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Structural and Microstructural Intra-Articular Bone Changes at Metacarpal Heads in Patients with Psoriatic Arthritis Compared to Controls: a HR-pQCT Study

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Introduction

Located inside joint capsule, the entire metacarpal head (MCH) is directly exposed to intra-articular inflammatory milieu. We hypothesize that bone loss and new bone formation in the MCH will be more prominent in psoriatic arthritis (PsA) compared to healthy controls.

Objectives

To investigate structural (bone erosion and enthesiophyte) and microstructural intra-articular bone changes in patients with PsA at the MCH 2 and 3 compared with controls.

Methodology

139 subjects (77PsA, 62 control) underwent HR-pQCT scanning at the MCH 2 and 3 and distal radius. 15 patients with joint destruction were excluded from further analysis. An integrative CART-EBEE approach was developed to investigate the structural and microstructural bone changes. CART method was used to calculate volume of bone erosion and enthesiophyte [Crop of metacarpal bone; Automated segmentation of periosteal surface; Restoration of the missing cortical boundary based on anatomic curve; Three-dimensional calculation of volume]; EBEE method was used to calculate volumetric bone mineral density (vBMD) and microstructure after Exclusion of Bone Erosion and Enthesiophyte.

Result

62 patients with PsA and controls were comparable in age, gender and body mass index. PsA patients had a significantly increased number (2.41.4 vs 1.31.1, p