Gender-dependent discrepancies in femoroacetabular impingement

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INTRODUCTION
Gender-dependent discrepancies are a well known phenomenon for various causes of hip osteoarthritis (OA), e.g. developmental dysplasia, Legg-Calvé-Perthes disease, or slipped capital femoral epiphysis. Besides these classical etiologic factors, femoroacetabular impingement was recently identified as another very common mechanical cause for hip OA. FAI is defined as an early pathological contact between osseous prominences of the acetabulum (‘pincer’ FAI) and/or the femur (‘cam’ FAI) leading to a painful conflict for certain hip motions.

In contrast to the above mentioned classical etiologies, no study exists so far that describes gender-dependent discrepancies in FAI. The knowledge of these differences might be of interest for the understanding of the development of the disease, the clinical manifestation, and the surgical treatment of patients with FAI.

The aim of the study was to investigate whether there are significant differences between genders for FAI. We questioned if men and women with documented FAI differ in terms of (1) demography, (2) individual patient history, (3) physical examination, (4) conventional radiography, (5) anatomically-based morphology, and (6) findings based on magnetic resonance imaging.

MATERIAL AND METHODS
This study was IRB approved. Using our digital database, we retrospectively identified 378 consecutive patients (481 hips) with documented FAI. We excluded 207 patients (260 hips) with a known previous history of hip disorders, previous hip surgery or incomplete radiographic documentation leaving 101 patients (126 hips) for evaluation.

All patients underwent a predefined examination protocol including data on demographics (age, side, height, weight, body mass index [BMI]), patient history (sports activity, location of pain, and necessity of pain medication, duration of symptoms), and clinical examination (amplitudes of range of motion, anterior/posterior impingement test, Merle d’Aubigné [MdA] score).

The following three radiographical projections were acquired for each patient: an anteroposterior pelvic radiograph, a cross-table lateral view and a strong lateral pelvic xray. All projections were acquired according to a standardized protocol. Seven qualitative (Tönnis OA grade, herniation pit, coxa profunda/protrusio, ischial spine sign, acetabular retroversion, os acetabuli) and 39 quantitative radiographic pelvic and hip (including lateral center edge angle, acetabular index, femoral head coverage, alpha angle, pelvimetric measurements, etc.) parameters were measured. With the help of validated software [1], all radiographic parameters were also calculated for a neutral pelvic orientation which were considered as the ‘anatomical values’.

The patients then underwent a specific magnetic resonance arthrogram with radial sequences to detect labral and chondral abnormalities. All MR images were judged by a specialized musculoskeletal radiologist.

All parameters were then compared between men and women. After determination of a normal distribution with the Kolmogorov-Smirnov test, the unpaired Student’s t-test or the Mann-Whitney-U test were used for comparison. Fisher’s exact test was performed for comparison between categorical variables.

RESULTS
Men showed a significant higher prevalence of pure cam deformities, groin pain, a lower preoperative Merle d’Aubigné score, a significant higher preoperative pain level, herniation pits, labral ossification, and intralabral ganglia, a higher alpha angle on the ap and lateral crosstable xray, and a decreased offset ratio.

Women had a higher incidence of non-inguinal groin pain (gluteal, thigh), of pure pincer-type deformities with more cona profunda and acetabular retroversion, a higher need of pain medication, a larger pelvic diameter and interteardrop distance, a lower interacetabular distance, increased acetabular depth.

Differences for the acetabular radiographic parameters disappeared when standardized to the neutral pelvic orientation. No differences were found for the clinical range of motion.

REFERENCES