

Femoroacetabular Impingement: Current Status of Diagnosis and Treatment

Editorial Comment

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It is with great pleasure that I served as guest editor of this Symposium for Clinical Orthopaedics and Related Research (CORR) dedicated to femoroacetabular impingement (FAI). As one looks at the body of work presented in this symposium, as well as what has been published in the last decade on the subject, it is evident our understanding of the pathology as well as treatment of FAI have substantially evolved. It was in 1999, in CORR, that the term femoroacetabular impingement was first coined in the English literature. In the paper by Myers et al. [3] the etiology of persistent pain in five patients who had undergone a periacetabular osteotomy was believed secondary to specific mechanisms of FAI; ie, insufficient femoral head/neck offset, or what we refer to now as cam type and acetabular overcoverage or pincer type. Since then FAI has been recognized as an important cause of hip pain and labral tears in young adults as well as postulated to be a leading cause of hip arthritis. More importantly, diagnostic criteria on plain radiographs as well as specialized MRI sequences and surgical techniques have been developed for treating FAI. Although there is strong clinical evidence that surgical correction of FAI relieves pain and improves function, there is still a considerable amount of research required in establishing causality between FAI and arthritis. In his 1965 presidential address at the Proceedings of the Royal Society of Medicine [2], Sir Anthony Hill laid out the groundwork on how one should aim for causality by identifying nine key factors to guide us in its establishment: (1) strength of association (2) consistency; (3) specificity; (4) temporality; (5) biological gradient; (6)

plausibility; (7) coherence; (8) experiment; and (9) analogy.

Although none can be required as a *sine qua non*, Sir Anthony Hill stated: “What they can do is to help us to make up our minds on the fundamental question - is there any other way of explaining the set of facts before us, is there any other answer equally, or more, likely than cause and effect?” [2].

The papers published in this issue of CORR will certainly contribute to a definition of those factors. Several articles are dedicated to the diagnosis of FAI through proper physical examination and radiographic imaging. Proper diagnosis and assessment are critical for developing reproducible and effective treatment plans. It is unclear which imaging modality represents an accepted standard in the diagnosis of FAI. Plain radiographs appear insufficient: how one interprets the radiographs to arrive at a diagnosis is far from agreed upon with experts in the field demonstrating fair reliability in identifying FAI. Further, defining the plane on which to measure the alpha angle on MRI has yet to be agreed upon, as well as what represents a normal value for the alpha angle. Agreement on evaluating imaging is especially important as the pathomechanism of FAI may not be solely dependent on the presence of a substantial bony abnormality, but also on the spatial relationship of the pelvis to the femur.

Perhaps the greatest progress has been made in the treatment of FAI. There is no doubt that the surgical dislocation of the hip as first described by Ganz et al. [1] was essential to our understanding of FAI, and still represents the gold standard in its treatment. This surgical technique has permitted us to treat patients with severe slipped capital femoral epiphysis in a more definitive manner by restoring anatomical alignment of the epiphysis as well as enhancing functional range of motion. In addition, the advent of

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modern hip arthroscopy techniques, as well as mini open surgical anterior approaches, has propelled FAI surgery into the mainstream of orthopaedic surgery. With all three techniques being reported in this symposium with good to excellent short-term outcomes and a relatively low complication rate, the debate has shifted from which surgical technique is the best to better determining what part of the deformity needs to be corrected: pincer versus cam deformity, or both. More importantly, although preserving a healthy labrum is now well-recognized, treating a damaged acetabular labral chondral complex, ie acetabular rim trimming with refixation versus simple débridement of the torn labrum, remains to be clarified. Finally, any treatment is associated with complications, and although the risk of nonunion is a well-known complication of trochanteric osteotomy, the development of new techniques of trochanteric osteotomy may help minimize this risk. However, other complications after open hip surgery, such as the intraarticular adhesions reported in this symposium, require further research.

While this symposium brings a wealth of new knowledge to our understanding of FAI, I would like to end with this quote by Sir Anthony Hill: “All scientific work is

incomplete - whether it be observational or experimental. All scientific work is liable to be upset or modified by advancing knowledge. That does not confer upon us a freedom to ignore the knowledge we already have, or to postpone the action that it appears to demand at a given time” [2].

I would like to extend my thanks to all of the authors as well as the reviewers who contributed to this issue of *Clinical Orthopaedics and Related Research*. Finally, this would not have been possible without the help of the editorial staff at CORR and the valuable input of Dr Richard Brand.

References

1. Ganz R, Gill TJ, Gautier E, Ganz K, Krügel N, Berlemann U. Surgical dislocation of the adult hip. A new technique with full access to the femoral head and acetabulum without the risk of avascular necrosis. *J Bone Joint Surg Br.* 2001;83:1119–1124.
2. Hill AB. The environment and disease: association or causation? *Proc Royal Soc Med.* 1965;58:295–300.
3. Myers SR, Eijer H, Ganz R. Anterior femoroacetabular impingement after periacetabular osteotomy. *Clin Orthop Relat Res.* 1999;363:93–99.