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CASE REPORT

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Rare forearm intramuscular myxoma: A case report

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Key Clinical Message: Intramuscular myxoma (IMM) is a benign soft tissue tumor of mesenchymal origin that occurs mainly in skeletal muscles which can be removed through surgery after diagnosis.

Abstract: Intramuscular myxoma (IMM) is a benign soft tissue tumor of mesenchymal origin that typically occurs in skeletal muscles. Its diagnosis is based on magnetic resonance imaging (MRI) and histopathologic evaluation of the lesion. In our report, we describe the case of a 60-year-old female with an IMM in the supinator muscle of the right forearm, which was confirmed by MRI and histopathologic examination. Following surgery to remove the mass, a follow-up confirmed the patient's recovery and the absence of movement limitations in the elbow joint.

KEYWORDS
benign tumor, forearm, intramuscular myxoma, mesenchymal neoplasm

1 | INTRODUCTION

Intramuscular myxomas (IMMs) are benign soft tissue tumors that are rare and account for 0.1–0.13 cases per 1,00,000 population.[1] Various theories have been proposed to explain the mechanism of IMM occurrence. Some researchers suggest that it may be due to fibroblasts that are unable to synthesize collagen fibers, leading to the synthesis of myxoid stroma without reticular fibers. Others consider traumatic mechanisms or the growth of polysaccharide-producing cells to be the etiology of IMM.[2] These tumors can occur in the buttocks, thigh, upper extremities, and shoulder muscles. Epidemiologically, their occurrence rate is higher in women (70%), increases with age (sixth and seventh decades of life), and the most common site of occurrence is in the upper extremity muscles (50%–60%).[3]

Magnetic resonance imaging (MRI) is the most important diagnostic tool for distinguishing IMM from other soft tissue lesions. It can be seen as a homogeneously hypointense mass in T1-weighted sections and hyperintense in T2-weighted sections.[4] In cases where edema is present with IMM in MRI sections (T1-weighted sections), it should be differentiated from other fluid-containing lesions, such as cystic teratoma, hematoma, myxoid sarcoma, cystic hygroma, and even normal lymph nodes.[5] In the present case, an intramuscular myxoma was observed in the inter-supinator muscle of the forearm.

2 | CASE REPORT

A 60-year-old female presented to the hospital with edema, progressive pain in the anterior-proximal side of the right

forearm, palpable well-defined masses with a high growth rate, and movement limitation during forearm flexion. Physical examination revealed a mobile tumor mass with specific boundaries inside the supinator muscle (anterior aspect of elbow joint) that did not exhibit any inflammatory or secretion symptoms. Sagittal and coronal MRI T2-weighted sections confirmed a 3.5×2.5×2 cm well-defined high-signal mass in the antero-proximal elbow joint and inside the supinator muscle (Figures 1 and 2).

During surgery, a longitudinal incision was made in the anterior area of the elbow joint on the supinator muscle at the site of the tumor lesion, and the encapsulated mucoid-gelatinous gray myxoid mass measuring 3.5×2.5×2 cm was removed from the muscle.

2.1 | Histopathologic evaluation

Histopathologic evaluation of the tumor mass revealed it to be a hypocellular capsule containing scattered fibroblasts (spindle or stellate cells) in a mucoid background. Thin collagen fibers and small cells with hyperchromatic nuclei and scanty cytoplasm were also scattered throughout the lesion. No cystic degeneration, mitosis, or necrosis were observed (Figure 3).

2.2 | Post-operation and follow-up

After 2 weeks of follow-up, no signs of inflammation, hematoma, pain, or infection were observed in the surgical area. Movement tests showed no limitation of movement in flexion-extension of the elbow joint (Figure 4).

3 | DISCUSSION

IMM is a rare benign soft tissue tumor that is believed to occur due to incomplete differentiation of mesenchymal cells into fibroblasts. However, it can also be a part of McCune-Albright syndrome and Mazabraud's syndrome, caused by mutations in the GNAS gene.[6,7] The term myxoma was first applied by Virchow in 1863 to describe a soft tissue tumor of mesenchymal cell origin. Stout, in 1948, described the histopathologic criteria for the diagnosis of myxoma and its differentiation from other lesions.[8] IMM typically presents as a capsular mass with hypocellular tissue in a mucoid background with scattered reticular fibers in the skeletal muscles. If not diagnosed or treated in time, it can cause movement limitation in the joint, interfere with the action of the involved muscle, and compress the nerves in the area. However, IMM has a good prognosis, and supportive measures such as physiotherapy usually result in the involved muscle/joint following its anatomical function.[3]

In MRI evaluation, differential diagnosis of a forearm mass with high water content (mimicking a cyst) includes synovial cyst, ganglion, bursa, neurogenic tumor, myxoid liposarcoma, and malignant fibrous histiocytoma. The majority of synovial cysts, bursae, and ganglia occur at typical locations such as the popliteal fossa and dorsal aspect of the wrist.[8] These lesions are typically seen in

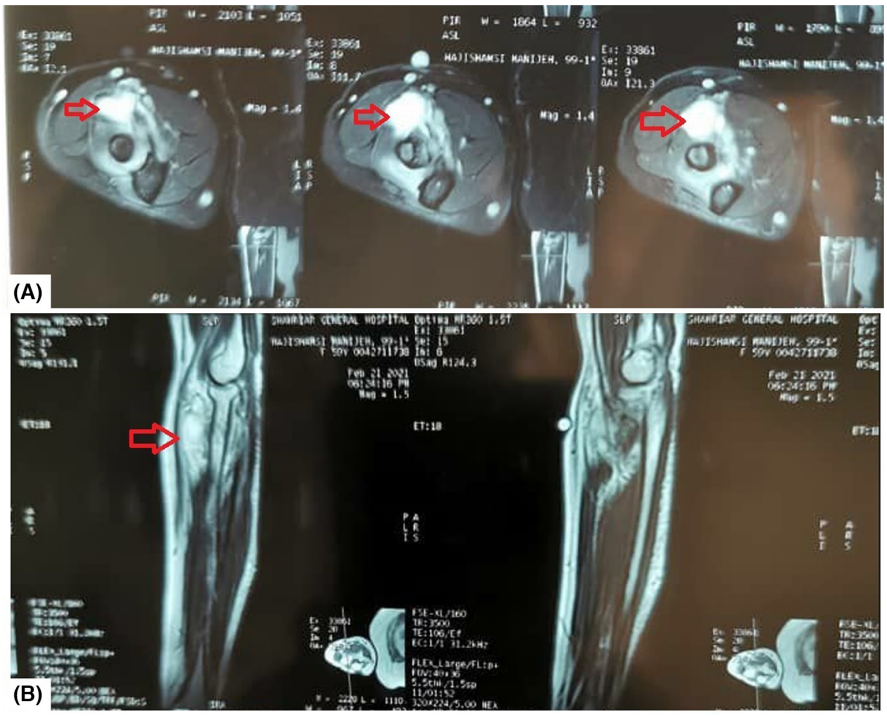

FIGURE 1 (A) Sagittal and (B) Axial MRI section showing high-signal intensity on T2-weighted images in soft tissue lesions. The red arrow indicates IMM inside the supinator muscle.

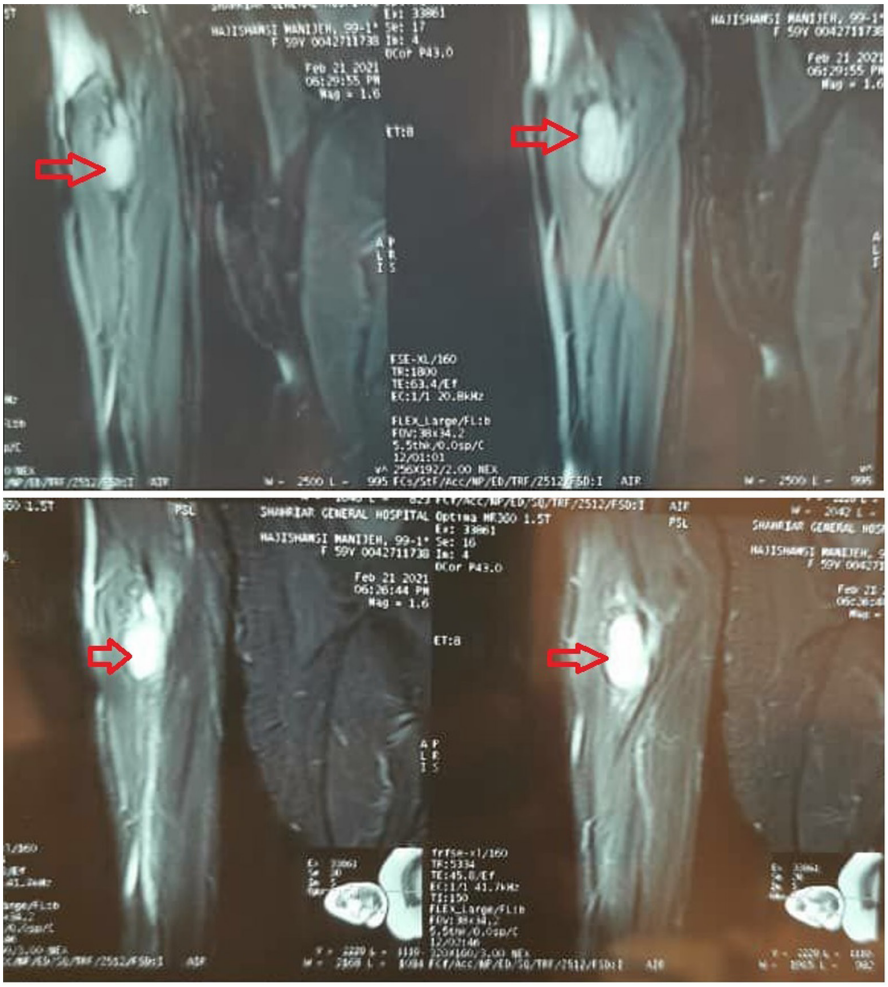

FIGURE 2 Coronal MRI section showing high-signal intensity on T2-weighted images in soft tissue lesions. The red arrow indicates intramuscular myxoma inside the supinator muscle.

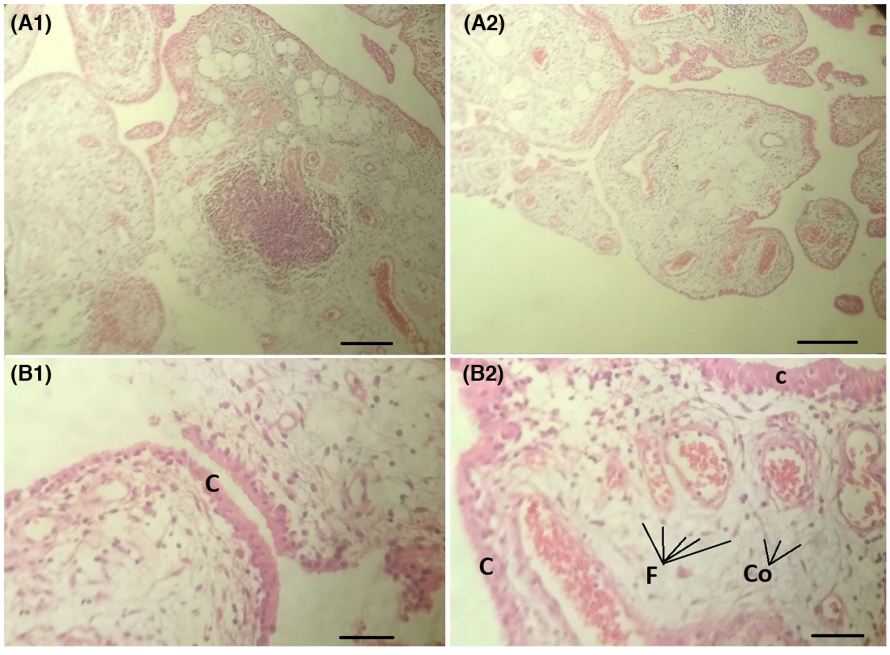

FIGURE 3 Histopathology of IMM masses. IMM with thin capsule, fibroblasts (spindle or stellate cells) and hypocellular mucoid background containing thin scattered collagen fibers. C: capsule, F: fibroblasts, and Co: collagen fibers [(A1 and A2) H & E staining ×100, Scale bar = 200 μm and (B1 and B2) H&E staining ×400, Scale bar = 50 μm].

intermuscular planes, whereas most soft tissue myxomas are intramuscular. Furthermore, as compared to intramuscular myxoma, these lesions show a cystic nature with peripheral rim enhancement and delicate septae, which are only seen on post-contrast computed tomography and MRI images.[9]

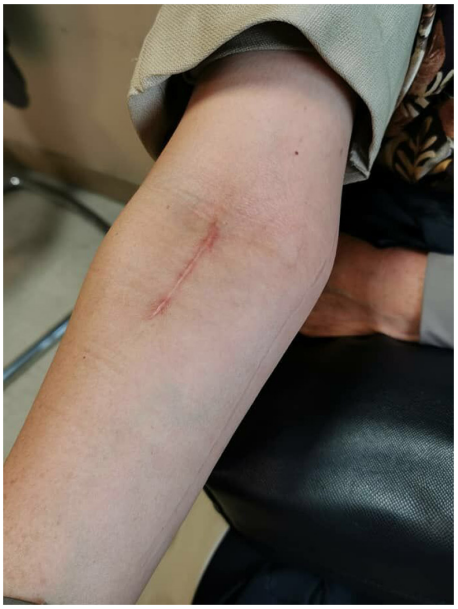

FIGURE 4 The surgical site of the right forearm of a 60-year-old female patient with IMM after healing of the incision site and follow-up physical examinations of supinator muscle and elbow joint functions.

IMM appears as an ovoid-shaped mass with low-signal intensity in T1-weighted images and as high signal intensity in T2-weighted images. In the present case, a hyperintense egg-shaped mass was observed in T2-weighted sections inside the supinator muscle.[10] *Adamonis* et al. (2019) also reported the presence of IMM in the deltoid muscle in a 34-year-old man, whose tumor lesion was observed in T2-weighted images with a hyperintense appearance. Histopathologic evaluation confirmed the presence of spindle-stellate fibroblast cells in a mucoid background with scattered collagen fibers of deltoid IMM.[4] In the present case, the mass has a thin capsule around the homogenous hypocellular mucoid tissue, in which the spindle-shaped cells (fibroblasts) are located in scattered collagen fibers. Reports of upper extremity IMM cases show that lesions in the muscles are typically removed subcutaneously after surgery, causing few complications.[7] Movement limitations caused by IMM are quickly resolved with physiotherapy if the nerves of the brachial plexus are not compressed.

4 | CONCLUSION

Cases with IMM should be differentiated from other connective tissue lesions using various diagnostic methods. MRI is a useful tool for diagnosing IMM and distinguishing it from other skeletal muscle lesions, which is confirmed by histopathologic evaluation of the lesion after biopsy. Despite its rapid growth, IMM is a benign lesion with a good prognosis after surgery and removal.

AUTHOR CONTRIBUTIONS

Hosein Pirmohamadi: Conceptualization; supervision; writing – review and editing. **Mahmood Jafar Begloo:** Supervision; writing – review and editing. **Mohsen Rahimi:** Supervision; writing – review and editing. **mohsen Akbaribazm:** Conceptualization; writing – original draft; writing – review and editing.

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CONFLICT OF INTEREST STATEMENT

The authors declare that there is no conflict of interest.

DATA AVAILABILITY STATEMENT

All data associated with the article is available if required.

CONSENT

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

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