

# What Could This Volar Thumb Mass Be?

Mathieu Boudier-Revéret<sup>1\*</sup>, Chueh-Hung Wu<sup>2</sup>

<sup>1</sup>Department of Physical Medicine and Rehabilitation, University of Montreal Health Center, Montreal, Canada, <sup>2</sup>Department of Physical Medicine and Rehabilitation, National Taiwan University Hospital, Taipei, Taiwan

## SECTION 2 – ANSWER

### Case

The case previously presented is one of a 28-year-old female with a rapidly growing mass over the volar aspect of her right thumb, in close contact with the flexor pollicis longus (FPL) tendon at the level of the 1<sup>st</sup> metacarpophalangeal joint, measuring approximately 8.2 mm × 3.3 mm × 6.6 mm in size. It showed no hypervascularity, was noncompressible, with hypoechoic homogeneous echotexture, and had mild posterior acoustic enhancement, smooth contours, and no evidence of bony involvement [Figures 1-4 and Videos 1, 2].

The dynamic ultrasound (US) allowed demonstration that there was no movement of the mass with FPL contraction.

### Interpretation

The differential diagnosis before the US was performed included ganglion cyst and giant cell tumor of the tendon sheath (GCTTS). Given the above-mentioned characteristics, the most likely diagnosis after the US was a giant cell tumor of the FPL tendon sheath. As the patient had noticed a rapid growth, she was sent directly to surgery for excision.

The pathology confirmed that tumor was a giant cell tumor of the tendon sheath, without any signs of malignancy. The patient evolved well afterward, without any surgical complications.

## DISCUSSION

GCTTS is the second most common mass of the hand, after ganglion cyst.<sup>[1]</sup> It is benign in nature<sup>[1]</sup> and is composed predominantly of four types of cells, namely synovial cell, multinucleated giant cell, foam cell, and histiocyte-like cell.<sup>[2]</sup>

Many terms have been utilized to refer to it since it was first described in 1852 as *fibrous xanthoma* by Chassaignac<sup>[3]</sup> and localized nodular tenosynovitis, pigmented villonodular

proliferative synovitis, sclerosing hemangioma, benign synovioma, proliferative synovitis, xanthoma, xanthogranuloma, xanthosarcoma, myeloid endothelioma, fibrohemosideric sarcoma, giant cell fibrohemangioma, pigmented villonodular tenosynovitis, fibroma, myeloxanthoma, and fibrous histiocytoma.<sup>[1,3-5]</sup>

A study by Middleton *et al.* has described the sonographic findings of GCTTS.<sup>[6]</sup> In their retrospective patient population of 12 (8 females and 4 males), presentation was most often one of a painless mass (10/12), involving the flexor tendon sheath (10/12), with cases involving all digits of the hand.<sup>[6]</sup> All tumors were hypoechoic, most of them were homogeneous (10/12) with internal vascularity (11/12), and posterior acoustic enhancement was seen in four of the 12 patients. Importantly, all the lesions were in contact with a tendon sheath, and they never moved as the digit was flexed or extended, as the tumor arises from the sheath and not the tendon itself.<sup>[6]</sup>

If the ultrasonographer is in suspicion that, if the lesion is cystic or not (GCTTS might be hypoechoic with posterior acoustic enhancement), the presence of internal vascularity can help confirm the solid nature of the mass.

In the case described, no hypervascularity was noted, which might be possible even if the contrary is more typical, but technical factors can also come into play, such as Doppler sensitivity and pressure applied by the US probe which might compress small vessels.

A study by Wang *et al.* proposed to use US as the initial method to assess a suspected GCTTS.<sup>[7]</sup> Nevertheless, although US appearance is often highly suggestive, definitive diagnosis can only be made by tissue pathology.

One of the distinctive features with ganglion cyst is that GCTTS is not amenable to aspiration or steroid injection. Marginal

Received: 26-11-2018 Revised: 22-01-2019 Accepted: 19-02-2019 Available Online: 17-05-2019

Videos available on: [www.jmuonline.org](http://www.jmuonline.org)

### Access this article online

Quick Response Code:



Website:  
[www.jmuonline.org](http://www.jmuonline.org)

DOI:  
10.4103/JMU.JMU\_116\_18

**Address for correspondence:** Dr. Mathieu Boudier-Revéret, Department of Physical Medicine and Rehabilitation, University of Montreal Health Center, 3840, St-Urbain St., Montreal, QC, H2W 1T8, Canada. E-mail: [mathieu.boudier-reveret@umontreal.ca](mailto:mathieu.boudier-reveret@umontreal.ca)

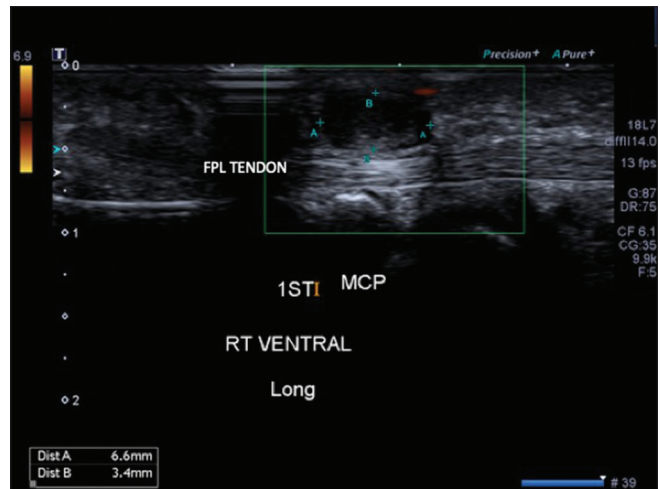
This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: [reprints@medknow.com](mailto:reprints@medknow.com)

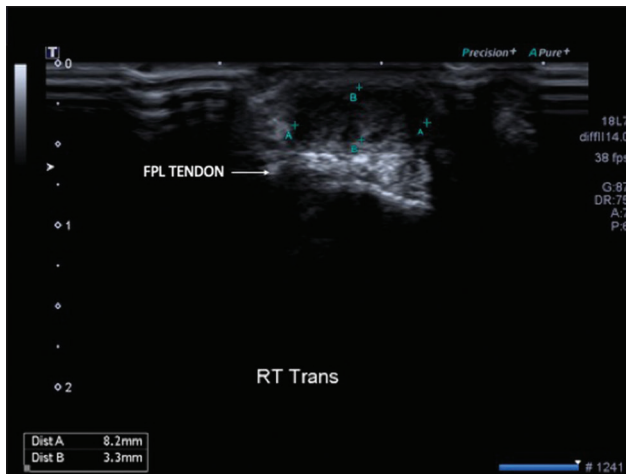
**How to cite this article:** Boudier-Revéret M, Wu CH. What could this volar thumb mass be?. *J Med Ultrasound* 2020;28:52-3.



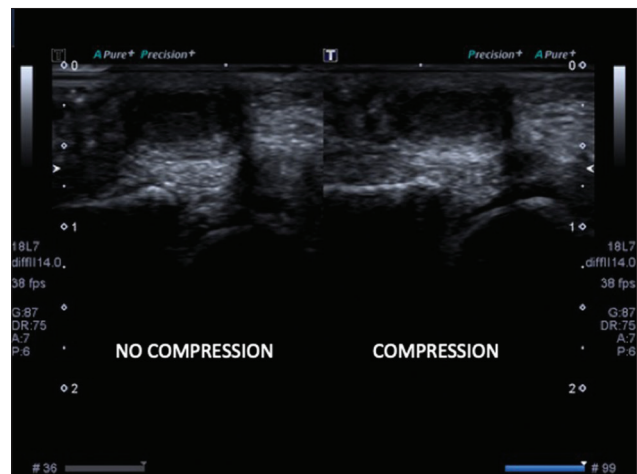
**Figure 1:** X-ray of the right hand showing the absence of bony involvement around the location of the mass at the first metacarpophalangeal joint



**Figure 2:** Ultrasound image of the right volar mass in the long axis, with power Doppler window activated



**Figure 3:** Ultrasound image of the right volar mass in the short axis



**Figure 4:** Ultrasound dual image of the mass without and with direct probe compression

surgical excision is the treatment of choice and recurrence rate varies, but is reported around 15% in more recent studies.<sup>[8]</sup>

For a complete overview on how to assess musculoskeletal soft-tissue masses and masses of the wrist and hand, the reader may refer to the articles by Bianchi *et al.* and Carra *et al.*<sup>[9,10]</sup>

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that her name and initials will not be published and due efforts will be made to conceal her identity, but anonymity cannot be guaranteed.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

### REFERENCES

- Phalen GS, McCormack LJ, Gazale WJ. Giant-cell tumor of tendon sheath (benign synovioma) in the hand. Evaluation of 56 cases. Clin Orthop 1959;15:140-51.
- Monaghan H, Salter DM, Al-Nafussi A. Giant cell tumour of tendon sheath (localised nodular tenosynovitis): Clinicopathological features of 71 cases. J Clin Pathol 2001;54:404-7.
- Jones FE, Soule EH, Coventry MB. Fibrous xanthoma of synovium (giant-cell tumor of tendon sheath, pigmented nodular synovitis). A study of one hundred and eighteen cases. J Bone Joint Surg Am 1969;51:76-86.
- Adams EL, Yoder EM, Kasdan ML. Giant cell tumor of the tendon sheath: Experience with 65 cases. Eplasty 2012;12:e50.
- Walsh EF, Mechrefe A, Akelman E, Schiller AL. Giant cell tumor of tendon sheath. Am J Orthop (Belle Mead NJ) 2005;34:116-21.
- Middleton WD, Patel V, Teefey SA, Boyer MI. Giant cell tumors of the tendon sheath: Analysis of sonographic findings. AJR Am J Roentgenol 2004;183:337-9.
- Wang Y, Tang J, Luo Y. The value of sonography in diagnosing giant cell tumors of the tendon sheath. J Ultrasound Med 2007;26:1333-40.
- Di Grazia S, Succi G, Frassetto F, Perrotta RE. Giant cell tumor of tendon sheath: Study of 64 cases and review of literature. G Chir 2013;34:149-52.
- Bianchi S, Della Santa D, Glauser T, Beaulieu JY, van Aaken J. Sonography of masses of the wrist and hand. AJR Am J Roentgenol 2008;191:1767-75.
- Carra BJ, Bui-Mansfield LT, O'Brien SD, Chen DC. Sonography of musculoskeletal soft-tissue masses: Techniques, pearls, and pitfalls. AJR Am J Roentgenol 2014;202:1281-90.