Nonsurgical Treatment of Acetabular Labral Tears

Melissa Theige and Shannon David

Clinical Scenario: Surgical treatment of acetabular labral tears has been explored in multiple studies, while there is a lack of research on the effectiveness of conservative methods. **Focused Clinical Question:** To what extent can nonsurgical treatment produce symptomatic or functional improvements in athletes with an acetabular labral tear? **Summary of Search, Best Evidence Appraised, and Key Findings:** The literature was searched for studies of patients with confirmed acetabular labral tears who participated in any level of sport. Four studies were located, all of which were included. **Clinical Bottom Line:** The research discussed in this review agreed that conservative management of acetabular labral tears produced measurable improvements in pain and function among the athletes studied, including their ability to participate in sport activities. Based on these findings, it appears that conservative management is effective at rehabilitating athletes with acetabular labral tears. However, this method should not be applied to every athlete based on the low strength of current research. Treatment plans should be decided upon on a case-by-case basis. **Strength of Recommendation:** The studies located were of low quality. The highest Oxford Center for Evidence-Based Medicine Level of Evidence achieved was 4. Higher level studies must be conducted before the conclusions of this research can be applied clinically with assertion. Strength of recommendation is level 3.

Keywords: rehabilitation, hip, acetabular labral tear, nonsurgical, conservative management

Clinical Scenario

Although there are multiple published studies regarding the surgical treatment of acetabular labral tears, little research has been conducted regarding nonsurgical methods.¹⁻⁵ Although the primary source of labral tears is believed to be bony femoroacetabular impingement, it has been hypothesized that hip instability and poor neuromuscular control can replicate or exacerbate this mechanism of injury.⁶ It stands to reason, then, that rehabilitation could address these deficits and improve symptoms, allowing patients to postpone or forgo surgical treatment. Furthermore, orthopedic surgeons frequently recommend or require conservative management of acetabular labral tears before performing surgery, and this recommendation should be made using evidence-based practice.⁷ Finally, for the athlete who cannot or does not wish to undergo surgery, it is important to determine what outcomes are feasible through conservative management alone.

Focused Clinical Question

To what extent can nonsurgical treatment produce symptomatic or functional improvements in athletes with an acetabular labral tear?

Summary of Search, Best Evidence Appraised, and Key Findings

A search of the literature was conducted to locate research addressing nonsurgical treatment of acetabular labral tears in athletes of any level (Figure 1). The search produced a limited number of relevant articles: 3 case reports and 1 case series. In each study, researchers used highly customized physical therapy protocols to address biomechanical abnormalities in each individual patient. These exercises were sometimes used in conjunction with other

nonsurgical therapies, such as ice and instrument-assisted soft tissue mobilization. Nonsurgical therapy of acetabular labral tears reduced pain in all cases and facilitated return to some level of sport, up to and including professional, for all athletes for whom that outcome was reported. Other measures of function, such as Lequesne Hip Score and Nonarthritic Hip Score, also improved in all cases.

Clinical Bottom Line

The research discussed in this review agreed that conservative management of acetabular labral tears produced meaningful improvements in pain and function among the athletes studied, including their ability to participate in multiple levels of sport. Based on these findings, it appears that conservative management is effective at rehabilitating some athletes with acetabular labral tears. However, this method should not be applied to every athlete based on the low strength of current research. Treatment plans should be decided upon on a case-by-case basis.

Strength of Recommendation

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Search Strategy

The search strategy used is depicted by a flow diagram in Figure 1.

Results of Search

The initial search produced over 40 results. Following the application of the eligibility criteria, 4 studies remained for review. Table 1 presents a summary of results.

Theige is with the Pingree School, Hamilton, MA. David is with Health, Nutrition, and Exercise Sciences, North Dakota State University, Fargo, ND. Theige (mtheigerichie@gmail.com) is corresponding author.

Figure 1 — Search strategy.

Table 1 Summary of Study Designs of Articles Retrieved

Level of evidence	Study design	Number located	Reference
4	Case series	1	Yazbek et al ⁶
5	Case report	3	Khoo-Summers and Bloom ⁸ Liem et al ⁷ MacIntyre et al ⁹

Best Evidence

All 4 studies were identified as the best available evidence due to their inclusion of athletic subjects and coverage of nonoperative treatment of acetabular labral tears. One article achieved a level 4 evidence grading according to Oxford Center for Evidence-Based Medicine criteria, whereas the other 3 studies were classified as level 5. The studies selected are summarized in Table 2.

Implications for Practice, Education, and Future Research

Three of the 4 studies located were case report designs, whereas the fourth study was a case series. Each study followed athletes ranging

from the recreational to professional level who underwent rehabilitation with or without modalities to address symptoms and loss of function associated with an acetabular labral tear. Every patient discussed in the literature showed observable improvement in pain ratings measured by a visual analog or numerical pain rating scale, as well as improvement to overall function measured by ability to return to some level of sport, Nonarthritic Hip Score, Lequesne Hip Score, or other similar measure. Pain-free athletic activity was achieved in as little as 6 weeks and was shown to be sustained at a 1-year follow-up posttreatment.⁶⁻⁹ Four of the 6 athletes studied were able to return to their previous level of sport, including 2 professional, 1 nationally competitive, and 1 recreational athletes.⁶⁻⁸ Another professional athlete had retired prior to the beginning of his conservative treatment but was able to return to participation at the recreational level.⁹ The remaining athlete's return to sport was not reported.⁶ No negative effects were reported in any case. No athlete studied was reported to elect surgery at a later date. In conclusion, the available literature agreed that nonsurgical treatment of acetabular labral tears produces favorable outcomes among athletes.

Unfortunately, the evidence presented is of low quality. Case report designs may include outliers, as the possibility of researcher bias in selecting which cases to publish is great. Case series designs lack controls and suffer from the skewing effects of a small sample size. It is imperative for future researchers to produce more robust studies, such as case-control or cohort designs, to ascertain whether

Table 2 Summary of Best Evidence

	Yazbek et al⁶	Khoo-Summers and Bloom⁸	Liem et al⁷	MacIntyre et al⁹
Study design	Case series	Case report	Case report	Case report
Participants	Four patients [aged 27 (male), 24 (male), 24 (female), and 24 (male) y] with the history of acetabular labral tear. The patient aged 27 y (male) had previously undergone a labral repair surgery. The males were athletes ranging from recreational to professional level, whereas the female was sedentary.	Subject was a 29-y-old female, professional ballet dancer with a clinically diagnosed acetabular labral tear. She danced 36 h/wk as a principal ballerina. Previously failed therapies included ice and medication.	The patient discussed was a 12-y-old female, nationally competitive figure skater who obtained an MRI diagnosis of an acetabular labral tear following a month of anterior hip pain worsened by 3 wk of rest. No skeletal abnormalities were found.	The patient was a 22-y-old male, retired professional hockey goalie with a confirmed acetabular labral tear, cam-type femoroacetabular impingement, and 4-y history of hip pain. The patient had recently retired from professional hockey due to (1) exclusion from surgical candidacy due to no trial of conservative treatment, (2) surgical apprehension, and (3) desire to preserve hip function.
Intervention investigated	All 4 patients underwent a 3-phase physical therapy protocol. Phase 1 addressed pain control, core stabilization, and movement pattern correction. Phase 2 focused on restoring ROM and correcting muscle strength imbalances. Phase 3 emphasized proprioception and sport-specific movement. Patients completed treatment within 9–16 wk depending on speed of progress.	The dancer was examined using a Sahrman analysis to identify deficits in movement patterns believed to have contributed to her labral pathology. Identification of improper biomechanics directed corrective programming. The subject was prescribed posture education, 6 physical therapy sessions over 2 mo, and a home exercise program to address muscular control during sitting, standing, and walking, as well as dancing.	The ice skater underwent a total of 4 mo of physical therapy beginning with sessions twice a week over 12 wk, as well as a daily home program, and ending with sessions once per week for the final 4 wk. Treatment goals addressed motor deficits found during her initial examination including poor core activation and weakness of the gluteus medius, external rotator, and paraspinal muscles, then progressed to related functional and sport-specific exercises.	Comprehensive, individualized, conservative treatment protocol including active release technique, instrument-assisted soft tissue mobilization, spinal manipulation therapy, Mulligan mobilizations with movement, electroacupuncture, and rehabilitation exercises. Treatment was administered in 8 treatments over 6 wk. Exercises progressed from strength and stability builders to functional activities to sports-specific movements.
Outcome measure	Patients were evaluated for hip strength, range of motion, pain, and level of function. Instruments used included a handheld dynamometer, 8 special tests (Impingement, FABER, Scour, Internal Rotation, Squish, Lasague, Piriformis, and Grava), a VAS, and the Lequesne Hip Score. Measurements were taken preintervention and at 4 and 6 mo posttreatment.	The patient was assessed using a numerical pain rating scale and a NHS both before and after the treatment. The patient was also questioned regarding pain during ADL and dance at both times.	The patient was assessed for pain using a VAS pretherapy and at 4 wk, 6 wk, 12 wk, 4 mo, and 1 y postinjury. The patient's level of participation in figure skating was also recorded.	Pretreatment and posttreatment pain ratings were collected using a VAS. The patient was also evaluated using the Scour, FADIR, and FABER tests. The patient's ability to perform ADL and participate in hockey was recorded as well.
Main finding	Following treatment, fewer special tests provoked pain in each patient. Each participant's VAS pain score also dropped 4–7 points with 3 patients reporting no pain at follow-up. Lequesne Hip Scores simultaneously fell between 4 and 9 points each. Strength of the hip adductors, abductors, flexors, and extensors improved 0%–98% in the involved limb and 0%–139% in the uninvolved limb. One patient was able to return to professional jiu-jitsu competition. Other athletes return to sport were not remarked upon.	Prior to treatment, the patient reported pain after 30 min of sitting, 15 min of standing, or 5 min of walking rated at a 7 out of 10, as well as a 36.25% NHS. Following treatment, the patient described pain as 0 out of 10 during ADLs and dance except mild groin pain during some advanced dance steps. Her NHS rose to 97.5%, and she was able to return to her ballet career. The patient reported that she remained pain-free and dancing professionally 5 mo posttreatment.	The patient reported initially reported an 8 out of 10 rating. This number was reduced at 4 wk of therapy, and pain was reported as 0 out of 10 from week 6 of therapy on. The patient rested from skating the first 6 wk of therapy, was limited to step routines at 6 wk, was able to perform jumps to 75% of normal height at 12 wk, and returned to competition after 4 mo. She remained pain-free and nationally competitive 1 y postinjury.	Scour, FADIR, and FABER tests produced positive results prior to treatment. At the 6-wk mark, tests were positive for a mechanical click, but no pain. The patient rated his pain as a 7 out of 10 prior to treatment. Pain was described as absent during ADL and exercise at 6 wk after the commencement of therapy. Pain was absent during recreational hockey participation at 8 wk and in competitive hockey at the time of publication.

(continued)

Table 2 (continued)

	Yazbek et al ⁶	Khoo-Summers and Bloom ⁸	Liem et al ⁷	MacIntyre et al ⁹
Level of evidence	4	5	5	5
Validity score (downs and black)	13	N/A	N/A	N/A
Conclusion	A 3-phase physical therapy program based on promoting healthy movement patterns, correcting hip strength imbalances, and training sensorimotor skills reduced pain and increased hip function in 4 subjects. Nonsurgical intervention can be effective in treating athletes with acetabular labral tears.	Identification and correction of biomechanical errors believed to cause a professional ballerina's labral tear allowed her to return to full participation with minimal symptoms.	An individualized treatment program based upon muscular weaknesses of an adolescent figure skater with an acetabular labral tear allowed her to return to national competition pain-free within 4 mo of injury. Technique development and avoidance of irritating activity were hypothesized to contribute to the treatment's success. It may be preferable to attempt conservative management prior to resorting to surgery in the skeletally immature athlete.	A goalie who previously retired from professional hockey due to persistent symptoms of an acetabular labral tear was able to return to competitive hockey pain-free following 6 wk of a many-faceted conservative treatment approach. Conservative treatment should be attempted prior to resorting to surgery. When formulating treatment regimen, the individual aspects of a patient's pathology must be considered, including sport demands.

Abbreviations: ADL, activities of daily living; FABER, flexion, abduction, and external rotation; FADIR, flexion, adduction, and internal rotation; MRI, magnetic resonance imaging; N/A, not available; NHS, Nonarthritic Hip Score; ROM, range of motion; VAS, visual analog scale.

this type of treatment is effective on a larger scale and while controlling for more variables.

In the meantime, the risk in utilizing the methods suggested by this research is low. Conservative management is less invasive, less expensive, and less prone to complications than surgical alternatives. Positive outcomes include decreased pain, increased strength, increased function, and return to sport, up to and including previous levels. As such, nonsurgical treatment should be considered as the first option in treating acetabular labral tears.⁹

Implementation of the type of nonsurgical treatment plans discussed in this research requires a good deal of tailoring to each athlete. While most protocols followed the same general 3-phase template of (1) range of motion and strengthening, (2) functional movement, and (3) sport-specific exercise, individual biomechanical deficits were often implicated in the development of hip pathology and identified as the key to reducing symptoms.^{7,8} This was especially apparent in the case of the ballerina, whose entire successful treatment was based upon a detailed movement analysis and correction rather than any generic rehabilitation exercises.⁸ This evidence supports the use of a sport-specific biomechanical evaluation, including hip stability and neuromuscular control to both direct treatment and measure progress. The ability to conduct this type of fine-tuned assessment is limited by the skill and experience of the attending clinician.

Furthermore, clinician experience with the sport in question could be another limiting factor for nonsurgical treatment. The diagnosis of acetabular labral tears appears to be concentrated within sports that demand extreme hip flexion, internal rotation, and adduction, such as dance and hockey.^{6,9} In the case of hockey, the butterfly technique used by some goalies has been implicated in the development of labral tears.⁹ Without knowledge of the demands of this technique, the clinician is limited in his or her ability to advise an athlete on biomechanical adjustments to be made. Further research into what other sport-specific movements

produce destructive forces is warranted to promote injury prevention.

In conclusion, the use of nonsurgical rehabilitation to treat acetabular labral tears in athletes is justifiable due to support of low-level evidence, low risk of implementation, and the possibility of avoiding invasive surgery. Limitations for use include lack of high-level supporting evidence and clinician experience. Opportunities for further inquiry are endless due to the extremely limited amount of current research. Worthy areas of study include the application of nonsurgical rehabilitation to a larger population of injured athletes in a controlled setting, longitudinal studies, correlation studies between labral tear location/severity and success of nonsurgical treatment, and studies among various sports and levels of sport, to identify populations in which nonsurgical treatment may be more or less effective.

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