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Case Report

Post-biopsy MRI changes in the size and enhancement of intramuscular myxomas: A report of two cases

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ABSTRACT

Intramuscular myxomas are benign soft-tissue tumors, characterized by bland spindle-shaped cells and fibroblasts within an abundant mucoid matrix on histologic examination. Classically, these are slowly enlarging masses which may occasionally cause pain, paresthesia, and muscle weakness secondary to mass effect. We present an interesting phenomenon of two histologically confirmed cases of intramuscular myxomas that exhibited size and enhancement changes on follow-up imaging after image-guided biopsy. To our knowledge, this is the first report to describe size and enhancement changes of intramuscular myxomas after biopsy.

1. Introduction

Intramuscular myxomas are benign soft-tissue tumors, well-described by Stout in 1948 and later refined by Enzinger in 1965 [1,2]. These are mesenchymal neoplasms characterized by bland spindle-shaped cells and fibroblasts within a mucopolysaccharide matrix. Histologically, these tumors are identical to myxomas elsewhere in the body, and can involve the heart, bone, skin, subcutaneous tissue, and genitourinary system [2]; with the intramuscular form demonstrating no propensity for metastases, recurrence, or malignant potential. Most present as solitary tumors. Clinically, patients typically present with symptoms of a slow-growing soft tissue mass which is most often painless. If large, these can become painful and present with paresthesias and muscular weakness [2,3,4].

Given the benign nature of these lesions, surgical resection is usually reserved for symptomatic patients. However, biopsy is often performed as part of the initial workup to ascertain the diagnosis, alongside imaging. We present two histologically confirmed cases of intramuscular myxomas that changed in size and enhancement pattern on follow-up imaging after percutaneous needle biopsy. To the authors' knowledge, this is the first report to describe such changes of intramuscular myxomas after biopsy.

2. Case 1

A 55-year-old female presented with three years of progressive midline lower back pain and numbness radiating to the toes, in addition to bilateral buttock pain, right greater than left. Initial noncontrast magnetic resonance imaging (MRI) of the lumbar spine demonstrated a well-defined, T2 hyperintense lesion, measuring approximately 4 cm in maximum diameter, within the right gluteus minimus muscle. On physical examination, this right gluteal mass was not palpable and neurologic examination was unremarkable.

Dedicated contrast-enhanced MRI of the right hip was subsequently obtained on a 1.5 Tesla (T) MRI system (Signa HDxt, General Electric Medical Systems, Milwaukee, WI), which again demonstrated the ovoid mass within the right gluteus minimus muscle, measuring approximately 4.0 × 4.0 × 3.0 cm (Fig. 1). The mass exhibited T1 hypointensity and T2 hyperintensity, a rim of perilesional fat anteriorly, and subtle perilesional edema at its proximal and distal poles. After the administration of intravenous gadolinium contrast (Multihance gadobenate dimeglumine, Bracco Diagnostics, Princeton, NJ), a few fine enhancing septae and patchy peripheral enhancement were seen (Fig. 1C).

One month after initial imaging, the patient underwent CT-guided

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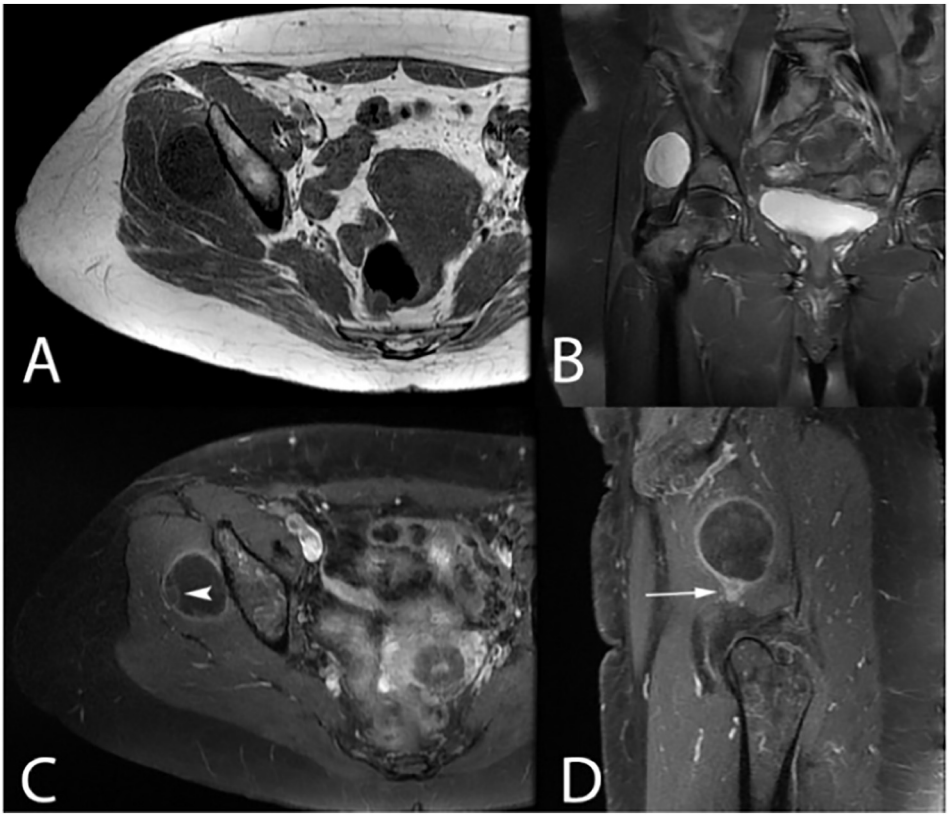

Fig. 1. Case 1 – **A** Axial T1W image demonstrates a T1 hypointense intramuscular myxoma in the right gluteus minimus muscle measuring 4.0 × 3.0 × 4.0 cm. **B** Coronal T2W fat-saturated image demonstrates homogeneous hyperintensity within the lesion. **C** Axial T1W post-contrast fat-saturated image demonstrates peripheral enhancement of the myxoma, as well as a few thin septa within the myxoma (white arrowhead). **D** Sagittal T1W post-contrast fat-saturated image demonstrates a subtle area of perilesional enhancement at the inferior pole of the myxoma (white arrow).

percutaneous biopsy of the right gluteus minimus lesion, and four core samples were obtained using a 14-gauge biopsy through a 13-gauge coaxial needle (SuperCore Semi-Automatic Biopsy Instrument, Argon Medical Devices, Plano, TX). Histology demonstrated focal infiltration of skeletal muscle by a myxoid, bland spindle-cell neoplasm, which was negative for S100, SMA, desmin, and beta-catenin; these findings were consistent with an intramuscular myxoma (Fig. 2).

Surgical resection was deferred since the patient's symptoms of lumbar radiculopathy were determined to be unrelated to the myxoma, and this mass was followed with serial MRI. Subsequent imaging demonstrated a decreased size of the myxoma at 2 and 6 months post-biopsy, measuring 2.5 × 3.5 × 2.5 cm and 1.6 × 2.8 × 1.8 cm, respectively. Overall, there was a diffuse central enhancement pattern, compared to the pre-biopsy peripheral enhancement pattern (Fig. 3).

However, at ten months post-biopsy, MRI demonstrated regrowth of the mass to approximately its original presentation size, measuring 3.7 × 3.2 × 3.9 cm. Overall, there was increased central heterogeneous enhancement (Fig. 3). Due to worsening symptoms, this mass was subsequently resected three months later, and confirmed the initial pathologic diagnosis of an intramuscular myxoma measuring 4.5 × 3.2 × 4.0 cm, surrounded by a thin, fibrous pseudocapsule (Fig. 4). Histology again demonstrated a bland spindle cell neoplasm within abundant mucoid matrix. There was no evidence of increased vascularity as compared to the biopsy specimen. Some areas of the specimen demonstrated pseudolipomatous change (Fig. 5). After resection, the patient reported a slight decrease in right-sided buttock pain, though the symptoms of lumbar radiculopathy persisted.

3. Case 2

A 55-year-old female presented with a four month history of a painful right posterior thigh mass. Physical examination was notable for a firm, palpable mass in the posterior thigh, without motor or sensory deficits. Initial sonographic examination revealed a noncompressible hypoechoic, complex, and well-defined mass measuring up to 5.2 cm, without internal vascularity (Fig. 6). Dedicated contrast-enhanced MRI of the right thigh on a 1.5 T MRI system (Signa HDxt, General Electric Medical Systems, Milwaukee, WI) revealed a 3.4 × 4.5 × 4.5 cm, well-defined, intramuscular ovoid mass in the long head of the biceps femoris muscle causing mass effect upon the adjacent sciatic nerve (Fig. 7). There was mild perineural enhancement of the sciatic nerve, which may be from vascular congestion or secondary compressive neuropathy (Fig. 7B). With contrast, there was no internal enhancement, but the mass showed mild peripheral enhancement and perilesional edema on fluid-sensitive sequences. Additionally, there were peritumoral fat rinds superiorly and inferiorly; altogether, these findings likely represented an intramuscular myxoma. A CT-guided percutaneous biopsy was performed one month later, with five cores obtained using the same needle system and technique as in the first patient, and biopsy confirmed the diagnosis of an intramuscular myxoma.

Ten months after biopsy, surveillance MRI demonstrated a marked decrease in size of the myxoma to approximately 1.1 × 1.8 × 1.7 cm (Fig. 8). In contrast to the pre-biopsy pattern of enhancement, the mass now showed heterogeneous central enhancement with minimal perilesional edema.

Interestingly, follow-up MRI performed twenty months after biopsy demonstrated a slight increase in size of the myxoma, measuring 2.0 × 3.0 × 3.9 cm, with slightly decreased internal enhancement. However, repeat images performed approximately three and four years post-biopsy demonstrated progressively decreasing size, measuring 1.5 × 2.5 × 2.9 cm and then 0.9 × 2.0 × 1.9 cm, respectively (Fig. 8).