

GIANT CELL TUMOR OF THE HAND MRI-APPEARANCE**Dr. Raissa Kaukone*¹ and Fatimzahra Lamrani²**

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Article Received on 07/06/2022

Article Revised on 27/06/2022

Article Accepted on 17/07/2022

ABSTRACT

Soft tissue tumors involving the hand are common and most often benign. It is important to know the spectrum of soft tissue tumors of the hand and to understand the typical and atypical imaging features seen on different imaging modalities. Tendon sheath giant cell tumors (GCTTS) are the second most common hand masses. We report the case of a young man in his thirties who consults for a swelling of his left hand which has been progressing for three months. we want to recall the MRI characteristics that guide us to the diagnosis.

KEYWORDS: Tumors Tissues Months – Hand –Mri.**INTRODUCTION**

Tendon sheath giant cell tumors (GCTTS) are the second most common hand masses and appear as benign, painless, well-defined masses involving the tendon sheath in the palmar aspect of the hand.^[1,2,3] Giant cell tendon sheath tumor (GCTTS) is a type of benign soft tissue tumor that was first described by Chassaignac in 1852.^[4] GCTTS is also called tenosynovial giant cell tumor, pigmented nodular tenosynovitis, xanthogranuloma, benign synovioma, and fibrous xanthoma of the synovium. The World Health Organization distinguishes between two types of giant cell lesions originating in the tendon and the synovium.^[5] 6 GCTTS can be classified into localized (L) or diffuse (D) type. LGCTTS.

Since magnetic resonance imaging (MRI) can be used to characterize and estimate the extent of soft tissue tumors, this imaging technique is currently the method of choice for the diagnosis of GCTTS (Giant cell tumors of the tendon sheath).^[4,5]

Embryology

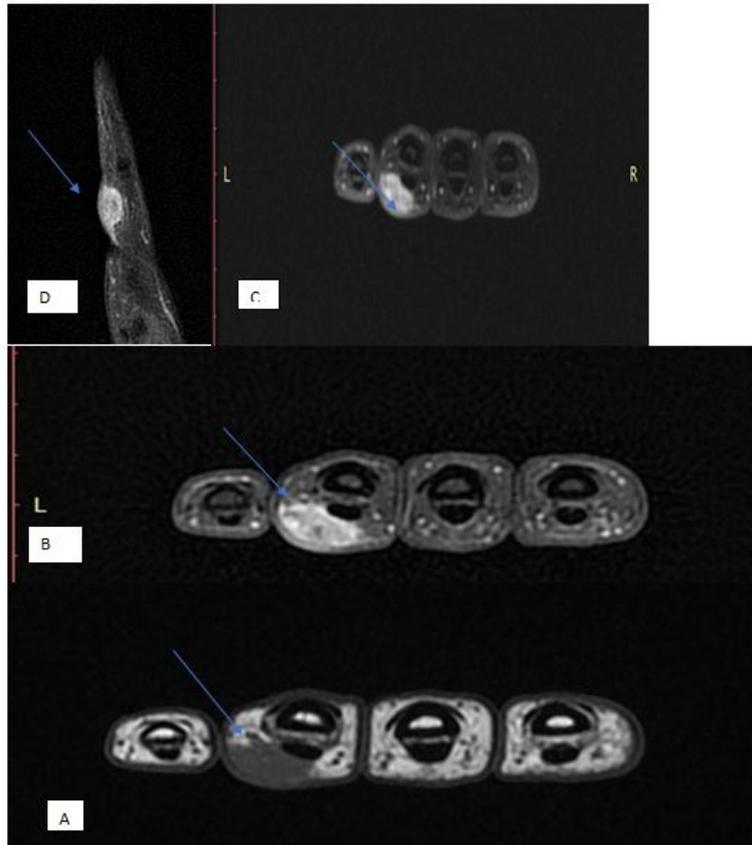
Embryologically, mesodermal mesenchyme differentiates into different soft tissue structures such as muscles, tendons, synovial sheath, skin, blood vessels, and nerves. Thus, the tumor of the hand can include these soft tissue structures. Although both hands total only 2% of total body surface area.^[6] and a total of only 1.2% of total body weight, they account for 15% of all soft tissue tumors.^[7] Another interesting fact is that 95% of hand tumors without skin involvement are benign.^[8] Most hand tumors present early, given the superficial location and therefore easily visible and palpable. So, for these reasons, most hand tumors have a good prognosis.

Malignant soft tissue tumors of the hand are rare and account for only 2% of all hand injuries

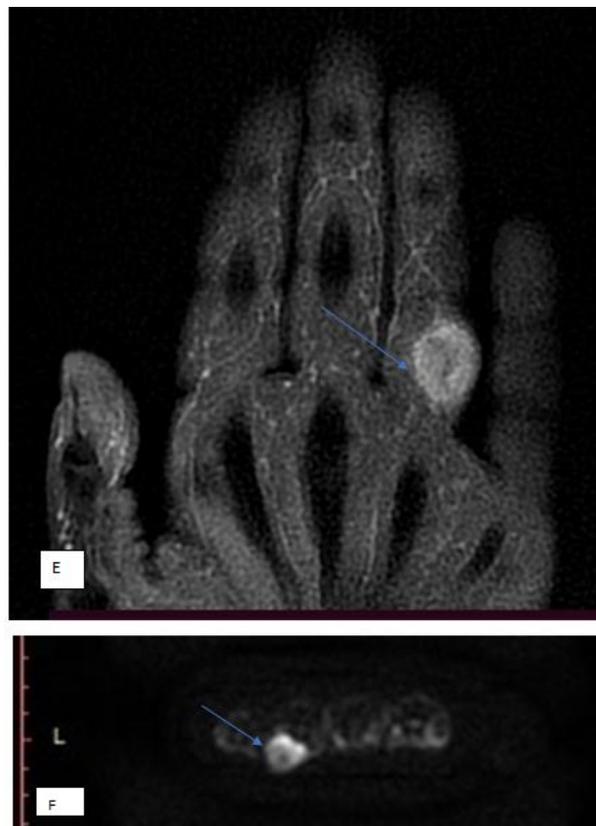
Clinical

This tumor has a location along the nerve that is the foil sign "foil sign". it interests 75% of tumors involve the hand along the finger, painful this mass is painless in 30–50 years adjacent to the tendon sheath. 85% in hand this Mass is near the joint in young age (1).

She also has a predilection for the three radial fingers especially around the distal interphalangeal joint 9).



31 year old man with lobulated mass centered in Deep finger flexor tendon causing mass effect. The mass is well limited demonstrates a hypointense T1W signal (A), a hyper-intense fat saturated signal T2W (b) and (d), And an avid improvement in post-gadolinium delivery over T1W (c) sequences.



Coronal and DP fat Sat (E) and axial diffusion (F)

MRI TECHNIQUES AND RESULTS

The examination is carried out on a general electric device 1, 5 TESLA or 3 TESLA

- Surface antennas: improve spatial resolution.
- The study is therefore one-sided.
- Thin, multiplanar sections.
- T1 ES sequences: anatomical study. The ligaments, tendons and cortex are hypointense and the bone marrow is hypersignal of the fatty type.
- T2 FSE FAT SAT or T2 STIR sequences offer an excellent signal-to-noise ratio, excellent contrast resolution by eliminating the hypersignal of the fat.
- If giant cell tumors of the synovial sheaths or villonodular synovitis are suspected, 2D gradient echo sequences are particularly useful for demonstrating hemosiderin deposits with a characteristic hypointense signal.
- The 3D gradient echo sequences are the sequences of choice for the study of cartilage and certain tendon structures.
- T1 sequences with gadolinium injection: to explore synovial joint or tendon pathologies, in the event of tumor lesion or to diagnose bone necrosis.

Fractionated fat sign", "target sign" and "fascicular sign" on MRI. Avid contrast enhancement, high T2 signal. Low in T1 and T2 due to hemosiderin. Calcifications in 1 / 3 rd. Well-defined benign-appearing lobulated mass

MRI It is the gold standard for soft tissue tumors. It allows a detailed description of the lesion containing: 9

The localisation

Determine the origin of the mass: it is the center of the lesion that determines its starting point. o Specify the position: intra or extramuscular, in the intermuscular fatty interface, along a neurovascular axis, in the subcutaneous fat, skin mass.

Contours: well or poorly limited, presence or not of a wall.

- The size with measurements in the 3 planes.
- The intralesional signal in T1, T2 and T1 after injection;
- Cystic image: T1 hypointense, T2 fluid hypersignal, lack of contrast enhancement
- Fat: T1 hypersignal, T2 hyposignal with saturation of the fat signal we can refer to the subcutaneous fat signal
- Bleeding: T1 and T2 hypersignal with asignal regions, without contrast enhancement
- Cartilage: T1 hypointense, intense T2 hypersignal with the presence of round, arciform or punctiform asignal images (areas of bone condensation)
- Liquid-liquid level: presence of regions of different but homogeneous signal component whose interface is rectilinear and perpendicular to the force of gravity.

- Contrast uptake: peripheral, heterogeneous or homogeneous.
- Structures invaded by muscle mass and muscle compartments, neurovascular structures, joints, bones, skin, etc.

MRI does not always make it possible to confirm a diagnosis but allows - a precise local extension assessment - a pre-biopsy guidance - a preoperative assessment. It is also the gold standard in post-treatment follow-up in search of recurrence.^[9]

Slightly favoring women aged 30 to 50. . 6, 7, 8 GCTTS are considered reactive lesions associated with degenerative processes rather than neoplasm, but expansive growth can lead to pressure changes of adjacent structures and affect hand function. 6, 7 Recurrence rates after surgical excision of up to 44% have been reported. 7 Hypointensity on T1WI and T2WI are characteristic imaging findings and may be accompanied by areas of low and high signal intensities on T2WI due to hemosiderin deposits and fluid buildup. 6, 8 sensitivity artefacts on GRE sequences and strong enhancement due to capillary proliferation are typical and may aid in diagnosis

Differential diagnosis

1 / Siderotic synovitis

Siderotic synovitis is a condition that can occur in chronic hemarthrosis.

Pathology It is characterized by rusty synovial pigmentation and hyperplasia but with an absence of foam cells and multinucleated giant cells which are observed in PVNS.

Suitable Conditions; Coagulation Disorders, Hemophilia - Hemophilic Arthropathy, Synovial Hemangioma.

MRI Radiographic Features Can be seen as focal or diffuse proliferation of the synovium. Signal characteristics may mimic pigmented villonodular synovitis (PVNS) and include 1,4

- T1: weak signal
 - T2: weak signal
 - Gradient echo (GE): shows flowering
- 2 / scarring and capsulitis

Cytology

Certain authors.^[20] have shown the interest of the cytological study of the product of aspiration of the tumor with a needle. Indeed, if this technique does not offer a diagnostic certainty of the histological type, it at least makes it possible to ensure the absence of cellular atypias in connection with a sarcoma.

Supported

The treatment is always surgical which consists in excision of the entire tumor. This resection must be meticulous and complete in order to prevent tumor

recurrence.21 rigorous assessment of the relative risk of recurrence of this type of tumor will make it possible to plan an appropriate surgery and to inform patients about the risk of recurrence 22.

CONCLUSION

L-GCTTS usually presents as a well-defined mass eccentrically located in association with or partially / completely enveloping a tendon. MRI is currently the optimal modality for preoperative assessment of the size of the tendon tumor, extent and invasion of the adjacent joint and tenosynovial space.

BIBLIOGRAPHIE

1. Teh J, Whiteley G. IRM des masses de tissus mous de la main et du poignet. *Br J Radiol.* 2007; 80 (949): 47-63.
2. Morris CJ, Younan Y, Singer AD, et al. Masses de la main et du poignet, une revue picturale. *Imagerie clinique.* 2016; 40 (4): 650-665.
3. Henderson MM, Neumeister MW, Bueno RA, Jr. Tumeurs de la main: I. tumeurs de la peau et des tissus mous de la main. *Plast Reconstr Surg.* 2014; 133 (2): 154e-164e.
4. Tumeurs communes des tissus mous impliquant la main avec corrélation histopathologique, Pankaj Nepal,¹Swachchhanda Songmen,¹Saeed Intakhab Alam,²Darshan Gandhi,¹Neeta Ghimire,³et Vijayanadh Ojili <https://dx.doi.org/10.25259%2FJCIS-6-2019>.
5. Giant cell tumor of the tendon sheath: Magnetic resonance imaging findings in 38 patients CHAO WANG, RUI-RUI SONG, PING-DING KUANG, LIU-HONG WANG and MIN-MING ZHANG *ONCOLOGY LETTERS* 13: 4459-446.
6. Rhodes J, Clay C, Phillips M. La surface de la main et de la paume pour estimer le pourcentage de la surface corporelle totale: résultats d'une méta-analyse. *Br J Dermatol.* 2013; 169 : 2013-169. doi: 10.1111 / bjd.12290. [PubMed] [CrossRef] [Google Scholar]
7. Garcia J, Bianchi S. Imagerie diagnostique des tumeurs de la main et du poignet. *Eur Radiol.* 2001; 11 : 2001-11. doi: 10.1007 / s003300000751. [PubMed] [CrossRef] [Google Scholar]
8. Mavrogenis AF, Panagopoulos GN, Angelini A, et al. Tumeurs de la main. *Eur J Orthop Surg Traumatol.* 2017; 27 : 2017-27. doi: 10.1007 / s00590-017-1984-y. [PubMed] [CrossRef] [Google Scholar]
9. Soft Tissue Masses of Hand: A Radio-Pathological Correlation Aditi Agarwal,¹ Mahesh Prakash,¹ Pankaj Gupta,¹ Satyaswarup Tripathy,² Nandita Kakkar,³ Radhika Srinivasan,⁴ and Niranjan Khandelwal Hindawi Publishing Corporation Radiology Research and Practice Volume 2015, Article ID 752054, 10 pages <http://dx.doi.org/10.1155/2015/752054>
10. These AIDE AU DIAGNOSTIC DES TUMEURS DES TISSUS MOUS EN IMAGERIE MEDICALE Le 22 juin 2017 Par BRUNEL Elodie UNIVERSITE DE PICARDIE JULES VERNES FACULTE DE MEDECINE D'AMIENS N° 2017 – 58
11. Wang K, Zhu B, Yang S, Liu Z, Yu M and Liu X: Primary diffuse-type tenosynovial giant cell tumor of the spine: A report of 3 cases and systemic review of the literature. *Turk Neurosurg* 24: 804-813, 2014.
12. Bredell M, Schucknecht B and Bode-Lesniewska B: Tenosynovial, diffuse type giant cell tumor of the temporomandibular joint, diagnosis and management of a rare tumor. *J Clin Med Res* 7: 262-266, 2015
13. Teh J, Whiteley G. MRI of soft tissue masses of the hand and wrist. *Br J Radiol.* 2007;80(949):47-63.
14. Morris CJ, Younan Y, Singer AD, et al. Masses of the hand and wrist, a pictorial review. *Clin Imaging.* 2016;40(4):650-665
15. Revue médicale suisse
16. Hand and masse and essential MRI view radiology (Nepal P, Songmen S, Alam SI, Gandhi D, Ghimire N, Ojili V. Common soft tissue tumors involving the hand with histopathological correlation. *J Clin Imaging Sci* 2019;9:15
17. radiopaediae Synovite sidérotique Dr Rohit Sharma®et Dr Yuranga Weerakkody® et coll
18. Ilyer KV, Kusum K, Kusum V. Fine-needle aspiration cytology of giant cell tumor of tendon sheath. *Diagn Cytopathol.* 2003 Aug;29(2):105-10. [PubMed] [Google Scholar]
19. Suresh SS, Zaki Hosam. Giant cell tumor of tendon sheath: case series and review of literature. *J Hand Microsurg.* 2010;2(2):67-71. [Article PMC gratuit] [PubMed] [Google Scholar]
20. Walid Osman,¹Zeineb Alaya,^{2,&}Ali Haggui,³Mohamed Ben Rejeb,⁴Sonia Jemni,⁵Nader Naouar,¹et Mohamed Laziz Ben AyechePan Afr Med J. 2017; 26: 128.