

Rare Tumors Adjacent to the Achilles Tendon: Report of Two Cases

Jay J. Wojcik, MD*^{*}; Aditi S. Majumdar, MD*^{*}; Kathleen M. Madden, MD†[†];
Richard A. Miller, MD*^{*}

*Department of Orthopaedics & Rehabilitation, The University of New Mexico Health Sciences Center, Albuquerque, New Mexico

†Department of Pathology, The University of New Mexico Health Sciences Center, Albuquerque, New Mexico

Abstract

Benign masses are not uncommon near the Achilles tendon of the ankle. However, the occurrence of angiomyomas or glomus tumors in the region has rarely been reported. We describe two patients, a 44-year-old woman and 44-year-old man, who presented with a tender mass posterior to the Achilles tendon. Excision led to successful removal of the lesion in both cases. Results of histological examinations revealed an angiomyoma and glomus tumor in the woman and man, respectively. Although rare, the presence of these tumors should be considered in the differential diagnosis of masses near the Achilles tendon.

Introduction

A palpable prominence near the Achilles tendon often results from tendon thickening owing to tendinopathy, ossific deposits within the tendon, or the Haglund deformity.¹ Other common masses in the area include rheumatoid nodules² and tophaceous gout deposits.³ However, studies have rarely reported angiomyomas or glomus tumors adjacent to the Achilles tendon.⁴⁻⁷

Angiomyomas, also known as vascular leiomyoma or angioleiomyoma, are benign, slow-growing, and solitary soft-tissue tumors usually less than 2 cm in diameter.^{4,5,8,9} They originate from vascular smooth muscle and have three histological subtypes: solid (most common), cavernous, and venous.⁸ The tumor commonly occurs in women but generally in adults aged 40 to 60 years.^{5,9} About 75% of angiomyomas are found in the lower extremity,^{4-6,8-10} with resultant pain reported by nearly half of patients.^{8,9} The tumors rarely recur after excision.⁸

Similarly, glomus tumor are rare, benign, and hamartomatous lesions, that derive from neuromyoarterial glomus cells that regulate peripheral blood flow and temperature.¹¹⁻¹³ Studies have reported common occurrences in the hand,¹¹ primarily within the subungual

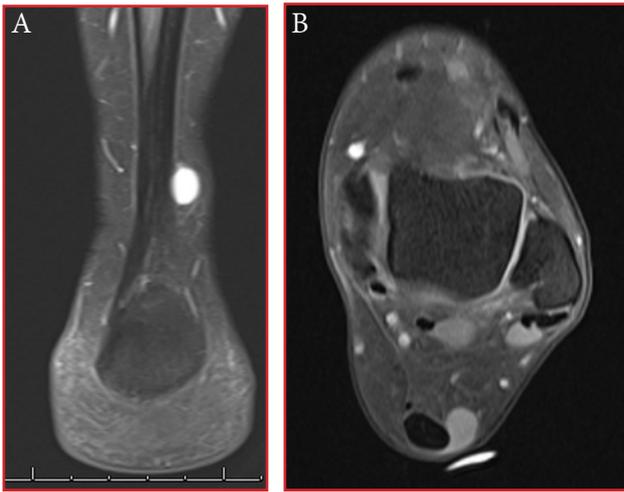
region of distal phalanges.^{12,14} Often associated with prominent peripheral capillary vasculature, the lesions account for 1.6% of all soft-tissue tumors.¹³ The tumors are typically small (≤ 1 cm in diameter), solitary, firm, painful, and intolerant to cold.^{11-13,15} Histologically, glomus tumors appear as an arteriovenous anastomotic complex comprised of uniform, circumscribed epithelioid, glomus, and smooth-muscle cells, which lack atypia or mitotic activity.¹⁶ Because clinical manifestations of extradigital glomus tumors vary in paroxysmal pain, cold sensitivity, and point tenderness, the diagnosis is often delayed.¹⁷

We describe two patients who presented with a tender mass posterior to the Achilles tendon at the ankle joint. An angiomyoma was present in the first, whereas the second involved a glomus tumor. The patients were informed that the data concerning the cases would be submitted for publication, and they provided verbal consent.

Case Reports

Case 1: Angiomyoma

A 44-year-old woman presented with a painful mass posterior to the midsubstance of the right Achilles tendon. No history of injury was reported. In the 5 months since the patient first noticed the mass, it had slowly enlarged; otherwise, she was healthy. The mass was about 1 cm in diameter, ovoid shaped, and tender to palpation. On physical examination, her ankle had full range of motion. Magnetic resonance imaging (MRI) revealed a solid enhancing mass adjacent to the Achilles tendon (Figures 1A and 1B). Excision of the mass showed no direct involvement with the Achilles tendon. The mass was mostly grayish in color with a firm, rubbery texture. Findings of histological examination were consistent with the presence of an angiomyoma (Figure 2). The area around the excision healed, and the patient had complete resolution of symptoms. No recurrence of the angiomyoma was noted.



Figures 1A and 1B. Magnetic resonance imaging in case 1, showing the angiomyoma lesion adjacent to the Achilles tendon.

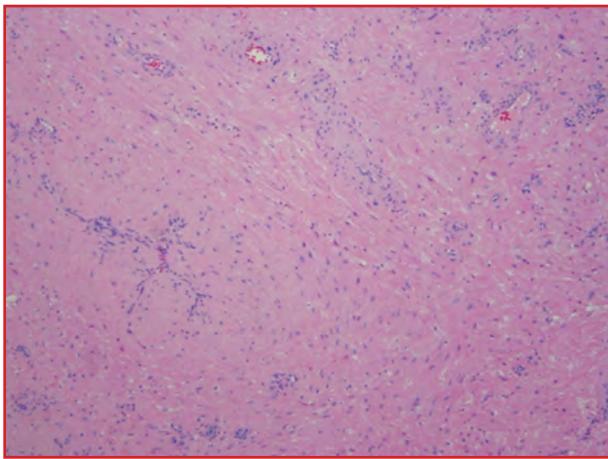


Figure 2. Results of the histological examination in case 1, showing proliferation of benign smooth muscle cells around blood vessels.

Case 2: Glomus Tumor

A 44-year-old man presented with a mass posterior to the midsubstance of his left Achilles tendon. The lesion had existed for about 6 months, and the patient had no history of an injury. The area around the mass was painful during ambulation and when rubbed against by his shoe. High blood pressure was noted in the medical history of the patient; otherwise, he was healthy. The mass was tender and about 1 cm in diameter. An MRI showed the mass to have decreased signal on T1- and T2-weighted imaging (Figure 3). No involvement of the Achilles tendon was observed. After surgical excision, the mass appeared encapsulated and bluish in color. Results of histological examination revealed signs consistent with a glomus tumor (Figure 4). Postoperatively, the patient had complete relief of pain. No recurrence of the tumor was found.

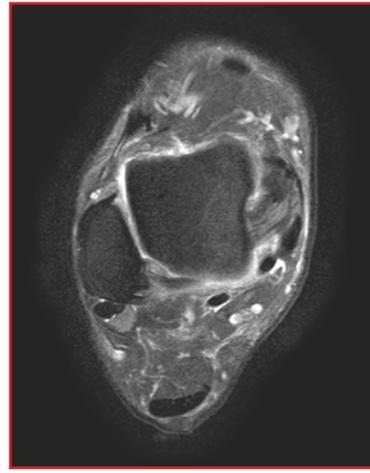


Figure 3. Magnetic resonance imaging in case 2, showing a subcutaneous mass posterior to the Achilles tendon.

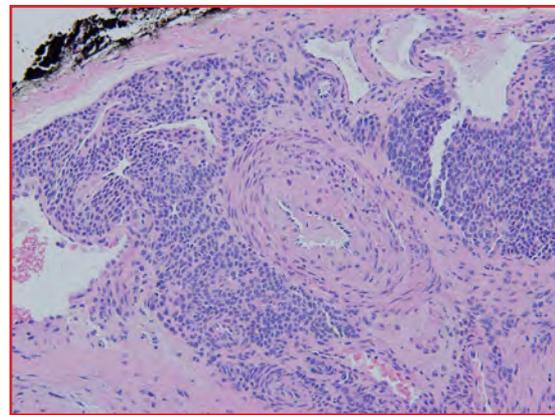


Figure 4. Results of the histological examination in case 4, showing a glomus tumor with vessels lined by uniform blue cells.

Discussion

Although benign masses may be found near the Achilles tendon, the presence of actual tumors adjacent to the tendon are rare. We describe two patients who presented with a tender mass found posterior to the Achilles tendon at the ankle joint. Findings of histological examinations revealed the presence of an angiomyoma in case 1 and glomus tumor in case 2. For both patients, excision of the mass led to successful resolution of pain.

Angiomyomas adjacent to the Achilles tendon have rarely been reported.⁴⁻⁶ Smith et al⁴ reported a 58-year-old woman with a 5-year mass at the Achilles tendon, which had slowly increased in size and led to difficulty in wearing shoes. Barnes et al⁶ reported a 37-year-old male police officer with a 2-year, intermittently painful mass next to his Achilles tendon. This was excised, and the patient noted a full recovery. Furthermore, Sonohata et al⁵ described a slowly enlarging 2-cm mass during a 2-year period, which was found on the heel of a 47-year-old male office worker.

Although findings can vary in preoperative diagnosis, results of the current case 1 support typical clinical signs of an angiomyoma near the Achilles tendon, including a size of less than 2 cm in diameter^{4,5,8,9} and prevalence in middle-aged adults, particularly women.⁶

To date, only one case by Nakamura et al⁷ in 2000 has reported extradigital glomus tumors near the Achilles tendon. In the study, a 48-year-old woman presented with a 14-year history of a painful para-Achilles nodule. In contrast, our patient in case 2 had a 6-month history of the lesion. As with the current study, simple surgical excision led to complete resolution of pain. Other reports have described extradigital paratendinous or intratendinous glomus tumors, including those near the rotator cuff musculotendinous junction,¹⁸ triceps tendon,¹⁹ quadriceps tendon,¹⁵ and patellar tendon.^{15,20} In a 20-year retrospective review of 56 extradigital glomus tumors, twenty-three patients (41%) had a lower-extremity lesion, with a total of 7 cases occurring in the leg, ankle, and foot regions.²¹ Mohler et al²² described a 55-year-old woman with a 12-year history of a solitary, painful subcutaneous nodule of the plantar arch. The lesion was treated with excisional biopsy, and findings of pathological tests confirmed a glomus tumor. Additionally, Chiang and Chen²³ reported recurrent subfascial glomus tumors in the right gastrocnemius muscle of a 51-year-old man, with severe local pain from minimal skin contact. Treatment with repeated excisions led to successful removal of six total masses.

Because angiomyomas and glomus tumors can vary in size, location, and noted pain between patients, studies have typically combined use of clinical findings with imaging tests such as MRI to help with diagnosis.^{4,12,13,15} Notably, the MRI in case 2 did not help isolate the lesion to the Achilles tendon. Subsequently, the results of the current cases may reinforce consideration of differential diagnosis in successfully identifying tumors near the Achilles tendon at the ankle joint.

Funding

The authors received no financial support for the research, authorship, and publication of this article.

Conflict of Interest

The authors report no conflicts of interest.

References

1. Weinfeld SB. Achilles tendon disorders. *Med Clin North Am* 2014;98(2):331-8. doi: 10.1016/j.mcna.2013.11.005.
2. Turesson C, Matteson EL. Clinical features of rheumatoid arthritis: extra-articular manifestations. In: Hochberg MC, Silman AJ, Smolen JS, Weinblatt ME, Weisman MH, eds. *Rheumatoid Arthritis*. Philadelphia, PA: Mosby Elsevier; 2009:62-67.
3. Ventura-Ríos L, Sánchez-Bringas G, Pineda C, et al. Tendon involvement in patients with gout: an ultrasound study of prevalence. *Clin Rheumatol* 2016;35(8):2039-44. doi:10.1007/s10067-016-3309-7.
4. Smith J, Wisniewski SJ, Lee RA. Sonographic and clinical features of angioleiomyoma presenting as a painful Achilles tendon mass. *J Ultrasound Med* 2006;25(10):1365-8.
5. Sonohata M, Okamoto T, Shigematsu M, Mawatari M, Hotokebuchi T. Angioleiomyoma overlying the Achilles tendon. *J Orthop Sci* 2007;12(5):502-4.
6. Barnes SJ, Gey van Pettius D, Maffulli N. Angioleiomyoma of the Achilles tendon. *Bull Hosp Jt Dis* 2003;61(3-4):137-9.
7. Nakamura Y, Nomura T, Ookubo M, Adati T, Harada D. Extradigital glomus tumor causing para-Achilles tendon pain: a case report. *Acta Orthop Belg* 2000;66(5):503-6.
8. Hachisuga T, Hashimoto H, Enjoji M. Angioleiomyoma: a clinicopathologic reappraisal of 562 cases. *Cancer* 1984;54(1):126-30.
9. Zhang JZ, Zhou J, Zhang ZC. Subcutaneous angioleiomyoma: clinical and sonographic features with histopathologic correlation. *J Ultrasound Med* 2016;35(8):1669-73. doi:10.7863/ultra.15.06056.
10. Yates BJ. Angioleiomyoma: clinical presentation and surgical management. *Foot Ankle Int* 2001;22(8):670-4.
11. Carroll RE, Berman AT. Glomus tumors of the hand: review of the literature and report on twenty-eight cases. *J Bone Joint Surg Am* 1972;54(4):691-703.
12. Trehan SK, Athanasian EA, DiCarlo EF, Mintz DN, Daluiski A. Characteristics of glomus tumors in the hand not diagnosed on magnetic resonance imaging. *J Hand Surg Am* 2015;40(3):542-5. doi:10.1016/j.jhssa.2014.12.002.
13. Nazzi V, Bagatti D, Mazibrada J, Franzini A. Glomus tumor closely related to a branch of the left sural nerve: a case of a rare lesion occurring at unusual location. *Acta Neurochir (Wien)* 2015;157(9):1619-22. doi:10.1007/s00701-015-2499-0.
14. Maxwell GP, Curtis RM, Wilgis EF. Multiple digital glomus tumors. *J Hand Surg Am* 1979;4(4):363-7.
15. El Hyaoui H, Messoudi A, Rafai M, Garch A. Unusual localization of glomus tumor of the knee. *Joint Bone Spine* 2016;83(2):213-5. doi:10.1016/j.jbspin.2015.07.001.
16. Kouskoukis CE. Subungual glomus tumor: a clinico-

- pathological study. *J Dermatol Surg Oncol* 1983;9(4):294-6.
17. Lee SH, Roh MR, Chung KY. Subungual glomus tumors: surgical approach and outcome based on tumor location. *Dermatol Surg* 2013;39(7):1017-22. doi:10.1111/dsu.12181.
18. Yoshikawa G, Murakami M, Ishizawa M, Matsumoto K, Hukuda S. Glomus tumor of the musculotendinous junction of the rotator cuff: a case report. *Clin Orthop Relat Res* 1996;(326):250-3.
19. Tomak Y, Dabak N, Ozcan H. Extradigital glomus tumor of the triceps tendon as a cause of elbow pain: a case report. *J Shoulder Elbow Surg* 2003;12(4):401-2.
20. Mabit C, Pécout C, Arnaud JP. Glomus tumor in the patellar ligament: a case report. *J Bone Joint Surg Am* 1995;77(1):140-1.
21. Schiefer TK, Parker WL, Anakwenze OA, Amadio PC, Inwards CY, Spinner RJ. Extradigital glomus tumors: a 20-year experience. *Mayo Clin Proc* 2006;81(10):1337-44.
22. Mohler DG, Lim CK, Martin B. Glomus tumor of the plantar arch: a case report with magnetic resonance imaging findings. *Foot Ankle Int* 1997;18(10):672-4.
23. Chiang ER, Chen TH. Multiple glomus tumors in gastrocnemius muscle: a case report. *Arch Orthop Trauma Surg* 2008;128(1):29-31.