

# A challenging case of diffuse diabetic musculoskeletal system involvement: diagnostic confusion with rheumatoid arthritis

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ACTA REUMATOL PORT. 2015;40:77-80

## ABSTRACT

A diabetic patient who was misdiagnosed as rheumatoid arthritis because of complicated musculoskeletal manifestations of diabetes is reported here. A 57-year-old woman had been on sulphasalazine treatment with a diagnosis of rheumatoid arthritis for 3 years but failed to respond. Her past medical history disclosed that she had been using metformin due to diabetes mellitus for 8 years. On physical examination there was no evidence of arthritis. Her clinical picture was compatible with diffuse idiopathic skeletal hyperostosis (DISH), shoulder periartthritis, carpal tunnel syndrome, limited joint mobility of diabetes and furthermore myalgia due to metformin induced by hypovitaminosis D. Finally rheumatoid arthritis was excluded and a diagnosis of diabetes mellitus originated diffuse musculoskeletal system involvement was made.

Diabetic musculoskeletal complications are common and sometimes cause clinical dilemmas. This case is also important for highlighting the contribution of low vitamin D levels to the clinical status.

**Keywords:** Rheumatoid arthritis; Diabetes; Diabetic musculoskeletal system involvement.

## INTRODUCTION

It is known that in patients with diabetes mellitus some musculoskeletal disorders can occur much more frequently than the normal population. Upper extremities are sometimes affected and the most frequently seen pathologies are tenosynovitis, limited joint mobility (diabetic cheiroarthropathy), shoulder capsulitis, car-

pal tunnel syndrome and Dupuytren's contracture respectively<sup>1</sup>. Another commonly seen complication in diabetes is DISH2. It is also shown that worse glycemic control is associated with musculoskeletal complications of diabetes<sup>1,2</sup>.

Herein we report a diabetic patient who was misdiagnosed and treated as rheumatoid arthritis according to her musculoskeletal complaints. To the best of our knowledge, there are only a few cases in the literature where musculoskeletal complications due to diabetes mimic rheumatoid arthritis<sup>3</sup>.

## CASE REPORT

A 57-year-old woman admitted to our clinic because of widespread muscle and bone pain irresponsive to treatment. She had a diagnosis of diabetes mellitus 8 years ago, which was not under control in spite of metformin treatment. Her previous history revealed that her complaints had been present for the last few years. 3 years ago she was investigated in another clinic because of pain and uncertain effusions in her left second and third proximal interphalangeal joints and she was put on sulphasalazine with a likely diagnosis of rheumatoid arthritis. On her current physical examination there was no erythema, swelling or restriction of any motion at the joints, also she didn't complain about early morning stiffness. There wasn't any chronic rheumatoid deformity of the hands. Her physical examination was significant for tenderness at the end ranges of left shoulder motion and a positive Neer test on the same side. As well as, the prayer sign was positive bilaterally (Figure 1). She also had positive Tinel and Phallen tests on both sides, suggesting carpal tunnel syndrome.

Laboratory findings on admission revealed normal complete blood count, sedimentation rate and C-reactive protein. The blood biochemical analysis was nor-

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**FIGURE 1.** Positive prayer sign

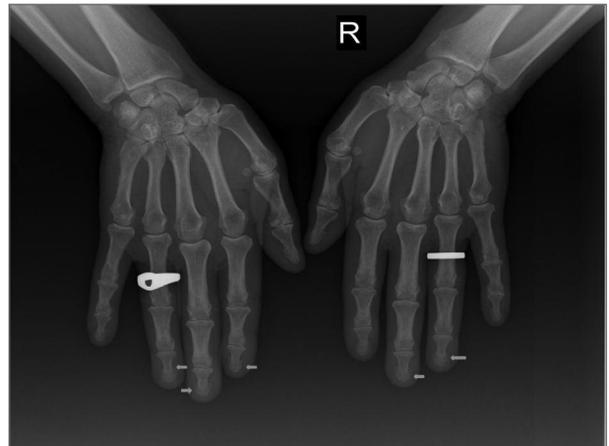


**FIGURE 2.** Linear calcifications along the anterolateral aspects of sixth and eleventh thoracic vertebrae

mal except a fasting blood glucose level of 200 mg/dl. Her autoantibody panel, rheumatoid factor, anti cyclic citrullinated peptide, HLA B-27 and Brucella agglutination tests were negative. The 25 OH vitamin D level was 8.1 ng/ml (>20). X-ray examination showed linear calcifications along the anterolateral aspects of sixth and eleventh thoracic vertebrae (Figure 2), enthesopathies on the left tibial tubercle and bilateral achill tendon insertions (Figure 3) and enlarged distal phalangeal tufts on both hands (Figure 4). Ultrasound examination of the left shoulder revealed signs of rotator cuff tendinopathy in particular with increased thickness and ecogenicity of the supraspinatus tendon. Ner-



**FIGURE 3.** Enthesopathies on bilateral achill tendon insertions



**FIGURE 4.** Enlarged distal phalangeal tufts on both hands

ve conduction studies of the upper extremities performed for carpal tunnel syndrome were normal.

On detailed questioning it was understood that there has never been acute arthritis involving any of her joints nor did she have any morning stiffness. According to her history and current physical examination she didn't fulfill the new American College of Rheumatology (ACR) or European League Against Rheumatism (EULAR) 2010 criteria for rheumatoid arthritis and consequently it was excluded as a diagnosis.

Finally a diagnosis of diabetes mellitus originated diffuse musculoskeletal system involvement comprising DISH, diabetic cheiroarthropathy, clinically diagnosed carpal tunnel syndrome with normal nerve conduction studies and shoulder periartthritis was made. Also diffuse myalgia from which the patient was

suffering, was thought to be an adverse effect of metformin<sup>9</sup> intensified by low vitamin D levels. Sulphasalazine was stopped, vitamin D supplementation was made properly and the blood glucose regulation was consulted with the endocrinology department. At the fourth month control visit it was found that her myalgia has been cured and she still had no complaints concerning arthritis.

## DISCUSSION

Diabetes has a prevalence increasing with age, approximately 20% of population 65 years and older are diabetic. In diabetics, among various musculoskeletal disorders hand and shoulder pathologies are much more commonly seen. Shoulder periarthritis and carpal tunnel syndrome with estimated prevalence of 10-29% and 11-16% respectively are two of these conditions which have been seen in our patient<sup>2,6</sup>.

Diabetic cheiroarthropathy or newly named limited joint mobility, with a prevalence of 30-76% among patients with diabetes, is characterized by thick, tight and waxy skin mainly on the dorsal aspects of the hands. It is determined by two signs: the "prayer sign", inability to appose the palmar sides of the hands with the wrists maximally dorsiflexed; and the "table top sign", inability to flatten the palm against the surface of a table<sup>6,7</sup>. Slight pain may appear in the early stages of this entity especially with hand movements, increasing with time<sup>2</sup>.

In the patient presented, due to the enlarged distal phalangeal tufts on X-rays, initially a diagnosis of primary or secondary hypertrophic osteoarthropathy was taken into account<sup>8</sup>. Our clinical decision however has been diverted from the prior hypertrophic osteoarthropathy diagnosis, based on the absence of the characteristics specifically; positive family history, thickening of the skin (leonine face), acne, seborrhoea, hyperhidrosis and folliculitis<sup>9</sup>. Furthermore the long bone graphsies revealed no periosteal reaction involving tibia, fibula, radius, the metacarpals or the metatarsals and the skeletal scintigraphy which was done after the administration of Tc 99 m methylene diphosphonate showed the absence of pericortical linear uptake along the above mentioned long bones. Secondary causes of hypertrophic osteoarthropathy were also excluded in view of a normal chest X-ray, abdominal ultrasonography, mammography, routine gynecological care and whole body bone scintigraphy. Acromegaly, because of the hyperostotic changes, has also been thought as a

differential diagnosis but failed when the growth hormone and insulin-like growth factor 1 levels were found within the normal ranges. Finally it is decided that all the new bone formations seen in our patient were components of DISH.

DISH is another entity frequent in diabetics, characterized by ossification of ligaments and entheses, therefore new bone formation, especially in the thoracolumbar spine and enthesal regions. Its prevalence is 13-49% in diabetics. The current definition of DISH was first made by Niwayama and Resnick in 1976. According to this definition there must be flowing anterolateral ossifications of at least 4 contiguous vertebral segments in the thoracic region, preservation of intervertebral disc spaces and absence of apophyseal joint degeneration of sacroiliac joints. In 1985 Utsinger revised the diagnostic criteria as anterolateral ossifications of 2 or more contiguous vertebra and also incorporated the involvement of peripheral entheses<sup>2,6,10</sup>. In the recent years the peripheral involvement is so expanded that according to some authors enlarged finger distal tufts (as in our patient) can also be seen as new bone formation<sup>11</sup>. Also it is claimed that ossification of the spinal ligaments and entheses may arouse stiffness in the morning and joint and tendon pain in some patients<sup>2,12</sup>.

All of the above mentioned conditions seen in diabetics including DISH and limited joint mobility are painful to some extent. Apart from these it is known that hypovitaminosis D alone can cause muscle aches<sup>13</sup>. In the literature it is shown that hypovitaminosis D induces statin myalgia in some cases<sup>14</sup>. Even in this case it is pretty likely that hypovitaminosis D may have induced myalgia caused by metformin. Resolution of myalgia after correction of vitamin D deficiency also supports this hypothesis. All of these challenging conditions together in our patient caused a misdiagnosis of rheumatoid arthritis and an unnecessary use of sulphasalazine.

In conclusion, complex clinical pictures in diabetics should always remind the musculoskeletal presentations of diabetes to clinicians.

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