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## CASE REPORT

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# A Rare Benign Tumour — Intramuscular Myxoma

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### ABSTRACT

*This report is of a patient with intramuscular myxoma of the right subscapularis. The patient had a history of parotid lymphoma. The diagnosis was confirmed by computed tomography-guided biopsy. The biopsy was positive only when the enhanced solid component was targeted. This information could be revealed by magnetic resonance imaging but not by computed tomography.*

*Key Words:* Computed tomography, Intramuscular, Magnetic resonance imaging, Myxoma

### INTRODUCTION

A middle-aged woman with a history of parotid lymphoma presented with a right axillary mass. Computed tomography (CT) -guided biopsy confirmed intramuscular myxoma. The characteristic imaging features of this benign lesion are described.

### CASE REPORT

A 43-year-old woman had a past medical history of hypertension and cirrhosis. She had been diagnosed with non-Hodgkin's lymphoma of the left parotid gland 3 years previously and was treated by surgical resection, chemotherapy, and radiotherapy. She was in complete remission.

She presented with gradual onset of a painless right axillary mass for several months. At clinical examination, there was a large mass palpable in the right axillary region that was clinically suspicious of axillary lymphadenopathy.

CT of the thorax showed a well-circumscribed 8 x 8 x 4 cm homogeneous low-density mass in the right axillary region arising from the right subscapularis muscle (Figure 1a). There was no significant contrast

enhancement within the lesion. There was no evidence of invasion into the scapula or ribs. The lungs were clear and no evidence of mediastinal or hilar lymphadenopathy was seen. The overall features favoured a non-aggressive lesion but a definitive diagnosis could not be made based on the CT findings. CT-guided biopsy was then performed in order to exclude lymphoma.

During the initial biopsy, a 20G co-axial needle was inserted into the superficial aspect of the lesion under local analgesia (Figure 1b). Three passes of a 22G Franseen needle followed. However, pathology revealed insufficient tissue.

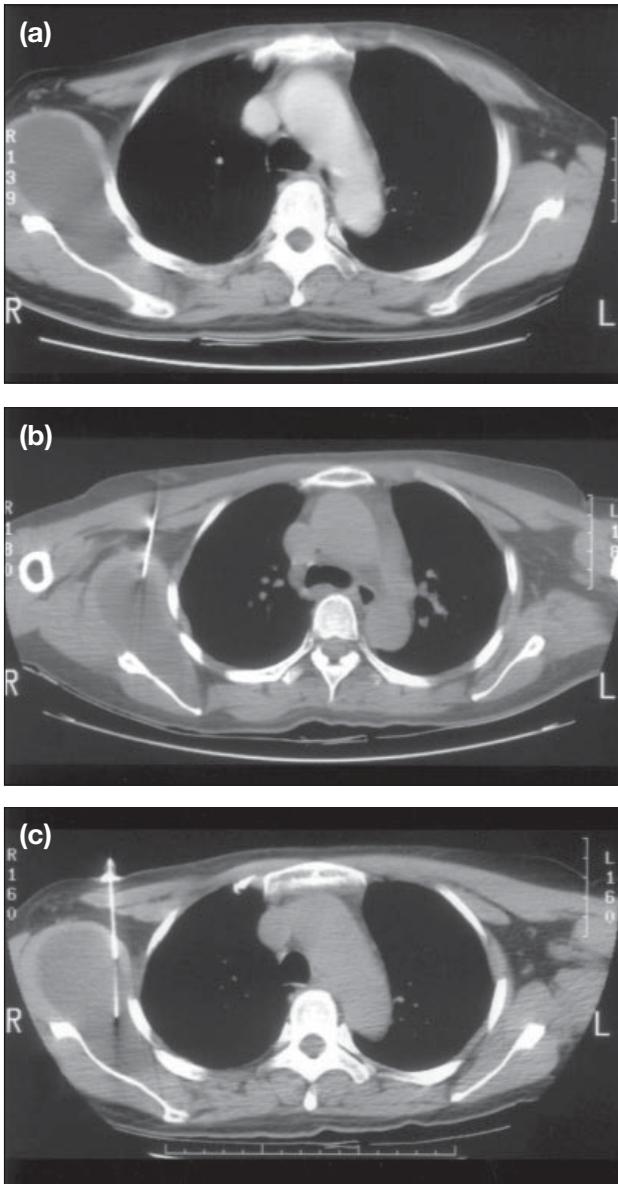
Re-biopsy of the lesion under CT guidance was performed by the same radiologist 1 week later, using the same technique but with the needle targeting the medial aspect and deeper part of the lesion (Figure 1c). The fine needle biopsy showed uniform cytologic and histologic appearances consisting of hypocellular spindle cells supported in a myxoid stroma. Nuclear pleomorphism was minimal and mitosis was not seen (Figures 2a and 2b). The pathologic appearances, together with radiologic features, are consistent with those of intramuscular myxoma.

Magnetic resonance imaging (MRI) was performed 1 month later for follow up monitoring and for delineation of the lesion's extent. Comparison with the CT scan showed no change in size, configuration, and extent of the lesion. The lesion was well demarcated in outline.

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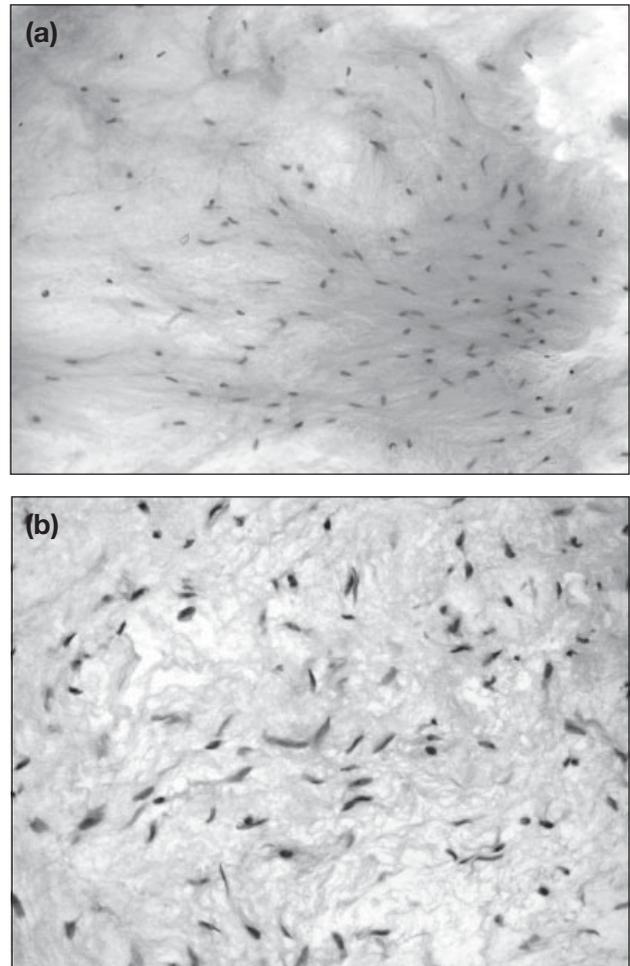
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**Figure 1.** Computed tomography showing (a) a well-demarcated, cystic, oval lesion arising from the right subscapularis muscle; (b) 20G co-axial needle inserted to the superficial aspect of the right subscapularis cystic lesion in the initial biopsy – the histology results showed that insufficient tissue was obtained; and (c) 20G co-axial needle targeted at the medial and deeper part of the right subscapularis cystic lesion in the second biopsy— the histology results showed that adequate tissue for diagnosis of intramuscular myxoma was obtained.

The lesion was hypointense on T1-weighted image (Figure 3a) and was hyperintense on T2-weighted image (Figure 3b). After intravenous gadolinium injection, the content of the lesion showed mixed cystic and solid enhancement change (Figure 3c). There was no evidence of extension or invasion into adjacent muscle and structures. The patient declined surgical resection of the lesion and had regular follow up at the Prince of Wales Hospital.

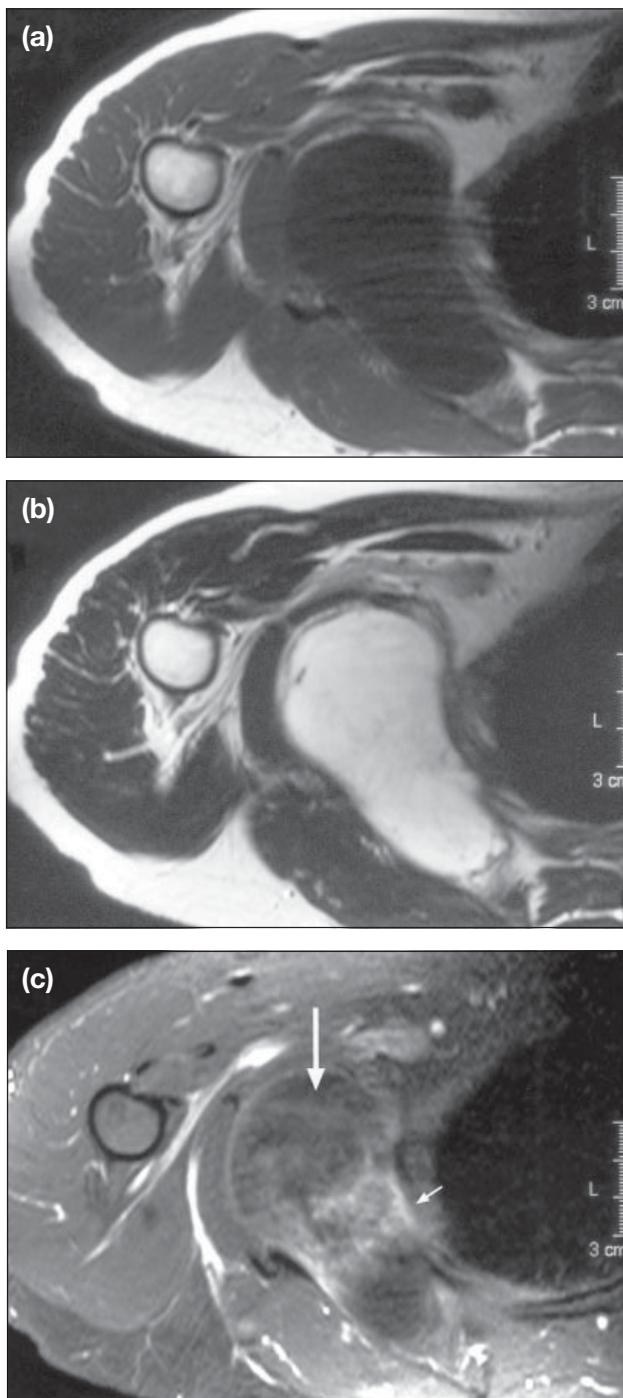


**Figure 2.** (a) Cytology smear shows hypocellular spindle cells in a myxoid background; and (b) histologic section shows hypocellular spindle cells supported in a myxoid stroma. Overall features are consistent with intramuscular myxoma.

## DISCUSSION

Intramuscular myxoma is an uncommon benign mesenchymal lesion consisting of bland spindled cells embedded in an avascular myxoid stroma. Current evidence favours an origin of myxoma from primitive mesenchymal cells that differentiate as fibroblasts, which lose their capacity to produce collagen but produce hyaluronic acid.<sup>1</sup>

Intramuscular myxoma usually occurs in adults aged between 40 and 60 years with a predilection for women (70%). The incidence varies between 0.1 and 0.13 per 100,000 population.<sup>2</sup> The condition usually presents as a solitary and painless mass that grows slowly in size. It can occur in any location but tends to involve the muscles of the thighs, buttocks, upper limbs, and shoulders. The current modes of imaging of intramuscular myxoma include ultrasound (USG), CT, and MRI. On USG, intramuscular myxoma appears as a hypoechoic lesion with



**Figure 3.** Magnetic resonance imaging of the lesion. (a) T1-weighted image shows hypointense signal change of the right subscapularis muscle lesion; (b) T2-weighted image shows the hyperintense signal change of the right subscapularis muscle lesion and mimics a cystic lesion; and (c) gadolinium enhanced T1-weighted with fat suppression image shows heterogeneous enhancement of the lesion. The superficial aspect of the lesion is hypointense and non-enhancing (large arrow), whereas the medial and deeper aspect (small arrow) shows enhancement.

a well-defined margin. Anechoic cystic foci may be present.<sup>3</sup> On CT, intramuscular myxoma usually presents as a well-demarcated homogeneous low-density lesion within

the skeletal muscle. Most of the lesions are without a capsule. The density of the lesion is lower than that of the surrounding normal muscles, with typical values between +10 and +60 Hounsfield units. There is no internal calcification or surrounding oedema. Enhancement of the lesion varies, ranging from no to mild enhancement.<sup>3</sup>

On MRI, the lesion usually appears as low-signal intensity on T1-weighted images and high-signal intensity on T2-weighted, gradient echo (T2\*) or short inversion time inversion-recovery MRI images. Most of the lesions show mild enhancement after intravenous gadolinium injection. Sometimes, MRI can demonstrate a partial capsule and oedema that are not visible on USG or CT scan.<sup>3,4</sup>

This imaging appearance of intramuscular myxoma reflects its high mucin and low collagen content. Contrast-enhanced imaging shows a mild enhancement, reflecting the solidity of the lesion compared with a cyst.

The differential diagnosis of intramuscular myxoma includes ganglion, neurofibroma, and myxoid liposarcoma. These conditions can be differentiated from intramuscular myxoma by their locations — these lesions usually arise from the intermuscular layer rather than being intramuscular in origin. Sometimes, however, it may be difficult to differentiate these lesions clinically and radiologically.

This case study illustrates that MRI is superior to CT for tissue characterisation and would provide a better guide for pre-biopsy planning. Whilst there was no definite contrast enhancement on CT scan, a large enhanced focus could readily be identified against the non-enhanced cystic background on contrast-enhanced MRI images. These findings are of clinical relevance for an optimally targeted biopsy necessary for a successful histological diagnosis.

The first CT-guided biopsy was unsuccessful, probably because of the targeting of a sub-optimal site that was retrospectively shown to be a cystic site on the following MRI. On the other hand, in the second biopsy with targeting of the medial and deeper part of the lesion, which corresponds to the area of contrast enhancement on MRI, a definite histological diagnosis could be made. We postulated that biopsy was helpful only if the enhanced focus was targeted. In retrospect, this vital information could be revealed by contrast-enhanced MRI but not by contrast-enhanced CT. Therefore, we

recommend that MRI should be done before image-guided biopsy in order to avoid unnecessary re-biopsy and to increase the diagnostic yield.

## CONCLUSION

This case report describes a rare case of intramuscular myxoma arising from the subscapularis muscle. Imaging features reflect the nature of the tumour, which is of high mucin and low collagen content. While recognition of the CT and MRI features of intramuscular myxoma is helpful for the presumptive diagnosis, MRI is recommended for pre-biopsy planning.

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