Report of Breakout Session

Intraarticular Work During Periacetabular Osteotomy—Simultaneous Arthrotomy or Hip Arthroscopy?

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Arthrotomy: Where Are We Now?

Periacetabular osteotomy (PAO) has come to the forefront as the pelvic osteotomy of choice in North America and Europe for treating the dysmorphic acetabulum. PAO is currently indicated as the preferred treatment for patients with symptomatic hip dysplasia and has a role in treating patients with acetabular retroversion and protrusio. The acetabular deformity commonly is associated with labral pathology and deformities in the shape of the femoral head and head-neck junction. In 1999, Myers et al. [3] recommended open arthrotomy at the time of the PAO to treat the concomitant labral pathology and to perform an osteochondroplasty of the femoral head and neck junction. Simultaneous arthrotomy allows the surgeon to assess intraarticular abnormalities and hip motion and impingement after reorientation of the acetabulum.

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The surgical technique used to perform the arthrotomy may be an important variable in relief of pain, restoration of function, and durability of the reconstruction, and described techniques are varied. Assessing labral pathology is difficult unless traction is applied on the leg. Some surgeons use manual traction to inspect the acetabular rim and labrum while others routinely use a fracture table or other similar traction table to distract the joint and enhance access to any intraarticular pathology. The use of an arthroscope without fluid, the so-called dry-scope technique, can further enhance visualization and improve the assessment and treatment of the acetabular labrum and cartilage. Regardless of the technique used, the risks of open arthrotomy should be weighed against its benefits. For most surgeons, opening the joint capsule requires detachment of the direct head of the rectus off the anterior inferior iliac spine and exposure of the iliocapsularis muscle off the anterior capsule. This increased surgical exposure, along with potentially increased operative time, could lead to complications, including formation of heterotopic ossification, scarring, or other undesirable consequences such as formation of adhesions between the femoral head-neck junction and capsule that could lead to groin pain.

Whether an open arthrotomy should be performed at the time of PAO remains controversial due to a lack of data and consensus in the literature. However, at this time, it seems most surgeons who perform a relatively high volume of PAOs prefer routine arthrotomy.

Several studies have failed to demonstrate improvement in pain and function as a result of arthrotomy at the time of PAO. Troelsen et al. [7] reported a greater than 80% survivorship at 9.2 years without routine arthrotomy. Matheney et al. [2] reviewed 189 hips in 157 patients treated with a PAO. Since 23 were lost to followup and 31 had diagnoses other than developmental dysplasia of the hip, 135 of the

189 hips in 109 patients were reviewed at an average of 9 years. Eleven percent of patients (135 hips) had a subsequent hip arthroscopy at an average of 6.8 years. All but one patient had received an open arthrotomy at the time of PAO, suggesting performing the arthrotomy did not necessarily protect against future reoperation.

On the other hand, there are increasing data from several other studies suggesting simultaneous arthrotomy improves outcomes associated with PAO. The initial experience with PAO from Bern, Switzerland, when routine arthrotomy was not performed for assessment of impingement or labral pathology, demonstrated more pain in patients with labral pathology and need for reoperation in two patients in whom an attempt of labral refixation was performed at the time of the primary PAO [6]. Similarly, in a consecutive series of PAOs, Albers et al. [1] demonstrated survival was improved once arthrotomy was routinely performed. Seventy-five hips were operated on before routine arthrotomy and 90 hips with routine arthrotomy and inspection for and correction of identified impingement. Fifty of 90 hips (56%) received osteochondroplasty of the femoral head-neck junction. The cumulative 10-year survivorship was better in the arthrotomy group than in the nonarthrotomy group (86% versus 77%). Their study emphasized the importance of the three-dimensional orientation of the acetabular fragment and the maintenance of impingement-free ROM. Finally, Peters et al. [4] have recently updated their original results after PAO, considering the influence of arthrotomy. In the group of 149 PAOs performed with routine arthrotomy, 85% received a head-neck offset restoration procedure and 21% received treatment of identified labral pathology. There were fewer failures, defined as conversion to THA or repeat PAO, in the group of PAOs performed with concurrent arthrotomy compared to the group that did not receive an arthrotomy (5% versus 17%), although the preoperative and postoperative Harris hip scores were similar between the two groups.

Arthrotomy: Where Do We Need To Go?

The consensus of this panel is that arthrotomy at the time of PAO should be considered conventional but not necessarily the standard of care or required for patients treated with a PAO. We do not believe there are any specific contraindications to its routine performance and with current evidence can be based on surgeon preference. It would, however, be best to identify those patients who do not require an arthrotomy at the time of PAO for assessment of the labrum and those who do not require a femoral head-neck junction osteochondroplasty for relief of impingement to avoid opening the joint. Such patients may include those who have undergone previous surgery such as a surgical

hip dislocation or hip arthroscopy in the same setting or staged, those without mechanical symptoms, those with MR images that do not show labral pathology, and those in whom the preoperative radiographic imaging does not show abnormalities of the femoral head-head junction. Some form of assessment of impingement other than direct inspection such as fluoroscopy would have to be sought. Fluoroscopic determination of impingement is possible but does not seem to be reliable enough to replace the arthrotomy. There is also need for detailed review of series in which the joint has not been opened to determine the need for further surgery as these data are lacking.

In summary, the role of the arthrotomy after PAO is (1) to assess ROM and treat impingement, that is, through a femoral head-neck osteochondroplasty or anterior inferior iliac spine or acetabular rim trimming; and (2) to assess and treat labral pathology, rim damage, and remove loose bodies. There are data to support the use of the arthrotomy to inspect impingement, and improved pain and function have been shown in those patients undergoing femoral head-neck offset restoration after PAO.

Hip Arthroscopy: Where Are We Now?

There has been some interest in the role of hip arthroscopy as an adjuvant to the PAO. The role of hip arthroscopy before PAO is twofold. Hip arthroscopy allows staging of articular cartilage damage and aids in the decision-making process as to whether a PAO should be performed at all. In those patients with labral tears and cartilage damage who are still candidates for PAO, hip arthroscopy is then used to treat the intraarticular damage before the PAO. One recent paper reported labral pathology was present in 86% of patients with mechanical symptoms undergoing PAO. Treatment consisted of acetabular chondroplasty, labral débridement, and reattachment in select cases (16%) [5].

Benefits of hip arthroscopy are improved visualization and treatment of cartilage and labral damage when compared to current treatment strategies and avoiding an open arthrotomy in patients with good ROM after correction who do not require femoral or pelvic bony resection for impingement. Avoiding the open arthrotomy has theoretical advantages with respect to rehabilitation, as the direct head of the rectus does not have to be detached from the anterior inferior iliac spine, although not all surgeons take down the rectus to perform arthrotomy.

On the other hand, we have concerns about recommending hip arthroscopy routinely before PAO as most surgeons are not sufficiently experienced with both procedures to perform these in a timely fashion. In addition, performing a hip arthroscopy before the PAO may pose some difficulties with exposure. Based on previous reports,

it would seem best to perform hip arthroscopy in those patients who have mechanical symptoms and MR images consistent with labral detachment, but the indications need to be better defined. It would be prudent for surgeons who wish to perform hip arthroscopy before PAO to have a relatively high-volume practice in both fields and/or either perform the procedure as a combined hip arthroscopy/open hip surgeon team or stage the procedures by a few weeks to decrease operative times and morbidity. However, as mentioned previously, there is a lack of data regarding the role of labral treatment associated with PAO.

Hip Arthroscopy: Where Do We Need To Go?

The role of hip arthroscopy as an adjuvant treatment for labral and cartilage damage at the time of PAO needs to be better defined. Can we selectively determine what patient characteristics and symptoms would be better treated with a preoperative hip arthroscopy? Would it be best then to simply wait until after correction and perform the hip arthroscopy in a staged manner for those patients with persistent symptoms and femoral head-neck abnormalities?

Hip Arthroscopy: How Do We Get There?

Both of these questions would be best answered by defining whether labral treatment at the time of PAO is even required. A randomized controlled trial comparing labral

treatment versus no treatment at the time of PAO is imperative, but its practicality and a thorough statistical analysis before performance of this study need to be evaluated. Similarly, further controlled trials investigating the effectiveness of staged or simultaneous arthroscopy with PAO would be helpful.

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