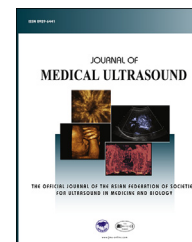
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BRIEF COMMUNICATION

Functional Impairment of the Thumb in a Case of Hand Osteoarthritis: What Can Musculoskeletal Ultrasound Tell Us?

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Abstract Osteoarthritis of the hand is common, frequently affecting postmenopausal women. Heberden's nodes are characteristic lesions. The present case is a 62 year old female having pain and functional impairment of her right thumb. She was examined by musculoskeletal ultrasound, which played a useful role in diagnosing the cause of pain and functional impairment.

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Introduction

Osteoarthritis is the most common disease of the joints and a leading cause of disability. It is associated with cartilage loss, subchondral sclerosis, and new bone formation (osteophytes) [1]. Distal interphalangeal, proximal interphalangeal, and first carpometacarpal joints are commonly involved. Elderly postmenopausal women are affected more than men and they typically present with pain, stiffness, nodes (osteophytes), deformity, and disability [2]. High resolution ultrasound is a useful imaging modality

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for assessment of hand osteoarthritis as it visualizes cartilage, osteophytes, synovium, ligaments, and tendons [3], providing good monitoring of osteoarthritis pathology and correlation with pain and functional impairment.

Case Report

A 62-year-old, right handed, retired female presented with gradual difficulty of typing on her smart phone by using her right thumb as well as pain over the palmar side of the distal phalanx. The patient reported the development of nodules over the dorsal aspect of her fingers, mild pain, and morning stiffness for <15 minutes for 8 years and was diagnosed as "nodal osteoarthritis of the fingers". She had received an oral nonsteroidal anti-inflammatory drug and α -D-Glucosamine 500 mg twice daily for 6 months. Physical examination revealed Heberden's and Bouchard's nodes on her hands, tenderness, and a palpable nodule over the base of the distal phalanx of the right thumb. We arranged a musculoskeletal ultrasound examination for her right thumb.

The longitudinal view of the dorsal aspect of the thumb revealed osteophyte at the interphalangeal joint (Figure 1A), while the palmar longitudinal scan revealed an osteophyte in continuation with the base of the distal phalanx pressing on and causing angulation of the flexor pollicis longus tendon before its insertion (Figure 1B). Palmar and dorsal osteophytes were assigned Grade 3, according to the scoring system developed by Keen et al [4] and the interphalangeal joint space was masked.

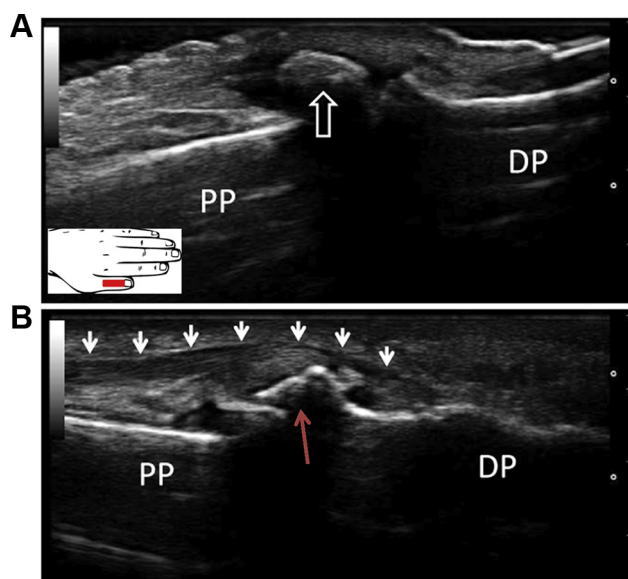


Figure 1 (A) The Dorsal longitudinal scan of the interphalangeal joint of the right thumb revealed osteophytes (void arrow) at the interphalangeal joint. (B) The palmar longitudinal scan of the interphalangeal joint of right thumb revealed osteophytes (red arrow) in continuation with the base of distal phalanx pressing on and causing angulation of the flexor pollicis longus tendon before its insertion (white arrows). DP = distal phalanx, PP = proximal phalanx.

Discussion

Hand osteoarthritis is a common ailment, affecting postmenopausal women and causing pain and disability. It is characterized by the formation of nodes especially on the dominant hand. Nodes are common in distal interphalangeal index and thumb joints, which are two adjacent joints used in fine precision and pincer grip. Such distribution supports the biomechanical hypothesis [5]. Pathologic changes of osteoarthritis include joint space narrowing and osteophytes [1]. Touch-screen cellular phone overuse might lead to a biomechanical stress which results in the development and or progression of the degenerative joint disease [6]. High resolution ultrasound can visualize osteophytes, joint space and soft tissue changes. However, it has difficulties in detecting joint space narrowing when osteophytes overlie the examined joint space [7]. Sonographically, osteophytes hyperechoic cortical protrusions are visualized in two planes in the dorsal aspect, palmar, lateral, medial proximal and distal phalanges of the interphalangeal joints [8]. Ultrasound can help semiquantitative evaluation of osteophytes at each joint as absent, mild, moderate, or severe on a scale of 0–3 [4]. Osteophytes are an independent cause of finger pain in hand osteoarthritis [8].

Our case is a postmenopausal right handed woman, presenting with thumb pain and a decline of hand function. High resolution ultrasound revealed a palmar osteophyte (Figure 1B) at the interphalangeal joint pressing on and causing angulation of the flexor pollicis longus tendon before its insertion. Overuse of a touch-screen cellular phone represents a mechanical stress across the interphalangeal joint of the right thumb leading to the development of palmar osteophyte or progression of the already present one with subsequent abnormal mechanics of the flexor pollicis longus tendon. The net result is pain and difficulty in typing by using her thumb. The present case highlights the usefulness of musculoskeletal ultrasound in the evaluation of finger pain in hand osteoarthritis. It reveals the relationship between the pathologic changes occurring in the osteoarthritic joint and soft tissues around the joint as tendons and ligaments aiding better understanding of the underlying mechanism of pain and functional impairment. The relationship between overuse of touch-screen cellular phones and the development of osteoarthritis in thumb joints needs more research. Avoiding overuse, two handed use, slow typing, and supporting forearms on a surface during typing might prevent hand joints from overloading and the subsequent joint degeneration.

References

- [1] Haugen KI, Bøyesen P. Imaging modalities in hand osteoarthritis – status and perspectives of conventional radiography, magnetic resonance imaging, and ultrasonography. *Arthritis Res Ther* 2011;13:248.
- [2] Zhang Y, Niu J, Kelly-Hayes M, et al. Prevalence of symptomatic hand osteoarthritis and its impact on functional status among the elderly: the Framingham Study. *Am J Epidemiol* 2002;156:1021–7.
- [3] Möller I, Bong D, Naredo E, et al. Ultrasound in the study and monitoring of osteoarthritis. *Osteoarthritis Cartilage* 2008; 16(Suppl. 3):S4–7.

- [4] Keen HI, Lavie F, Wakefield RJ, et al. The development of a preliminary ultrasonographic scoring system for features of hand osteoarthritis. *Ann Rheum Dis* 2008;67:651–5.
- [5] Rees F, Doherty S, Hui M, et al. Distribution of finger nodes and their association with underlying radiographic features of osteoarthritis. *Arthritis Care Res* 2012;64:533–8.
- [6] Canillas F, Colino A, Menéndez P. Cellular phone overuse as a cause for trapeziometacarpal osteoarthritis: a two case report. *J Orthop Case Rep* 2014;4:6–8.
- [7] Kortekaas MC, Kwok WY, Reijnierse M, et al. Osteophytes and joint space narrowing are independently associated with pain in finger joints in hand osteoarthritis. *Ann Rheum Dis* 2011;70:1835–7.
- [8] Usón J, Fernández-Espartero C, Villaverde V, et al. Symptomatic and asymptomatic interphalangeal osteoarthritis: an ultrasonographic study. *Reumatol Clin* 2014;10:278–82.