

Subungual Glomus Tumour of Right Ring Finger; MRI Features

Case Report

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Abstract

Glomus tumors are benign vascular neoplasms rarely found on the hand especially in the subungual region. Glomus tumors usually appear as a reddish-green or pink nail plate with an old triad of local sensitivity, severe pain, and cold sensitivity. In addition to various clinical trials, imaging studies such as Radiography, Ultrasonography and Magnetic resonance imaging (MRI) are often helpful in diagnosis. Complete surgery is the treatment of choice to get complete relief from symptoms and to avoid recurrence. The purpose of this article is to study the Clinical & MRI features of Subungual Glomus tumor in a 41-year-old woman who developed chronic pain in her right ring finger during her daily activities.

Keywords: Hand glomus tumor, Glomangioma, Subungual tumors

Introduction

Glomus tumors are rare malignant lesions arising from a neuroarterial structure called the glomus body located in the reticular areas of the hand, accounting for 1% to 4.5% of the tumors in the hand [1]. The body of Glomus is believed to function in hot regulation. The general clinical triangle of local soft tissue, severe pain, and sensitivity to colds significantly favors the glomus tumor.

The average age of presentation ranges from 30 to 50 years, although it can occur in any age [1].

The glomus body can develop hypertrophy that appears as yellow or purple under the nail bed. Glomus tumors are usually isolated, but many lesions have been associated with type 1 neurofibromatosis [2].

The aetiology of glomus tumors is unknown and may be related to gender, age, trauma, or heredity. Some authors have suggested that a deficiency in glomus structure can lead to functional hypertrophy after trauma [3]. The first reported case of glomus tumor was by Masson in 1924 [4], a few studies have reported glomus tumors, its pathophysiology and management.

Although many clinical trials are helpful in diagnosing these lesions, they may not be recognized due to their small size leading to diagnostic delays [3]. MRI has been shown to be very useful for diagnosis in detecting small lesions, especially those as small as 2 mm [5].

Case Report

A 41-year-old woman has been given a history of severe pain at the tip of her right ring finger, whenever she applied pressure to the volar tip during her daily activities for the past three years with a cold sensitivity. She has visited several different health care providers in the past, with various diagnoses listed in her medical records including neuroma, radiculitis, Raynaud's event, and reversible reactions. There are no formal systemic complaints.

A physical examination revealed that the digit did not change color and that the nail appeared normal. There is no apparent difficulty but of pain relief by applying pressure to the central pulp. Radiographs and standard laboratory results were within normal limits.

An MRI scan revealed an oval T1W isointense, T2W / STIR / PDFS / SPIR hyperintense lesion measuring 6 x 5.3 mm in the subungual area of right 4th finger. In the T1W fat sat post-contrast pictures, the tumor showed significant contrast enhancement. In Computed Tomography images there is no bone erosion in the distal phalanx. In the USG examination there is an isoechoic wound with no additional vascularity in color flow studies.

Discussion

Different types of tumors can affect the subungual area, including solid tissues (glomus tumor, subungual exostosis, soft-tissue chondroma, keratoacanthoma, hemangioma, lobular capillary hemangioma), benign lesions cystic (epidermal and mucoid cysts), and malignant tumors (cell carcinoma, malignant melanoma [10].

Glomus tumors are rare, benign, and vascular neoplasms arising from the glomus body which is a contractile neuromyoarterial structure found in the reticular dermis. The Glomus body contains the afferent arteriole, anastomotic vessel known as the Sucquet-Hoyer canal, primary collecting vein, intraglomerular reticulum, and capsular portion [6]. This structure regulates blood pressure and temperature by regulating blood flow to the cutaneous vasculature [7 - 9]. Although glomus tumors can affect any part of the body, up to 75% of the hand, and about 65% of these are found on the fingers, especially in the subungual area. The prevalence of glomus tissue is approximately equal to that of men and women [11, 12].

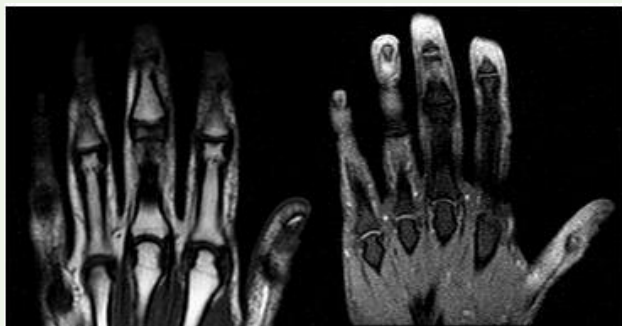


Figure 1: A) T1W coronal section reveals an oval isointense lesion in the subungual region of right ring finger. B) Coronal SPIR (Spectral Presaturation with Inversion Recovery) shows an oval hyperintense lesion in the subungual region of right ring finger.

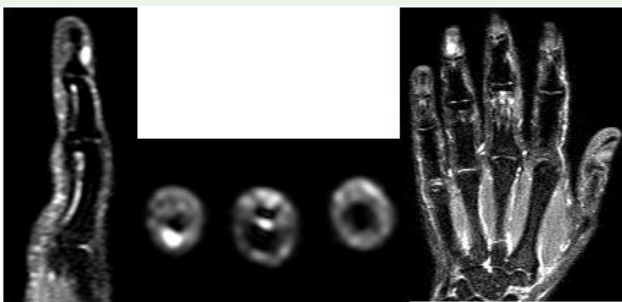


Figure 2: STIR (Short Tau Inversion Recovery) (A) Sagittal, (B) Axial and (C) Coronal images reveal an oval hyperintense lesion in the subungual region of right ring finger.



Figure 3: (A,B). T2W Coronal (A) and Axial (B) show a hyperintense oval lesion in the subungual area of the right ring finger.

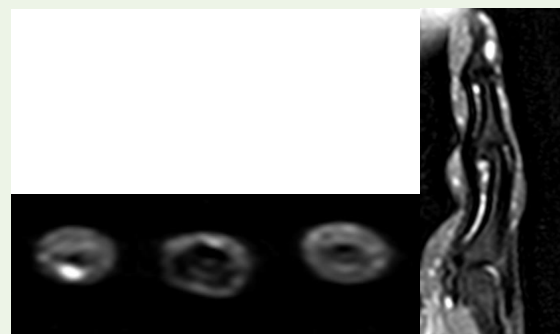


Figure 4: (A,B) PD (Proton density) weighted pictures show an oval hyperintense lesion in the subungual region of right ring finger.

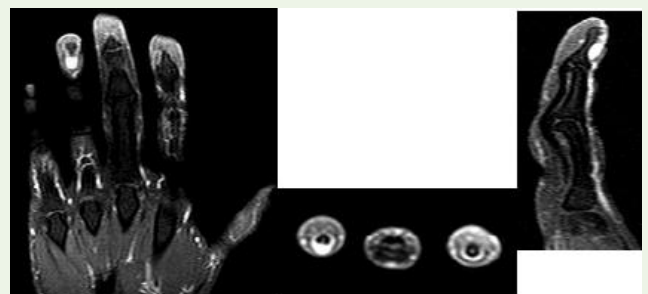


Figure 5: (A-C). Post contrast T1W SPIR (Spectral Presaturation with Inversion Recovery) shows an oval intensely enhancing lesion in the subungual region of right ring finger.

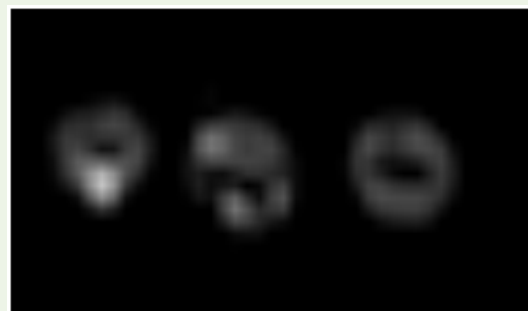


Figure 6: Diffusion Weighted image (DWI) reveal focal oval area of restricted diffusion in the subungual region of right 4th finger.

Clinical features include excruciating pain, intense tenderness that may be provoked by mild trauma, and temperature sensitivity. The nail may be discolored & ridged due to tumour in the subungual area [6, 11].

Although, the cause of pain in glomus tumor is not well understood, several hypotheses have been made; the presence of a capsule, sensitive to stress, the presence of mast cells releasing substances such as heparin, histamine and 5-hydroxytryptamin that produce pressure and sensitive heat receptors [13]. In addition, overuse of the nerve fibers that do not have myelinated nerve fibers that penetrate glomus tumors has been suggested as a cause of pain [14]. Glomus tumors are usually found clinically. In addition to the classic presentation, Love's pin tests, Hildreth tests, trans-illumination tests and cold-sensitivity tests are helpful in diagnosing these lesions [3,15].

Radiological Imaging plays an important role in identifying and classifying subungual tumors because of their small size, indirect clinical manifestations, and the importance of their function. Recent research emphasizes the use of studies such as ultrasound & MRI, to assist in diagnosing and planning surgical management [16, 17].

As the tumor is external to the bone, there may be no radiographic findings as bone involvement is less common than soft tissue involvement. Bone changes adjacent to the tumor, caused by pressure erosion include shallow well corticated osseous defect involving the distal phalangeal tufts [18].

The MR imaging features considered diagnostic of glomus tumor include moderate or low signal intensity in T1-weighted images, high intensity marked in T2-weighted images, and strong enhancement after gadolinium-based contrast injection (Fig. 5 A-C). MR angiography is a useful non-invasive supplement to normal MR imaging to detect glomus tumor. Typical findings of MR angiography include areas of strong development in the arterial stage and tumor blush, which increases in size in the delayed stage [6, 12].

In Ultrasound, the glomus tumor usually appears as an hypoechoic mass under the nail with hypervascularity in the color doppler study specific for the diagnosis (11, 19, 20).

In the analysis of histology, the glomus tumor appears as endothelium-containing arteries enclosed by a series of circular epithelioid cells that have a specific tendency to take the form of spinning [21].

The imaging features of glomus tumors are similar to those of hemangiomas and are usually not detected before surgery.

Hemangiomas are highly concentrated in the papillary dermis and epidermis, usually with well-defined margins but may show invasive margins and usually have a intermediate signal intensity in T1-weighted images and a high signal intensity in T2-weighted images. Parts of the blood vessels produce heterogenous signal intensities with a snake pattern and flow void artifact in T2-weighted images. Low signal strength in T1- and T2-weighted images can be caused by phleboliths, calcification, or fibrosis. Contrast enhanced MR imaging reveals the serpentine or lattice like enhancement of the lesion [6, 22, 23, 24].

Subungual Lobular capillary hemangioma is a benign vascular neoplasm of the skin and a mucous membrane that may occasionally appear inside the vessels or under the skin (25). In MR imaging, the lesion is isointense in T1-weighted images and hyperintense in T2-weighted images, with marked enhancement after injection of contrast [25, 26, 27].

Subungual exostosis, also known as Dupuytren exostosis, is a rare, isolated, malignant lesion from the distal phalanx under the nails [28]. MR imaging is the best radiologic method to show the effect of subungual exostosis on surrounding structures and to differentiate between this lesion and osteochondroma. The fibrocartilaginous cap in subungual exostosis is hypointense on all MR imaging sequences, while hyaline cartilage in osteochondroma has high signal intensity.

Conclusion

Diagnosis of glomus tumor can be made clinically based on history taking and clinical examination. Magnetic Resonance Imaging is required to ensure further diagnosis and management of surgery.

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