The role of magnetic resonance imaging in a patient with rheumatoid arthritis presented with lymphedema-like swelling: a case report

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Abstract: We report a 45-year-old lady with rheumatoid arthritis (RA) presented to us with unilateral swelling of the left hand and wrist, mimicking lymphedema. She was arranged to have a magnetic resonance imaging (MRI) of the affected hand and wrist. Lymphedema was successfully ruled out, and severe synovitis and tenosynovitis were found to be the causes of the extensive swelling. The case report aims to illustrate the importance of MRI in diagnosing and differentiating other important pathologies for lymphedema-like swelling in patients with RA.

Keywords: Rheumatoid arthritis; lymphedema; magnetic resonance imaging; synovitis; tenosynovitis

1 Introduction

Lymphedema is a rare complication of rheumatoid arthritis (RA) and it was first reported by Kalliomake and Vastamaki in 1968.[1] The development of lymphedema is not associated with the disease activity of RA and is relatively refractory to treatment. Although some studies have shown the beneficial effects of etanercept on lymphedema,[2, 3] there is still no consensus on treatment of this complication.

If a patient with RA develops limb swelling, lymphoscintigraphy can be considered to establish the diagnosis of lymphedema, as it reveals the drainage activity of the lymphatic system.[1] However, the procedure can be time consuming and the resolution may not be as high as with other imaging techniques. Magnetic resonance imaging (MRI) has the advantage of providing high-resolution three-dimensional images of the soft tissues; therefore, we propose using MRI to determine the cause of limb swelling and differentiate lymphedema from other conditions.

We report a patient with RA who presented to us with unilateral swelling of the left hand and wrist. Lymphedema was suspected at the beginning, but later, with the use of MRI, it was confirmed that the soft tissues were not involved and the lymphedema-like presentation was due to underlying synovitis and tenosynovitis.

2 Case Report

A 45-year-old woman with seronegative erosive RA diagnosed at the age of 21, presented with painless swelling of the left hand and wrist for 2 years (Figure 1). Physical examination showed non-pitting edema extending from the wrist to the dorsum of the hand. It was not associated with erythema or an increase in temperature. There was no fever, rash, palpable lymph node, or breast mass.

Based on the clinical presentation, lymphedema was suspected. Power Doppler ultrasound of the hand and wrist was performed, and it showed soft tissue swelling, diffuse synovial hypertrophy over the extensor tendons, and the left wrist with minimal hypervascularity. At that time, the patient was treated with sulfasalazine, hydroxychloroquine, prednisolone, and tocilizumab. The disease activity score (DAS) 28 joints (DAS28) was 2.6, and both the C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR) were within normal limits.

Swelling of the left wrist persisted, but the CRP and ESR remained normal, that was, <0.35 mg/dL and 15 mm/h, respectively. Intraarticular steroid (40 mg depo-Medrol) was injected to the left radiocarpal joint with minimal effect. MRI of the left hand was performed in March 2015 and showed extensive contrast-enhanced...
synovial thickening in the left wrist associated with soft tissue swelling, bone erosion, and joint effusion (Figure 2a-c). Tenosynovitis was also detected along the flexor and extensor tendons of the left wrist. There was no abnormal contrast-enhanced soft tissue or mass. The MRI findings concluded that the lymphedema-like picture was related to RA.

Later, the patient had increased disease activity with DAS28 went up to 3.62. As a result, tocilizumab was switched to abatacept in May 2015 and then later to tofacitinib in December 2015. Sulfasalazine was stopped, and leflunomide was commenced in March 2016. The disease activity and lymphedema-like swelling improved (Figure 3) after treatment.

3 Discussion

Among different imaging techniques, MRI has long been an outstanding tool for the diagnosis and management of RA. Typical features of RA including inflammation of the synovial membrane and tenosynovium, bone erosion, bone marrow edema, thinning of cartilage, and osteitis can be visualized clearly with MRI.\[4\]

As mentioned, lymphedema is a rare complication of RA, but it usually tends to be more widespread than the swelling caused by synovitis. It is believed that lymphedema in RA is either a result of venous obstruction, generalized increase in capillary permeability, or lymphatic obstruction.\[5\] Since its first discovery in 1968, lymphoscintigraphy has remained the primary imaging modality for the investigation of lymph swelling in patients with RA. However, the use of magnetic resonance lymphangiography (MRL) has become more prevalent because it has a superior spatial resolution, which allows a better delineation of the lymphatic system.\[6\]

In this case report, we demonstrated that the lymphedema-like picture could be due to severe synovitis or tenosynovitis and should be treated accordingly with disease-modifying antirheumatic drugs. Although ultrasound is cheaper, more readily available, and the

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**Figure 1.** Painless swelling of left wrist and hand, mimicking lymphedema

**Figure 2a-c.** Synovial thickening, soft tissue swelling, joint effusion, marrow edema and bone erosions in MRI (red arrows indicate synovial thickening/hypertrophy)
application of power Doppler helps reveal ongoing synovial inflammation,[7] MRI has higher sensitivity, specificity, and reproducibility than ultrasound.[8] The role of lymphoscintigraphy or MRL in this scenario was limited because only the lymphatic system could be visualized. In comparison, MRI is a multi-parameter imaging technique that offers large-field scanning and visualization of different tissues in the scanning areas. [6] In case of lymphedema, stagnated lymph in enlarged lymph vessels can be visualized in T2-weighted images because of greater attenuation of fluid. [9] Therefore, we suggest the use of MRI to investigate for the cause of peripheral swelling in patients with RA with or without lymphoscintigraphy or MRL.

In contrast to X-ray and computed tomography (CT) scan, MRI is the best imaging modality to visualize joint inflammation and delineate soft tissues lesions. On fat-saturated (FS) T1-weighted (T1W) images, the presence of thickened synovium and tenosynovium suggests synovitis and tenosynovitis, respectively. Besides, regions of inflammation would enhance on T1W post-contrast images because of increased vascularity.[4] In case of lymphedema, MRI would characteristically show excessive accumulation of interstitial fluid in the subcutaneous layer. The absence of extra fluid collection helps rule out true lymphedema and, hence, renders workups for lymphedema unnecessary.

4 Conclusion

Lymphedema is rare, and it is not the only cause of extensive limb swelling in patients with RA. In this case, we have demonstrated the advantage of using MRI for accurate assessments and determination of the exact pathology of limb swelling in patients with RA.

References