Total Hip Arthroplasty in Adults with Sequelae of Legg-Calvé-Perthes: Contemporary Outcomes from a High-Volume Single Center

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INTRODUCTION: Sequelae of Legg-Calvé-Perthes Disease (LCDP) pose numerous challenges in total hip arthroplasty (THA) due to altered proximal femoral anatomy, concomitant acetabular dysplasia, significant leg length discrepancies (LLD), and prior surgeries. Previous series' have reported relatively high rates of intraoperative fracture and postoperative neural deficits. However, outcomes of THA in these patients using contemporary surgical techniques and implants remain poorly defined.

METHODS:

We retrospectively reviewed all adult patients with a history of LCPD who underwent THA at a high-volume tertiary center from 2016–2023. Patient demographics and surgical details were collected. The primary outcome was incidence of postoperative complications, defined according to the Hip Society's standardized list of 19 complications, including revision surgery. Secondary outcomes included change in operative limb length and HOOS JR scores.

RESULTS:

A total of 108 THAs were performed in 98 patients, with a mean follow-up of 2.2$\pm$1.9 years. Mean patient age was 45 $\pm$ 16 years, 72% were male, and 25% of patients had previous hip surgery. Average preoperative LLD was 1.8 $\pm$ 1.2 cm. A posterior approach was used in 87% of cases, and robotic assistance in 25%. All acetabular components and 93% of femoral stems were uncemented. Splined tapered stems were used in 30 hips (28%), 21 of which were modular. The operative limb was lengthened an average of 1.5 cm. Complications occurred in 7 hips (6.5%), including 2 revisions (aseptic loosening, infection) and 2 neural deficits; no intraoperative fractures or dislocations were observed. HOOS JR scores improved significantly from 55.6 $\pm$ 15.6 to 89.9 $\pm$ 16.6 ($p<0.001$), and 34/44 (77%) of patients achieved patient-acceptable symptom state (PASS) at follow-up $\geq$ 1 year.

DISCUSSION AND CONCLUSION: In this large, contemporary series from a high-volume center, THA for adults with sequelae of LCPD was associated with a low complication rate and substantial improvements in patient-reported outcomes. Success in this complex population relies on: (1) meticulous preoperative planning and/or intraoperative technology to achieve optimal cup position and offset restoration without excessive limb lengthening, and (2) ensuring availability of modular or monoblock splined tapered stems to address high femoral anteversion in a substantial proportion of cases. Ultimately, these findings underscore the safety and efficacy of modern THA techniques in managing the challenging anatomy associated with LCPD.

Figure 1. *Preoperative (A), immediate postoperative (B), and 6-year postoperative (C) radiographs from a 41-year-old male with a history of bilateral LCPD who underwent simultaneous bilateral uncemented THA via a posterior approach. The patient developed non complications, and his HOOS JR score improved from 58.9 preoperatively to 100 at 5 years.*