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Sex-Dependent Differences in Acetabular Dysplasia Characteristics

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Description

Patients with acetabular dysplasia generally develop secondary osteoarthritis (OA) [1]. These patients with osteoarthritis of the hip report moderate to severe hip pain. Non-steroidal anti-inflammatory drugs (NSAIDs) are often prescribed to relieve hip pain. Up to the present, however, no drug has the evidence to delay the development of osteoarthritis of the hip.

Reducing articular cartilage contact stress with pelvic osteotomy delays the appearance or reduces the severity of osteoarthritis [2,3]. Various reorienting acetabular osteotomies have been described [4-8]. Various survivorships after periacetabular osteotomy (PAO) have been reported. Satisfactory intermediate to long-term clinical results have been reported using these osteotomies [9-12]. However, those good results could not be obtained for some patients [13,14].

Currently the reasons for these differences are not clear, and various factors which affect the results after PAO have been reported. These factors include severity of the acetabular dysplasia, surgical techniques, age of the patients at surgery, intra-articular abnormalities, secondary femoroacetabular impingement (FAI), and occurrence of perioperative complications. Duncan et al. [15] showed that sex-dependent differences in acetabular dysplasia is one of the important factors, and represent a major step forward in our understanding of what should be considered in the treatment of male patients. By analysing results with patient demographics, physical examination, patient self-reported outcome scores, radiographic morphologic features, and intraoperative findings, they found differences between the sexes for reduced internal rotation in flexion, a higher Dunn alpha angle, increased incidence of a crossover sign, and a lower anterior center-edge in male patients. Although the power of this study might be inadequate to detect differences, they clarify male patients have a greater prevalence of clinical, radiographic and intra-articular findings consistent with concurrent FAI, and increased risk of secondary FAI after PAO. The sex-dependent differences are found to potentially affect the surgical results after PAO; however, this study still leaves us with some unanswered questions.

The average physical size of males is larger than females. It is possible that the differences are based on the size of the patient and not specifically related to the chromosomal make up of male or female. It should be investigated in future.

The prevention of secondary FAI after PAO should also be considered. What steps can surgeons take to minimize FAI? They performed post hoc power analysis; however, the number of 180 patients is relatively small to derive conclusions.

What differences in surgical techniques between male and female patients should we make to prevent secondary FAI? If posterior deficiency of the acetabulum is core common in male patients, should we rotate the acetabular fragment more internally in male patients to reduce anterior over coverage and improve posterior coverage? Should we routinely perform femoral osteochondroplasty in male patients?

Future studies to investigate male and female patients with almost the same average and distribution of height, weight and BMI are necessary. These studies will likely demonstrate actual distribution of sex-dependent differences. They proposed surgical procedures to prevent FAI which included intraoperative check of adequacy for the reduction of the acetabular correction, assessment of hip ROM after acetabular reorientation, and open arthrotomy on patients at risk for FAI. The long-term results of these procedures would contribute to establish surgical procedures to prevent FAI.

Their study is a landmark which investigates sex-dependent differences in acetabular dysplasia. Future anatomical studies using CT scans which investigate precise acetabular morphology in a large number of patients with the acetabular dysplasia can potentially contribute to acquire knowledge regarding the distribution of sex-dependent differences from the anatomical point of view.

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