

Glomus Tumors of the Finger: An Uncommon Cause of Finger Pain

Alan H. Lockwood, M.D. and David H. Hildreth, M.D.

Hand pain is a common complaint among musicians. Frequently this is attributable to overuse; however, other diagnoses must be considered. We have encountered three patients with severe finger pain caused by glomus tumors.

Case 1

This 44-year-old woman has had pain in the middle finger of her right hand for 4 years. She is a professional musician, and, although her primary instrument was the flute, she began to play the electric bass guitar 4 years ago. Pain in the middle finger of the right hand began shortly thereafter in a setting that included overuse symptoms in the left hand. The pain was initially confined to the lateral aspect along the distal phalanx of the right long finger. The pain was burning, shock-like, and triggered by even minor trauma or tactile stimuli, including plucking the guitar strings. As time passed, symptoms became more severe, and pain occurred during other activities. It would occasionally awaken her from sleep. The pain radiated up the arm as far as the shoulder when it was particularly severe. She stated that the pain was so intense that it would force her to stop whatever she was doing until it subsided. She had stopped playing the gui-

tar one year ago because the pain induced by playing became unbearable. The examination of the hand was unremarkable: specifically, there was no deformity of the fingernail of the affected digit. Pressure over the point she identified as a trigger point always produced a sudden jolt of pain.

At surgery, a 1–2 mm reddish globular mass was removed from the finger pulp. There was minimal evidence of sculpting of the bone of distal phalanx immediately adjacent to the tumor. Microscopic examination showed typical features of a glomus tumor (Fig. 1).

Case 2

A 34-year-old female nonmusician laboratory technologist sought help in our Performing Artists Clinic because of our expertise in dealing with hand problems. Over the previous 10 years she had developed a progressive deformation of the nail of the right ring finger consisting of a pink-brown streak beginning near the lunula and running the length of the nail and curling of the nail tip (Fig. 2). This was associated with an increasingly severe pain syndrome. Relatively minor trauma or touch of the tip of the finger or the nail produced severe pain radiating up the arm. The pain was severe enough to necessitate the discontinuation of activity. A small scar was present on the ulnar side of that finger at the distal interphalangeal (DIP) joint from an old injury. On examination, pressure applied to the nail or fingertip triggered pain. There were no other abnormalities. The nail changes, history, and findings on examination are diagnostic

of a glomus tumor in the nail bed. She has declined surgical removal, fearing that the nail deformity would be increased.

Case 3

A 19-year-old female conservatory student studying the string bass presented with a 6-month history of pain in the tip of her left index finger. At the onset of the problem, she had 1–2 days of pain in several fingers of her left hand that subsided, except for index finger pain. The pain has persisted, and grown steadily worse. She describes the pain as a severe, dysesthetic sensation in the tip of the finger caused by any pressure applied to the fingertip. Playing in positions other than thumb position is unaffected, as the contact-point between the finger and string is along the radial side (thumb side) of the finger. Thumb position necessitates the use of the tip of the finger to hold the string down on the finger board, and triggers pain. This has led to a need for re-fingering and adjustments in finger position. She was depressed and worried about her career. She had a history of overuse syndrome of the right arm that resolved completely 4 years ago. On examination, slight flattening of the tip of the nail was evident on that finger only. The application of pressure to the tip of the finger produced pain. The remainder of the examination revealed only a slight ulnar deviation of the left index finger at the proximal interphalangeal (PIP) joint with some difficulty in achieving complete extension at the distal interphalangeal (DIP) joint. There was no spontaneous pain after immersion of

From the Performing Artists Clinic, Department of Neurology (Dr. Lockwood), and Division of Orthopedic Surgery (Dr. Hildreth), University of Texas Medical School at Houston, Houston, Texas. Address correspondence to Alan H. Lockwood, M.D., Department of Neurology, University of Texas Medical School, P.O. Box 20708, Houston, TX 77225.

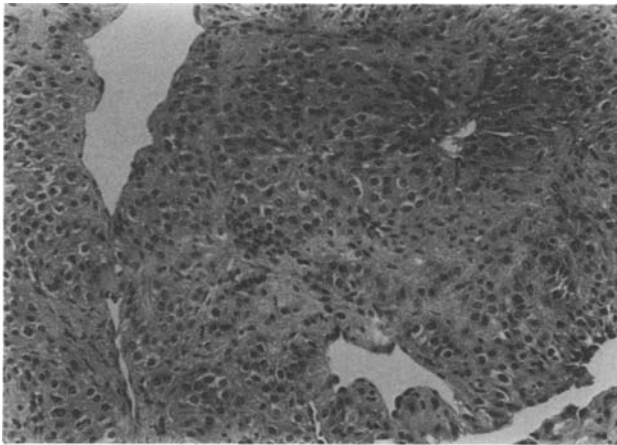


FIGURE 1 Photomicrograph of the glomus tumor removed from the patient in case 1. The endothelial cell-lined lumen, cuboidal myoepithelial cells with well-formed, regularly shaped, and staining nuclei are diagnostic of a glomus tumor. Hemotoxylin and eosin stain.

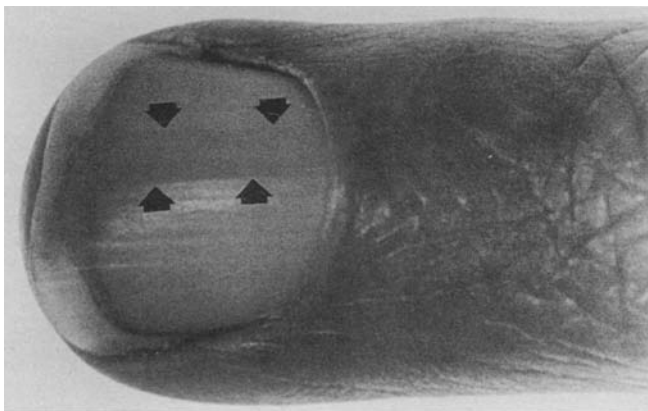


FIGURE 2 Nail changes characteristic of a glomus tumor in the nail bed. Note the streak, marked by the arrows, and the curled, dystrophic free end of the nail.

the finger in ice water. X-ray films of the finger were normal. We believe that the symptoms are sufficiently characteristic of glomus tumor to offer her an exploration of the pulp, which she is considering.

Discussion

Glomus bodies are normal arteriovenous shunts found throughout the skin. They are most dense in the nail bed, where there are 10–20 per cm².¹ The structure of the typical glomus is shown in Figure 3.² The normal glomus body is an encapsulated structure composed mainly of modified smooth muscle cells. Endothelial cells line the lumen that connects the arteriole with the venule. It is richly innervated, sen-

sitive to temperature, and serves to regulate arteriolar flow.

Glomus tumors are rare benign tumors that may be found anywhere in the body.¹ In tumors, the general structure of the glomus body is partially preserved. They may be very small, as in Patient 1, measuring 1–2 mm in diameter. Microscopically, there is a proliferation of the myoepithelial cells that have very regular nuclei with no evidence of mitotic figures, as seen in Figure 1.

The first clinical description of these tumors was published by Wood, in 1812.³ He reported 8 patients with what he termed painful subcutaneous tubercles. He wrote the following description:

[They] appear to be well worthy of attention, both from the severe suffering which it causes to the patient, and from the singularity of the symptoms. It becomes the cause of very severe and even excruciating pain. So strongly is this pain represented by the patients, that we might be apt to amagine [archaic spelling] their statement exaggerated, did we not find them all concurring in the same representation, and most of them willing to submit to any operation. Two . . . came to me even from a distance above 30 miles.

Subsequent descriptions add little to what he wrote, but serve to emphasize the extreme level of pain and lack of physical findings. Leriche notes that the severity of the pain is limited only by the patient's vocabulary (quoted in translation by Pierre.⁴) And Pierre states that the intensity of the pain has often led to the treatment of these patients as though they were mentally ill.⁴

Seventy-five percent of these tumors occur in the hand where they are most frequently located in the fingertips.¹ They account for between 1 and 4% of all tumors of the hand in large hand clinics.¹ About two-thirds are found under the nail bed and the remainder in the pulp of the finger.¹ When they occur under the nail bed, there may be a nail deformity and streak, as shown in Figure 2.^{1,4} With small tumors in the pulp of the finger, there may be no evidence of their existence. As they enlarge, a small mass may become palpable. X-ray films of the finger are likely to be normal when the tumors are small, but may reveal a scalloping of the terminal phalanx when larger tumors are present.⁴

A glomus tumor should be suspected when the patient gives a history of severe pain precipitated by touch or probing a very small portion of the skin. The severity of the pain may remit to be followed by subsequent exacerbations. The long-term trend is for increasing severity of the pain as the tumor slowly enlarges. Since the lumen of the glomus body enlarges when the finger is cooled, the application of cold water

*General anesthesia was not introduced until 30 years after the publication of this report. Thus, patients willing to submit to surgery did so without this benefit of modern medicine.

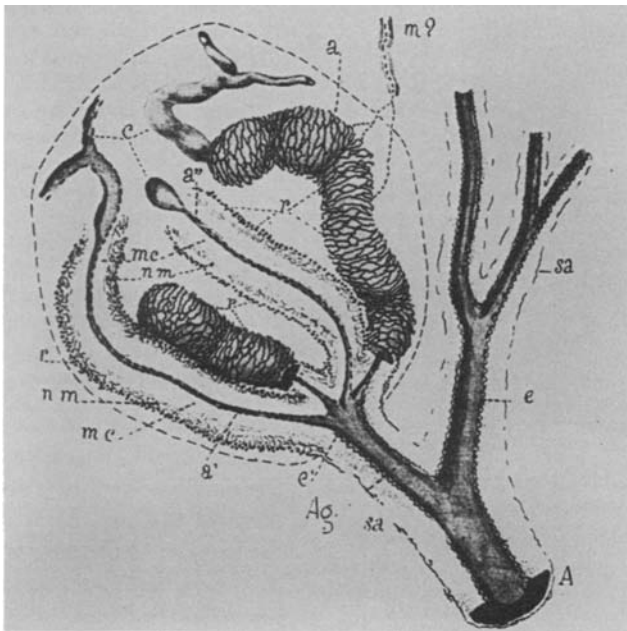


FIGURE 3 Microscopic anatomy of the glomus body. Four glomus bodies in various sections are shown beginning with a cross-section through the afferent arteriole. Note the reticular network of nerve endings surrounding the body and the termination in a venule (labeled c). (Reproduced from Barre et al, 1924.²)

or ice may provoke attacks of pain. In some patients the only abnormality on examination will be a very focal, exquisite sensitivity to pressure. All three of our patients had pressure-sensitive areas that were only 2–3 mm in diameter.

The diagnosis of a glomus tumor may be overlooked for a considerable length

of time. Our patients 1 and 2 had many years of pain prior to establishment of the diagnosis. The most common misdiagnosis is neuroma, but others, including causalgia and rheumatoid arthritis, have been reported.¹ Unnecessary surgical procedures, due to incorrect diagnosis, have been described, including sympathectomy, posterior

rhizotomy, laminectomy, and even amputation.¹ Surgical exploration and removal are usually curative.^{1,3,4} The most common cause of a failed operation is an inability to find the tumor.⁴ Although they are usually solitary, up to four tumors have been found in a single finger.⁵

The cause of these tumors is not known; however, about 25% of all patients give a history of antecedent finger trauma.¹ Our two musician-patients both play instruments where repeated pressure to small areas of the fingertip is required. Whether this leads to the development of this unusual tumor is a matter for speculation.

ACKNOWLEDGMENT

We wish to express our gratitude to Lauren Langford, M.D. for the photomicrograph in Figure 1.

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