



A large intermuscular shoulder lipoma causing pain and weakness in an 87-year-old patient: a case report



Samer S. Hasan, MD, PhD ^{a,*}, Jack P. O'Loughlin ^a, Joel I. Sorger, MD ^b

^a Mercy Health-Cincinnati SportsMedicine and Orthopaedic Center, Cincinnati, OH, USA

^b TriHealth Orthopedic and Sports Institute, Cincinnati, OH, USA

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Rotator cuff dysfunction is more common with advancing age; the prevalence of full-thickness rotator cuff tears has been estimated at 22% in patients older than 65 years³ and 51% in patients older than 80 years,¹⁹ although many of these arise insidiously and remain asymptomatic. Chronic rotator cuff insufficiency may progress to cuff tear arthropathy,¹² often characterized by declining active shoulder motion and dysfunction. However, not all older patients presenting with insidious shoulder pain, weakness, and limited mobility have a large chronic rotator cuff tear or cuff tear arthropathy. We report on an older patient with these symptoms resulting from a large intermuscular lipoma displacing the supraspinatus and infraspinatus muscles and compressing the suprascapular and axillary nerves.

Case

Presentation

The patient is an active 87-year-old woman, living independently without chronic medical problems, with chief complaint of greater than one-year history of insidious onset and progressive dominant right shoulder pain. She had received initial conservative

treatment for rotator cuff disease elsewhere comprising nonsteroidal medications and a subacromial space corticosteroid injection but neither of these provided any relief. Her right shoulder pain had become severe and persistent, and interfered with sleep and activities of daily living.

Physical examination

The patient appeared healthy and spry and could get on and off the examination table independently and with ease. Palpation of the right shoulder revealed a soft mass overlying the supraspinatus fossa and tenderness over the suprascapular notch region but no subacromial or glenohumeral crepitation. Active right shoulder range of motion was limited: forward elevation to 90°, abduction to 70°, external rotation to neutral, and internal rotation to L5. Strength testing revealed an external rotation lag compared with 4+/5 external rotation strength on the left. Deltoid and internal rotation strength testing revealed 4+/5 strength and belly press test was normal. The patient rated her pain as 9/10 and reported an American Shoulder and Elbow Surgeons (ASES) score of 17/100 and 0 “yes” responses on the Simple Shoulder Test.

Imaging

Plain radiographs comprising true anteroposterior radiographs in internal and external rotation and axillary lateral views revealed no signs of chronic rotator cuff insufficiency or glenohumeral arthropathy. Noncontrast magnetic resonance imaging (MRI) revealed a large irregular posterior shoulder mass, with a thin capsule and without any obvious septations or

Institutional Review Board approval was not required for this case report. The patient was informed that details of her case would be collected and submitted for publication. The patient consented to the use of this information.

Statement of Informed Consent: The patient was informed that details of her case would be collected and submitted for publication and she consented to this.

* Corresponding author: Samer S. Hasan, MD, PhD, Mercy Health-Cincinnati SportsMedicine and Orthopaedic Center 10663 Montgomery Road, 1st Floor Cincinnati, Ohio 45242, USA.

E-mail addresses: sshasan@zoomtown.com; s1663h@yahoo.com (S.S. Hasan).

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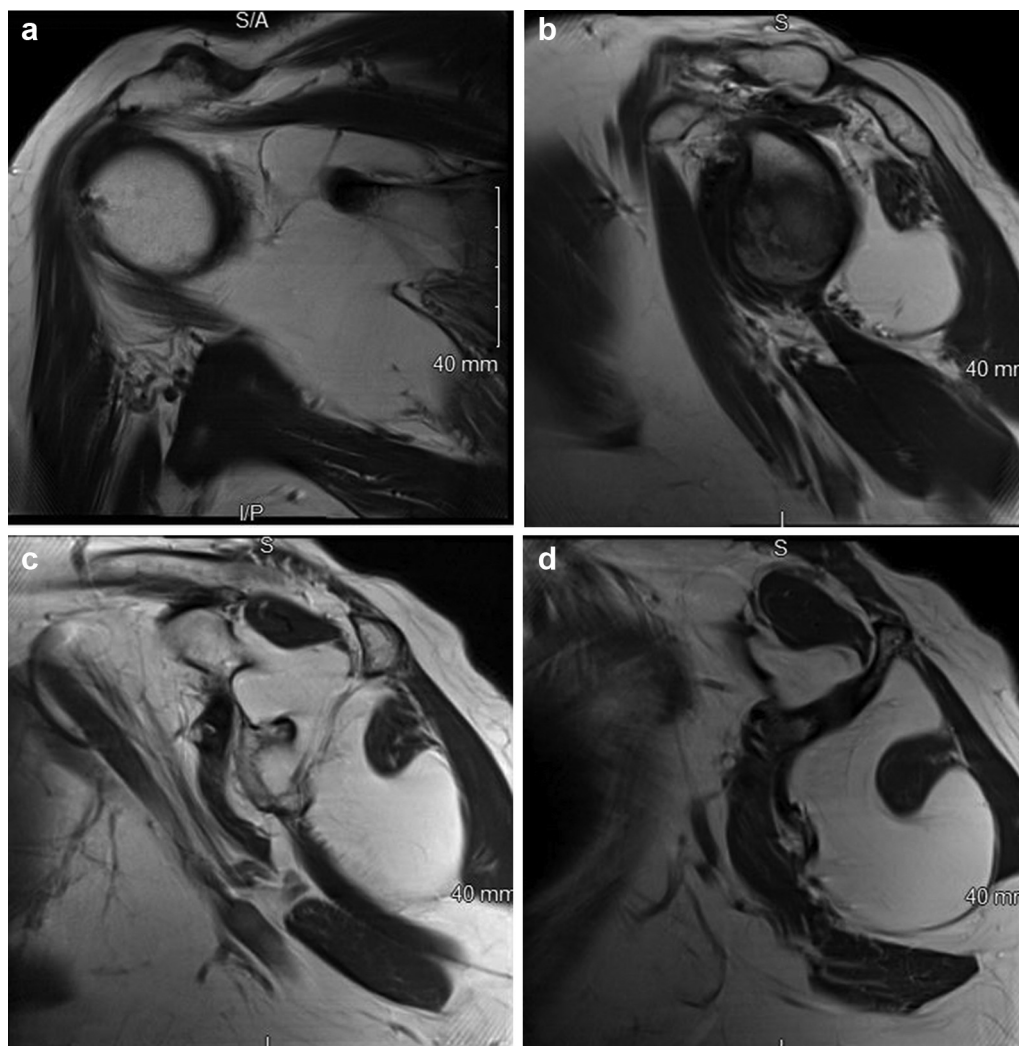


Figure 1 Representative MRI cuts demonstrating the large posterior shoulder intramuscular lipoma: (a) Coronal proton density cut demonstrating the mediolateral extent of the intramuscular lipoma; (b–d) Three sagittal proton density cuts from lateral to medial demonstrating infraspinatus and supraspinatus muscle displacement.

heterogeneity, extending between the supraspinatus and infraspinatus muscles and along the scapula, consistent with an intermuscular lipoma (Fig. 1, a–c). The mass measured 7.3 x 9.0 x 5.2 cm in craniocaudal, transverse, and anteroposterior dimensions. The MRI demonstrated teres minor muscle atrophy but no rotator cuff tear or tendinosis; the supraspinatus and infraspinatus muscle bellies were displaced medially owing to a mass effect.

Diagnosis

The patient was diagnosed with a large intermuscular lipoma vs. low-grade liposarcoma with pain and weakness attributed to compression of the axillary nerve branch to the teres minor and the suprascapular nerve distal to the spinoglenoid notch. An oral prednisone taper was prescribed but this provided only transient pain relief. The patient lacked any chronic medical problems and desired definitive treatment to eliminate the intensifying right shoulder pain that had failed multimodal conservative treatment and to resume her independent active lifestyle. Consequently, we elected to proceed with surgical excision of the right shoulder mass.

Operative details

After the induction of general anesthesia, the patient was positioned in a modified lateral decubitus position (Fig. 2a). A 12-cm incision was made over the posterior shoulder mass to the deltoid fascia, from just inferior to the mid-scapular spine directed laterally and inferiorly near the inferior border of the posterior deltoid. The deltoid muscle was gently elevated from distal to proximal, without detaching its origin or insertion, and the mass was identified (Fig. 2b). A circumferential marginal dissection was performed, and the mass was excised en bloc (Fig. 2c) and sent to pathology. The empty lateral fossae and prominent scapular spine highlighted the medial displacement and atrophy of the infraspinatus and supraspinatus muscles (Fig. 2d). After routine wound closure and dressing, the patient was awakened from anesthesia, transferred to the recovery room in stable condition, and discharged home as an outpatient.

Pathology

The mass consisted of partially encapsulated yellow fatty lobulated tissue measuring 9 cm x 11 cm x 2.5 cm (Fig. 2c) and

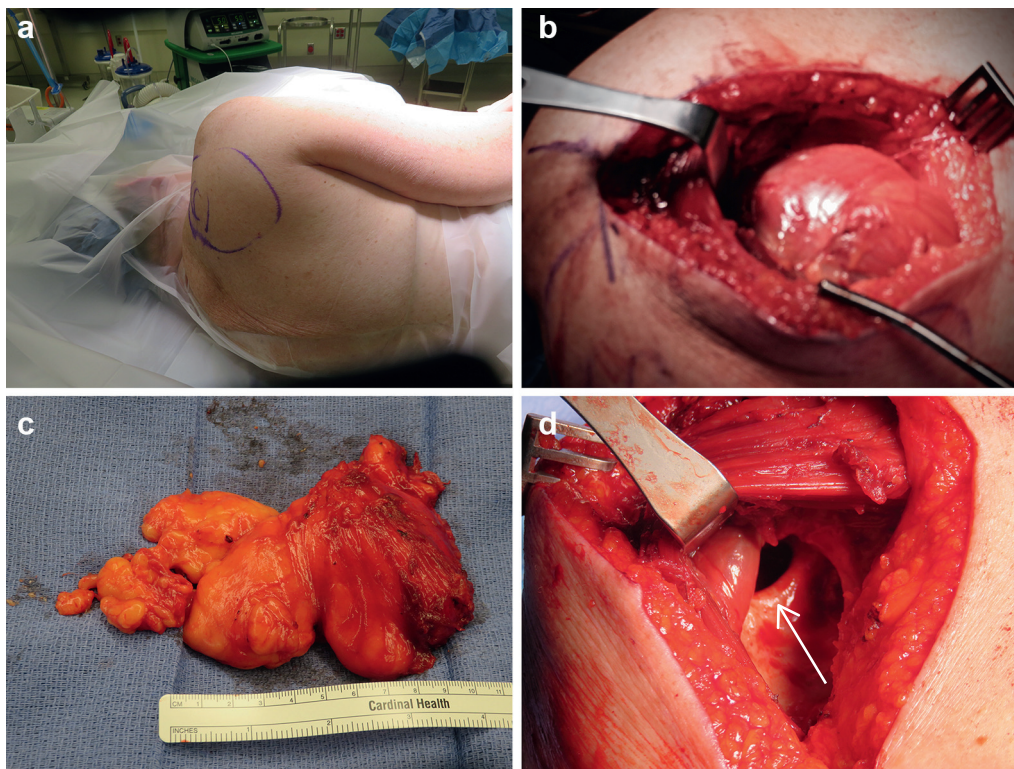


Figure 2 Intraoperative photographs demonstrating (a) patient positioning in the lateral decubitus position (note the posterior shoulder fullness); (b) posterior shoulder incision. The mass can be seen bulging into the defect beneath the deltoid and immediately underneath the infraspinatus muscle fascia; (c) en bloc excision of the mass; (d) empty supraspinatus and infraspinatus fossae resulting from medial displacement of the supraspinatus and infraspinatus muscle bellies. The arrow points to the spine of the scapula.

composed of mature noninflammatory adipose tissue consistent with a benign lipoma. The entire specimen was inked, and sectioning displayed a yellow fatty lobulated cut that was grossly unremarkable. [Figure 3](#) depicts the histology on H&E staining.

Recovery

The patient's recovery was uneventful and uncomplicated. She wore a simple sling as needed for comfort and transitioned to using the right arm as tolerated for activities of daily living. She enrolled in supervised physical therapy for active range of motion and strength training and continued physical therapy and home exercises for 6 months. Active forward elevation and abduction improved to 150° and to 110°, respectively. Active external rotation remained at neutral and passive external rotation was to 20°. Supraspinatus and infraspinatus muscle atrophy persisted. Deltoid strength was maintained but external rotation strength remained limited at 3/5. She rated her shoulder pain as 3/10 and assessed her shoulder function with an ASES score of 67 and Simple Shoulder Test of 10. She declined repeat MRI.

Discussion

Lipomas are benign fatty tumors most commonly observed around the shoulder and thigh.^{10,11} Deep-seated or subfascial lipomas, such as intermuscular or intramuscular lipomas, are rare,¹¹ accounting for about 2% of all lipomas⁵. Intermuscular and intramuscular lipomas between and within the rotator cuff muscles, including supraspinatus,^{4,7} infraspinatus,^{9,14} and subscapularis⁸ have been described. The clinical and imaging characteristics of subfascial lipomas may resemble those of well-differentiated liposarcomas, which confounds the differential diagnosis¹¹ and

supports confirmatory excisional biopsy, especially in patients with symptomatic tumors.

Subfascial lipomas around either or both of the spinoglenoid and suprascapular notch may compress the suprascapular nerve and cause weakness. Other more common causes of suprascapular nerve entrapment include spinoglenoid and suprascapular notch morphology, taut ligaments, bony excrescences, and ganglion cysts related to a chronic superior or posterior labrum tear.^{1,15} Our patient presented with severe pain and weakness, most likely related

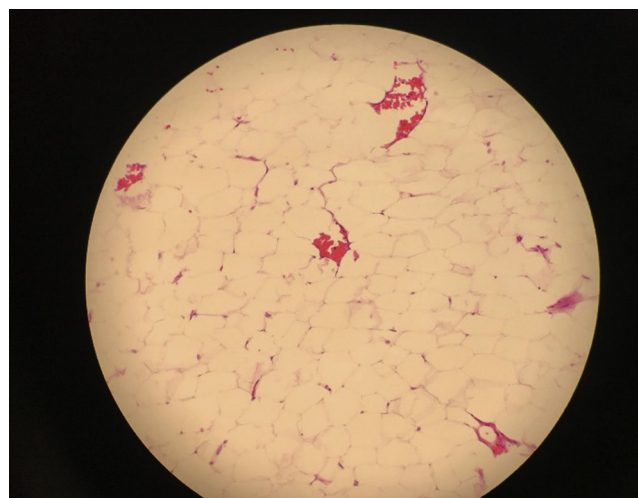


Figure 3 Representative histology consistent with benign lipoma.

to compression by the lipoma of the suprascapular nerve and axillary nerve, especially the branch to the teres minor muscle.

Others have previously reported on patients with shoulder pain and weakness resulting from intermuscular and intramuscular lipomas.^{4,7,9,16–18,20} In some cases, the symptoms related to nerve compression, as appeared to be the case for our patient, whereas in others, the symptoms mimicked shoulder impingement. Ferrari et al reported on a 45-year-old man with symptoms, attributed initially to subacromial impingement, that abated after excision of a 5-cm intramuscular supraspinatus lipoma through an open posterior approach.⁴ Relwani et al reported on a 52-year-old woman whose similar symptoms resolved after excision of a 5-cm subacromial lipomatous mass compressing the rotator cuff.¹⁶ Park et al reported on a 49-year-old woman with an intramuscular infraspinatus lipoma causing subtle positional pain without obvious nerve compression.¹⁴

In addition, several reports have described lipomas around either or both of the suprascapular and spinoglenoid notch causing direct suprascapular nerve compression.^{7,9,20} Hazrati et al reported on a 50-year-old man presenting with deltoid referred pain and modest motion deficits. An MRI revealed a lobulated homogeneous mass at the suprascapular notch and EMG revealed suprascapular nerve compression. Symptoms resolved after open mass excision and suprascapular neurolysis and ligament release.⁷ Kim et al reported on a 61-year-old man with shoulder pain and weakness suggesting a rotator cuff tear, but with an MRI demonstrating a 9.3 x 3.2 x 4.3 cm lipomatous mass at the spinoglenoid notch with evidence of suprascapular nerve compression. Shoulder strength and function recovered after marginal excision and spinoglenoid notch exploration through a posterior deltoid approach.⁹ We chose a single-stage en bloc resection without preoperative biopsy because the MRI demonstrated a mass with benign features. In addition, we did not obtain a right upper extremity EMG preoperatively because it would not influence surgical decision-making given our patient's severe pain, shoulder weakness, and MRI findings.

Arthroscopy has been combined with open excision of subfascial shoulder lipomas to treat concurrent shoulder pathology.^{2,6,7,13} We did not entertain arthroscopy for our patient because plain radiographs, MRI, and physical examination did not demonstrate any obvious rotator cuff disease or intra-articular pathology. Others have raised similar concerns regarding concurrent arthroscopy.⁴

Our 87-year-old patient is considerably older than others reported to have undergone rotator cuff muscle lipoma excision. Despite her advanced age, she experienced chronic severe right shoulder pain and dysfunction that were refractory to various nonoperative treatments and chose surgery because she did not want to suffer indefinitely. Although her improvements in comfort and function are more modest than those described elsewhere, the improvement in pain levels from 9/10 to 3/10 and the 50-point improvement in ASES score validate our decision to proceed with surgical excision.

Conclusion

This case serves as a reminder that not all older patients presenting with insidious onset pain and weakness have symptoms related to rotator cuff tears or arthritis. An intermuscular or intramuscular lipomatous tumor of the supraspinatus and/or

infraspinatus should be considered in the differential diagnosis of the older patient presenting with insidious onset shoulder pain, progressive weakness, and loss of active elevation and external rotation, especially when there is no crepitation, plain radiographs are unremarkable, and a rotator cuff tear is not apparent by ultrasonography or MRI.

Disclaimer

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References

- Boykin RE, Friedman DJ, Higgins LD, Warner JJ. Suprascapular neuropathy. *J Bone Joint Surg Am* 2010;92:2348–64. <https://doi.org/10.2106/JBJS.1.01743>.
- Egea Martínez JM, Mena JF. Lipoma of the supraspinatus muscle causing impingement syndrome: a case report. *J Shoulder Elbow Surg* 2009;18:e3–5. <https://doi.org/10.1016/j.jse.2008.09.017>.
- Fehring EV, Sun J, VanOeveren LS, Keller BK, Matsen FA III. Full thickness rotator cuff tear prevalence and correlation with function and co-morbidities in patients sixty-five years and older. *J Shoulder Elbow Surg* 2008;17:881–5. <https://doi.org/10.1016/j.jse.2008.05.039>.
- Ferrari L, Haynes P, Mack J, DiFelice GS. Intramuscular lipoma of the supraspinatus causing impingement syndrome. *Orthopedics* 2009;32:e1–e3. <https://doi.org/10.3928/01477447-20090624-24>.
- Fletcher CD, Martin-Bates E. Intramuscular and intermuscular lipoma: neglected diagnoses. *Histopathology* 1988;12:275–87.
- Greenhalgh J, Whan A, Page RS. Combined arthroscopic and open operative management of an intramuscular supraspinatus lipoma in the treatment of subacromial impingement syndrome: A case report. *Int J Surg Case Rep* 2018;51:147–9. <https://doi.org/10.1016/j.ijscr.2018.08.008>.
- Hazrati Y, Miller S, Moore S, Hausman M, Flatow E. Suprascapular nerve entrapment secondary to a lipoma. *Clin Orthop Relat Res* 2003;411:124–8. <https://doi.org/10.1097/01.blo.0000063791.32430.59>.
- Kawano Y, Nakamichi N, Matsumura N. Lipoma in the subscapularis muscle causing scapular malposition. *Shoulder Elbow* 2015;7:268–71. <https://doi.org/10.1177/1758573215592267>.
- Kim JY, Choe JS, Cho JH. A Large Size Lipoma at Spinoglenoid Notch Mimicked Traumatic Rotator Cuff Tear. *J Hand Surg Asian Pac* 2018;23:267–9. <https://doi.org/10.1142/s2424835518720141>.
- Kindblom LG, Angervall L, Stener B, Wickbom I. Intermuscular and intramuscular lipomas and hibernomas. A clinical, roentgenologic, histologic, and prognostic study of 46 cases. *Cancer* 1974;33:754–62.
- McTighe S, Chernev I. Intramuscular lipoma: a review of the literature. *Orthop Rev (Pavia)* 2014;6:5618. <https://doi.org/10.4081/or.2014.5618>.
- Neer CS 2nd, Craig EV, Fukuda H. Cuff-tear arthropathy. *J Bone Joint Surg* 1983;65A:1232–44.
- Pagán Conesa A, Aznar CV, Herrera MR, Lopez-Prats FA. Arthroscopic Marginal Resection of a Lipoma of the Supraspinatus Muscle in the Subacromial Space. *Arthrosc Tech* 2015;4:e371–4. <https://doi.org/10.1016/j.eats.2015.03.016>.
- Park HW, Jo H, Moon SH, Baek S. Painful Intramuscular Lipoma of the Infraspinatus: Unusual Location and Presentation. *Orthopedics* 2016;39:e370–3. <https://doi.org/10.3928/01477447-20160307-03>.
- Piasecki DP, Romeo AA, Bach BR Jr, Nicholson. Suprascapular neuropathy. *J Am Acad Orthop Surg* 2009;17:665–76. <https://doi.org/10.5435/00124635-200911000-00001>.
- Relwani J, Ogufero W, Orakwe S. Subacromial lipoma causing impingement syndrome of the shoulder: a case report. *J Shoulder Elbow Surg* 2003;12:202–3. <https://doi.org/10.1067/mse.2003.45>.
- Singh R, Malhotra A, Cribb G, Cool P, Hay S. Unusual lesions mimicking impingement syndrome in the shoulder joint - Think medially. *Ann Med Surg (Lond)* 2016;10:88–91. <https://doi.org/10.1016/j.amsu.2016.08.006>.
- Sucuoglu H, Akgun K. Subacromial lipoma causing shoulder impingement syndrome. *J Back Musculoskelet Rehabil* 2017;30:707–10. <https://doi.org/10.3233/BMR-140222>.
- Tempelhof S, Rupp S, Seil R. Age-related prevalence of rotator cuff tears in asymptomatic shoulders. *J Shoulder Elbow Surg* 1999;8:296–9.
- Zvijac JE, Sheldon DA, Schürhoff MR. Extensive lipoma causing suprascapular nerve entrapment. *Am J Orthop* 2003;32:141–3.