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Case Report

Tabetic arthropathy of the knee: A case report ☆

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ABSTRACT

Tabetic arthropathy is a chronic, destructive neurogenic disease, that is considered the late stage of syphilis. The causative agent is Trepanoma pallidum, a spirochete bacterium that is sexually transmitted. It is characterized by extensive destruction and joint deformity in an indolent context. Syphilis serology confirms the diagnosis. Prevention requires early treatment of syphilis with penicillin G. We report the case of a 59-year-old patient with a history of an untreated syphilitic chancre at the age of 32 years who presented with significant joint deformity of the knee that had been evolving for 10 years in the context of joint effusion. A CT scan of the affected knee revealed destruction of the lateral femoral condyle and homolateral tibial plateau, subchondral osteosclerosis, thickening and irregularity of the femoral and tibial cortical bone, marginal exuberant proliferative osteophytes of the medial femoral and superior tibial condyles, and the presence of multiple cystic joint cavities communicating with each other and with the synovium, with thickened walls and multiple loose calcified bodies of different shapes and sizes, resulting in a "bag of bones" appearance. The patient's syphilitic serology was positive, and the diagnosis of tabetic arthropathy was confirmed. This case study aims to raise awareness of this rare manifestation of syphilis, which is becoming rare today, to avoid delays in diagnosis and to limit its complications.

Teaching points

- Tabetic arthropathy is currently a rare condition due to the early diagnosis and treatment of syphilis.
- One should consider tabetic arthropathy in joint swelling and deformity in the absence of pain.
- Tabetic arthropathy is a rare but significant and destructive manifestation of syphilis.
- Treatment relies on prevention and early treatment before the onset of joint manifestations, which are difficult to manage.

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Introduction

Tabetic arthropathy is a destructive neurogenic arthropathy. It is a rare complication of neurosyphilis that occurs within 10 to 30 years of untreated or mistreated early syphilis [1,2]. Thanks to early treatment of syphilis, neurosyphilis is now a rare, if not historic, complication [2]. Syphilis can be mono- or polyarticular, affecting, in order of frequency, the knee, ankle, tarsus, hip, dorsolumbar spine, shoulder, and elbow. There is often a delay in diagnosis due to the painless nature of the disease, which is disproportionate to the degree of joint destruction [3]. Imaging plays a key role in providing pathognomonic signs, the most important of which is the presence of multiple intra-articular bony formations or "loose bodies" forming a "bag of bones" [4]. It emphasizes joint destruction and deformation. Treatment is based on intravenous penicillin G to prevent progression to other forms of late syphilis and surgical treatment, which are discussed case by case, depending on the degree of joint destruction.

This case aims to highlight that syphilis should be considered in the differential diagnosis of patients with neuropathic arthropathy.

Case report

We report the case of a 59-year-old patient with no known diabetes or congenital neurological pathology and a history of untreated syphilitic chancre at age 32. The patient presented with electrical sensations in the right lower extremity, which had developed over 10 years, together with significant swelling of the knees, and his general condition was good.

Clinical examination revealed a patient in good general condition with significant, hard-to-palpate knee swelling (Fig. 1), which was painless and accompanied by the absence of osteotendinous reflexes. The contralateral knee was unremarkable.

A CT scan of the right knee revealed destruction of the lateral femoral condyle and ipsilateral tibial plateau with subchondral osteosclerosis, thickening, and irregularity of the femoral and tibial cortical bone. There was evidence of periosteal apposition with intramedullary extension at the distal femoral level, an irregular and disorganized periosteal reaction with local cortical bone erosions, and abundant marginal proliferative osteophytes on the medial femoral and superior tibial condyles (Fig. 2). There were multiple articular cystic areas in communication with the synovium, with thickened walls and scattered calcified formations of various shapes and sizes (loose bodies), resulting in a "bag of bones" appearance. These findings resulted in significant swelling and deformity of the knee with no identifiable soft tissue abnormalities (Fig. 3). Posterolateral tibiofemoral dislocation was also observed.

Blood tests were positive for TPHA/VDRL serology. The patient's immune profile and inflammatory workup, including CRP, infectious disease studies, fasting blood glucose, and glycated hemoglobin, were all within normal limits.

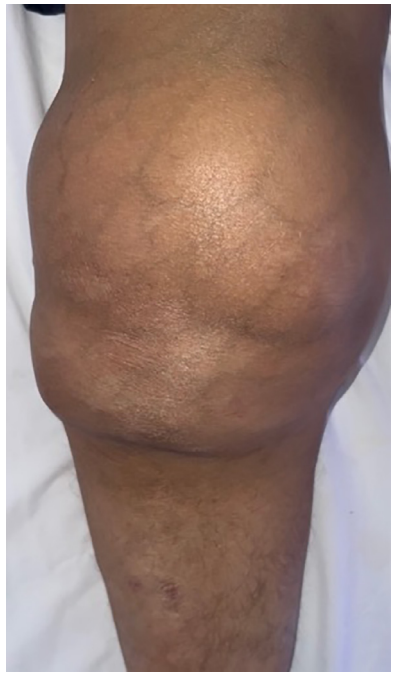

Fig. 1 – A 59-year-old male patient presenting with significant swelling of the right knee, which is firm to palpation.

The treatment included penicillin G with crutch unloading. The patient was subsequently treated with prosthetic arthroplasty.

Discussion

Tabetic arthropathy is a destructive neurogenic arthropathy categorized as nervous osteoarthropathies since there is a loss of deep pain and proprioceptive sensitivity [2]. It was first described in 1868 by Jean-Martin Charcot [1]. Its tabetic nature was initially reported by Kroenig in 1884 and later by Abadie in 1900 [3].

It is the late stage of syphilis, a highly contagious, nonimmunizing sexually transmitted infection caused by the spirochete Treponema pallidum [5]. Owing to the early diagnosis and treatment of syphilis, it has become an exceptional complication of neurosyphilis. In Morocco, the true incidence of the disease remains unknown [1].

It can develop from 10 - 30 years after the primary syphilitic infection, with an average interval of 25 years [4,5]. Its pathogenesis is controversial, and involves 2 theories that may complement each other: the mechanical theory and the neurovascular theory [6].

The neurovascular theory emphasizes vascular changes and alterations in medullary nerves that disrupt osteoarticular trophicity, leading to significant joint destruction through osteoclast activation and bone resorption. The mechanical theory posits that loss of joint sensitivity results in repeated trauma, leading to joint destruction. The resulting loss of sensitivity causes laxity in the ligaments and joint capsule,

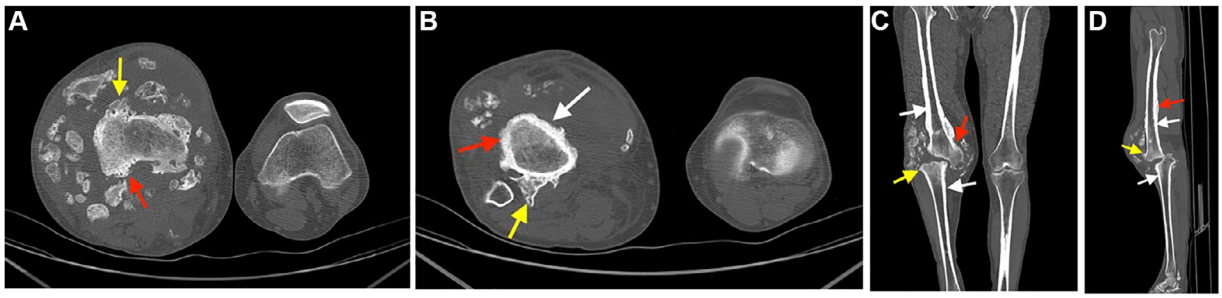

Fig. 2 – CT scan of the right knee of a 59-year-old male patient, in bone window settings with axial reconstruction (A, B), coronal (C), and sagittal (D) views, showing thickening and irregularity of the femoral and tibial cortical bone (white arrow), an irregular and disorganized periosteal reaction with areas of cortical bone erosion (red arrow), exuberant marginal proliferative osteophytes on the femoral condyles and the superior tibia (yellow arrow), and a posterior-external dislocation.

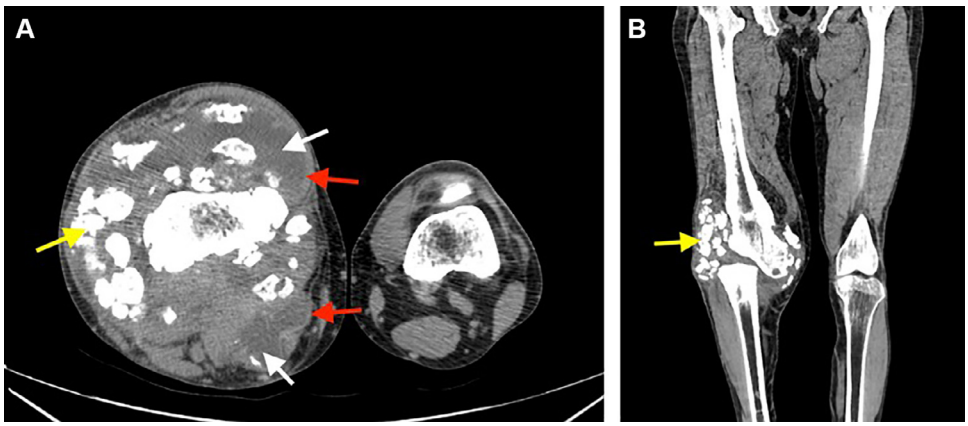

Fig. 3 – CT scan of the right knee of a 59-year-old male patient, in soft tissue window settings with axial (A) and coronal (B) reconstructions, showing multiple cystic joint compartments communicating with each other and with the synovium (white arrow). The synovium has thickened walls (red arrow) with multiple scattered calcified formations of various shapes and sizes (loose bodies), creating a "bag of bones" appearance (yellow arrow).

destruction of the cartilage, and the formation of multiple bone growths [1].

Involvement is usually mono- or polyarticular in 18%-40% of cases and can affect any joint, although it predominantly impacts the lower limbs (60%-75%), with the knee, hip, ankle, dorsolumbar spine, and upper limbs affected in decreasing order of frequency [4].

Clinically, there is a striking contrast between the extent of joint deformity and the absence or minimal degree of pain. Patients present with deformed, swollen, and painless joints. Sensory disturbances include a loss of deep sensation and proprioception. Ataxia and a positive Romberg's sign may be present in advanced cases. Osteotendinous reflexes are absent in 90% of patients with tabes dorsalis.

Motor disturbances are also present and are characterized by an imbalance between the extensor and flexor muscles, which leads to progressive joint deformity and soft tissue relaxation, causing joint subluxation. Vegetative disturbances may include skin dryness, hyperemia, and edema.

Early radiologic signs may include degenerative lesions such as osteosclerosis, subchondral spongiosis, and osteophytes. These abnormalities progress to destruction of the joint, resulting in marginal exuberant proliferative osteophytes, bone lysis with intra-articular bone fragments, malalignment, and even subluxation.

Three forms are distinguished:

- The hypertrophic form is characterized by joint destruction and fragmentation, bone sclerosis, and bone proliferation with an OS and cartilaginous debris in the joint cavity, with the formation of osteophytes of enormous size and bizarre shape [4].
- Atrophic type manifests as bone resorption. It is observed in nonweight-bearing joints [4].
- Mixed Form: Displays features of both hypertrophic and atrophic types.

Joint effusion may also cause distension.

The radiographic features of a Charcot joint are commonly summarized by the 6 "D"s: density (osteopenia or sclerosis), destruction (fragmentation and resorption of bone), debris, distension (joint effusion), disorganization, and dislocation [5].

Other manifestations may include tenosynovitis, periostitis, myositis, and myonecrosis [5,7].

Diagnosing tabetic arthropathy can be challenging because of its nonspecific clinical presentation and the broad range of

differential diagnoses. The slow progression of this disease often contrasts with the severe joint damage observed.

The differential diagnosis includes destructive arthropathies, a group of pathologies characterized by cartilaginous degradation with subchondral osteolysis. Diabetes mellitus remains the principal differential diagnosis [4].

In contrast to tabetic arthropathy, septic arthritis manifests with severe pain and inflammatory signs.

Other differential diagnoses include inflammatory rheumatism, metabolic arthropathies (chondrocalcinosis), infectious arthritis (tuberculosis), leprosy, and syringomyelia [4].

Treponema pallidum is a noncultivable germ and does not require antibiotic susceptibility testing [8]. Positive syphilis serology in the blood and CSF is necessary to maintain the diagnosis.

Like forms of syphilis, treatment includes penicillin G, which is given to prevent the development of other late-lesions syphilis lesions [3].

Prolonged unloading or the use of orthoses and weight reduction may limit the exacerbation of bone lysis by reducing microtrauma.

Orthopedic treatment is discussed case by case, but it is still disappointing.

Arthrodesis, used since the early 1900s [2], is indicated for instability, deformity, and joint pain. The indications for prosthetic arthroplasty are limited by the extent of destruction, the local condition, and the risk of loosening [3,4].

Conclusion

Tabetic arthropathy is now rare. It is a serious complication of neurosyphilis and should be considered in cases of destructive, deforming, and painless arthropathy. Its prognosis is poor, especially without radical surgery, and the best treatment remains prevention and early treatment of primary syphilis.

This article highlights that painless, destructive arthropathy may be a manifestation of syphilis. Sir William Osler, referring to this pathology as the “great simulator,” once said: “He who knows syphilis knows medicine.”

Patient consent

Written informed consent was obtained from the patient for publication of his case.

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