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# 12 years' pain of a woman caused by glomus tumor: a case report and literature review

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or is one rare benign tumor, it is often misdiagnosed or osis in the early stages, the patients get the confirmed en at 3 to 15 years after the onset of symptoms. This case omus tumor on the right ring finger of one woman who had emptoms persisted for 12 years. Before the woman got the osis, she had consulted more than ten doctors in seven clinics. We analyzed the possible causes of misdiagnosis and osis of glomus tumor, and reviewed the methods of physical

SCHOLARONE™ Manuscripts **Title:** 12 years' pain of a woman caused by glomus tumor: a case report and literature review **Author names, affiliations:** Shuliang Zhang, Bin Xu, Yangjun Lao, Junming Wan\*\*,

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**Short title:** a missed glomus tumor

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Not Applicable

#### **Declaration of conflicting interest**

The authors declare that there is no conflict of interest.

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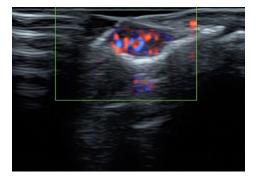
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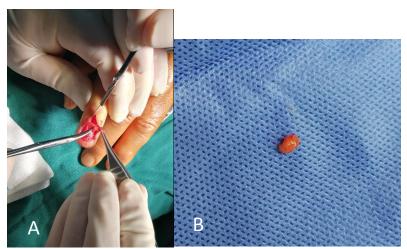
**Figure 1.** There was fold elevation on the right ring finger nail and bluish discoloration at the base of the nail.



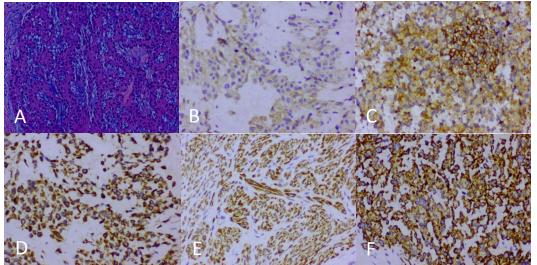
**Figure 2.** The X-ray film of the woman right ring finger was normal.



**Figure 3.** Color doppler ultrasound showed a hypoechoic nodule about 0.7cm×0.4cm in the right ring finger, with a clear boundary and abundant blood flow.



**Figure 4.** the nail plate was removed and the glomus tumor with 0.5cm diameter was completely excised.



**Figure 5.** Histopathology showed glomus cells with small, regular, round nuclei, eosinophilic cytoplasm, aggregating to be nestlike (A. hematoxylin and eosin stain, ×100). Immunohistochemistry (original magnification, ×100) showed the histocytes were positive for Calponin (B), CD34 (C),Vim(D), Desmin(E) and SMA (F).

# 12 years' pain of a woman caused by glomus tumor: a case report and literature review

#### **Abstract**

Glomus tumor is one rare benign tumor, it is often misdiagnosed or missed diagnosis in the early stages, the patients get the confirmed diagnosis often at 3 to 15 years after the onset of symptoms. This case report one glomus tumor on the right ring finger of one woman who had the typical symptoms persisted for 12 years. Before the woman got the correct diagnosis, she had consulted more than ten doctors in seven hospitals or clinics. We analyzed the possible causes of misdiagnosis and missed diagnosis of glomus tumor, and reviewed the methods of physical examination and imaging examination for glomus tumor.

# **Keywords**

glomus tumor, hand, finger, misdiagnosed, missed diagnosis

## Introduction

Glomus tumor is one rare benign soft tissue tumor which infrequently encountered in clinical practice. Early paper reported the tumor often happened among young adults, but the recent report suggested the tumors tend to strike women between the ages of forty and seventy<sup>1</sup>. Its typical clinical manifestation is severe intermittent pain, hypersensitivity to cold, excruciating pain on touch<sup>2</sup>. Because glomus tumor is a uncommon disease,

it is often missed in the early stages, the patients get the confirmed diagnosis often at 3 to 15 years after the onset of symptoms<sup>2</sup>. Here we report a case of glomus tumor on the right ring finger of one woman who had the typical symptoms persisted for 12 years. All procedures were performed according to the Declaration of Helsinki and approved by the Ethics Committee of Tongde Hospital of Zhejiang Province and written informed consent was obtained from the patient.

# Case report

One 63 years old woman came to our orthopedic outpatient department, she complained that her right ring finger had been painful for 12 years. She had seen more than ten doctors in seven hospital or clinic in the past 12 years, the doctors checked her finger and carried out X ray examination, they found nothing wrong with her and prescribed analgesics or nonsteroidal anti-inflammatory medication to relieve the pain. But the drug effect was not obvious. The pain in her right ring finger persisting to now. She said the pain was not constant, it was intermittent and paroxysmal. The pain was worse in winter, and the pain got severe when she washed her hand with cold water. As the pain intensified, she could hardly sleep at night. When she turned over in a deep sleep, she would wake up with pain if her finger touched other objects. She had no injury to her right hand and no history of surgery. There were no the same symptoms in her family members.

Physical examination found normal skin color of her finger, no redness and swelling, the finger movements was normal. However, her right ring finger nail was not as smooth as other fingernails, there was fold elevation and significant tenderness on her right ring fingernail (Fig.1). Moreover, there was bluish discoloration at the base of the nail. We gave her X ray examination again and found nothing (Fig.2). At the same time, color Doppler ultrasound examination was performed and detected a hypoechoic nodule with a clear boundary and abundant blood flow signals, its size was about 0.7cm×0.4cm (Fig.3). We advised the woman to have a surgery, she agreed and said that she would rather have her right ring finger amputated if only she could get rid of the 12 years pain. The woman underwent a tumor excision with a transungual approach, the nail plate was removed and the tumor was completely excised (Fig.4). After the surgery, the woman symptoms vanished, she was very grateful to us for cuing her 12 histopathologic examination Postoperative years pain. immunohistochemical examination verified the tumor did be one glomus tumor (Fig.5).

#### **Discussion**

Glomus tumor has characteristic presentation of severe intermittent pain, hypersensitivity to cold, excruciating pain on touch<sup>2</sup>. However, due to its rare incidence, glomus tumor is usually misdiagnosed <sup>3</sup> or missed diagnosis<sup>4</sup>. The patients got the confirmed diagnosis often at 3 to 15 years

after the onset of symptoms<sup>2</sup>, it was reported that the glomus tumor patients had consulted 2.5 physicians on average before got the correct diagnosis<sup>5</sup>, the averaged interval between onset of symptoms and treatment of glomus tumor patients was 10 years<sup>5</sup>. Refer to our reported patient, the woman had consulted more than ten doctors in seven hospital or clinic. She was missed diagnosis for 12 years.

Although glomus tumor has typical clinical manifestation, why it is often misdiagnosed or missed? On the one hand, many clinicians has less awareness of glomus tumor is the main cause. When they were medicine college students, they were only taught the common soft tissue tumors such as hemangioma, hydatoncus and neurofibroma, the rare glomus tumor was not mentioned by their teacher. After they graduated, there was little chance to meet one patient with uncommon glomus tumor in their work unit, the superior doctor would not specialize in giving them the knowledge of glomus tumor. Once the clinicians met one glomus tumor patient, it was paronychia or other most common disease flashing in their brain but not glomus tumor. Consequently, the corresponding physical examination and imaging examination would not be carried out. It is necessary to strengthen the continuing medical education and improve the clinicians' awareness of glomus tumor. On the other hand, the characteristics of the glomus tumor itself make it easy to miss diagnosis. The glomus tumor is small, it is difficulty to locate the tumor. Its diameter usually less than 1cm and

average about 0.3cm-0.4cm in diameter<sup>6</sup>. The diameter of our case glomus tumor is about 0.5cm. The X-ray film of most glomus tumor patient is normal, only a little more than 30% of glomus tumor patient can be found osseous defect on X-ray film<sup>7</sup>. So we found nothing wrong with our case through X-ray film. One crucial feature of glomus tumor is rich internal vascularity, but there is no significant internal blood flow in about a quarter of glomus tumors<sup>8</sup>. This also increases the difficulty of diagnosis.

To reduce the chance of misdiagnosed and missed diagnosis, physical and imging examination should be combined. There are several tests can be used to distinguish glomus tumor. The first is Love' pin test, it has 100% sensitivity and 78% accuracy. The second is Cold sensitivity test, its sensitivity, accuracy and specificity are all 100%. The third is Hildreth's test, it presents 100% specificity, 71.4% sensitivity and 78% accuracy. The fourth is trans-illumination test, its sensitivity is 23%-38%, specificity is 90%9. X-ray is the first choice of imging examination. If there is bony erosion, X ray will show scalloping on the distal phalanx<sup>2</sup>. But more than 60% of glomus tumor patient' X ray is normal<sup>7</sup>. Multidetector computed tomography angiography (MDCTA) had been used to check glomus tumor, the acquired three-imensional volume-rendered images could clearly illustrate vascular branches, the location and extent of glomus tumor<sup>10</sup>, MDCTA is more useful for such ill-defined tumor at the initial stage.Magnetic Resonance Imaging(MRI) is one better choice for soft tissue tumor, it can clear present the tumor boundary. MRI can detect a glomus tumor as small as 2 mm<sup>11</sup>. Glomus tumor presents T1-weighted images with low signal intensity, T2-weighted images with high signal intensity<sup>9, 11</sup>. However, the effect of MRI in glomus tumor diagnosis remains controversial. Ham' study<sup>11</sup> showed that MRI had a 100% positive predictive value for detecting a glomus tumor. On the contrary, the report of Al-Qattan showed that MRI had no value in the diagnosis of glomus tumor<sup>12</sup>. In addition, some patients with low incomes were unwilling to pay high MRI inspection fees for such a pinkle. Since MRI cannot be immediately available and high cost, its use is limited. So our patient did not got MRI examination. At present, the most widely used and essential examination way is color Doppler ultrasound<sup>3, 8</sup>. It can not only clearly show the characteristics of the glmous tumor in real time, such as location, size, borders, depth to superficial, but also whether it is with or without capsule, and relationship between internal blood flow and the surrounding tissues, which are important parameters for surgery<sup>8</sup>. Our patient underwent ultrasonic examination when she arrived outpatient department, a hypoechoic nodule with a clear boundary and abundant blood flow signals was shown .But the disadvantage of ultrasound is that it is greatly influenced by the experience of the examing physician.

In this article, we present one rare glomus tumor female patient undiagnosed for 12 years, she had consulted more than ten doctors in seven hospital or clinic in the past twelve years. She underwent longterm pain, the quality of her life had seriouly declined. There is still difficulty in the early diagnosis of glomus tumors, but it is our duty to avoid missed diagnosis and misdiagnosis, so to eliminate the suffering of patients. In any case, the most important thing is to introduce glomus tumor widely through any medium, let the general doctors know it. As a result, when they come across a suspicious patient, the glomus tumor will come into their mind.

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