Calcifying tendinitis of the gluteus maximus tendon presenting as a tumor-like lesion: a case series

Evelien van der Meij¹, Rienk Eshuis², Arthur de Gast³ *

Address: ¹ Evelien van der Meij, MD, Dept. Of Orthopaedic surgery, Clinical Orthopedic Research Center midden-Nederland, Diakonessenhuis Utrecht/Zeist, PO box 1002, 3700 BA Zeist, +31 (0) 88 250 5000(T);

² Rienk Eshuis, MD, Dept. Of Orthopaedic surgery, Clinical Orthopedic Research Center midden-Nederland, Diakonessenhuis Utrecht/Zeist, PO box 1002, 3700 BA Zeist, +31 (0) 88 250 5000(T);

³Arthur de Gast*, MD, PhD, Dept. Of Orthopaedic surgery, Clinical Orthopedic Research Center midden-Nederland, Diakonessenhuis Utrecht/Zeist, PO box 1002, 3700 BA Zeist, +31 (0) 88 250 5000(T) and Department of Rehabilitation and Sports Medicine, Utrecht University (UMCU), Postbus 85500 3508 GA Utrecht, The Netherlands

Email:

Evelien van der Meij, MD: evdmeij2@diakhuis.nl;

Rienk Eshuis, MD: reshuis@diakhuis.nl;

³Arthur de Gast, MD, PhD*: adgast@diakhuis.nl*
Abstract

Introduction Severe pain and limitation of function of the hip joint can be a challenge for the clinician. Unawareness of the presence of calcifying tendinitis in hip joint muscle and tendons can lead to unnecessary (invasive) diagnostics and potentially harmful treatment.

Case presentation We present two cases of calcifying tendinitis of the gluteus maximus muscle. The patients presented with excruciating pain at the lateral part of the thigh with limitation of daily activities. In one case, a caucasian male 44 years of age, the diagnosis was based on the characteristic radiologic appearance of a calcification in the tendon of the gluteus maximus muscle without any other findings. In the other case, a caucasian male 45 years of age, there was also considerable cortical erosion at the insertion of the muscle, which led to the suspicion of malignant disease. Further radiologic investigation and a needle biopsy narrowed the diagnosis down to calcifying tendinitis. Both patients revoved fully with conservative treatment.

Conclusion

Calcifying tendinitis sometimes presents as a tumor-like lesion. Having knowledge of the symptoms, the findings on radiographs, the anatomical location of tendon insertions and the knowledge that calcifying tendinitis sometimes presents with cortical erosion prevents unnecessary further investigations and delay in treatment and recovery.
Introduction

When patients present with extreme pain in the upper thigh and hip region, differential diagnosis includes fractures, malignancies, infections and herniated intervertebral disk. Calcifying tendinitis can also be included, but due to its low incidence at the hip region, there is a low index of suspicion.

Calcifying tendinitis is a common disorder that occurs predominantly in the supraspinatus tendon, but is much less common in the hip region.\textsuperscript{1,2,3} It is a self-limiting condition that presents with local pain and tenderness, and loss of function of the affected joint. If plain radiographs clearly demonstrate calcifications in addition to these clinical findings, the diagnosis is straightforward. In some cases however, the disorder can be associated with cortical erosions and bone marrow edema. These findings together with a less common anatomic location -e.g. the hip region- will wrongly cause a suspicion of malignant disease.\textsuperscript{4,5,6,7}

This report describes 2 patients with calcifying tendinitis of the gluteus maximus tendon. They presented with excruciating pain and loss of function of the hip joint. In one patient there were considerable cortical erosions of the proximal femur that led to the suspicion of infectious disease or malignancy.

This report helps to recognize calcifying tendinitis of the gluteus maximus and to differentiate this entity from other pathologic conditions. With early recognition unnecessary (invasive) diagnostic studies and treatment can be avoided.
Case presentation

Case 1

A 45-year old caucasian man presented with extreme pain at the lateral part of his left thigh that existed for one week. The patient did not have a history of trauma. He was in good general health. He had no fever an no weight-loss. He was unable to stand on the left leg. There was marked tenderness just below the greater trochanter. Internal rotation of the hip joint was particularly painful at this area too. There were no signs of a neurological disorder.

His leukocyte count was 12700/µl (reference 4000-10000/µl), C-reactive protein level was 18mg/l (<10 mg/l) and the erythrocyte sedimentation rate was 37mm/h (referende 0-15 mm/h). Plain radiographs showed a cloudy and translucent calcification below the greater trochanter. On the axial image cortical erosions were seen (Figure 1). The cortical erosions led to the suspicion of infection (Brodies abscess) or malignant disease, so we decided to perform magnetic resonance imaging (MRI) of this region. The MRI showed a small lesion in the greater trochanter with a cortical erosion. T2- weighted images showed a fluid collection, most likely an abscess, in the soft tissues near the femur (Figure 2). To rule out other locations of malignancy or infection, we performed a bone scan (Technetium scintigraphy). The bone scan showed a focal area of increased activity lateral of the proximal femur, just below the greater trochanter, without signs of osteomyelitis. (Figure 3).

In consultation with the Dutch Committee of Bone Tumors we performed a needle biopsy under CT guidance. This CT scan showed a cortical erosion at the insertion of the gluteus maximus muscle and the biopsy revealed normal bone marrow and no signs of a Brodies abscess or neoplasm (Figure 4). We diagnosed his condition as a calcifying tendinitis of the gluteus maximus tendon. He was treated conservatively by a local injection with lidocain and corticosteroids (Depomedrol) at the insertion of the gluteus maximus. There was a
good clinical response after two months. After five months there were no signs of the calcific depot on plain radiographs. We concluded that the calcific depot was completely resolved.

Case 2

A 44-year old caucasian man presented with severe pain at the posterior part of his right thigh that existed for a few weeks. He was able to stand on the left leg, but the pain was so extreme that he could not sit on the toilet seat. The patient did not have a history of trauma and he was in good general health. He had no fever and no weight-loss. Four years before the patient got a local injection with corticosteroids in the left trochanteric bursa with some improvement of the same type of symptoms. Physical examination showed marked tenderness just below the greater trochanter. Internal rotation of the hip joint was particularly painful at this area too. There were no signs of a neurological disorder.

Plain radiographs showed a small calcification below the greater trochanter without any other findings (Figure 5). We diagnosed his condition as calcifying tendinitis of the gluteus maximus tendon and treated him by a local injection with lidocain and corticosteroid (depomedrol). After two months patient was pain free.
Discussion

Calcifying tendinitis is a common benign self-limiting disorder that occurs predominantly in the supraspinatus tendon. Less common locations include the hip, elbow, wrist, and knee, in decreasing order of frequency.\(^1,2,3\) Calcifying tendinitis produces pain and local tenderness.\(^8\)

A commonly used classification of calcifying tendinitis is the Gärtner classification. It is based on the radiographic appearance of the calcification. A type I calcification is homogenous in structure and has well defined borders; a type II calcification is heterogeneous with a sharp outline or homogenous without a defined border; and a type III calcification is cloudy and translucent.\(^9\)

The pathogenesis of calcifying tendinitis is not completely understood. Uhthoff et. al describes progressive stages of calcifying tendinitis: pre-calcification stage, calcification stage and post-calcification stage. During the pre-calcification stage hypoxia causes chondrocyte mediated fibrocartilaginous metaplasia in the tendon without demonstrable radiologic changes. The calcific stage is divided into three phases: a formative phase, a resting and resorptive phase. During the formative phase, the previously formed fibrocartilage is replaced with a calcific deposit. Radiographs obtained during this phase may reveal a homogenous, well-defined deposit (Gärnter type I) or reveals a heterogeneous/homogenous deposit with a sharp or without a defined border (Gärnter type II). The resting phase begins when calcium deposition ends and when there aren’t any signs of inflammation. The resorptive phase is believed to be the painful phase. Macrophages and multinucleated giant cells surround the deposits and phagocytose debris till the calcium is resorbed. On plain radiographs the calcification looks cloudy and translucent (Gärnter type III). During the third stage, the post-calcific period, the phagocytosed calcifications are replaced by granulation tissue with subsequent scar formation.\(^1,5,10\)
Besides rheumatoid arthritis, gout and pseudo gout, calcifying tendinitis is also a calcium pyrophosphate deposition disease (CPDD). Calcium pyrophosphate deposition diseases (CPDD) are metabolic arthropathies caused by the deposition of calcium pyrophosphate dihydrate in and around joints, especially in articular and fibrocartilage. The calcium deposit in gout consists of sodium urate crystals and in pseudo gout of calcium pyrophosphate crystals. In calcifying tendinitis the deposition consists of calcium hydroxyapatite crystals, which causes inflammation, necrosis, and loss of tissue structure.

Recent reports documented erosion and bone marrow edema as associated findings to calcifying tendinitis in a variety of locations, most commonly the tendons of the hip muscles and the pectoralis major insertion of the proximal humerus. The erosion and bone marrow edema are caused by the inflammation process that provokes a hyperemic reaction, which facilitates absorption of the adjacent tissue.

It is also known that cortical erosion occurs in malignancies. The atypical location of soft tissue calcifications, the extreme clinical symptoms and osseous erosion can be a diagnostic challenge to differentiate calcifying tendinitis from infection or malignant disease. Thorough knowledge of soft tissue anatomy of the musculoskeletal system leads to inclusion of calcifying tendinitis in the differential diagnosis.

If plain radiographs clearly demonstrate calcifications in addition to clinically local pain and tenderness of the affected joint, the diagnosis is straightforward and no further workup is necessary.

**Conclusion**

Calcifying tendinitis sometimes presents as a tumor-like lesion. Having knowledge of the symptoms, the findings on radiographs, the anatomical location of tendon insertions and
the knowledge that calcifying tendinitis sometimes presents with cortical erosion prevents unnecessary further investigations and delay in treatment and recovery.
Consent

Written informed consent was obtained from the patients for publication of this case reports and the accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Competing interests

The authors declare that they have no competing interest.

Authors’ contribution

EM and RE analyzed and interpreted the patients data regarding the clinical data, records, lab test and images. They both wrote the basic outline of this paper. AdG was the treating physician and provided writing assistance. All authors read and approved the final manuscript.
a. Anteroposterior view of the left femur shows a rounded calcification below the greater trochanter.

b. Axial view shows the rounded calcification and reveals some cortical erosions.

Figure 2.

A magnetic resonance image shows a small lesion below the greater trochanter with a cortical erosion (a) and T1- weighted images shows a fluid collection, most likely an abscess, in the soft tissues near the femur (b).

Figure 3.

Bone scan shows a focal area of increased activity lateral of the proximal femur shaft below the greater trochanter.

Figure 4.

Computed tomography shows a cortical erosion at the insertion of the gluteus maximus muscle.

Figure 5.

Plain radiograph, axial view, of the right femur shows a small calcification near the tendon insertion of the gluteus maximus.
References


