CORR Insights

CORR Insights®: Similar Clinical Outcomes for THAs With and Without Prior Periacetabular Osteotomy

Parthiv A. Rathod MD

Where Are We Now?

Acetabular osteotomies, like the Bernese periacetabular osteotomy, are performed to improve the biomechanical environment of the hip by correcting structural

deformities and subsequently improve pain and hip function. The goal is to delay the need for THA. This surgery can carry substantial risks, and effective patient selection is critical for the success of this procedure [2]. The number of patients undergoing pelvic or femoral osteotomies is increasing, as is the aging population with previous osteotomies. The majority of studies have used THA as an endpoint with a 5-year survivorship between 90% and 95%, which drops to 81% to 88% at 10 years [1, 4]. Most of these studies represent the work of specialized, high-volume centers for hip preservation surgery. Although the low conversion rate of periacetabular osteotomy to THA is encouraging, it is vital to determine whether a prior periacetabular osteotomy indeed “burns any bridges” in the event the patient needs to undergo subsequent arthroplasty. Getting the answer to this will provide a guide for

both patient and surgeons, in that it can help guide informed decision making both for patients considering joint-preservation surgery and those evaluating a possible THA after a previous pelvic osteotomy.

Unfortunately, there are few studies on this issue. Parvizi et al. [5] reported on the results of 41 patients who underwent THA after Bernese periacetabular osteotomy with a mean followup of 6 years. Their study lacked a comparison group of patients undergoing THAs who had not had an earlier periacetabular osteotomy. The authors concluded that previous periacetabular osteotomy did not alter surgical outcomes based on the improvement in mean Merle d’Aubigné and Postel scores. There are few other studies that compare outcomes of THA with or without other types of pelvic osteotomies (Chiari/Salters/Triple innominate) [6, 7]. Therefore, prior to the study of Amanatullah et al, there was insufficient evidence to refute or support a claim that THA after prior periacetabular osteotomy yields similar results to THA without prior periacetabular osteotomy.

This CORR Insights® is a commentary on the article “Similar Clinical Outcomes for THAs With and Without Prior Periacetabular Osteotomy” by Amanatullah and colleagues available at: DOI: [10.1007/s11999-014-4026-7](https://doi.org/10.1007/s11999-014-4026-7).

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/s11999-014-4026-7](https://doi.org/10.1007/s11999-014-4026-7).

P. A. Rathod MD (✉)
Woodhull Hospital, NYU Hospital for
Joint Diseases, 760 Broadway, 9th Floor,
Brooklyn, NY 11206, USA
e-mail: drparthivrathod@gmail.com

CORR Insights

Where Do We Need To Go?

Amanatullah et al. performed a multicentric review of 562 patients undergoing 645 Bernese periacetabular osteotomies without adjunctive femoral osteotomy during a 15-year period (1994 to 2008). Twenty-three hips in 22 patients with Crowe Type 1 developmental dysplasia of the hip (DDH) underwent THA after prior periacetabular osteotomy. Amanatullah et al. identified a control group of 23 hips in 23 patients matched for age, sex, and BMI, with all but one being Crowe Type 1 DDH. With a minimum followup for both the groups at 2 years, the study authors compared the two groups to determine whether THA after periacetabular osteotomy has: (1) Higher complication rates, (2) a higher likelihood of resulting in revision THA, (3) comparable improvements in Harris hip score, and (4) comparable radiographic results. Amanatullah et al. did not find any differences in Harris hip scores, complication rates or revision rates between the two groups. Both groups showed similar improvement in Harris hip scores. The only difference found by the study authors was in acetabular component version. Ten of the 23 hips (44%) were retroverted after periacetabular osteotomy at the time of THA. The acetabular component was placed at 17° more retroversion during THA after prior

periacetabular osteotomy. The authors noted the challenging nature of exposure and dislocation after prior periacetabular osteotomy, as well as dealing with retroversion, which could potentially result in cup malalignment, postoperative impingement, and recurrent dislocations. Conversely, persisting acetabular dysplasia following periacetabular osteotomy may lead surgeons to place the acetabular component in excessive cup abduction [3].

As noted by the authors, even with patients enrolled from two high-volume centers for a period of almost 15 years, the study was underpowered to detect potentially important differences in complication rates and revision rates. The multicenter nature of the study with 13 different surgeons introduced variability of surgical approaches and rehabilitation regimens. Patients in the THA without prior periacetabular osteotomy group (mean followup 6 ± 4 years) had less time to clinical followup than patients in THA with prior periacetabular osteotomy group (mean followup 10 ± 4 years). Consequently, the study reveals both the strengths and limitations of multicenter retrospective studies.

Although this study reasonably proves that hip function measured by Harris hip scores is expected to be similar after THA with or without prior periacetabular osteotomy at mid-term

followup, there are still questions that need definitive answers: (1) Can we detect differences with other detailed function scores which do not exhibit the ceiling effect of Harris hip scores (WOMAC, Oxford-12 item questionnaire, HOOS)? [8] (2) Does complication and survival rate of THA differ with the presence of a prior periacetabular osteotomy? (3) Are the results of this study generalizable?

How Do We Get There?

The core issue with any study on this topic is that the conversion from periacetabular osteotomy to THA does not occur frequently enough to generate sufficient numbers during a time period of one or two decades at a single center. Therefore, a single center, prospective, comparative clinical trial, although ideal, would not be feasible. Maintenance of prospective registries with accurate followup can offset some of the shortcomings associated with retrospective data. We need more studies on THA after prior periacetabular osteotomy from different centers to add to our current pool of data so that systematic reviews and meta-analyses can pool large enough samples to allow us to answer questions about differences in low-frequency events like complication rates and revision rates. Incorporating

CORR Insights

information on previous periacetabular osteotomy while collecting registry data can shed light on whether results at high-volume centers are comparable to low-volume centers.

References

1. Albers CE, Steppacher SD, Ganz R, Tannast M, Siebenrock KA. Impingement adversely affects 10-year survivorship after periacetabular osteotomy for DDH. *Clin Orthop Relat Res.* 2013;471:1602–1614.
2. Clohisy JC, Schutz AL, St John L, Schoenecker PL, Wright RW. Periacetabular osteotomy: a systematic literature review. *Clin Orthop Relat Res.* 2009;467:2041–2052.
3. Hartig-Andreasen C, Stilling M, Søballe K, Thillemann TM, Troelsen A. Is cup positioning challenged in hips previously treated with periacetabular osteotomy? *J Arthroplasty.* 2014;29:763–768.
4. 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.
5. Parvizi J, Burmeister H, Ganz R. Previous Bernese periacetabular osteotomy does not compromise the results of total hip arthroplasty. *Clin Orthop Relat Res.* 2004; 423:118–122.
6. Peters CL, Beck M, Dunn HK. Total hip arthroplasty in young adults after failed triple innominate osteotomy. *J Arthroplasty.* 2001;16:188.
7. Tokunaga K, Aslam N, Zdero R, et al. Effect of prior Salter or Chiari osteotomy on THA with developmental hip dysplasia. *Clin Orthop Relat Res.* 2011;469:237.
8. Wamper KE1, Sierevelt IN, Poolman RW, Bhandari M, Haverkamp D. The Harris hip score: Do ceiling effects limit its usefulness in orthopedics? *Acta Orthop.* 2010;81:703–707.