Correlation of Clinical and MRI Findings in Professional Dancers’ Hip: A New Femoro-acetabular Impingement?

INTRODUCTION
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 [1].

Aims of the study were (1) to look at femoroacetabular lesions explaining the pain described by many dancers, (2) to investigate if femoroacetabular joint congruency was preserved while doing extreme movements as splits; (3) to clinically evaluate professional dancers’ hip, and (4) to correlate clinical findings to MRI examination.

METHODS
Professional female ballet dancers and active healthy female matched for age (control group) were recruited. The study was approved by the local ethics committee and the volunteers gave written informed consent. All of them had to complete a questionnaire on hip pain. All of them underwent a complete physical examination of the hip with measures of ROM in flexion/extension, abduction/adduction and internal rotation/external rotation in supine position with hip and knee flexed at 90°. Anterior and posterior impingement tests were done, looking at elicited pain.

MRI of the hip in supine position was performed for all patients to look for femoroacetabular lesions, and dancers also went in MRI while doing splits to see hip position and congruency in this extreme position (Fig.1). Acetabular depth, neck-shaft angle, neck anteversion and alpha angle were measured on MRI for each participant.

RESULTS
We recruited 20 professional ballet dancers and 15 healthy active female as controls. The questionnaire on hip pain revealed that 12/20 dancers complained of hip pain (VAS 2-6), 4 bilaterally, 7 on the right hip and 1 on the left. Pain was inguinal and felt only while dancing, mainly at end of ROM of “grand battement à la seconde”, “grand développé à la seconde”. Pain could be reproduced by the main movements as splits; (3) to clinically evaluate professional dancers’ hip, and (4) to correlate clinical findings to MRI examination.

Femoral neck pit. D: lesions on acetabular rim were located in posterior-superior position. Acetabular depth, neck-shaft angle, neck anteversion and alpha angle were measured on MRI for each participant.

DISCUSSION
Dancer’s hip ROM is normal and comparable to control group (p=0.05), however with tendency to increased flexion, external rotation and abduction, and a decreased internal rotation, as already described in other studies [5], in relation to the “turnout” position in dancing.

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) [4]. 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.

REFERENCES