Original Article

Glomus tumor of the fingertips: A frequently missed diagnosis

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Abstract

Background: Glomus tumors present as painful lesions, most commonly in the fingertips. These can present to outpatient clinics of multiple specialties. **Materials and Methods:** Retrospective review was performed of 37 patients diagnosed as having glomus tumor in the thumb or fingertips over a 10-year period. The data collected included demographics, presenting symptoms, duration, previous treatment history, physical examination, treatment, and recurrence. The data were presented by means of descriptive statistics. **Results:** The mean duration of symptoms before presentation was 3.8 years (range 2 to 12 years). The mean age at presentation was 38 years (range 16 to 62 years), and female to male ratio was 21:16. Twenty-two patients had left-hand involvement; thumb 8, index finger 5, middle finger 5, ring finger 14, and little finger 5. Clinical and radiological assessments were made preoperatively. At presentation, 18 cases had nail changes, whereas 19 had no obvious nail changes – out of these, 4 had pulp involvement. The lesion involved the subungual region in 33 cases. The mean size of the lesion was 3.8 mm (range 2 to 10 mm). Thirty-six patients were found to have histopathologically proven glomus tumors, whereas in one no specific lesion was found on histopathological examination; this patient returned with recurrence of symptoms at 2-month follow-up. There was no other patient experienced recurrence of symptoms. **Conclusion:** Early diagnosis of glomus tumors is important to avoid lengthy treatment delays, chronic pain, disuse syndromes, and psychiatric misdiagnoses.

Keywords: Digits, finger, glomus tumor, hand, misdiagnosis

Introduction

Glomus tumors are neoplasms of the normal glomus body. These are rare tumors and may affect any area of the body. Up to 75% occur in the hand, and approximately, 65% of these are in the fingertips, particularly in the subungual location[1,2] though pulp lesions have also been reported.[3-5] Solitary glomus tumors usually present as painful lesions. Multiple lesions may be painless.[1,6] They classically present with a triad of symptoms, which include - pain, pinpoint tenderness, and hypersensitivity to cold. This presentation is presumed to enable a clinical diagnosis in 90% of cases.[6-9]

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Glomus tumors can present to outpatient clinics of multiple specialties, and patients usually report a long duration of symptoms before correct diagnosis and treatment. They are difficult to diagnose, particularly as they are often small, and situated deep in the fingertip. Non-specific symptoms and unremarkable physical examination mean that incorrect diagnoses and inappropriate treatments are common place.[2-6,10] We present our experience with the management of 37 cases of glomus tumors of the fingertips treated over a period of 10 years.

Materials and Methods

This is a retrospective review of 37 patients presenting with clinically suspected glomus tumor of fingertip, over a period of 10 years. Institutional human ethics committee approval was obtained prior to commencing the study (IHEC-LOP/2018/

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IM0182). Medical records were reviewed for patient demographics, presenting symptoms, duration, previous treatment history, physical examination, treatment, and recurrence. The complaints of all patients were excruciating pain on touching or with exposure to coldness in the fingertip. The clinical criteria used to make the diagnosis were the classical triad of findings – localized tenderness, pain, and cold-sensitivity. Plain radiographs were taken in all patients. Ultrasound (US) examination was performed selectively in 4 cases to confirm the diagnosis and localize the lesion. All patients were treated with surgical excision.

All cases were performed as day-cases. One dose of intravenous antibiotic was administered prophylactically about 30 min prior to the procedure. After prepping and draping, the lesion was localized on-table before administering anesthesia. All operations were performed under loupe-magnification, under digital nerve block anesthesia, and under tourniquet control.

Subungual lesions were excised through a transungual approach [Figure 1a and b] and those with pulp lesions with a direct incision [Figure 2] over the suspected site. All specimens were sent for histopathological examination (HPE). Suture removal was done at 2 weeks. Subsequent follow-up was at 6 to 8 weeks and at 6 months. Patients were advised to return if they experienced any recurrence of symptoms and postoperative nail plate deformity.

Results

Table 1 summarizes the details of the cases. The mean duration of symptoms before presentation was 3.8 years (range 2 to 12 years). The mean age at presentation was 38 years (range 16 to 55 years), and the female to male ratio was 21:16. Twenty-two patients had left-hand involvement; thumb 8, index finger 5, middle finger 5, ring finger 14, and little finger 5.

Eighteen cases had nail changes, whereas 19 had no obvious nail changes – out of these, 4 had pulp involvement, in these the mass of the pulp was remarkably greater than normal side digit. The lesion involved the subungual region in 33 cases. The mean size of lesion was 3.8 mm (range 2 to 10 mm). There was no case with multiple tumors detected. There was no case of surgical site infection. HPE confirmed the diagnosis of glomus tumor in all patients [Figure 3a and b] except one.

Follow-up

All patients were symptom-free postoperatively except one with a thumb pulp lesion (patient no. 24) who presented with the reappearance of symptoms after an 8-week pain-free interval. The HPE report of this patient had not revealed any specific lesion. She was offered re-exploration; she refused and did not return for follow-up. There was no other patient experienced recurrence of symptoms during the post-operative follow-up, which was a minimum of 6 months (range 6 months to 4 years).

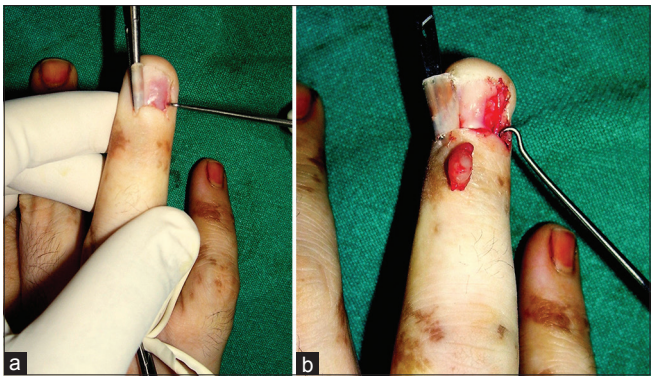

Figure 1: (a) Nail plate reflected and showing glomus tumor in subungual location of the right ring finger. (b) Excised glomus tumor from the subungual location

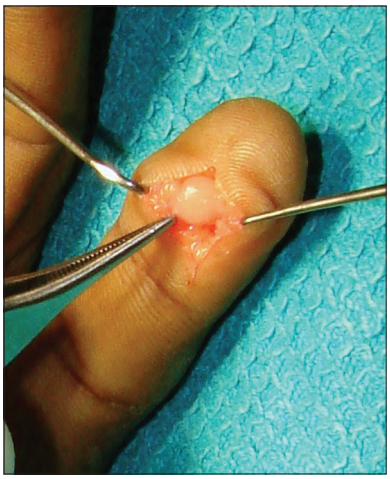

Figure 2: Glomus tumor of the pulp of left little finger

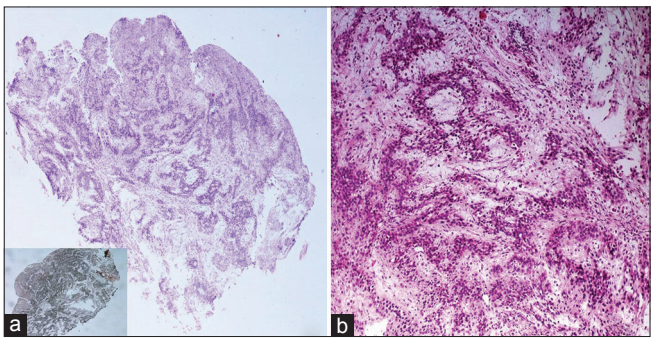

Figure 3: (a) The photomicrograph shows somewhat circumscribed tumor showing cords, nests of glomus cells surrounding intricate vascular network (H and E; ×40). Inset shows reticulin stain highlighting the rich vascular network. (b) Photomicrograph shows cuboidal monomorphic glomus cells with round nuclei. Intervening stroma is edematous, myxoid, and shows numerous mast cells. (H and E; ×200)

Discussion

Glomus tumors are difficult to diagnose, particularly as they are often small, and situated deep in the fingertip. The common characteristic in most series is the long duration of symptoms before correct diagnosis and treatment. The average delay in the diagnosis was 4 years in our series. During this period, the patient

Table 1: Distribution of 37 glomus tumors according to age, sex, side, digit involved, location, duration before presentation, size of lesion, and nail changes

Case No.	Age (years)	Sex	Side	Digit	Location	Duration before presentation (years)	Size (mm)	Nail changes
1	50	F	L	Ring	Subungual	12	10	Yes
2	30	F	L	Ring	Subungual	2	3	Yes
3	43	F	R	Thumb	Subungual	3	3	Yes
4	28	F	L	Ring	Subungual	5	3	Yes
5	47	F	R	Ring	Subungual	5	4	Yes
6	35	M	L	Ring	Subungual	4	4	Yes
7	26	F	R	Index	Subungual	3	4	Yes
8	35	M	R	Index	Pulp	5	5	No
9	38	F	R	Thumb	Subungual	5	5	Yes
10	33	F	L	Middle	Subungual	2	6	No
11	26	F	L	Ring	Subungual	2	3	No
12	36	F	L	Ring	Subungual	2	3	No
13	36	M	R	Ring	Subungual	3	3	No
14	38	M	L	Little	Subungual	4	3	Yes
15	16	F	L	Ring	Subungual	4	4	Yes
16	50	F	R	Middle	Pulp	5	5	No
17	36	F	R	Middle	Subungual	5	5	Yes
18	50	M	L	Ring	Subungual	4	4	Yes
19	37	M	L	Middle	Subungual	5	3	No
20	22	M	L	Index	Subungual	4	4	Yes
21	16	F	R	Index	Subungual	2	4	No
22	38	M	L	Little	Pulp	5	4	No
23	55	F	L	Index	Subungual	3	4	No
24	35	F	L	Thumb	Pulp	2	2	No
25	52	M	R	Thumb	Subungual	3	4	No
26	42	F	L	Ring	Subungual	4	4	No
27	45	M	L	Thumb	Subungual	4	4	No
28	30	F	L	Thumb	Subungual	3	3	No
29	34	F	R	Ring	Subungual	5	3	No
30	43	M	R	Thumb	Subungual	4	3	Yes
31	38	F	L	Little	Subungual	3	3	No
32	48	M	L	Middle	Subungual	2	3	Yes
33	48	M	L	Ring	Subungual	3	3	Yes
34	39	M	L	Ring	Subungual	4	3	Yes
35	35	F	R	Thumb	Subungual	4	3	No
36	45	M	R	Little	Subungual	5	3	No
37	38	M	R	Little	Subungual	2	4	Yes

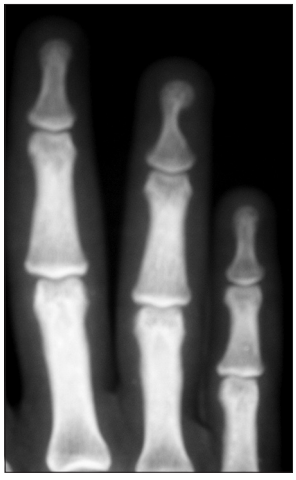

Figure 4: Scalloping of the distal phalanx of right ring finger (same patient shown in Figure 1)

is in pain because of both errors in diagnosis and the fact that other medical and surgical treatments are useless.[2-6,10]

Most patients spent these years visiting multiple physicians and other health professionals without a definitive diagnosis or treatment plan. Some of the various specialties involved in the care of our patients, as in most series, included primary care, dermatology, neurology, rheumatology, neurosurgery, orthopedics, and even alternative medical treatments.[3,8,11,12] The prescribed investigations included electrophysiological studies, magnetic resonance (MR) imaging of the cervical spine, computed tomography of the cervical spine and hand, isotope-bone scans, etc. Inappropriate treatments advised included among others: physiotherapy, radiotherapy, cortisone injections, vasodilator therapy, carpal tunnel release, ulnar nerve decompression, laminectomy,

sympathectomy, and even amputation; these are also common with other series.[11]

In the present series, the subungual location of the tumor was found in 89% cases. The subungual lesions that need to be kept in mind during evaluation of these patients include benign solid tumors (glomus tumor, subungual exostosis, soft-tissue chondroma, keratoacanthoma, hemangioma, and lobular capillary hemangioma), benign cystic lesions (epidermal and mucoid cysts), and malignant tumors (squamous cell carcinoma and malignant melanoma).[6,7] The differential diagnosis for glomus tumor that needs consideration includes subungual angioleiomyoma,[13] hyperplastic pacinian corpuscles,[14] blue nevi, blue rubber bleb nevus syndrome, eccrine spiradenoma, Kaposi sarcoma, Maffucci syndrome, neurilemmoma, and venous malformations.[15]

Radiologically, glomus tumors appear either as bone erosion or invasion depending on where it arises. A sclerotic border is present owing to the slowly enlarging mass.[16] In the present series, radiographs in 15 patients showed changes in the distal phalanx that ranged from mild indentation to scalloping of phalangeal cortex [Figure 4]. The radiological differential diagnoses include epidermal inclusion cyst, enchondroma, chronic osteomyelitis, sarcoidosis, metastatic carcinoma, subungual melanoma, and osteoid osteoma.[16]

High-velocity flow in intra-tumoral shunt vessels causes these lesions to be hypervascular at color-Doppler imaging, a finding that is specific for the diagnosis.[6,10] Using high-frequency probes (15-MHz), US may help identify the exact relationship of a tumor with the various components of the nail apparatus and underlying bone.[17] In this series, US examination was performed selectively in 4 cases to confirm the diagnosis and localize the lesion.

The MR imaging features considered diagnostic for glomus tumor include intermediate or low-signal intensity on T1-weighted images, marked hyperintensity on T2-weighted images, and strong enhancement after the injection of gadolinium-based contrast material.[6,7] The MR imaging has been shown to be highly sensitive, detecting 82% to 90% of glomus tumors in the hand.[8,10,18] However, negative imaging studies do not rule out the presence of a small-sized tumor, and investigation should proceed with surgical exploration in the setting of a well-established clinical suspicion.[6,10] The MR imaging was not done for any cases in this series.

The treatment of glomus tumor is surgical.[1,4,12] In various series, the recurrence rates have varied from 12% to 33%. It is generally thought that symptoms that recur within days to weeks of surgery may suggest inadequate excision; in contrast, symptoms when they appear 2 to 3 years postoperatively may indicate multiple tumors.[19] The possibility of a postoperative neuroma accounting for pain cannot be overlooked.[8] We had no case with recurrence of symptoms except one in whom no specific lesion was found histopathologically.

The transungual approach for excision of the glomus tumor is usually recommended[4,9,11,12,20] as it gives the best exposure if the lesion is completely subungual. In the present series, the transungual approach was used in all cases with subungual lesions. Replacing the nail plate in its original position has been suggested to prevent nail deformities.[12] In all transungual excisions, we replaced the nail plate and encountered no case of postoperative nail deformity. Some authors have used lateral approaches, viz., lateral subperiosteal[21] and latero-ungual.[6] The main disadvantage reported with lateral approaches is the lesser degree of exposure of the nail bed in subungual lesions, particularly in cases of very small tumors.[6] Vasisht *et al.*[21] reported a recurrence rate of 15.7% in their series of 19 patients treated with excision using the lateral subperiosteal approach.

Conclusion

Patients with glomus tumors can present to a variety of specialties. General practitioners and family physicians may be the first medical specialists to see these patients. It is of utmost importance to take a careful history and perform a meticulous clinical examination to avoid missing this lesion. Complete excision of lesion using transungual approach for subungual lesions and direct incision for pulp lesions has resulted in excellent results in our experience. The alleviation of symptoms following surgery is quite gratifying both for the patient and the surgeon.

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Conflicts of interest

There are no conflicts of interest.

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