) and in acetabulum
  
  - Abnormalities in the adjacent soft tissues (signal changes)

Relatively infrequent or mild signs, both in x-ray and MRI: (fig. 7) on page 10

- subchondral esclerosis
- osteophytosis

Radiographs of other joints may demonstrate more conventional osteoarthritic changes.

In the differential diagnosis should be considered several diseases that produce destruction of the hip, including:

- Septic arthritis
- Avascular osteonecrosis with secondary osteoarthritis
- Rheumatoid or seronegative arthritis
- Neuropathic arthropathy

An adequate clinical history and laboratory findings can exclude these diagnosis in most cases. However, MRI can be useful to evaluate all these disorders, especially in early stages.

OUR PATIENTS

We retrospectively reviewed, over a three years period, x-ray and MRI studies of 10 patients:

- 8 with unknown arthropathy,
- 1 with pyrophosphate associated arthropathy
- 1 with hidroxyapatite arthropathy
None of the patients with known arthropathy had radiologic evidence of chondrocalcinosis before the onset of the symptoms.

We excluded those patients with history of destructive arthropathy of the hip of other causes:

- Septic arthritis,
- avascular osteonecrosis with secondary osteoarthritis,
- rheumatoid or seronegative arthritis

All patients were women.

The ranging age of presentation was 46-70 years.

Nine patients had unilateral disease and 1 patient had bilateral disease.

All patients had follow-up radiographs: AP of the pelvis and AP and lateral of the painful hip.

9 patients underwent MRI

1 patient underwent CT

4 patients had synovial fluid analysis (negative results)

In our serie the diagnosis was suspected with the clinical profile and radiographic evolution (changes observed in serial radiographs), before MRI was performed (fig. 8) on page 11.

- At the first X-ray study we found initial changes of osteoarthritis with superolateral joint space narrowing.
- In the successive radiographs we found severe loss of joint space with subchondral cystic changes and flattening of femoral head.
- In three patients we found subluxation.

Most cases demostrated subchondral defects and mild sclerosis.

Osteophytes were small or absent.

MRI findings were not specific for this entity and, as other series, we found:

- Bone marrow edema
- Subchondral cystic femoral and acetabular changes
- Joint effusion and synovitis

Images for this section:

Fig. 1 coronal  STIR: Bone marrow edema in the femoral head and acetabulum

Fig. 1
Fig. 2 Sagittal STIR: Hip joint effusion and synovitis. Subchondral cyst at the acetabulum. Superolateral migration of femoral head.
Fig. 3 coronal SE T1: Flattening of femoral head

Fig. 3
Fig. 4 Rx AP: Superolateral subluxation of the femoral head/intrusion deformity within the ilium. Destruction of femoral head.

Fig. 5 coronal T2 FSE: superolateral subluxation with femoral head destruction
Fig. 6 subchondral cyst at the femoral and acetabulum.
Fig. 6

Fig. 7. Rx AP: mild subchondral esclerosis and osteophytosis
Fig. 8. Rx AP: in successive radiographs (9 months of interval) we found subchondral fracture-flattening of femoral head with superolateral migration loss.
Conclusion

- The diagnosis of rapidly destructive hip osteoarthritis is based on clinical and radiographic findings.
- MRI is sometimes performed, mainly in non-typical cases, to rule out other diseases.
- MRI findings, including bone marrow edema, joint effusion, synovitis and subchondral cysts, are non-specific.

The radiologist must be aware of this rare disorder, as an early diagnosis allows a better outcome after surgical hip replacement.

Personal Information

References

