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## Barbotage of Subscapularis Calcific Tendinopathy

JOSPT Cases 2024;4(3):119-120. Epub 6 June 2024. doi:10.2519/josptcases.2024.12039

### CASE PRESENTATION

A 49-year-old right-handed female military officer was referred to physical therapy (PT) by an emergency department physician for severe left shoulder pain and loss of active range of motion (AROM) following heavy household lifting the previous day. Radiographs demonstrated a 1.4-cm oval calcification in the subscapularis tendon consistent with hydroxyapatite deposition (FIGURE 1). Imaging from 2 years prior indicated a similar 1.1-cm calcification.

The patient's past medical history was unremarkable except for 2.5 years of left shoulder pain previously evaluated in primary care and orthopedic clinics. She completed 12 PT visits 1 year prior, consisting of manual therapy and exercise, with no reported improvement. Currently, the patient reported 3/10 on the numeric pain-rating scale (NPRS) at rest and 10/10 NPRS with all left shoulder movements. AROM was limited to 30-degree flexion, 15-degree abduction, and 0-degree external rotation. Passive motions were similarly limited with empty end-feels. After consulting with interventional radiology, the patient was referred for ultrasound-guided barbotage.

### TREATMENT OUTCOME

The procedure was performed 9 days later, consisting of multiple ultrasound-guided small injections into the calcification with 1% lidocaine solution (FIGURE 2), followed

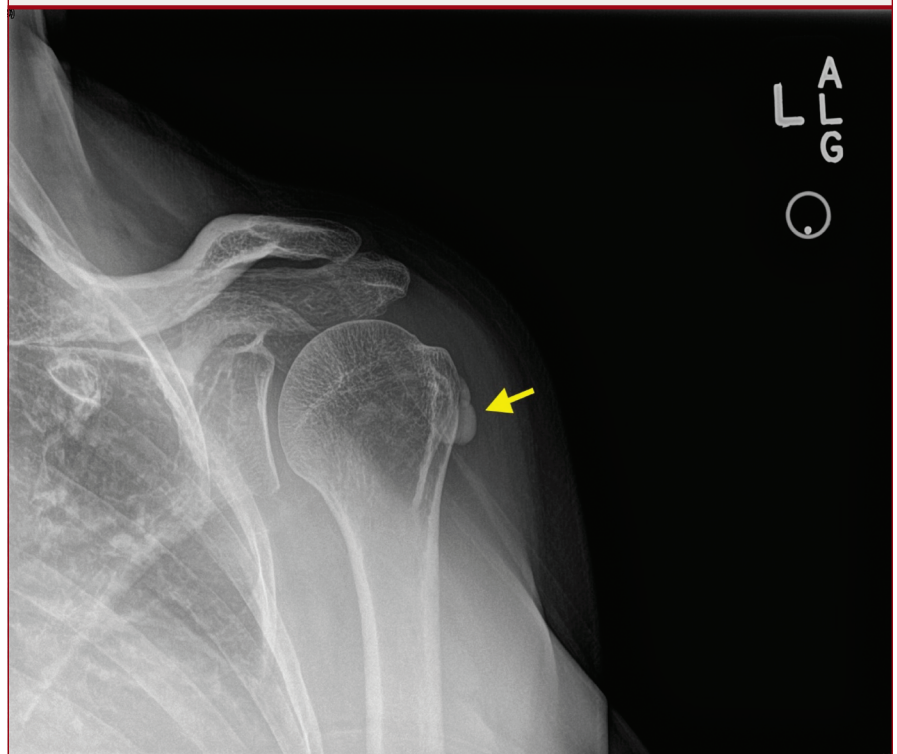
by a Kenalog/lidocaine subcoracoid bursal injection. Two weeks following the procedure, the patient reported 0/10 NPRS with full AROM restoration. No further PT was required. Repeat radiographs 7 months later demonstrated calcification resorption (FIGURE 3) and the patient reported intermittent 1/10 NPRS with continued full AROM.

### Learning Points

- Though calcific tendinopathy is often asymptomatic<sup>3</sup> and self-limiting,<sup>1</sup> it can produce disabling pain and a frozen shoulder-like presentation.<sup>2</sup>
- Mechanical impingement and localized inflammation associated with the calcific mass may be the theoretical etiology of this patient's pain and mobility impairments.<sup>1</sup>
- Current literature suggests ultrasound-guided barbotage as a valid first-line treatment for calcific tendinopathy with studies averaging 55% pain improvement at 11 months post procedure.<sup>1,4</sup> ■

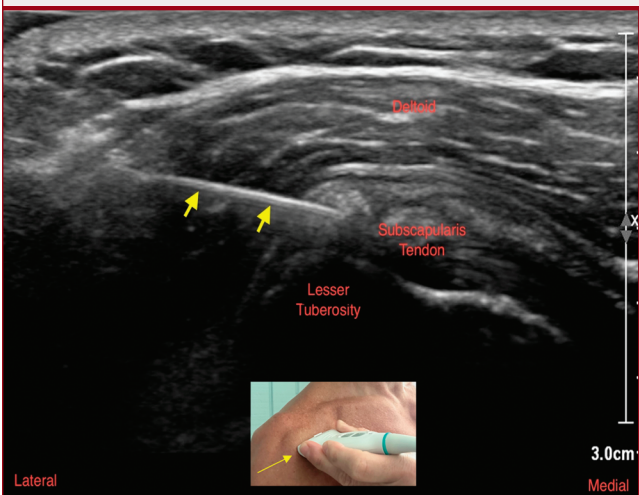
**FIGURE 1**

True anterior-posterior radiograph of the left shoulder demonstrating an oval calcification in the distribution of the subscapularis tendon (indicated by the yellow arrow) measuring 1.4 cm, consistent with hydroxyapatite deposition.

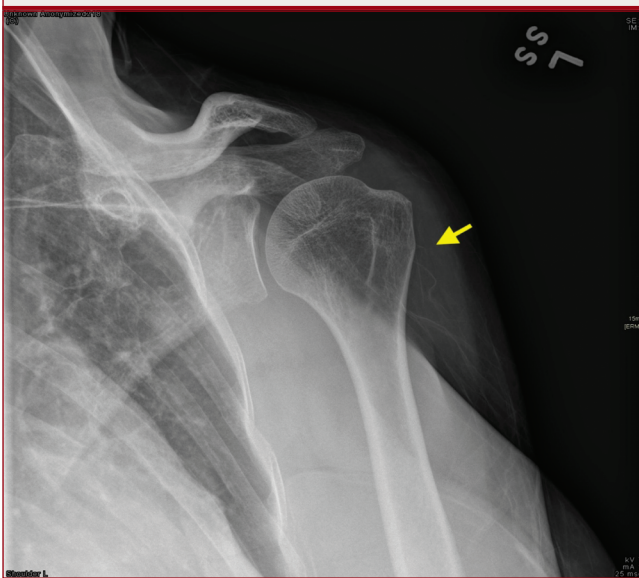


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**FIGURE 2**  
Long-axis diagnostic ultrasound image of the left shoulder captured while performing ultrasound-guided barbotage procedure for hydroxyapatite deposition in distribution of left subscapularis tendon. Needle location is indicated by the yellow arrows.



**FIGURE 3**  
True anterior-posterior radiograph of the left shoulder, taken 7 months after the barbotage procedure, demonstrating almost complete resorption of the hydroxyapatite deposition. The yellow arrow indicates the area where hydroxyapatite deposition was located prior to barbotage procedure.



**DECISION PATHWAY**  
At the time of treatment planning for the patient in a military health care setting, physical therapists have clinical privileges for referral to specialists and imaging.

Exam findings	Initial imaging	Outcome	Additional imaging	Final outcome
<ul style="list-style-type: none"> <li><b>Health care provider:</b> physical therapist</li> <li><b>Setting:</b> outpatient military physical therapy clinic</li> <li><b>Impairments:</b> severe left shoulder pain (NPRS: 10/10) with active movement; AROM: 30-degree flexion, 15-degree abduction, and 0-degree external rotation at neutral; empty end feel with PROM</li> <li><b>Differential diagnoses:</b> adhesive capsulitis, rotator cuff tendinopathy, rotator cuff tear, cervical radiculopathy</li> </ul>	<ul style="list-style-type: none"> <li><b>Imaging modality:</b> radiographs of the left shoulder</li> <li><b>Support:</b> ACR AC, variant 1: chronic shoulder pain. Initial imaging<sup>3</sup></li> </ul>	<ul style="list-style-type: none"> <li><b>Diagnosis:</b> left shoulder subscapularis calcific tendinopathy</li> <li><b>Treatment:</b> left shoulder ultrasound-guided barbotage followed by subcoracoid bursa injection.</li> <li><b>Support:</b> ACR AC, variant 3: chronic shoulder pain. Radiographs demonstrate calcific tendinopathy or calcific bursitis. Next imaging study<sup>3</sup></li> <li><b>Outcome after 2 weeks:</b> Pain (NPRS: 0/10) Full shoulder AROM. Hydroxyapatite deposition resorption</li> </ul>	<ul style="list-style-type: none"> <li><b>Imaging modality:</b> radiographs of the left shoulder</li> <li><b>Support:</b> ACR AC, variant 3: chronic shoulder pain. Radiographs demonstrate calcific tendinopathy or calcific bursitis. Next imaging study<sup>3</sup></li> </ul>	<ul style="list-style-type: none"> <li><b>Diagnosis:</b> Calcific tendinopathy</li> <li><b>Treatment:</b> ultrasound-guided barbotage</li> <li><b>Outcome after 7 months:</b> Pain (NPRS: 1/10). Full AROM Continued hydroxyapatite deposition resorption</li> </ul>

Abbreviations: ACR AC, American College of Radiology Appropriateness Criteria<sup>®</sup>; AROM, active range of motion; NPRS, numeric pain-rating scale; PROM, passive range of motion.

**REFERENCES**

- Catapano M, Robinson DM, Schowalter S, McInnis KC. Clinical evaluation and management of calcific tendinopathy: an evidence-based review. *J Osteopath Med.* 2022;122:141-151. <https://doi.org/10.1515/jom-2021-0213>
- De Carli A, Pulcinelli F, Delle Rose G, Pitino D, Ferretti A. Calcific tendinitis of the shoulder. *Joints.* 2014;2:130-136. <https://doi.org/10.11138/jts/2014.2.3.130>
- Kalayci CB, Kizilkaya E. Calcific tendinitis: intramuscular and intraosseous migration. *Diagn Interv Radiol.* 2019;25:480-484. <https://doi.org/10.5152/dir.2019.18593>
- Lanza E, Banfi G, Serafini G, et al. Ultrasound-guided percutaneous irrigation in rotator cuff calcific tendinopathy: what is the evidence? A systematic review with proposals for future reporting. *Eur Radiol.* 2015;25:2176-2183. <https://doi.org/10.1007/s00330-014-3567-1>
- Nacey N, Fox MG, Blankenbaker DG, et al. ACR Appropriateness Criteria<sup>®</sup> chronic shoulder pain: 2022 update. *J Am Coll Radiol.* 2023;20:S49-S69. <https://doi.org/10.1016/j.jacr.2023.02.017>