Lipoma in the subscapularis muscle causing scapular malposition

Yusuke Kawano¹, Noriaki Nakamichi² and Noboru Matsumura¹

Abstract

A 70-year-old woman had pain and fatigability of her left shoulder with asymmetric scapular position. The medial border of the scapula was more prominent in the left side compared to the right scapula, and scapular motion was different between sides. Magnetic resonance imaging showed a mass on the ventral surface of the scapula. Tumour resection was performed through the medial approach, and the tissue samples were found to be a lipoma with a pathological examination. Post-operatively, her pain immediately disappeared. Two years after surgery, no recurrence of the tumour had been found.

Soft tissue tumours have never been reported as a cause of scapular malposition or winging. We reported a case with scapular malposition and dyskinesia caused by lipoma in the subscapularis muscle. Surgical resection successfully relieved her symptoms and improved the scapular motion. Soft tissue tumour occurring in the subscapularis muscle could possibly cause abnormal scapular position and motion.

Keywords

Rotator cuff lipoma, scapular dyskinesia, scapular malposition, scapular winging, subscapularis lipoma

Date received: 26th March 2015; accepted: 28th May 2015

Introduction

Scapular winging is defined as observable alterations in scapular position and motion in relation to the thoracic cage. Neurologically-based scapular winging and the other shoulder pathologies are known causes of scapular dyskinesia. However, to the best of our knowledge, a soft tissue tumour in the rotator cuff muscle has never been reported to obstruct scapular motion. A case with lipoma in the subscapularis muscle that caused scapular malposition, and in which surgical resection improved the scapular motion, is described.

The patient was informed that data concerning the case would be submitted for publication, and she provided her consent.

Case report

A 70-year-old woman felt neck-to-shoulder pain with no apparent cause. Her pain worsened, and she had fatigability of the left shoulder during shoulder motion. Two months later, she visited our hospital complaining of difficulty in daily activities. She had

no relevant medical history and no history of trauma affecting the shoulder girdles.

The patient felt dull pain in her neck and shoulder. She had rapid fatigability during shoulder elevation and internal rotation. An asymmetric scapular position was noted. The medial border of the scapula was more prominent on the left side compared to the right side (Figure 1). The active range of motion of her left shoulder was 170° of flexion, 150° of abduction and 50° of external rotation at the side. Her thumb reached to the eighth thoracic vertebra during shoulder internal rotation. There was no side-to-side difference in the range

¹Department of Orthopedic Surgery, Keio University School of Medicine, Shinjuku-ku, Tokyo, Japan

²Department of Orthopedic Surgery, Kawasaki Municipal Hospital, Kawasaki, Kanagawa, Japan

Corresponding author:

Noboru Matsumura, Department of Orthopedic Surgery, Keio University School of Medicine, 35 Shinanomachi, Shinjuku-ku, Tokyo 160-8582, Japan.

Tel: +81 3 5363 3812

Email: noboru18@gmail.com

of shoulder motion. However, scapular dyskinesis was found in the left scapula. During shoulder elevation, her left scapula rotated more internally and tilted more posteriorly than the right scapula. Compared to the right side, the strength of shoulder internal rotation with the arm at the side was decreased in the left shoulder. However, the strength of shoulder elevation and external rotation was not different between the sides. The American Shoulder and Elbow Surgeons score was 85 points.

On radiographic examination, plain X-rays showed no abnormality. However, magnetic resonance imaging (MRI) showed a 70 mm × 50 mm × 30 mm homogeneous tumour in the subscapularis muscle (Figure 2). The tumour showed a uniformly high intensity signal on both T1 and T2 sequences, and it showed a low intensity signal on T1 fat suppression. These radiographic findings suggested that the lesion was a benign lipoma.

Figure 1. The medial border of the scapula is more prominent on the left side than on the right side.

Because she had difficulty in daily activities, surgical excision of the tumour was performed. Under general anaesthesia, she was placed in the right lateral decubitus position. A 10-cm long incision on the medial border of the scapula was made. The rhomboid major muscle was then detached from the medial edge of the scapula and retracted medially. The scapula was lifted off the chest wall, and the tumour was exposed. To avoid subscapular nerve injury, the subscapularis muscle was bluntly divided in the direction of its fibres, and the tumour was carefully divided and gradually removed from the subscapularis muscle. There was no adhesion around the tumour, and a 70 mm × 58 mm × 29 mm tumour was resected (Figure 3). Finally, the rhomboid major muscle was re-attached to the medial border of the scapula. The patient was allowed to use her arm unless she felt pain after surgery. The tumour was confirmed to be a lipoma on pathological examination.

The patient's neck-to-shoulder pain disappeared immediately after the resection. She recovered strength of shoulder internal rotation in 1 month. At the final follow-up, 2 years after surgery, she did not have any discomfort in the shoulder girdle (Figure 4), and the American Shoulder and Elbow Surgeons score improved to 100 points. Her scapular prominence and dyskinesis disappeared, and MRI showed no recurrence of the tumour.

Discussion

Abnormal scapular position and/or motion has been collectively called 'scapular winging', 'scapular dyskinesia' and, more appropriately, 'scapular dyskinesis'.¹ Scapular winging is defined as prominence of the medial border of the scapula, which is often associated

Figure 2. Magnetic resonance imaging shows a 70 mm × 50 mm × 30 mm homogeneous tumour in the subscapularis muscle (white arrows). (A) Axial section, T1-weighted image. *Tumour; HH, humeral head; S, scapula; ISP, infraspinatus muscle. (B) Oblique sagittal section, T2-weighted image. *Tumour; SSP, supraspinatus muscle, ISP, infraspinatus muscle.

Figure 3. A 70 mm × 58 mm × 29 mm tumour is resected from the subscapularis muscle through the medial approach. White arrow, tumour; black arrow, medial border of the scapula.

Figure 4. Two years after surgery, the prominence of the scapula is unclear.

with spinal accessory or long thoracic nerve palsy, and, in some cases, overt scapular weakness.² In addition to neurologically-based scapular winging, subacromial impingement,³ rotator cuff tear,⁴ clavicle fracture,⁵ acromioclavicular separation⁶ and other shoulder pathologies are known to lead to scapular dyskinesis.⁷ A few cases with a large scapular osteochondroma arising from the medial border have been reported to cause winging of the scapula.^{8–12} To the best of our knowledge, however, soft tissue tumours have never been reported as a cause of scapular winging and dyskinesis.

Lipomas are among the most common soft tissue tumours. Despite their frequency in the subcutaneous tissues, only two cases have been reported with lipomas arising in the rotator cuff muscles.^{13,14} Both cases had tumours in the supraspinatus muscle, although a lipoma in the subscapularis muscle has never been reported. Different from the other rotator cuff muscles,

the subscapularis is located between the thoracic wall and scapula. Thus, a disorder in the subscapularis muscle can obstruct scapulothoracic joint motion because of its anatomical position. Surgical resection of the tumour successfully restored scapular position and motion, and resulted in pain relief in the present case.

The present patient suffered from shoulder girdle pain and rapid fatigability associated with scapular dyskinesis, which was caused by a lipoma between the thorax and scapular body. The patient also presented with loss of strength of shoulder internal rotation, which may also have been caused by the tumour that occupied most of the subscapularis muscle area. Furthermore, any soft tissue lumps greater than 5 cm should be considered malignant until proven otherwise.¹⁵ With an appropriate pre-operative assessment, surgical treatment can lead to good results.¹⁶ Thus, surgical resection was performed in the present case. There are several surgical approaches to the ventral surface of the scapula. The classical anterior approach between the deltoid and pectoralis major muscles can be an option, although this approach has difficulty in reaching the scapular body. Arizono et al. reported the scapula-splitting posterior approach for a desmoid tumour in the subscapular region that originated from the serratus anterior muscle.¹⁷ Although this method can provide a wide operative field without endangering nerve structures, it appears to be too invasive for resection of a lipoma. Fageir et al. reported the medial approach to osteochondroma arising on the ventral surface of the scapula.⁹ They explained that the method is straightforward and safe, allowing excellent exposure of medial ventral scapular osteochondromas. This technique is useful for accessing the ventral side of the scapular body without splitting the scapula, although subscapular nerve injury may occur during the procedure. In the present case, it was possible to remove the tumour using this medial approach. We bluntly divided the subscapularis muscle in the direction of its fibres, and carefully removed the tumour from the muscle to avoid the subscapular nerve injury. At the final follow-up, MRI showed successful removal of the tumour without denervation of the subscapularis muscle.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

References

1. Kibler WB and Sciascia A. Current concepts: scapular dyskinesis. *Br J Sports Med* 2010; 44: 300–5.
2. Kuhn JE, Plancher KD and Hawkins RJ. Scapular winging. *J Am Acad Orthop Surg* 1995; 3: 319–25.
3. Lukasiewicz AC, McClure P, Michener L, Pratt N and Sennett B. Comparison of 3-dimensional scapular position and orientation between subjects with and without shoulder impingement. *J Orthop Sports Phys Ther* 1999; 29: 574–83.
4. Paletta GA Jr, Warner JJ, Warren RF, Deutsch A and Altchek DW. Shoulder kinematics with two-plane x-ray evaluation in patients with anterior instability or rotator cuff tearing. *J Shoulder Elbow Surg* 1997; 6: 516–27.
5. Matsumura N, Ikegami H, Nakamichi N, et al. Effect of shortening deformity of the clavicle on scapular kinematics: a cadaveric study. *Am J Sports Med* 2010; 38: 1000–6.
6. Gumina S, Carbone S and Postacchini F. Scapular dyskinesis and SICK scapula syndrome in patients with chronic type III acromioclavicular dislocation. *Arthroscopy* 2009; 25: 40–5.
7. Kibler WB, Sciascia A and Wilkes T. Scapular dyskinesis and its relation to shoulder injury. *J Am Acad Orthop Surg* 2012; 20: 364–72.
8. Chillemi C, Franceschini V, Ippolito G, et al. Osteochondroma as a cause of scapular winging in an adolescent: a case report and review of the literature. *J Med Case Rep* 2013; 7: 220.
9. Fageir MM, Edwards MR and Addison AK. The surgical management of osteochondroma on the ventral surface of the scapula. *J Pediatr Orthop B* 2009; 18: 304–7.
10. Mohsen MS, Moosa NK and Kumar P. Osteochondroma of the scapula associated with winging and large bursa formation. *Med Princ Pract* 2006; 15: 387–90.
11. Scott DA and Alexander JR. Relapsing and remitting scapular winging in a pediatric patient. *Am J Phys Med Rehabil* 2010; 89: 505–8.
12. Tomo H, Ito Y, Aono M and Takaoka K. Chest wall deformity associated with osteochondroma of the scapula: a case report and review of the literature. *J Shoulder Elbow Surg* 2005; 14: 103–6.
13. Egea Martinez JM and Mena JF. Lipoma of the supraspinatus muscle causing impingement syndrome: a case report. *J Shoulder Elbow Surg* 2009; 18: E3–5.
14. Ferrari L, Haynes P, Mack J and DiFelice GS. Intramuscular lipoma of the supraspinatus causing impingement syndrome. *Orthopedics* 2009; 32: 8.
15. Johnson CJ, Pynsent PB and Grimer RJ. Clinical features of soft tissue sarcomas. *Ann R Coll Surg Engl* 2001; 83: 203–5.
16. Cribb GL, Cool WP, Ford DJ and Mangham DC. Giant lipomatous tumours of the hand and forearm. *J Hand Surg Br* 2005; 30: 509–12.
17. Arizono T, Chuman H and Shiota E. Surgical treatment of a desmoid tumor from the serratus anterior in the subscapular region with use of a scapula-splitting posterior approach. *J Shoulder Elbow Surg* 2001; 10: 190–3.