

## Achilles Orthopaedic Sports Medicine Research Award

### Correlation of Clinical and MRI findings in Professional Dancers' Hip: A New Femoro-Acetabular Impingement?

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#### **Abstract:**

##### Background:

Professional ballet dancers use extreme hip range of motion (ROM) to achieve ideal ballet technique. Many of them complain of inguinal pain during dancing, and they are at higher risk to present early hip osteoarthritis.

##### Purpose:

Aims of the study were to clinically evaluate dancers' hip, to look for femoroacetabular lesions with MRI explaining their groin pain, to assess femoroacetabular joint congruency in splits, to correlate clinical to MRI findings to MRI.

##### Study Design: Case-control Study

##### Methods:

Professional female ballet dancers and active healthy female matched for age (control group) completed a questionnaire on hip pain, underwent hip examination with impingement tests and measures of passive range of motion (ROM). All had hips MRI, back-lying, and while doing splits for dancers, to look for femoro-acetabular morphology, lesions and congruency.

##### Results:

We recruited 20 professional ballet dancers and 15 healthy active female as controls. 12/20 dancers complained of groin pain, only while dancing; control group was asymptomatic.

The mean hip dancers' ROM was 133/0/19 in F/E, 56/0/20 in Abd/Add, and 33/0/56 in IR/ER; and 127/0/20 in F/E, 46/0/20 in Abd/Add and 40/0/44 in IR/ER for controls.

MRI revealed a mean acetabular depth of 7.9 mm for dancers and 8.8 mm for controls, a mean neck-shaft angle of 132° for dancers and 135° for controls, and a mean femoral neck anteversion of 12° for dancers and 14° for controls.

Mean alpha angle in anterior position is 48° (range 39.9-68.3) for dancers and 47.5° (range 39-55.1) for controls, and 53° (38.2-76) for dancers and 47.5° (37.3-62.3) for controls in antero-superior position. Cam morphology was found in only one dancer, none in the control group. MRI of dancers doing splits showed a femoroacetabular subluxation of 2.05 mm (range 0.63-3.56 mm) and 3 types of lesions: labral tears, cartilage thinning, and pits, in superior/postero-superior position. Lesions on MRI were the same for symptomatic and asymptomatic dancers.

##### Conclusion:

Dancer's passive hip ROM is normal and comparable to control group. In this study, almost all ballet dancers present labral and/or cartilaginous lesions on MRI, symptomatic only for some of them. No criteria in the data explain why some dancers present pain and/or femoroacetabular lesions while others don't. This discrepancy between clinical and MRI findings lets us think that surgical treatment should not be only based on MRI findings.

Dancers' labral and acetabular cartilaginous lesions are the same as those found in patients with femoro-acetabular impingement (FAI). However, they were located in the superior or postero-superior position of the acetabular rim, as opposed to the anterior or antero-superior lesions found in patients with cam or pincer FAI type. In this study, only one hip presented a cam impingement explaining usual MRI lesions. For the others, such lesions could be explained by repetitive extreme movements, leading to a superior/postero-superior dance-related FAI. Consequently, early

osteoarthritis in dancers' hip could be prevented by limiting these extreme movements implying femoro-acetabular abutment.