Acetabular Reorientation Osteotomy for Hip dysplasia: A Multi-Institutional Registry Analysis of 387 Cases in Japan

Tamon Kabata, Masaki Takao, Yutaka Inaba, Ayumi Kaneuji, Etsuo Chosa, Yasuharu Nakashima, Hidetoshi Hamada, SHIGERU Mitani, Yuji Yasunaga, Takuaki Yamamoto, Nobuhiko Sugano

INTRODUCTION: Various acetabular reorientation osteotomy techniques can be used to treat hip dysplasia in adults, but comparative data on outcomes and complications are limited. This study analyzed a Japanese multicenter registry of acetabular reorientation osteotomies to evaluate complication rates specific to each technique, radiographic correction, and early postoperative rehabilitation. The goal was to inform surgical practice. This is the first large-scale study to compare outcomes across multiple acetabular reorientation osteotomy techniques in a standardized registry.

METHODS: We reviewed 387 consecutive acetabular reorientation osteotomies recorded prospectively in a hip preservation registry across nine centers from April 2021 to March 2025. The procedures included five techniques: rotational acetabular osteotomy (RAO), curved periacetabular osteotomy (CPO), spherical periacetabular osteotomy (SPO), transposition osteotomy of the acetabulum (TOA), and Bernese (Ganz) PAO. Patient demographics (age, sex, and body mass index [BMI]) and diagnoses were documented. The radiographic lateral center-edge angle (LCEA) was measured preoperatively and postoperatively on hip radiographs to assess correction. Early postoperative rehabilitation milestones (time to mobilization, partial weight-bearing, and full weight-bearing) were recorded. We tracked surgical complications within one month of surgery, with an emphasis on nerve palsy, including lateral femoral cutaneous nerve neuropraxia, major vascular injury, and postoperative fractures. We evaluated comparative complication frequencies between techniques descriptively.

RESULTS:

The mean patient age was 34.9 years (range: 13–60 years), and the patient population was 91.7% female (n = 355) and 8.3% male (n = 32). The mean BMI was 22.5 kg/m². The predominant diagnosis was development of dysplasia. The Tönnis grade was predominantly 1 and 2 (grade 0: 199 cases, grade 1: 152 cases, grade 2: 34 cases, grade 3: 2cases).

Of the 387 osteotomies performed, the most common technique was RAO (142 cases), followed by TOA (98 cases) and CPO (70 cases). The remainder underwent SPO or Bernese PAO. This distribution reflects varied regional preferences. The mean surgical time was 182 minutes (range, 87–358), and the mean intraoperative blood loss was 523 mL (range, 25–3250). A navigation system was used in 35% of cases and fluoroscopy in 64%. All techniques achieved substantial radiographic correction. The mean LCEA improved from an average of 11.2° preoperatively to 35.1° postoperatively, restoring normal lateral coverage. The magnitude of correction was comparable across techniques. Radiographic joint congruency improved as well: 96% of hips had good or excellent congruency postoperatively (vs. 75% preoperatively). Patients were out of bed by an average of 2.7 days post-surgery and began partial weight-bearing by an average of 3.1 weeks. They reached full weight-bearing by an average of 10 weeks. However, the timing of rehabilitation varied widely across centers, surgical techniques, and patient conditions (full weight-bearing range: 3–28 weeks).

Overall, short-term complications occurred in 30.2% (117 cases) of cases, but the types of complications differed by technique. Neurological disorders were identified in 64 cases (16.8%). The most common issue was LFCN neuropraxia (55 cases), which had a high incidence rate in CPO and SPO. Major nerve injuries were very rare: four cases of femoral nerve disorders, three cases of sciatic nerve disorders, one case of obturator nerve disorder, and one case of peroneal nerve palsy in the entire cohort. Intraoperative fractures were relatively rare (five cases), whereas postoperative fractures were observed in approximately 12% (46 cases) of hips overall, typically involving the posterior column and/or pubis. These fractures were most frequent in CPO and TOA cases. All fracture cases healed conservatively without requiring additional surgery. Slight displacement of the reoriented acetabular fragment was observed in 5.2% (20 cases) of cases; this was most frequent in RAO, and only two cases required additional re-fixation. There were no cases of deep infection, thromboembolic events, major vessel injury, or other severe acute complications, and no patients required conversion to total hip arthroplasty during the observation period.

DISCUSSION AND CONCLUSION: This large, multicenter study shows that acetabular reorientation osteotomy reliably improves acetabular coverage in adult hip dysplasia without severe early postoperative complications. However, the choice of surgical technique affects the risk profile and recovery. Although rehabilitation protocols varied considerably, reflecting a lack of consensus, early mobilization was generally achieved. These findings underscore the need for technique-specific surgical planning and highlight opportunities to standardize postoperative management, thereby minimizing complications and optimizing outcomes. The diversity of techniques observed indicates the need to establish a consensus on best practices. Our registry provides a foundation for comparing surgical procedures, facilitating knowledge transfer and potentially guiding the standardization of acetabular reorientation osteotomy techniques and postoperative care internationally.