

GLOMUS TUMOR – DERMOSCOPY AND SURGERY

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Uwe Wollina^{1*}, Jacqueline Schönlebe^{2†}

¹Department of Dermatology and Allergology, Academic Teaching Hospital of the Technical University of Dresden, Dresden, Germany
²Institute of Pathology, Städtisches Klinikum Dresden, Academic Teaching Hospital of the Technical University of Dresden, Dresden, Germany

Corresponding author:

Prof. Dr. U. Wollina,
 Department of Dermatology and Allergology, Städtisches Klinikum Dresden,
 Academic Teaching Hospital of the Technical University of Dresden,
 Friedrichstrasse 41, 01067 Dresden, Germany
 Email: wollina-uw@khdf.de

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Abstract

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Background. Glomus tumors are rare and mostly benign lesions of the subcutaneous tissue. Single lesions are preferably located on the acral parts of the body, including the subungual nail apparatus.

Observations. We analyzed our files for glomus tumors of the last 10 years and found four tumors, with an equal gender distribution. The patients' age ranged from 41 to 78 years. The dominant site was subungual on fingers. Advanced and long-standing tumors tend to destroy the overlying nail plate. Another tumor was found on the plantar heel. All patients had a delayed diagnosis between $\frac{3}{4}$ of a year to three years. Nail plate dermoscopy is a useful tool for diagnosis of early subungual lesions. All tumors were successfully treated surgically with rapid and complete pain relief. Histologically, all four tumors were of the glomangioma subtype with predominant vascular structure. No relapse occurred within a follow-up of up to nine years.

Conclusions. Glomus tumors are rare. In case of subungual localization, nail plate dermoscopy is a useful non-invasive diagnostic tool. The treatment of choice is complete tumor removal by surgery. A better knowledge of this tumor will help to reduce the time to final diagnosis and treatment.

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Introduction

Glomus tumors are rare mostly benign lesions occurring typically on the acral body parts but may occur in various localizations and organs (1). They can develop subungual in the lateral or central nail bed of fingers and toes. Here, the typical symptoms are subungual circumscribed purple erythema, paroxysmal pain and hypersensitivity to cold and pressure. Clinical diagnosis is possible by Love's pin test (severe pain when the nail plate above the lesion is pressed with a pin head), Hildreth's test (disappearance of pain and tenderness after application of a tourniquet cuff proximally on the same arm), and cold test (increased pain intensity with temperature drop). In typical cases, magnetic resonance imaging

and ultrasound are not necessary for diagnosis and treatment planning (2).

Case series

We present a series of four patients with benign solitary glomus tumors of different localization (two females and two males). Their age ranged from 41 to 78. The symptoms were present for $\frac{3}{4}$ of a year to three years. The patients had consulted between two and four medical doctors before the final diagnosis, and treatment could be realized. The diagnosis was confirmed in all cases by histology and immunohistology. All patients underwent surgery and remained relapse-free. We observed no malignant glomus tumor.

Cases 1-3 – subungual lesions

A 41-year-old male patient presented with a painful subungual lesion on his 3rd left finger for about 12 months. He did not remember any recent trauma. Medical history was unremarkable.



Figure 1. Clinical presentation of subungual glomus tumor in a 41-year-old male

On examination, a single erythematous subungual lesion of about 2 mm diameter was noted (Figure 1). For dermoscopy we used a DermLite 3 Gen Cam (DermLite; San Juan Capistrano; USA). On dermoscopy with polarized light, the lesion was clearly visible within the distal nail bed, with discrete ramified telangiectasias (Figure 2). Love's pin test and cold test were positive. The suspected diagnosis was a glomus tumor. The tumor was surgically removed by transungual approach with block anesthesia under tourniquet control. The nail plate was sutured above the resulting defect as a biologic protective dressing. The patient was painless after surgery. No relapse occurred.



Figure 2. Nail plate dermoscopy with polarized light demonstrating discrete ramified telangiectasia around a red spot (Patient # 1)

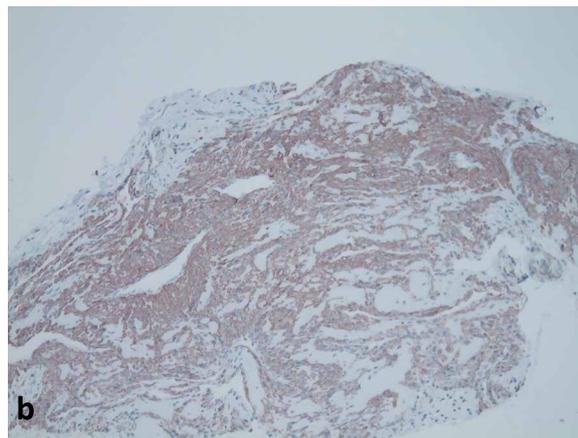
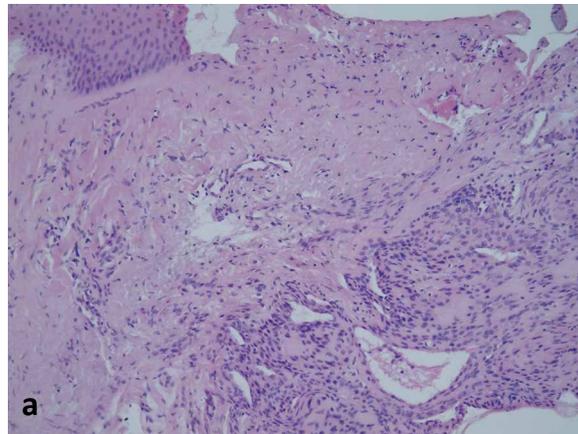


Figure 3. Histopathology of the glomus tumor in patient #1: (a) Numerous vascular spaces (HE x 10); (b) Immunostaining is positive for CD34 (x 10)

Histologic examination showed a tumor with dilated vascular channels with lining CD34- and smooth-muscle actin-positive glomus cells, which confirmed the diagnosis of a subungual solitary glomangioma (Figure 3 a and b).

When subungual tumors enlarge, the nail plate becomes spliced as seen in a 58-year-old female patient and a 78-year-old male patient. In those cases, a similar surgical approach was used, and the patients became pain-free. No relapse occurred in the follow-up period of nine years (Figure 4 a and b).

Case 4 – a lesion on the plantar heel

A 59-year-old female with a history of cutaneous melanoma presented with a painful subcutaneous nodule on her right heel. Clinically, the lesion was palpable but not visible.

We performed minor surgery to remove the painful lesion (Figure 5 a and b). On histology, the vascular tumor was positive for smooth-muscle actin and CD34 (Figure 6 a and b) and final diagnosis was glomangioma. After suturing the defect, wound healing was unremarkable. No relapse occurred during a five-year follow-up.



Figure 4. More advanced subungual glomus tumors with secondary nail plate destruction. (a) Glomus tumor of the distal nail matrix of the right index finger in a 78-year-old male; (b) Glomus tumor of the distal nail matrix of the right thumb in a 58-year-old female



Figure 5. Glomus tumor of the heel in a 59-year-old female. (a) Excision of the subcutaneous lesion; (b) Surgical specimen

Discussion

Glomus tumors are rare. They represent less than 2% of benign soft tissue tumors. These tumors are composed of glomus cells, blood vessels, and smooth muscles. Benign glomus tumors can be differentiated into three subtypes, *i.e.* glomangiomas (vessels are predominant), solid glomus tumors (glomus cells are dominant), and glomangiomyomas (with a predominance of smooth muscles). Although the majority of glomus tumors of skin are

benign, only 1% of all glomus tumors are malignant (3). Deep-seated tumors bear a higher potential risk of malignant transformation and metastatic spread. Five-year cumulative metastatic risk increased significantly for tumors with a size of more than 2 cm and with atypical mitotic figures (4).

Glomus tumors can occur as single or multiple lesions. Single lesions are more commonly seen in adolescents and adults and represent 90% of all

Test	Sensitivity	Specificity	Accuracy	Reference
Cold sensitivity	100%	100%	100%	Netscher <i>et al</i> , 2012
Love's pin test	100%	–	78%	Netscher <i>et al</i> , 2012
Hildreth's test	100%	71.4%	78%	Netscher <i>et al</i> , 2012
Trans-illumination	23-38%	90%	–	Samaniego <i>et al</i> , 2009

Table 1. Clinical tests for subungual and cutaneous glomus tumor

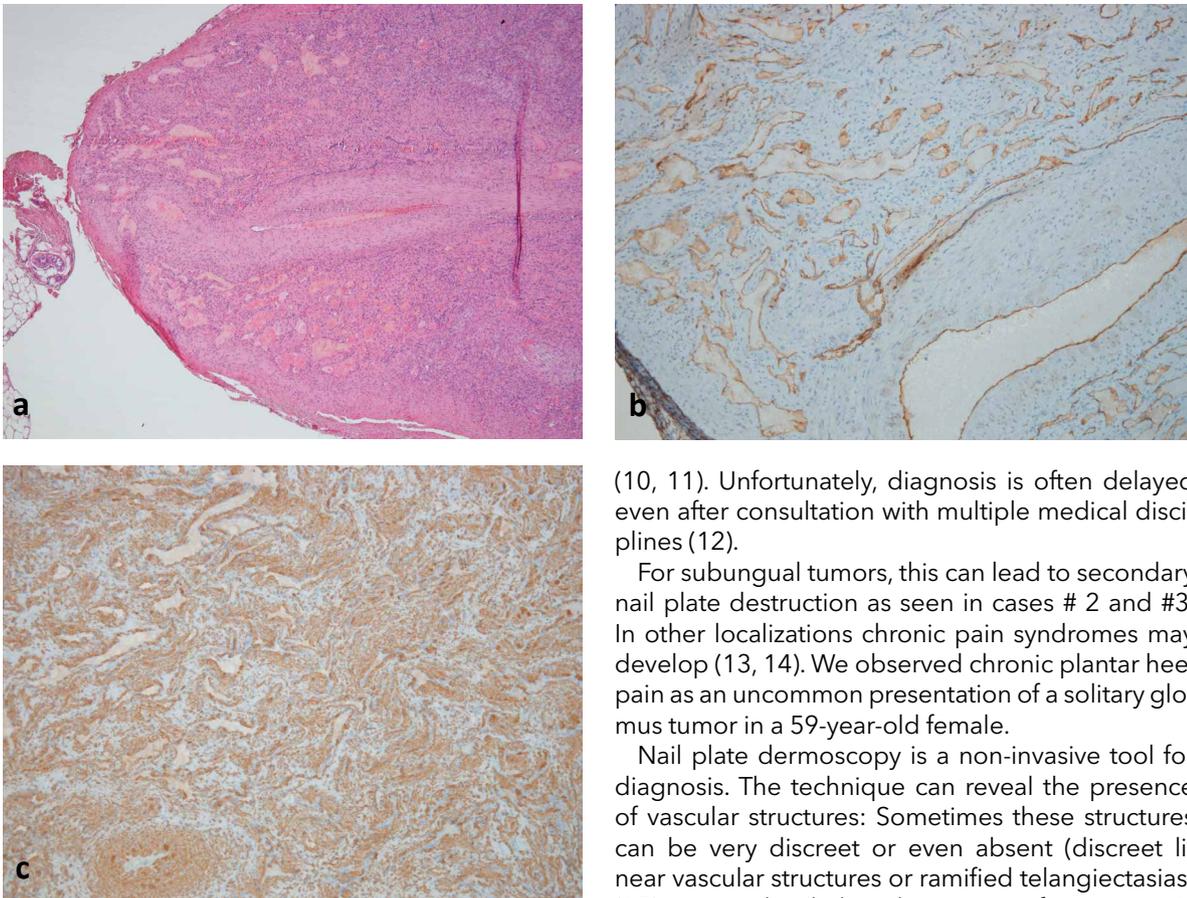


Figure 6. Histopathology of the glomus tumor in patient # 4. (a) Overview of the vascular lesion (HE x 4); (b) Immunostaining is positive for CD34 (x 10); (c) Smooth-muscle actin expression (x 10)

glomus tumors, with a preference for acral body regions. Multiple glomus tumors are bluish deep-seated nodules of childhood without acral dominance. They are also called glomuvenous malformations and are caused by mutations in the glomulin gene (5). However, the pain sensations are stronger in solitary lesions.

Glomus tumors belong to the painful skin tumors under the mnemonic “Blue ANGEL” or “BENGAL”: **B**lue rubber bleb nevus, **A**ngiolipoma/**A**ngioleiomyoma/**A**ngiosarcoma, **N**euroma/**N**euurilemmoma, **G**lomus tumor, **E**ccrine spiradenoma, and **L**eiomyoma. Due to the common symptomatology, these tumors need to be considered in the differential diagnosis of a glomus tumor. For the subungual lesions the following entities should also be evaluated: exostosis (6, 7), digital mucoid pseudocyst (8), and acquired digital arterio-venous malformation (ADAVM) (9).

The diagnosis of glomus tumor is primarily clinical for cutaneous and subungual lesions (Table 1)

(10, 11). Unfortunately, diagnosis is often delayed even after consultation with multiple medical disciplines (12).

For subungual tumors, this can lead to secondary nail plate destruction as seen in cases # 2 and #3. In other localizations chronic pain syndromes may develop (13, 14). We observed chronic plantar heel pain as an uncommon presentation of a solitary glomus tumor in a 59-year-old female.

Nail plate dermoscopy is a non-invasive tool for diagnosis. The technique can reveal the presence of vascular structures: Sometimes these structures can be very discreet or even absent (discreet linear vascular structures or ramified telangiectasias) (15). We used nail plate dermoscopy for patient #1, where the lesions had not been long-standing. The nail plate was untouched. We identified ramified telangiectasias.

Surgery is the only effective method for glomus tumor treatment. For subungual lesions, both transungual and lateral subperiosteal (periungual) approach have been used successfully (16, 17). Transungual surgery is the preferred method for tumors located medially, while perinugual surgery is preferred for lateral tumor position (18).

Conflicts of interest: none declared.

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