

## Test yourself: index finger subungual pain

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### Diagnosis: right index subungual glomus tumor

In the case presented, a 36-year-old female complained of persistent pain at the tip of the index finger with exquisite cold sensitivity. The differential diagnosis for nail bed pain includes trauma; degenerative manifestations such as osteophytes and mucous cysts; foreign body and granulomatous reactions; epidermal inclusion cysts; benign neoplasms such as hemangioma, soft tissue chondroma, osteoid osteoma, and glomus tumor; and, rarely, malignant lesions such as squamous cell carcinoma, melanoma, and metastatic disease [1]. Radiographs of the patient's hand demonstrated no significant

abnormality aside from equivocal scalloping of the index finger dorsal cortex at the nail bed (Fig. 1). Clinically, a nail bed lesion was suspected, and MRI was performed, demonstrating a 2 × 3 × 4-mm rounded lesion centered in the nail bed with increased signal on fat-suppressed proton density images and avid enhancement after contrast administration (Figs. 2, 4). A high-frequency (18-MHz) ultrasound examination was also performed, which showed a hypoechoic to isoechoic rounded lesion of the index nail bed with internal power Doppler signal (Figs. 3 and 5). The imaging studies and clinical presentation of this patient were highly suggestive of glomus tumor. The patient underwent surgical excision of the lesion, and a histologic diagnosis of glomus tumor was confirmed (Figs. 6 and 7).

Glomus tumors are rare benign neoplasms of the glomus body that account for up to 5 % of hand tumors [2, 3]. Glomus bodies are an arterio-venous anastomosis with a high degree of sympathetic innervation that aid in thermoregulation. Glomus tumors arise from modified smooth muscle cells within the glomus body [4]. Approximately 75 % of glomus tumors occur in the hand and are most often located in the subungual space [1, 3, 5]. Glomus tumors typically present between 30 and 50 years of age and have equal prevalence in women and men [2]. The classic clinical presentation of a glomus tumor includes a triad of severe pain, temperature sensitivity, and point tenderness. Some patients may present with a nail bed deformity. The Hildreth sign can be a helpful clinical test in the evaluation of a possible extremity glomus tumor. The arm or foot is elevated to exsanguinate the extremity, and a tourniquet is applied. The Hildreth sign is positive if the patient reports rapid onset of pain at the site of the lesion upon release of the tourniquet [4]. The treatment of glomus tumors involves surgical excision, which is almost always curative. Up to 10 % of glomus tumors can recur after surgical excision [6].

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Glomus tumors can cause osseous scalloping, which can be detected on radiographs in up to 50 % of patients [5]. Otherwise, glomus tumors are not associated with any radiographic findings. Chondromas and hemangiomas of the finger tips can develop internal mineralization that can be detected on radiographs, whereas glomus tumors do not [1]. On MRI examination, a glomus tumor typically has high signal on T2-weighted images and demonstrates avid enhancement after contrast administration [1]. Osseous scalloping and adjacent bone marrow edema may also be evident on MRI. Because of the hypervascular nature of glomus tumors, contrast administration is helpful, as glomus tumors typically demonstrate avid enhancement. Failure of fat suppression, which can occur more commonly at the distal extremities, can decrease glomus tumor conspicuity. The smallest field of view coil possible should be used to aid in glomus tumor detection. High-frequency ultrasound examination can offer an alternative evaluation for glomus tumors of the nail bed. High-frequency ultrasound waves are not greatly impeded by the nail itself, allowing for evaluation of the nail bed. Glomus tumors typically appear as hypoechoic, well-circumscribed, rounded lesions with internal Doppler signal [1, 7, 8]. Glomus tumors can be isoechoic and have a flattened shape, which can make them less conspicuous on ultrasound [7, 8]. Because glomus tumors can be very painful to the touch, applying a thick layer of gel as a standoff for the ultrasound probe can improve patient comfort during the examination.

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**Compliance with ethical standards**

**Conflict of interest** The authors report no relevant conflicts of interest.

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