CORR Insights

CORR Insights®: Are There Sex-dependent Differences in Acetabular Dysplasia Characteristics?

Hiroshi Ito MD

Where Are We Now?

Duncan and colleagues describe two major themes in their study: (1) Sex-dependent differences in acetabular dysplasia; (2) surgical strategies to treat male patients in periacetabular osteotomy (PAO). It is important to

This CORR Insights® is a commentary on the article “Are There Sex-dependent Differences in Acetabular Dysplasia Characteristics?” by Duncan and colleagues available at: DOI: [10.1007/s11999-015-4155-7](https://doi.org/10.1007/s11999-015-4155-7).

The author certifies that he, or any member of his immediate family, has no funding or commercial associations (eg, consultancies, stock ownership, equity interest, patent/licensing arrangements, etc) that might pose a conflict of interest in connection with the submitted article.

All ICMJE Conflict of Interest Forms for authors and *Clinical Orthopaedics and Related Research*® editors and board members are on file with the publication and can be viewed on request.

The opinions expressed are those of the writers, and do not reflect the opinion or policy of *CORR*® or the Association of Bone and Joint Surgeons®.

This *CORR Insights*® comment refers to the article available at DOI: [10.1007/s11999-015-4155-7](https://doi.org/10.1007/s11999-015-4155-7).

understand these themes in order to obtain better clinical results following PAO.

Hip joint survival after PAO varies. Although some studies report good clinical results in many patients treated with PAO [1–5], it is clear that not all patients do similarly well [5, 6]. The reasons for these differences have not been fully investigated, but relevant factors might 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.

The current study represents a major step forward in our understanding of what should be considered in the treatment of male patients. By analyzing results with patient demographics, physical examination, patient self-reported outcome scores, radio-

graphic morphologic features, and intraoperative findings, Duncan and colleagues 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. Even though the power of this study might be inadequate to detect differences, they clarify male patients have a higher frequency of clinical, radiographic, and intra-articular findings consistent with concurrent FAI, and increased risk of secondary FAI after PAO.

Although the sex-dependent differences found in the current study can potentially affect the surgical results after PAO, this study still leaves us with some unanswered questions.

Where Do We Need To Go?

Generally, males grow larger than females. It is possible that the sex-dependent differences described in the study are based on the size of the patient and not specifically related to the chromosomal make up of male or

H. Ito MD (✉)
Department of Orthopaedic Surgery,
Asahikawa Medical University,
Midorigaoka Higashi 2-1-1-1,
Asahikawa 078-8510, Japan
e-mail: itohiro@asahikawa-med.ac.jp

CORR Insights

female. This is worth investigating in future studies.

Another significant area of inquiry will be the prevention of secondary FAI after PAO; what steps can surgeons take to minimize FAI? To answer this question, the authors performed a posthoc power analysis. However, because the study only has 180 patients, it remains difficult to develop conclusions. Importantly, there are additional unanswered questions pertaining to sex-dependent differences and FAI after PAO: (1) What differences in surgical techniques between male and female patients should we make to prevent secondary FAI? (2) If posterior deficiency of the acetabulum core is common in male patients, should we rotate the acetabular fragment more internally in male patients to reduce anterior overcoverage and improve posterior coverage? (3) Should we routinely perform femoral osteochondroplasty in male patients?

How Do We Get There?

To clarify sex-dependent differences in acetabular dysplasia, future studies

investigating male and female patients after controlling for height, weight, and BMI are necessary. These studies will help clarify which differences are sex-related rather than driven by anthropometrics or size differences.

The authors performed a standard set of surgical procedures to prevent FAI: 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 could help establish a surgical procedures to prevent FAI in the future.

Future anatomical studies using CT scans that can investigate precise acetabular morphology in a large number of patients with the acetabular dysplasia can potentially contribute substantial knowledge regarding the distribution of sex-dependent differences from the anatomical point of view.

References

1. Hartig-Andreasen C, Troelsen A, Thillemann TM, Soballe K. What

factors predict failure 4 to 12 years after periacetabular osteotomy? *Clin Orthop Relat Res.* 2012;470:2978–2987.

2. Ito H, Tanino H, Yamanaka Y, Minami A, Matsuno T. Intermediate to long-term results of periacetabular osteotomy in patients younger and older than forty years of age. *J Bone Joint Surg Am.* 2011;93:1337–1354.
3. Matheney T, Kim YJ, Zurakowski D, Matero C, Millis M. Intermediate to long-term results following the Bernese periacetabular osteotomy and predictors of clinical outcome. *J Bone Joint Surg Am.* 2009;91:2113–2123.
4. Nassif NA, Schoenecker PL, Thorsness R, Clohisy JC. Periacetabular osteotomy and combined femoral head-neck junction osteochondroplasty: a minimum two-year followup cohort study. *J Bone Joint Surg Am.* 2012;94:1959–1966.
5. Steppacher SD, Tannast M, Ganz R, Siebenrock KA. Mean 20-year followup of Bernese periacetabular osteotomy. *Clin Orthop Relat Res.* 2008;466:1633–1644.
6. Ziebarth K, Balakumar J, Domayer S, Kim YJ, Millis MB. Bernese periacetabular osteotomy in males: Is there an increased risk of femoroacetabular impingement (FAI) after Bernese periacetabular osteotomy? *Clin Orthop Relat Res.* 2011;469:447–453.