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Superficial radial nerve compression due to fibroma of the brachioradialis tendon sheath: A case report

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ABSTRACT

Fibroma of the tendon sheath (FTS) is a rare benign tumour that usually develops in the upper extremity, particularly in the fingers, hands and wrists. Herein, we present the case of a patient with an unusually localised FTS compressing the superficial branch of the radial nerve. A 62-year-old woman presented with a superficial radial nerve compression due to FTS of the brachioradialis. Histopathological diagnosis was confirmed as a FTS after marginal excision. The patient who had compression-related symptoms in the superficial branch of the radial nerve recovered completely at one month after surgery. One year later, the patient remained free of symptoms and no recurrence was observed.

Introduction

Fibroma of the tendon sheath (FTS) was first reported by Burton in 1923.[1] Following this, the first detailed description of FTS was presented by Geschickter and Copeland in 1949.[2] A study including a series of 138 cases of FTS was published by Chung and Enzinger in 1979.[3] FTS is a rare benign tumour that usually develops in the upper extremity, particularly in the fingers (49%), hands (21%) and wrists (12%).[4] In the literature, FTS, which causes nerve compression, was generally reported in isolated case reports.[5–8] Herein, we present the case of a patient with an unusually localised FTS compressing the superficial branch of the radial nerve.

Report of the case

A 62-year-old woman presented with a 3-month history of a slowly enlarging and mildly tender mass in the left distal forearm. She did not have a history of trauma. Moreover, no skin adhesion was observed, and her skin colour was normal. She complained of paraesthesia and numbness over the dorsoradial aspect of the hand in the distribution of the superficial radial nerve. Physical examinations revealed a palpable mass, which was immobile and not pulsative in the anterolateral aspect of the distal forearm. A positive Tinel's sign over the distribution of the left superficial branch of the radial nerve was confirmed. The diagnosis was made by typical distribution of pain and sensory change. She had a radiating pain over the dorsal radial aspect of the hand on percussion of the mass and complained of hypoaesthesia over the dorsal radial aspect of the hand on examination. Electromyography and nerve conduction studies confirmed the sensory deficit of the radial nerve with no other abnormality. Conventional radiographs revealed normal results. Magnetic resonance imaging (MRI) revealed a multilobulated, well-circumscribed mass with homogeneous low isointensity on both T1-and T2-weighted images of the distal forearm (Fig. 1A and B).

The patient underwent surgery, and a longitudinal incision was made over the swelling radial aspect of the forearm. The tumour (4.5 × 2.7 × 1.5 cm) was identified partly above of the brachioradialis tendon (Fig. 2A). It was well-circumscribed, firmly adherent to the brachioradialis tendon and compressed the superficial radial nerve at this level. Moreover, the tumour pushed the radial artery towards the flexor carpi radialis tendon (Fig. 2B). A complete tumour excision was performed, and the tendon, radial artery and superficial radial nerve were preserved (Fig. 2C). Histopathological examinations revealed that the mass was FTS, which was a

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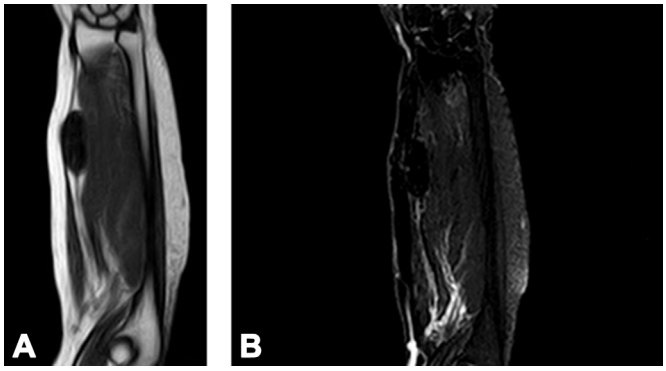

Fig. 1. Magnetic resonance imaging of the left forearm, coronal T1-**(A)** and T2 fat-saturated **(B)**-weighted sequence. Well-circumscribed mass with homogeneous low isointensity on both T1-and T2-weighted images of the distal forearm.

hypocellular mass comprising spindle-shaped cells distributed irregularly within the dense fibrosclerotic stroma. The well-circumscribed tumour was lobulated with no infiltrative border, necrosis and mitosis or cellular atypia (Fig. 3).

No operative or postoperative complications, such as infection and bleeding, were observed. The patient who had compression-related symptoms in the superficial branch of the radial nerve recovered completely at one month after surgery. One year later, the patient remained free of symptoms and no recurrence was observed. Written informed consent was obtained from the patient for publication of this case report.

Discussion

FTS is an uncommon soft tissue tumour, which can develop at any age. However, it is usually observed in adults between 20 and 40 years of age, and men are more commonly affected compared with women, with a ratio of 1.5:1 to 3:1.[3,9] Approximately 75%–82% of FTS develops in the upper extremities, which are usually localised in the fingers, hands or wrist tendons.[10] The symptoms of nerve compression have been described in individuals with FTS in the wrist and distal forearm, which presents as median nerve and ulnar nerve neuropathy.[7,8,11] However, to the best of our knowledge, FTS causing the compression of the superficial branch of the radial nerve has not been previously described in the literature and its development in the brachioradialis tendon has never been reported.

The aetiology is unknown, less than 10% of patients have reported a history of trauma.[9,10] In the present study, the patient did not have a history of trauma in the region. Moreover, changes in the tumour due to chromosomal abnormality of 2:11 translocation may cause FTS.[12]

The diagnosis of FTS is based on the patient's history, clinical examination and MRI and histology results. Clinically, FTS presents as solitary, painless and slowly enlarging subcutaneous mass. Some patients present with localised tenderness and pain due to the compression of the underlying nerves.[3,5–9] In the present study, the patient presented with a palpable mass deeply located in the left distal forearm. The patient complained of paraesthesia and numbness over the dorsoradial aspect of the wrist due to the compression of the superficial radial nerve.

On MRI, FTS presented as a well-defined mass with homogeneous low isointensity on T1-weighted images, whereas its signal intensity is more variable on T2-weighted images and may range from low to high. The variations in the appearance of FTS on MRI can be attributed to the diversity of its histological appearance. The hyalinised forms tend to have a lower signal on T2-weighted images, whereas the cellular variants tend to have a higher signal on T2-weighted images.[10,11,13,14] In this case, MRI revealed a multilobulated, well-circumscribed mass with homogeneous low isointensity on both T1-and T2-weighted images in the distal forearm. When we correlated the imaging results with histological findings, we believed that both T1-and T2-weighted images resulted in homogeneous low signal intensity due to the presence of relatively more collagen bundles in our case.

Microscopic examinations revealed a hypocellular benign tumour comprising rare scattered spindle-shaped cells interspersed between the dense fibrosclerotic stroma, and these were typical histological findings of FTS.

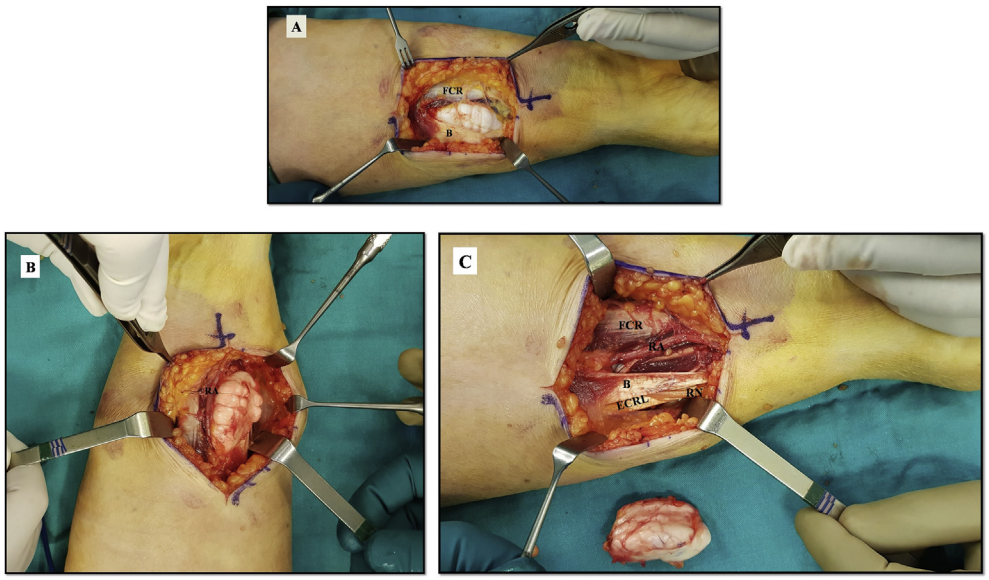

Fig. 2. Operative view of the fibroma of the tendon sheath (FTS) **(A)**. FTS firmly adhered to the brachioradialis tendon and compressed the superficial radial nerve at this level and the tumour was pushed the radial artery toward the flexor carpi radialis tendon **(B)**. The appearance of associated anatomical structures after tumour excision **(C)** (B: brachioradialis, FCR: flexor carpi radialis, RA: radial artery, RN: radial nerve and ECRL: extensor carpi radialis longus).

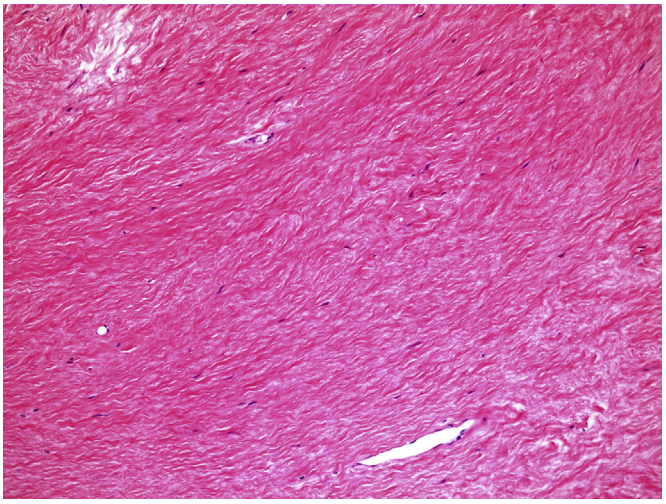

Fig. 3. Histologic findings of the fibroma of the tendon sheath. The tumour comprised rare scattered spindle-shaped cells interspersed between the dense fibrosclerotic stroma (Haematoxylin and Eosin staining, ×200).

Other soft tissue tumours of the forearm, such as lipoma, leiomyoma, neurofibroma, schwannoma, giant cell tumour of the tendon sheath and desmoplastic fibroma, should also be considered during a differential diagnosis.[15,16] Typically, these masses can be identified using their clinical characteristics. Moreover, they can be further evaluated via imaging studies, and histological evaluations can be performed accordingly.

Superficial radial nerve compressive neuropathies due to internal causes, such as ganglion cyst, lipomas, parosteal lipoma of the proximal forearm, lipofibromatous hamartomas, accessory brachioradialis muscle and intraneural lipoma of the radial nerve, have been reported.[17–23] However, to our knowledge, superficial radial nerve compression due to FTS of the brachioradialis tendon has never been reported.

The treatment of FTS includes marginal excision with preservation of the surrounding neurovascular structures. The largest series of cases has reported a recurrence rate of 24% after surgical excision.[3,24] Almost all recurrences were observed in the fingers or hands, and they usually developed between one and four months after the initial surgery.[3] This suggests that recurrence can be attributed to incomplete excision in such cases. At the 1-year follow-up in this case, the patient remained free of symptoms and showed no recurrence. To our knowledge, a malignant transformation has never been described in the literature.

Conclusion

This case is interesting due to the unusual localisation and clinical features of FTS. FTS in the brachioradialis tendon, which causes neurological symptoms due to superficial radial nerve compression, has not been reported in the literature. In patients with neurological symptoms prompt excision of the fibroma is indicated to restore the function of the nerve and to prevent further injury. Complete excision of the fibroma should be performed without damaging the superficial radial nerve. Surgical excision of the fibroma resulted in full recovery from the sensory symptoms.

Conflict of interest

There are no conflicts of interest related to the manuscript.

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