

## CASE REPORT

# Thrombosed vascular malformation within the flexor tendon sheath of the index finger in the palm

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### Abstract

Vascular malformations are relatively infrequent among benign lesions of the hand. We report the case of an arteriovenous malformation in a 48-year-old white woman presenting a mass in her left hand without any symptoms. The diagnosis was confirmed by histopathology and the lesion completely removed by surgery.

### Key words:

Flexor tendon, hand, palm, thrombosed lesion, thrombus, vascular malformation

### History

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### Introduction

Arteriovenous malformations (AVMs) of the hand are rare pathological conditions [1]. The differential diagnosis for masses of the hand is difficult and therefore precise characterization of a lesion is necessary to determine the correct treatment [2]. We report herein the case of a 48-year-old woman presenting at our clinic with an AVM of the hand.

### Case report

A 48-year-old Caucasian woman attended our clinic presenting with a swelling in her palm at the index finger ray level. She reported that the lesion onset dated 6 months with no history of trauma. No neurological or vascular symptoms were present, no pain reported and no triggering was evident. Patient's medical history did not reveal any chronic disease. A 3.5 × 3 cm painless mass was detected at physical examination just under the skin of the palm. Ultrasound revealed a well-defined mass around both flexor tendons. Even if helpful, an MRI was not performed preoperatively due to the patient's allergy to gadolinium. Surgical excision was performed under locoregional anaesthetic combined with tourniquet control. Surgical exploration identified a well-defined encapsulated tumor, which was localized within the sheath of flexor tendons without invading them (Figure 1). Total excision with preservation of the flexor tendons was achieved. The specimen's appearance was similar to a ‘tortellino pasta’,

having grown within a highly vascularized capsule (Figure 2). The patient was discharged on the same day. Histology was performed with the aid of an immune-histochemical staining, which reported the characteristics of a thrombus within an AVM (Figure 3). The wound healed without complications and sutures were removed at day 14. At a 12-month follow-up, the index finger of the left hand showed full range of motion and no evidence of recurrence was detected.

### Discussion

Masses of the hand are very challenging lesions to remove as the anatomical site requires meticulous attention due to its complexity. Within the hand, a broad spectrum of benign lesions and neoplasms can occur, although they are less frequent than in other parts of the body. The diagnosis of a swelling in the hand is often indeterminate because of the close proximity of many different tissues (musculoskeletal, vascular, osseous, paronychia, cutaneous, soft tissues). Therefore, a differential diagnosis is mandatory to determine the correct management of the lesion.

The patient's medical history must include any pertinent condition and a family history of similar lesions. It is also important to obtain information about the lesion's growth, consistency and location, together with associated symptoms and any prior trauma to the area [2].

Thrombosis of an artery aneurysm is common and can be associated with varying degrees of ischemia [3].

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Figure 1. The tumor wrapping both flexor tendons.



Figure 2. The tumor appearance similar to a 'tortellino pasta'.

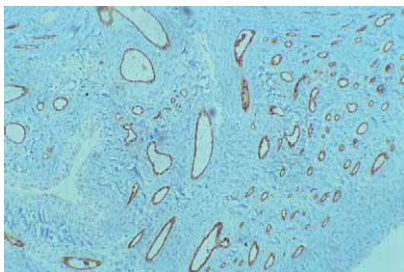


Figure 3. Anti cd 31 antibody staining for immunohistochemistry.

Surgical resection of thrombosed aneurysms may need microsurgical reconstructive procedures such as interpositional vein grafts to restore arterial flow [4]. Hemangiomas can arise from the vascular tissue in the tendon synovium of extensors [5,6] or flexors [7] in the hand. Once tendons are invaded, it is necessary to resect them with the tumor [5].

We already described a case of a mass in the palm as an histiocytoid hemangioma invading the radial digital artery to

the index finger [8]; this uncommon benign vascular proliferative lesion of unknown origin has no reported incidence of metastatic disease and a good prognosis. Very few cases of vascular malformation in a tendon sheath can be found in the literature. Cassileth et al. reported a capillary vascular malformation involving the vinculum of the flexor tendon sheath contained entirely within the flexor tendon sheath of an 8-year-old girl [9], while Hill et al. reported a case of a vascular malformation of the flexor tendon presenting as tenosynovitis [10].

Clinical diagnosis of benign lesions of the hand is often difficult. While imaging can be useful to study tumor extension, vascular involvement and any other simultaneous presentations, histology is mandatory.

AVMs have a bimodal presentation, can be diagnosed at birth or after childhood, are more common in females and occur more frequently in the right upper limb. Hormones can influence symptoms as related to AVMs, which usually present as warm and painful masses associated with bruits and thrills. Skin discoloration may appear, especially in body areas with a terminal circulation such as the hand. Altered distal thermoregulation, pain and/or functional symptoms and compression neuropathies may appear because of tumor compression on adjacent structures (nerves, vessels or tendons). However, AVMs can also be asymptomatic such as in our patient's case.

Conservative measures include compression garments and compression pumps, although their effectiveness can vary. Arterial embolization is more commonly used as a standard procedure before surgery to minimize potential blood loss; however, this should be performed cautiously to avoid limb-threatening ischemia.

Complete resection with or without microvascular reconstruction should be the end goal for AVMs, thereby avoiding injury to adjacent nerves, minimizing blood loss and preventing distal limb ischemia [1].

## Conclusion

Our report shows a rare localization of a thrombosed vascular malformation within the flexor tendon sheath of the left index finger. The surgical challenge consisted of preserving both the flexor tendons, which was performed successfully through the approach described herein. Our reported case is a clear example of how a benign lesion can form a structure around important tissues without interfering with their function and can adapt three-dimensionally in the hand spaces.

**Declaration of interest:** The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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