Long-term Survivorship in Patients with Coxa Profunda and Acetabular Overcoverage: An Average 11-Year Follow-up After Hip Arthroscopy

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INTRODUCTION: A prior study investigating 2-year patient-reported outcomes (PROs) following hip arthroscopy found that patients with coxa profunda and acetabular overcoverage report similar overall outcomes scores yet higher rates of conversion to total hip arthroplasty (THA) (88.9% vs 100%; p = 0.04). Currently, there remains a paucity of literature on the effects of coxa profunda and acetabular overcoverage on patient outcomes beyond 2-year follow-up. The objective of the present study was to report the long-term survivorship, revision surgery rate, patient satisfaction, pain level, and functional outcome scores for patients with coxa profunda and acetabular overcoverage following hip arthroscopy.

METHODS: This was an institutional review board-approved retrospective cohort study of patients with coxa profunda and a LCEa > 40° who underwent hip arthroscopy for labral tears or FAI between November 2002 and May 2013. Patients with a minimum 8-year follow-up, complete PROs, the presence of coxa profunda as indicated by the acetabular wall projecting medial to the ilioischial line, and a LCEa > 40° were included (**Figure 1**). Patients with severe osteoarthritis (Tönnis osteoarthritis grade $\geq$ 1) or any previous hip surgeries were excluded. Patients meeting inclusion and exclusion criteria represented the overcoverage cohort (OC) and were matched 1:1 by sex, age within 8 years, body mass index (BMI) within 5 kg/m^2, Tönnis grade, and labral treatment (repair vs debridement) to a matched control (MC) cohort that had a LCEa between 25° and 40°. Collected postoperative outcomes include conversion to THA, revision hip arthroscopy, patient satisfaction, pain level (0-100), number of corticosteroid injections, and 6 PROs (modified Harris Hip Score (mHHS), Nonarthritic Hip Score (NAHS), Lower Extremity Functional Scale (LEFS), Hip Outcome Score (HOS)–Activities of Daily Living subscale (HOS-ADL), HOS–Sports Specific subscale (HOS-SSS), and 33-item International Hip Outcome Tool (iHOT-33). Unadjusted survival analysis was performed using Kaplan-Meier curves. All statistical analyses were performed using Stata software (version 18.0; StataCorp).

RESULTS: A total of 38 patients in the OC cohort were 1:1 matched with 38 patients in the MC cohort. There were no differences in patient demographics including age, BMI, sex, Tönnis grade, labral treatment, follow-up duration, and Beck classification of labral damage or transition zone (chondrolabral junction) cartilage damage. At an average of 11.3 years postoperatively (minimum 8-year follow-up), patients in the OC and MC cohort experienced similar rates of conversion to THA (OC: 11 [28.9%] vs MC: 6 [15.8%]; p = .169) and revision hip arthroscopy (OC: 4 [10.5%] vs MC: 1 [2.6%]; p = .165). The average time from primary hip arthroscopy to conversion to THA was 8.0 ± 6.5 years for OC and 3.7 ± 3.0 years for MC (p = .144) with the OC cohort converting to THA between 6.5 months to 17.14 years while the MC cohort ranged from 4.8 months to 7.8 years. Age at conversion to THA was 54.3 ± 8.0 years for the OC cohort and 59.0 ± 4.0 years for the MC cohort (p = .195). By Kaplan-Meier survival analysis, patients showed similar rates of survivorship (84.2%) at 12 years after hip arthroscopy; however, OC patients showed a 13.1% decrease in long-term survivorship (71.1%) between years 12 and 18 (**Figure 2**). Additionally, OC and MC patients showed similar levels of patient satisfaction, pain level, postoperative corticosteroid injections, and scores for all 6 PROs (**Table 1**).

DISCUSSION: Patients with coxa profunda and overcoverage (LCEa > 40°) showed similar levels of survivorship, revision arthroscopy, patient satisfaction, pain level, number of corticosteroid injections, and PROs to a 1:1 matched cohort of patients with normal acetabular coverage (LCEa between 25° and 40°) at a minimum 8-years after primary hip arthroscopy. When analyzing long-term survivorship after 12 years, however, patients with overcoverage showed a 13.1% decrease in long-term survivorship (71.1%) compared to a matched control cohort.

SIGNIFICANCE/CLINICAL RELEVANCE: Our study found that despite increased challenges in performing hip arthroscopy, coxa profunda and acetabular overcoverage does not portend worse long-term outcomes compared to a matched control cohort.

Table 1. Rates of Revision, Conversion to THA, Patient-Reported Outcomes, Pain Relief, and Patient Satisfaction

	Study Group (n=38)	Control Group (n=38)	p-value
Rates of Revision			
Revision arthroscopic surgery, n	4 (10.5%)	1 (2.6%)	.165
Time to revision arthroscopic surgery, y	4.1 ± 2.7	2.65	NA
Conversion to THA (Total Hip Arthroplasty)			
Conversion to THA, n	11 (28.9%)	6 (15.8%)	.169
Time to THA, y	8.0 ± 6.5	3.7 ± 3.0	.144
Age at conversion to THA, y	54.3 ± 8.0	59.0 ± 4.0	.195
Patient-Reported Outcomes			
mHHS (modified Harris Hip Score)	85.9 ± 13.5	89.4 ± 12.0	.237
NAHS (Nonarthritic Hip Score)	84.5 ± 15.7	87.3 ± 11.8	.388
LEFS (Lower Extremity Functional Scale)	64.3 ± 17.5	69.7 ± 10.6	.111
HOS-ADL (Hip Outcome Score - Activities of Daily Living)	89.3 ± 14.2	89.7 ± 11.4	.889
HOS-SSS (Hip Outcome Score - Sports Specific subscale)	72.2 ± 30.2	75.9 ± 23.6	.559
IHOT-33 (33-item International Hip Outcome Tool)	73.5 ± 23.9	77.2 ± 20.5	.476
Pain Relief			
Experienced pain relief, n	28 (73.7%)	30 (79.0%)	.450
Decrease in pain level	33.1 ± 35.7	46.6 ± 30.9	.085
Number of preoperative corticosteroid injections	0.97 ± 1.01	1.30 ± 1.54	.289
Number of postoperative corticosteroid injections	0.49 ± 0.93	0.18 ± 0.51	.085
Patient Satisfaction			
Satisfaction with treatment, n	30 (83.3%)	33 (86.8%)	.180
Satisfaction with post-operative regimen, n	26 (72.2%)	28 (75.7)	.113
Would choose the same treatment again, n	27 (75.0%)	31 (83.8%)	.862

Figure 1. Presence of coxa profunda and a LCEa > 40 degrees

Figure 2. Kaplan-Meier Survival Curve