

# Hip Arthroscopy Versus Physical Therapy for the Treatment of Symptomatic Acetabular Labral Tears in Patients Older Than 40 Years: A 2-Year Report of A Randomized Controlled Trial

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**DISCLOSURES:** None.

**INTRODUCTION:** Acetabular labral tears have gained recognition as a significant cause of hip pain in the non-arthritic population. The utilization of arthroscopic labral repair with femoroacetabular osteoplasty has increased in treating symptomatic labral tears associated with femoroacetabular impingement, yielding positive outcomes and symptom improvement. However, numerous studies have identified older age and advanced osteoarthritis (OA) as strong predictors of inferior outcomes and early conversion to total hip arthroplasty (THA), suggesting that non-surgical treatment with physical therapy (PT) may be more appropriate for older patients. Given that hip cartilage lesions are very common in patients older than 40 years, it remains unclear whether OA is a confounder of the effects of age on surgical outcomes seen in these studies or if age alone portends inferior outcomes. Thus, the purpose of the current study was to perform a randomized controlled trial (RCT) comparing arthroscopic surgical management versus nonoperative management in patients with symptomatic labral tears who were older than 40 years and did not have severe arthritis. We hypothesized that hip arthroscopy would not be more clinically effective than physical therapy.

**METHODS:** A single-surgeon prospective RCT was performed. Inclusion criteria required participants to be 40 years or older, have a diagnosis of acetabular labral tear, and have completed at least three months of conservative management. Exclusion criteria included the presence of significant OA (Tönnis Grade 3 changes), clinical suspicion of extra-articular hip or back processes, and previous hip surgery. Patients were randomized 1:1 to either the surgery and physical therapy (SPT) group or physical therapy alone (PTA) group. PTA patients were permitted to cross over to SPT if they completed  $\geq 14$  weeks of PT, and their physical therapists determined they achieved the maximal possible improvement from PTA. Patient-reported outcome metrics (PROMs), including International Hip Outcome Tool-33 (iHOT-33), modified Harris Hip Score (mHHS), Non-Arthritic Hip Score (NAHS), Hip Outcome Score-Activities of Daily Living Subscale (HOS-ADL), Hip Outcome Score-Sports Subscale (HOS-SS), visual analog scale (VAS) for pain, and conversion to THA were compared. Outcomes were assessed at baseline and at 3, 6, 12 and 24 months after randomization. Primary analysis was performed on an intention-to-treat basis using linear mixed-effect models. Sensitivity analyses included a modified as-treated analysis, using linear mixed-effect models, and a treatment-failure analysis, using an ANOVA with Tukey post-hoc analysis. The treatment-failure analysis compared PROM and pain score improvements between patients in SPT, PTA, and a third crossover group (CO) consisting of PTA patients who crossed over to PTA and used scores at 24-month follow-up or the time of failure in order to assess the maximum improvement achieved by each course of treatment within 24 months. Failure was defined as crossing over to SPT, undergoing a revision hip arthroscopy, or converting to THA prior to 24-month follow-up. Regarding patients who crossed over to SPT, scores before crossover were attributed to PTA and scores after surgery were attributed to CO.

**RESULTS:** A total of 110 patients were enrolled in the present study. Of these patients, 7 (3 SPT, 4 PTA) did not undergo their assigned treatment protocol, and 6 (2 SPT, 4 PTA) were lost to follow-up before 24 months or THA conversion. Thus, 97 patients (40 [41.2%] males, 57 [58.8%] females) with 24-month follow-up and mean (standard deviation) age 48.34 (5.7) years, BMI 26.38 (4.1) kg/m<sup>2</sup>, and Tönnis grade 0.85 (0.8) were included in our analysis, with 52 (53.6%) in the SPT group and 45 (46.4%) in the PTA group. At the time of analysis, 32 (71.1%) PTA patients failed to achieve adequate progression and crossed over to arthroscopy at mean (SD) 5.10 (3.3) months after physical therapy initiation. In both the intention-to-treat and modified as-treated analyses, the SPT group displayed significantly superior average PROM and pain scores across the study period for all metrics, except HOS-SS relative to the PTA group (Table I). In the treatment-failure analysis, the SPT and CO groups showed significantly greater improvement across all metrics compared to the PTA group. However, post-hoc analyses revealed no significant differences in improvement between the SPT and CO groups (Table II). Finally, 18 (18.6%) patients in the study sample converted to THA, including 10 (19.2%) from the SPT group [mean months after primary arthroscopy (SD); 51.9 (25.2)], 7 (21.9%) from those in the PTA group that crossed over [37.9 (25.8) months], and 1 from the PTA group 23.6 months after PT initiation.

**DISCUSSION:** In patients older than 40 years with limited osteoarthritis, arthroscopic acetabular labral repair with postoperative physical therapy led to better outcomes than physical therapy alone. However, additional physical therapy prior to surgery did not negatively impact the magnitude of postoperative improvement experienced at 24-month follow-up, as evidenced by the CO group.

**SIGNIFICANCE/CLINICAL RELEVANCE:** Age over 40 years should not be considered a contraindication to arthroscopic acetabular labral repair. Yet, delaying surgery for at least 6 months in favor of physical therapy does not negatively impact postoperative outcomes and may allow some patients to avoid operative management.

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**Table I.** Weighted Differences in Average PROM and Pain Scores Between SPT and PTA Groups\*

| PROM                                | Weighted Difference in Average Scores (95% CI) <sup>†</sup> | P Value            |
|-------------------------------------|---|--------------------|
| <b>Intention-to-Treat Analysis</b>  |   |                    |
| iHOT-33                             | 10.5 (3.1, 17.9)  | .006 <sup>‡</sup>  |
| mHHS                                | 6.4 (1.1, 11.7)   | .019 <sup>‡</sup>  |
| NAHS                                | 6.8 (1.2, 12.4)   | .017 <sup>‡</sup>  |
| HOS-ADL                             | 6.3 (0.7, 11.8)   | .027 <sup>‡</sup>  |
| HOS-SS                              | 3.4 (-6.1, 12.9)  | .482               |
| VAS                                 | -1.2 (-2.1, -0.3)   | .008 <sup>‡</sup>  |
| <b>Modified As-Treated Analysis</b> |   |                    |
| iHOT-33                             | 15.0 (9.9, 20.1)  | <.001 <sup>‡</sup> |
| mHHS                                | 8.6 (5.1, 12.1)   | <.001 <sup>‡</sup> |
| NAHS                                | 8.7 (5.2, 12.2)   | <.001 <sup>‡</sup> |
| HOS-ADL                             | 6.5 (3.1, 9.8)  | <.001 <sup>‡</sup> |
| HOS-SS                              | 2.4 (-3.0, 7.8)   | .378               |
| VAS                                 | -1.8 (-2.5, -1.2)   | <.001 <sup>‡</sup> |

\*Weighted differences in average scores are reported as mean (95% confidence interval). <sup>†</sup>Reference group: PTA group. <sup>‡</sup>A significant difference between groups ( $p < .05$ ). PROM, patient-reported outcome metric; SPT, surgery and physical therapy; PTA, physical therapy alone; CI, confidence interval; iHOT-33, International Hip Outcome Tool-33; mHHS, modified Harris Hip Score; NAHS, Non-Arthritic Hip Score; HOS-ADL, Hip Outcome Score-Activities of Daily Living; HOS-SS, Hip Outcome Score-Sports Subscale; VAS, visual analog scale.

**Table II.** Cohort Comparison of Improvements in PROM and Pain Scores at 24 Months or Failure: Treatment-Failure Analysis\*

| PROM    | Mean Improvements (95% CI) |                    |                   | P Value            | Post-Hoc P Values  |          |                    |
|---------|----------------------------|--------------------|-------------------|--------------------|--------------------|----------|--------------------|
|         | SPT Group (n = 52)         | PTA Group (n = 45) | CO Group (n = 32) |                    | SPT v PTA          | SPT v CO | PTA v CO           |
| iHOT-33 | 33.5 (26.2, 40.8)          | 3.3 (-2.7, 9.4)    | 37.6 (27.6, 47.5) | <.001 <sup>†</sup> | <.001 <sup>†</sup> | 0.741    | <.001 <sup>†</sup> |
| mHHS    | 20.8 (16.3, 25.2)          | 2.9 (-1.4, 7.3)    | 19.8 (11.8, 27.8) | <.001 <sup>†</sup> | <.001 <sup>†</sup> | 0.965    | <.001 <sup>†</sup> |
| NAHS    | 19.4 (14.9, 23.9)          | 1 (-3.5, 5.5)      | 22 (14.2, 29.8)   | <.001 <sup>†</sup> | <.001 <sup>†</sup> | 0.782    | <.001 <sup>†</sup> |
| HOS-ADL | 14.7 (10.2, 19.2)          | -0.6 (-5.2, 3.9)   | 18.4 (9.7, 27.1)  | <.001 <sup>†</sup> | <.001 <sup>†</sup> | 0.635    | <.001 <sup>†</sup> |
| HOS-SS  | 31.5 (23.7, 39.2)          | 0.6 (-5.6, 6.9)    | 34.3 (24, 44.5)   | <.001 <sup>†</sup> | <.001 <sup>†</sup> | 0.881    | <.001 <sup>†</sup> |
| VAS     | -2.5 (-3.4, -1.6)          | -0.3 (-1.3, 0.7)   | -3.3 (-4.6, -2)   | <.001 <sup>†</sup> | .004 <sup>†</sup>  | 0.563    | <.001 <sup>†</sup> |

\*Improvements in PROM and pain scores are reported as mean (95% confidence interval). <sup>†</sup>A significant difference between groups ( $p < .05$ ). PROM, patient-reported outcome metric; SPT, surgery and physical therapy; PTA, physical therapy alone; CO, crossover; CI, confidence interval; iHOT-33, International Hip Outcome Tool-33; mHHS, modified Harris Hip Score; NAHS, Non-Arthritic Hip Score; HOS-ADL, Hip Outcome Score-Activities of Daily Living; HOS-SS, Hip Outcome Score-Sports Subscale; VAS, visual analog scale.