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The MRI Features and Treatment of Scapulothoracic Bursitis: Report of Four Cases

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ABSTRACT

Among cases of soft tissue tumours arising between the inferior angle of the scapula and thoracic wall, scapulothoracic bursitis has rarely been reported. All the reported cases were surgically treated and there have been no reports about the results of conservative treatment observed for a long period. Therefore, we retrospectively evaluated the clinical findings, magnetic resonance imaging (MRI) features, and treatment procedures in order to elucidate the differential diagnosis for, and efficacy of, conservative treatment. The patients were those who consulted our department of orthopedic surgery from 1994 to 1998 with complaints of thoracic back tumours. The patients were 2 men and 2 women whose ages ranged from 46 to 66 years. The tumour locations, MRI findings and treatments were evaluated. The cysts appeared in the inferior angle of the scapula with the shoulder flexed and adducted. There was neither pain nor tenderness, local heat nor redness. The cysts were elastic hard, fluctuating, and less mobile and the margins were well circumscribed by palpation. The diameters were from 6 × 6 cm to 20 × 15 cm. On MR imaging, the cysts were located between the serratus anterior muscle and the chest wall. Slightly high signal intensity on T1WI, high on T2WI and fluid-fluid levels were seen in the cysts in three cases. For the treatment, in one case we performed multiple aspirations until a reduction appeared to occur. The average aspirated contents of the cyst were 100 mL to 200 mL and were bloody-serous. In two cases no special treatments were employed, and in one case the tumour was surgically removed because it was unresponsive to aspiration. In the three cases with conservative treatment, the follow-up time was 8, 9 and 25 months, respectively. The tumours had disappeared in all cases at the time of the final follow-up. High signal intensities on T1 and T2 weighted images, and fluid-fluid level on T2 weighted images were very useful MRI features for the diagnosis of scapulothoracic bursitis. Our observations indicate that conserv-

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ative treatment can be successful and surgery is not necessary except for cases with pain, excessive friction, or dysfunction.

INTRODUCTION

Among soft tissue tumours arising between the inferior angle of the scapula and the serratus anterior muscle, elastofibromas have often been reported (1). However, in regard to painful and annoying disorders arising between the articulation of the scapula and the thoracic wall, cystic tumors have rarely been described (2, 3). There is an anatomical bursa called the infraserratus bursa, and bursitis often occurs at this site (4). All the reported cases have been surgically treated (2–9) and there are no reports about conservative treatment such as by puncturing, or simply observing the natural course over a long period. We experienced four cases of bursitis, each mimicking a tumor between the scapula and the thoracic wall. The features of the occurrence sites, MRI findings, and efficacy of conservative treatment are described.

PATIENTS AND METHODS

The patients were those who consulted our department of orthopedic surgery from 1994 to 1998 with the chief complaints of thoracic back tumors. The tumor locations, MRI findings, and treatments were evaluated. The patients were 2 men and 2 women whose ages ranged from 46 to 66 years. MRI examination was done at the first medical visit, and the treatments and the clinical courses were retrospectively examined.

RESULTS

(1) Clinical findings

The tumors appeared in the vicinity of the inferior angle of the scapula with the shoulder flexed and adducted. Neither pain nor tenderness, local heat nor redness was seen at the tumor sites. The tumors were elastic hard, fluctuating, and less

Table 1. Clinical details of the patients with scapulothoracic bursitis.

Case no.	Age Sex	Duration before consultation (months)	Diameter (cm)	Aspiration times, volume, contents	Treatment	Follow up period (months)
1	66 M	1	20×15	5 times 216 mL (average) serobloody	conservative	25
2	46 F	46	7×5	not done	conservative	8
3	64 F	14	6×6	not done	conservative	9
4	64 M	7	18×10	3 times 120 mL (average) serobloody	bursectomy	–

Table 2. MRI features of reported cases.

Case no	Margin	T1-weighted images	T2-weighted images	Gd enhancement
1	smooth, well circumscribed	more than muscle, homogeneous	high, fluid-fluid level	rim enhanced, thin
2	smooth, well circumscribed	more than muscle, homogeneous	high, fluid-fluid level	rim enhanced, thin
3	smooth, well circumscribed	more than muscle, homogeneous	high, heterogeneous	rim enhanced, thin
4	smooth, well circumscribed	more than muscle, homogeneous	high, fluid-fluid level	rim enhanced, thin

mobile and the margins were well circumscribed by palpation. The tumor diameters were from 6 × 6 cm to 20 × 15 cm. Scapula floating and crepitation between the scapula and the chest wall were absent (Table 1).

(2) MRI

The tumors were located between the latissimus dorsi, serratus anterior muscle and the chest wall. Slightly high signal intensity on T1WI and high signal intensity on T2WI and fluid-fluid level were seen in the tumours in three cases. These MRI findings led us to believe that they were cystic lesions. The cyst wall was enhanced after Gd injection. Soft tissue protrusion toward the lumen of the cyst wall was not seen (Table 2).

(3) Treatment

In one case we performed multiple aspirations until a reduction in size occurred. In two cases no special treatments were undertaken and one case underwent surgical removal because the tumour was unresponsive to aspiration. The aspirated contents of the cysts were 100 mL to 200 mL and they were bloody-serous. In the three cases with conservative treatment, the follow-up time was 8, 9 and 25 months, respectively. The tumours had disappeared in all cases at the time of the final follow-up.

Representative Cases

[Case 1]

A 66-year-old man visited a nearby clinic because of a tumour in his back. The size of the tumour was 20 x 15 cm and it appeared under the inferior angle of the scapula with shoulder flexion and adduction. The tumour was elastic-hard and well circumscribed. Pain, tenderness, crepitation, and scapula ballottement were not seen (Figure 1). MRI revealed that the tumour had slightly high signal intensity on T1WI and high signal intensity on T2WI with fluid-fluid level. The margin of the tumour was enhanced by Gd injection (Figure 2a, b, c). The tumour reduced in size after several aspirations over 25 months. Afterwards, neither recurrence nor shoulder dysfunction was seen.

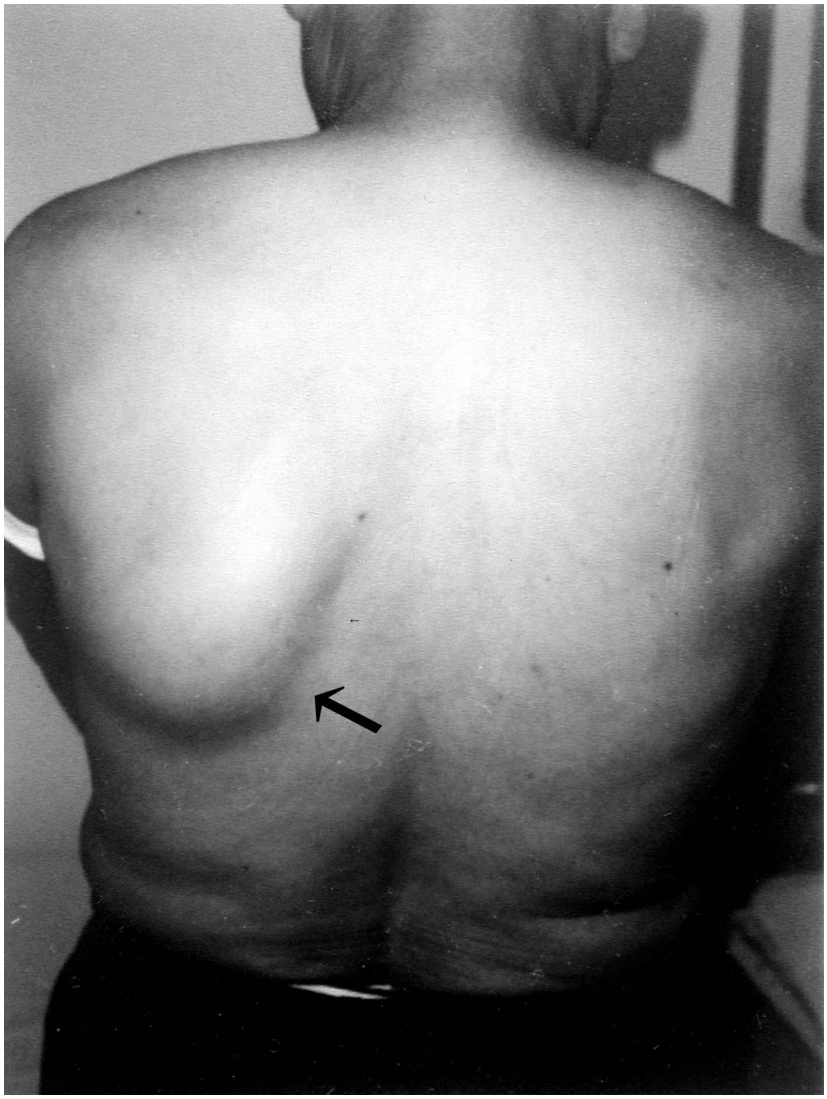

Fig. 1 The inferior scapular lesion can be seen on the patient's back. The size of the tumor was approximately 20 × 15 cm and appeared under the inferior angle of the scapula with shoulder flexion and adduction.

[Case 2]
A 46-year-old female, noticed a mass in her back and consulted a doctor. The mass appeared medial to the scapula with the shoulder in flexion and adduction positions. On MR imaging, the mass had slightly high signal intensities as compared with the muscle on T1WI and high signal intensities on T2WI with fluid-fluid level. The tumour had disappeared without treatment after 9 months.

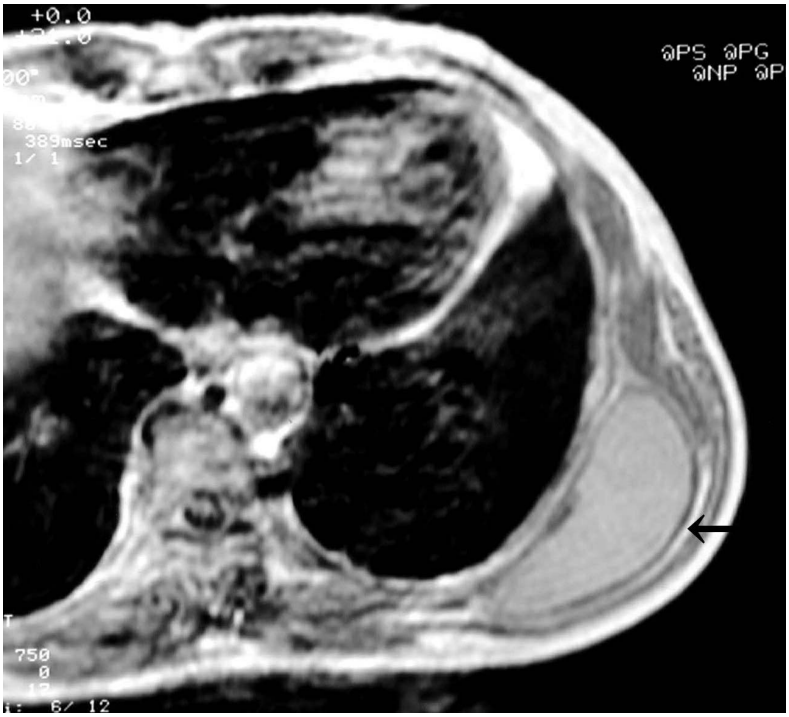

Fig. 2a

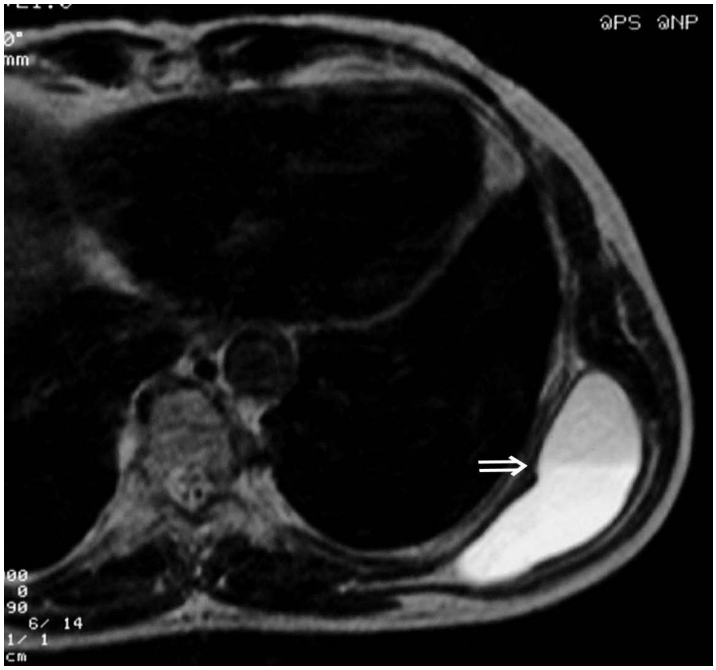

Fig. 2b

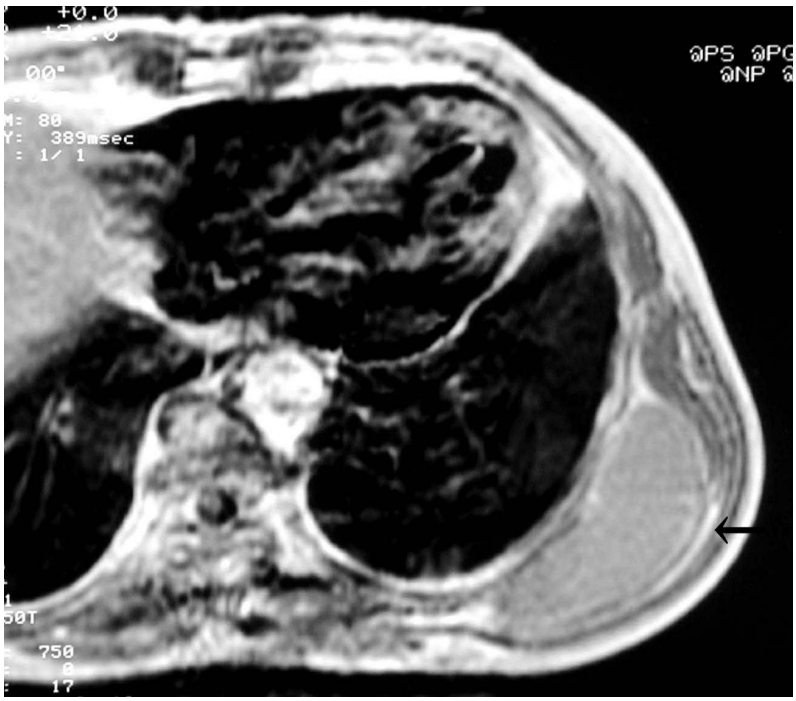

Fig. 2a, b, and c MRI displays well-circumscribed lesion on the thoracic back (the examination was done in the prone position). The mass was located between the serratus anterior muscle and thoracic wall. The tumor had slightly high signal intensity on T1-weighted image (a) and high signal intensity on T2-weighted image with fluid-fluid level (b). The margin of the tumor was enhanced after Gd injection (c).

DISCUSSION

In the scapular region, there are different bursas; the bursa between the inferior angle of the scapula and thoracic wall (9), the infraserratus bursa (10), and the scapulothoracic bursa (3). Our present cases were diagnosed as scapulothoracic bursitis that occurred between the thoracic wall and the inferior angle of the scapula.

The etiology of this type of bursitis is thought to be trauma (11), overuse from sports (3), incongruity due to osteochondroma (2, 5–8, 12), or thoracic deformity (3). In the present cases there was no apparent cause for the development of the bursitis. However, it seems reasonable that some stimulus has caused the pathological enlargement. Any repeated or constant friction between the scapula and thoracic wall might cause the bursa to become inflamed.

In 1998 Ma et al. described that synovial cysts usually have homogeneous, decreased signal intensity on T1-weighted images and homogeneous, bright signal intensity on T2-weighted images (9). The present four cases had high signal intensities on T1 and T2 weighted images. Moreover, fluid-fluid level was observed on T2 weighted images in three of our four cases. It was assumed that the rich protein content might have altered the imaging appearance in the bursal fluid and caused the

high signal intensities on the T1 weighted images. Debris and cell component precipitation were thought to form the fluid-fluid level on T2 weighted images.

The main differential diagnoses for benign cystic conditions are seroma, lymphocele, abscess. The absence of a past history of surgery and the lack of evidence of inflammation can assist in the differential diagnosis of benign lesions, which usually have a thick wall (>3 mm) and are enhanced with gadolinium administration (9). Epidermoid cyst can also be differentiated from bursitis based on the MRI findings (13). Differential diagnoses for malignant conditions including chondrosarcoma, myxoid sarcoma, and metastasis should be ruled out as well. Chondrosarcoma shows lower intensity than muscle on T1-weighted images, and a solid or thick and multiseparated rim. Most cases of myxoid sarcoma and metastasis do not show a solid rim enhanced by gadolinium (9).

In the treatment, surgery is recommended for cases that have an incongruity between the scapula and thoracic wall, and satisfactory results have been reported (2, 5–8). Bursectomy has also been recommended for cases without morphological abnormalities that have persisted with symptomatic bursitis due to habitual, repeated and constant friction between the scapula and thoracic wall (3). In our four cases of bursitis surgery became necessary in only one case, in the other three cases conservative treatment alone resulted in disappearance of the mass. The experiences from our cases indicate that conservative treatment can be proved and surgery be reserved for cases with pain, excessive friction or dysfunction.

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