An extremely rare case of an intramuscular nuchal type fibroma in distal arm

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Section: Musculoskeletal system
Area of Interest: Musculoskeletal soft tissue
Musculoskeletal joint
Procedure: Diagnostic procedure
Procedure: Biopsy
Imaging Technique: MR
Imaging Technique: Experimental
Special Focus: Neoplasia Case Type: Clinical Cases

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Patient: 48 years, male

Clinical History:

A 48-year-old man was referred for plain radiography and MRI with history of a painless swelling in distal right arm gradually enlarging in size over the past 2 months. He had undergone an ultrasound guided biopsy elsewhere which proved to be inconclusive on histopathology. Surgical excision was planned.

Imaging Findings:

Plain radiographs revealed soft tissue swelling along the anteromedial aspect of distal right arm with no internal calcification or underlying bony changes. MRI showed a relatively well defined mass lesion with predominant hypointense signal on all sequences located within the brachialis muscle in distal arm. The lesion showed heterogeneous enhancement on post contrast images. Irregular areas of T1W hypointense/STIR hyperintense signal and contrast enhancement were also seen in subcutaneous soft tissues along medial aspect of the mass suggestive of inflammatory changes due to previous biopsy.

The lesion was also seen abutting the anterior margin of distal right humerus. No abnormal marrow signal changes were however noted within the humerus. The neurovascular structures were displaced anteriorly by the mass. No definite extension of the mass beyond muscle margin was seen. A possibility of an intramuscular fibrous soft tissue tumour was put forth based on MRI findings. Histopathology revealed a nuchal-type fibroma.

Discussion:

Nuchal type fibroma (NTF), classified as a type of benign fibrous proliferation, is a rare tumour-like process that usually occurs in the nuchal and interscapular regions [1, 2]. Although the process is considered benign, it has a potential for recurrence. A male predominance has also been reported. Histopathologically NTF is composed of paucicellular collagenous connective tissue with entrapped adipocytes, nerves and blood vessels. Extension into skeletal muscle is seen in some cases. NTFs are named so due to the fact that they mimic the thick collagenous tissue normally residing in the nuchal area [1]. Extranuchal sites of occurrence have been described in case studies. The most common location for extranuchal NTF was the upper back, but facial, chest wall, extremity and other locations have been described [1, 3]. Extranuchal NTFs also show histology similar to the nuchal sites [1].

MRI is an invaluable tool in the evaluation of soft tissue tumours. Fibrous tumours in general show hypointense...
signal on T1 and T2 weighted images. T2 weighted images in particular have been shown to reveal information related to histology. Fibrous tumours that have low cellularity and dense collagenous components usually show lower signal intensity on T2 weighted images. Cellular tumours tend to appear hyperintense on T2 weighted images and are associated with a higher risk of recurrence. Most fibrous soft tissue tumours also show enhancement on post contrast images [2]. Calcification in a soft tissue mass may also result in hypointense signal on MRI. Calcification can however be reliably excluded on conventional radiography or CT. Any underlying bony changes are also well seen on plain radiographs or CT.

Our case was peculiar due to the fact that the soft tissue tumour with hypointense signal on all sequences was entirely intramuscular, located within the brachialis muscle in distal arm. Calcification and underlying bony changes were excluded using plain radiography. Based on MRI features a diagnosis of a fibrous soft tissue tumour was made and possibilities of extra-abdominal desmoid tumour and desmoplastic fibroblastoma were put forth based on propensity for muscle involvement [2, 4]. At surgery a firm ovoid soft tissue mass was excised from within the brachialis muscle and histopathology revealed features consistent with a NTF. Although cases of NTF involving adjacent skeletal muscle have been described [1, 3], NTF occurring primarily in an intramuscular location has not been previously reported to the best of our knowledge.

**Differential Diagnosis List:** Nuchal type fibroma within the brachialis muscle in distal arm., Extra abdominal desmoid tumour, Desmoplastic fibroblastoma

**Final Diagnosis:** Nuchal type fibroma within the brachialis muscle in distal arm.

**References:**


**Description:** T1W sagittal image showing a relatively well defined mass lesion with predominant hypointense signal within the brachialis muscle anterior to the distal humerus. **Origin:** Department of Radiology and Imaging Sciences, Billroth Hospitals, Chennai, India.
Description: T2W sagittal image also shows a predominantly hypointense mass lesion within the brachialis muscle. Origin: Department of Radiology and Imaging Sciences, Billroth Hospitals, Chennai, India.
Description: T1W coronal image shows a hypointense mass lesion within the anteromedial aspect of brachialis muscle. Few irregular hypointense areas in the subcutaneous soft tissue medial to the mass are likely related to previous biopsy. Origin: Department of Radiology and Imaging Sciences, Billroth Hospitals, Chennai, India.
Description: Coronal STIR image showing the intramuscular hypointense mass lesion within the brachialis muscle and the likely post biopsy subcutaneous soft tissue changes. Origin: Department of Radiology and Imaging Sciences, Billroth Hospitals, Chennai, India.
Description: STIR axial image shows a hypointense mass within the brachialis muscle focally abutting the anterior margin of humerus and displacing neurovascular structures anteriorly. Likely post-biopsy changes also seen in medial subcutaneous soft tissues. Origin: Department of Radiology and Imaging Sciences, Billroth Hospitals, Chennai, India.
Description: Sagittal image shows heterogeneous contrast enhancement within the mass lesion.
Origin: Department of Radiology and Imaging Sciences, Billroth Hospitals, Chennai, India.
**Description**: Coronal image showing enhancement within the mass lesion and in soft tissues along the likely biopsy path. Vascular structures appear displaced around the lesion. **Origin**: Department of Radiology and Imaging Sciences, Billroth Hospitals, Chennai, India.
Description: Axial image shows an enhancing mass lesion within the expanded brachialis muscle displacing neurovascular structures anteriorly and abutting anterior margin of humerus. Enhancement also seen in soft tissues along likely path of previous biopsy. Origin: Department of Radiology and Imaging Sciences, Billroth Hospitals, Chennai, India.
Description: A rounded soft tissue opacity along the medial aspect of the distal humerus is seen. No significant calcification is seen within this opacity. The underlying bones appear normal. Origin: Department of Radiology and Imaging Sciences, Billroth Hospitals, Chennai, India.
Description: A prominent soft tissue opacity is noted anterior to the distal right humerus on the lateral view. No significant underlying bony abnormality is noted. The elbow joint appears unremarkable.

Origin: Department of Radiology and Imaging Sciences, Billroth Hospitals, Chennai, India.
**Description:** Histopathology revealed a poorly circumscribed unencapsulated neoplasm of low cellularity composed of spindle cells embedded in pinkish collagen bundles with scattered thin blood vessels, nerve bundles, muscle fragments and adipose tissue. **Origin:** Department of Radiology and Imaging Sciences, Billroth Hospitals, Chennai, India.