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Case Study

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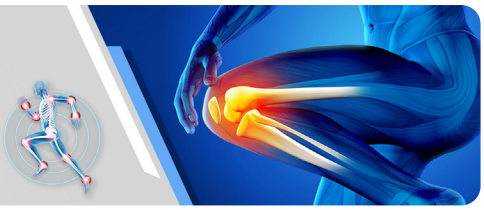

A Novel Ultrasound-Guided Approach for the Management of an Anterior Paralabral Cyst of the Hip

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Main Focus of Article

To share a novel ultrasound guided intervention for management of anterior paralabral cysts of the hip. This article also discusses the clinical presentation, diagnostic investigation, and traditional treatments for paralabral cysts of the hip.

Introduction

Paralabral cysts of the hip are viscous, fluid-filled sacs that arise from myxoid degeneration of connective tissue of a joint capsule. Paralabral cysts are most commonly described in association with shoulder joint pathology, however they can also arise within the hip joint, secondary to pathology such as labral tears, dislocation, psoas impingement, osteoarthritis, and inflammatory rheumatologic disorders [1]. These cysts are estimated in 1-4% of the general population and seen in up to 50-70% of patients with hip labral tears [2]. Cyst location at the femoroacetabular joint is generally seen at the anterosuperior position and typically lateral to the iliopsoas muscle [3,4]. Compression of local structures is rare, though femoral vein, obturator nerve, sciatic nerve, and femoral nerve involvement have been reported in the literature [5,6]. The classic patient presentation of a paralabral cyst includes anterior hip pain, limited range of motion (ROM) with internal/external rotation, pain with hip flexion, an occasional "snapping" sensation, positive Flexion Abduction External Rotation (FABER), Flexion Adduction Internal Rotation (FADIR), and Scour tests at the affected joint [2]. MRI and MRA are the gold-standard imaging modalities for cyst visualization and the diagnosis of associated labral tears [2]. However, ultrasound (U/S) is also useful for diagnostic and therapeutic purposes in cysts greater than 1.5 cm in size [2].

U/S-guided approaches in the management of paralabral cysts are more commonly reported in the shoulder joint [7]. Traditional treatment of hip paralabral cysts includes surgical excision of the cyst during arthroscopic labral debridement or repair [2,8]. There is a paucity of literature regarding U/S-guided intervention of paralabral cysts of the hip. However, ultrasound proves to be a useful modality as it allows clear visualization of the target structure along with the ability to identify the femoral neurovascular bundle to avoid potential injury. Thus far, customary non-surgical intervention has involved cyst aspiration with or without a subsequent combination injection of anesthetics with corticosteroids [5]. We introduce a novel U/S-guided cyst rupture technique, where the needle enters the skin from distal to proximal, increasing the conspicuity of needle visualization and making a technically more feasible procedure, and then pressurizing the hip paralabral cyst until rupture.

Case Report

A 50-year-old male with an unremarkable orthopedic past medical history

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was referred for management of his left hip anterior paralabral cyst. An MRI of the left hip, which was completed prior to his referral, demonstrated a tear of the left anterior labrum extending to the superior labrum associated with an anterior paralabral cyst measuring 3.6 × 2.1 cm. This paralabral cyst extended into the left iliopsoas muscles (Figure 1 and 2).

The patient described the pain as sharp, intermittent, 7/10, and located over his anterolateral left hip without radiation. His pain was aggravated with increased activity such as walking, crossing his left-leg over his right, ascending and descending stairs, prolonged standing, and rising from a seated position. Alleviating factors included frequent positional changes. He denied numbness, tingling, and weakness of the left lower extremity. He had previously attempted conservative treatment options without relief, including physical therapy, non-steroidal anti-inflammatory drugs (NSAIDs), and sonographically guided corticosteroid injections to the hip joint capsule. On physical examination, the patient was neurovascularly intact. Muscle strength was 5/5 for hip flexion, hip extension, hip abduction, hip adduction. Pain was elicited with passive internal and external rotation of the left hip joint. Physical examination was also remarkable for a positive anterior impingement sign with pain elicited on flexion, adduction, and internal rotation (FADIR). Ambulation exam revealed a non-antalgic gait.

We recommended an ultrasound-guided cyst aspiration and subsequent corticosteroid injection into the joint capsule, for which the patient agreed. The procedure was carried out via sterile technique. The patient was positioned supine with the left leg placed in slight internal rotation. Target structures were localized with a 5-2 MHz curve-linear transducer. Prior to the procedure, the probe was scanned medially, color doppler was employed, and neurovascular structures were identified. The probe was then scanned laterally until the cyst was identified, and color doppler remained on to ensure no vascular flow coming to or from the cystic structure. Color doppler was then turned off to increase the conspicuity of

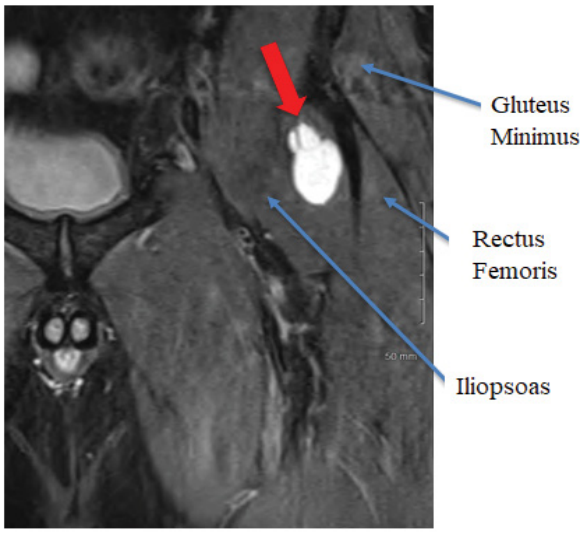

Figure 1: MRI Left Hip (Coronal View): This demonstrates the left hip paralabral cyst (red arrow) with extension into the left iliopsoas muscle belly.

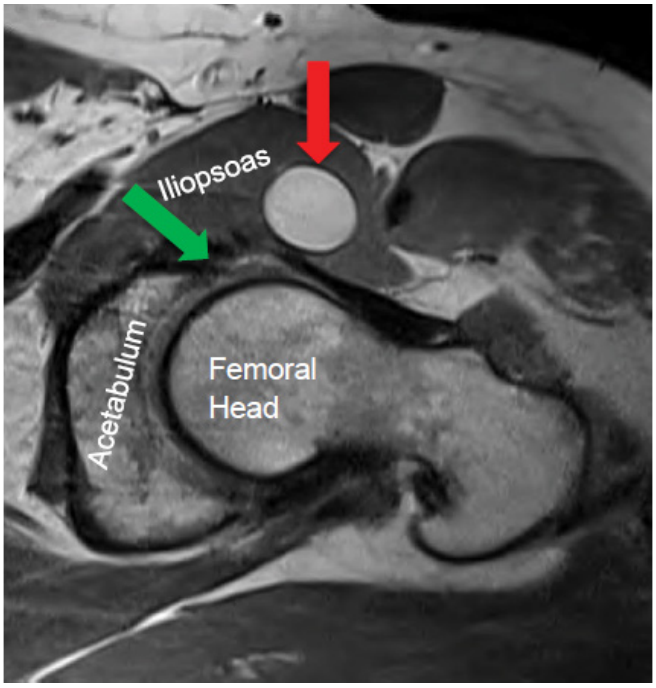

Figure 2: MRI Left Hip (Axial View): This demonstrates the left hip anterior paralabral cyst (red arrow) with associated anterior labral tear (green arrow).

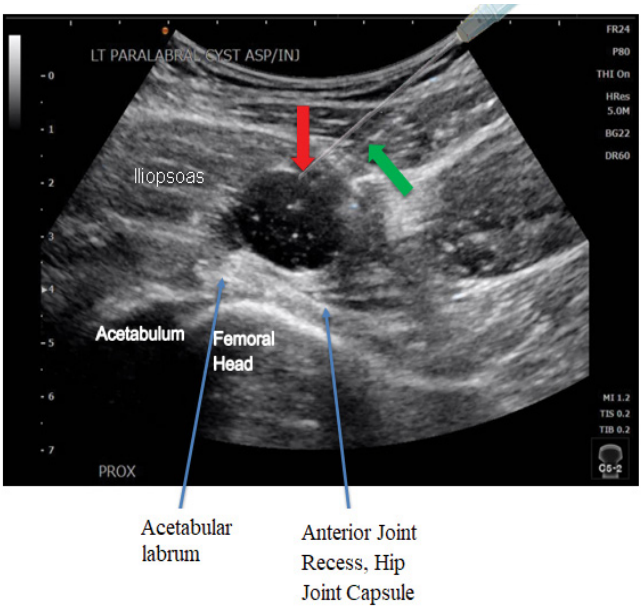

Figure 3: Ultrasound demonstrating needle trajectory (green arrow) and insertion into hypoechoic anterior paralabral cyst for needle fenestration (red arrow). A transparent needle illustration [9] is seen directly adjacent to the actual needle trajectory for ease of viewing.

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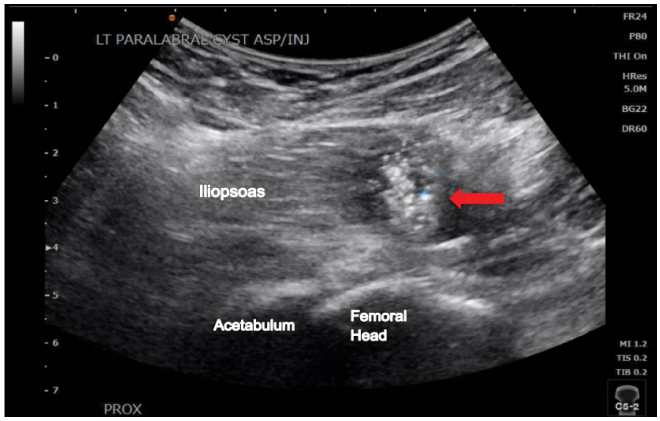

Figure 4: Ultrasound of anterior paralabral cyst status-post cyst rupture (red arrow).

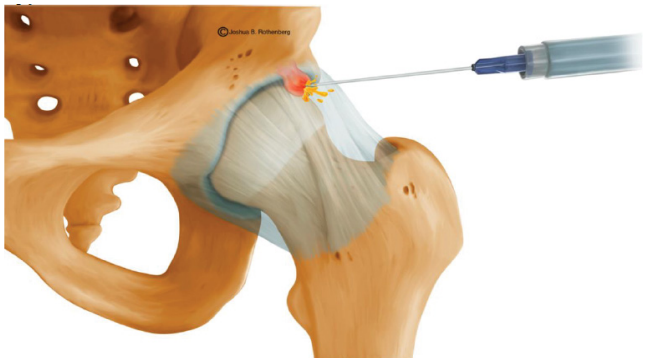

Figure 5: Anatomic illustration demonstrating cyst rupture of an anterior paralabral cyst of the hip joint.

needle visualization. Thereafter, 0.5 cc of 1% lidocaine local anesthesia to the skin and subcutaneous tissues was delivered distal-to-proximal. Following local anesthesia, a new 20-gauge 3.5-inch needle was inserted from distal to proximal into the cyst. A syringe was attached, however no fluid was able to be aspirated (Figure 3). The procedure was then converted to a cyst rupture, in which the cyst was initially pressurized with 0.5 mL of 1% lidocaine when resistance was felt. Next, an additional 0.5 mL of 1% lidocaine was injected, causing the cyst to rupture (Figure 4). After the cyst rupture, a new 25 gauge 3.5-inch needle was inserted from distal to proximal to the hip joint capsule. A new 5 mL syringe containing 3 mL of 1% lidocaine, 1 mL of 4 mg/mL dexamethasone, and 1 mL of 40 mg/mL Kenalog was injected with a confirmatory arthrogram effect. An anatomic illustration is provided (Figure 5).

The patient reported immediate pain relief following the procedure. No procedural complications were experienced. At six-week follow-up, the patient expressed complete resolution of his pain. He maintained being pain-free eight months post procedure. He reported being able to complete his activities of daily living without consequential pain or immobility at the end of each day. He endorsed being able to perform a Figure 4 position, ascend and descend steps, transition from sitting to standing, and remain standing for an extended duration without pain.

Discussion

Initial treatment of hip paralabral cysts and associated labral tears, excluding full-thickness tears, is conservative management [10] including physical therapy, NSAIDs, cyst aspiration, and corticosteroid injections (CSI). If less invasive therapies fail to produce an acceptable functional outcome, arthroscopic cyst decompression or excision with labral repair is typically pursued [5,8]. As demonstrated in this case study, U/S-guided intervention of a paralabral cyst may be a satisfactory treatment alternative that can provide immediate pain relief and functional improvement in particular cases.

In general, high-level evidence examining ultrasound-guided therapy for paralabral cysts of the hip is scarce. There are documented cases regarding U/S-guided intervention of hip paralabral cysts utilizing aspiration with or without steroid delivery [4,11]. However, difficulties in aspiration due to cyst viscosity, and high cyst recurrence rates are commonly reported [5,7,8]. It has been reported that cysts can reoccur in up to 50% of hip paralabral cyst aspirations – with or without CSI [6]. Risk factors for cyst recurrence include large cyst size, extracapsular extension, and ovoid shape (as opposed to flatter shapes) [7].

To the best of the authors' knowledge, this is the first case study examining intentional hip paralabral cyst rupture via pressurized lidocaine delivery under ultrasound guidance. We believe this procedure may provide an alternative solution in combating paralabral cyst recurrence regardless of the cyst's associated risk factors. The anterior paralabral cyst in our patient exhibited the previously mentioned risk factors for recurrence (large ovoid size of 3.6 × 2.1 cm and extracapsular extension into the iliopsoas), yet the patient remained symptom-free at six-week and eight-month follow-up post cyst rupture. The authors believe the cyst rupture to be the alleviating factor as the patient had failed a previous sonographically-guided cortisone injection alone.

Posing an analogous solution at a different anatomic location are studies examining intentional synovial cyst rupture of lumbar facet joints under fluoroscopic guidance. In certain studies, most patients reported immediate symptomatic improvement, and many avoided surgical interventions. However, the long-term benefits of intentional cyst rupture in lumbar facet joints are controversial [12,13].

The benefits of this intervention include safety, timeliness, potential avoidance of surgery, cost-effectiveness, and immediate clinical improvement. This technique is easily deployable for physicians familiar with ultrasound-guided interventions and may be useful in managing cysts

in the hip and other anatomical locations, such as paralabral cysts in the shoulder or ganglion cysts in the wrists, hands, or feet. However, our report does have limitations. No follow-up was conducted beyond eight months, and no clinical examination was performed after six weeks post-intervention. Furthermore, despite this intervention's safety, it carries risks similar to other needle-driven procedures, including infection, bleeding, localized nerve injury, and pain. These risks could be amplified in a patient with a large body habitus due to difficulty visualizing critical anatomy. Cyst rupture and injectate delivery also leads to localized volume expansion, posing a theoretical risk of neurovascular compression. A potential limitation to this approach is the location and size of the paralabral cyst, as it may be located near vital vascular structures.

Notably, the patient in this case did not experience any complications, and the procedure was well tolerated. The cyst was easily visualized under ultrasound and accessible with a needle in an anterolateral location, avoiding proximity to the femoral neurovascular bundle. However, not all cysts occur in the same, easily-accessible location; they could be more medial, where the proximity to the femoral neurovascular bundle would dissuade the provider. Therefore, practitioners should carefully scan these cysts pre-procedurally and note their location throughout the procedure to avoid neurovascular damage.

Regarding future considerations, this case study has raised the hypothesis that reoccurrence rates following cyst fenestration and rupture may be lower than mere aspiration alone. Thus, U/S-guided intentional cyst rupture could be a minimally invasive alternative to arthroscopic surgery in cases that do not involve full-thickness labral tears. However, control trials examining this modality are needed to effectively evaluate its efficacy and the likelihood of hip paralabral cyst recurrence.

References

1. Scott E, Westermann R, Rosneck J. A posterior labral cyst associated with an anterior labral tear of the hip. Skeletal Radiol 47 (2018): 849-852.
2. Batta N, Roberts D. Paralabral cyst of the hip. Reference article, Radiopaedia.org (2022).
3. Magerkurth O, Jacobson JA, Girish G, et al. Paralabral cysts in the hip joint: findings at MR arthrography. Skeletal Radiol 41 (2012): 1279-1285.
4. Hsiao MY, Wu CH, Lin CW, et al. Sonographic Diagnosis and Treatment of Posterior Paralabral Cyst in the Hip Joint. Pain Medicine 18 (2016): 994-995.
5. Shin KY, Park SJ, Lee WS. Paralabral Cyst of the Hip Compressing Common Femoral Vein Treated with Sono-guided Cyst Aspiration Followed by Arthroscopic Labral Debridement: A Case Report. Hip Pelvis 29 (2017): 194-198.
6. John H, Avneesh C, Mina G, et al. Acetabular paralabral cysts demonstrating perineural propagation. The British Journal of Radiology 95 (2022): 1136.
7. Chong Y, Kwon JW, Song Y, et al. CT-guided aspiration and steroid injection of symptomatic paralabral cysts of the hip. Jpn J Radiol 33 (2015): 229-232.
8. Keun-Ho L, Youn-Soo P, Seung-Jae L. Arthroscopic Treatment of Symptomatic Paralabral Cysts in the Hip. Orthopedics 36 (2013): e373-e376.
9. Database Center for Life Science (DBCLS) (https://commons.wikimedia.org/wiki/File:Needle_togopic.png), "Needle togopic", https://creativecommons.org/licenses/by/3.0/legalcode
10. Karadsheh M. Hip Labral Tear. OrthoBullets (2021). https://www.orthobullets.com/knee-and-sports/3097/hip-labral-tear
11. Chang KV, Wu WT, Lin WT, et al. A Female Patient with Right Anterior Hip Pain: A Paralabral Cyst of the Hip. J Med Ultrasound 28 (2019): 273-274.
12. Martha JF, Swaim B, Wang DA, et al. Outcome of percutaneous rupture of lumbar synovial cysts: a case series of 101 patients. The Spine Journal 9 (2009): 899-904.
13. Eshraghi Y, Desai V, Cajigal Cajigal C, Tabbaa K. Outcome of Percutaneous Lumbar Synovial Cyst Rupture in Patients with Lumbar Radiculopathy. Pain Physician 19 (2016): E1019-1025.

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