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Does Prevalence of Small Size Acetabular Bone Marrow Edema or Cystic Lesion on 3 Tesla MRI Correlate With Poor Clinical Outcomes After Hip Arthroscopy? An Analysis of 2 to 6 Year Follow-Up

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Summary:
There were no significant differences between subchondral change (SC, bone marrow edema or cyst) group and non-SC group regarding postoperative clinical outcomes. Significantly higher conversion rate to total hip replacement (THR) was seen in patients with large (>= 15.3 mm) SC of the acetabulum measured preoperatively with 3T-MRI. Conversely, patients with small SC had no conversion to THR.

Abstract:
Background: Presence of acetabular subchondral changes (SC) such as bone marrow edema (BME) or cystic lesion (CL) has been reported to correlate with poor prognosis after hip arthroscopy.

Purpose: To determine if acetabular SC (BME or CL) size, measured on 3-Tesla MRI (3T-MRI) correlates with poor clinical outcomes and higher failure rates in patients undergoing hip arthroscopy for the treatment of intraarticular pathologies.

Methods: Patients older than 30 years old who underwent primary hip arthroscopic surgery for intraarticular pathology by an experienced hip surgeon between 2010 and 2012 were enrolled in this study. Patients younger than 30 year-old, with a history of avascular necrosis of the hip or the other pathologies, with follow-up of less than 2 years were excluded. Images from a single 3T-MRI were examined using a defined protocol. The prevalence of SC was evaluated using proton density-weighted MR image with chemical fat saturation by two blinded reviewers. Clinical outcomes were collected, including conversion to total hip replacement (THR), patient recorded outcomes (MHHS, WOMAC, HOS-ADL, HOS-Sports) and patient satisfaction. Statistical analysis was performed using Mann-Whitney U-test or Fisher's exact test, $p < 0.05$ was defined as significant. The cut-off value was calculated using receiver operating characteristic (ROC) curve analysis.

Results: One hundred and forty-two patients were included. Patients had a mean follow-up of 3.4 years (range, 2.0 to 5.9). Fifty patients (35%) had BME or CL in the preoperative 3T-MRI (SC group). SC was found more frequently in male subjects than female (SC group v non-SC group, percent male, 70% v 47%, $p < 0,01$). The median age of SC group was significantly higher than that of non-SC group (45 years v 42 years, $p < 0.05$). There were no significant differences between SC and non-SC group regarding rate of conversion to THR (8% v 3%, $p = 0.198$) postoperative MHHS, WOMAC, HOS-ADL, HOS-Sports or patient satisfaction ($p > 0.05$). Regarding the characteristics of SC, we found 23 patients with BME and 27 patients with CL. Postoperative outcomes (WOMAC, HOS-ADL, HOS-Sports) of patients with BME was significantly worse comparing to those with CL ($p < 0.05$) The ROC curve analysis identified 15.3 mm of SC size as the cut-off value. A greater SC than the cut-off value was found in 17 patients from which four (24%) were converted to THR ($p < 0.01$) while patients with SC measuring less than 15.3 mm had no conversion to

THR.

Conclusion:
There were no significant differences between SC group and non-SC group regarding postoperative clinical outcomes. Significantly higher conversion rate to THR was seen in patients with large (>= 15.3 mm) SC of the acetabulum measured preoperatively with 3T-MRI. Conversely, patients with small SC had no conversion to THR. These findings suggest the possible indication of hip arthroscopy for patients with small size acetabular SC especially cyst.