

MR Imaging of Bone Marrow Edema and Joint Effusion in Patients with Osteonecrosis of the Femoral Head: Relationship to Pain

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摘要

Abstract

OBJECTIVE: Our aim was to determine the occurrence of bone marrow edema and joint effusion and their relationship to pain in patients with osteonecrosis of the femoral head on the basis of MR imaging. **MATERIALS AND METHODS:** There were 71 patients with osteonecrosis of the femoral head based on characteristic radiographic and MR imaging findings. All patients had surgical confirmation of the disease. Both hips were affected with osteonecrosis in 39 patients, whereas only one hip was involved in 31 patients. The last patient underwent an arthroplasty of one hip during the study and had only one hip imaged. We evaluated a total of 110 hips in this study, of which 98 were painful. We staged osteonecrosis of the femoral head, using the classification of Steinberg et al. The 31 unaffected hips served as controls. Bone marrow edema and joint fluid were evaluated on MR images. Bone marrow edema was defined as an ill-defined area of low signal intensity on T1-weighted images with corresponding high signal intensity on T2-weighted or inversion recovery images localizing to the femoral head, neck, and intertrochanteric region. The amount of joint fluid was graded from 0 to 3. **RESULTS:** The peak of bone marrow edema occurred in stage III disease (72%); its odds ratio was seven times greater than that for stage I osteonecrotic hips. Effusions of a grade greater than or equal to 2 were seen most often in stage III disease (92%), compared with 10% in the control hips. With an effusion, bone marrow edema was 12.6 times greater when the hip was painful than when it was not. **CONCLUSION:** Both bone marrow edema and joint effusions existed with a peak occurrence in stage III disease. Bone marrow edema seems to have a stronger association with pain than does joint effusion in osteonecrosis of the femoral head.