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CORR Insights

CORR Insights®: Hips With Protrusio Acetabuli Are at Increased Risk for Failure After Femoroacetabular Impingement Surgery: A 10-year Followup

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Where Are We Now?

Pincer impingement, as currently conceptualized, invokes stability between the rim of the acetabulum and the intracapsular femoral neck. Previously published studies [1, 2] have identified numerous pelvic, acetabular, and femoral morphologies that may contribute to pincer mechanics. Among these, protrusio is considered both a clear and an important cause of pincer FAI, and treatment of protrusio acetabuli seeks to address the mechanical issues this deformity causes by focally or globally reducing the acetabular rim either by surgical dislocation or arthroscopy.

It is now understood that pincer mechanics may be associated with a low-volume maloriented acetabulum, retroversion of the femur with a normal acetabulum, and acetabuli with a wide variation of depth and orientation. The current study by Hanke and colleagues is important, and any surgeon who treats patients with FAI should be aware of this paper for two reasons. First, this study demonstrated a marked difference in outcome when patients with protrusio were compared to other patients treated for pincer impingement not associated with protrusio. Second, it differentiates the differences in regions of pathologic deterioration found in protrusio hips compared to pincer hips caused by other morphologies.

Where Do We Need To Go?

The study by Hanke and colleagues reflects the complex biomechanics associated with protrusio, including peripheral impingement, possible intra-articular medial instability, and early radiographic signs of arthrosis that occur in regions of the hip joint not typically seen in patients with more traditionally conceptualized patterns of femoroacetabular impingement. The results of the study confirm the clinical impression held by many hip-preserving surgeons that surgery for protrusio does not provide the same consistent and durable results when compared to

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most other patients who undergo treatment for symptomatic anterior FAI.

The study also illustrates the shortcomings in our understanding of hip pathomechanics, particularly of the pincer model of FAI when applied to protrusio. That protrusio hips are subject to impingement-producing abutment at the end ROM is not debated. Understanding the mechanical etiology of unique locations of degeneration, the pathomechanical importance of a negatively tilted sourcil (also termed "medial dysplasia"), and the contribution of pathologic shear forces present within a protrusio hip remain unclear. There is a need to improve our basic understanding of normal and abnormal hip mechanics through in-vivo and in-vitro studies. In addition, the importance of prospective data collection is foremost in assisting researchers striving to characterize patterns of hip pathoanatomy, understand natural history, and to document efficacy of clinical treatment.

How Do We Get There?

Based on the presented data, symptomatic protrusio patients must be approached cautiously using high-quality cartilage imaging, including at a minimum dedicated cartilage sequences performed on a 3T MRI, in order to identify degenerative regions within the hip joint. Despite inferior clinical results when compared to pincer patients, some patients do respond favorably to treatment, according to anecdotal discussions with my peers. Therefore, completely abandoning joint preserving treatments, based upon the presented data, seems to be an over-reaction. Based upon the current data, surgery for symptomatic protrusio should be undertaken cautiously and only in carefully selected patients.

While it seems clear that protrusio patients with degenerative findings are not likely to benefit from joint preservation surgery, these patients should be followed clinically and radiographically and may form a "control" group of untreated protrusio. In order to move forward, there is a need to perform high quality, prospective studies on patients who are identified with protrusio at any stage of joint degeneration, whether symptomatic or not. Now that technology exists to obtain high quality images of articular cartilage, studying the patterns of cartilage degradation is feasible.

The natural history and pattern of degeneration in protrusio needs to be characterized and compared to treated patients. Only by gathering as many of these patients as possible, probably from multiple centers, will we understand both the natural history and the effects of treatment.

References

1. Fabricant PD, Fields KG, Taylor SA, Magennis E, Bedi A, Kelly BT. The Effect of femoral and acetabular version on clinical outcomes after arthroscopic femoroacetabular impingement surgery. *J Bone Joint Surg. Am.* 2015;97:537–543.
2. Nepple JJ, Lehmann CL, Ross JR, Schoenecker PL, Clohisy JC. Coxa profunda is not a useful radiographic parameter for diagnosing pincer-type femoroacetabular impingement. *J Bone Joint Surg. Am.* 2013;95:417–423.