

Early Recognition of Glomus Tumor of Hand Using Clinical Tests: Experience from an Indian Tertiary Center

Abhishek Sharma¹, Akshay Kumar¹, Kuldeep Singh¹, Iti Jain¹, Preksha Sharma¹, Eashnoor Singh²

Learning Point of the Article:

Early diagnosis of glomus tumor with high suspicion and simple bedside tests can reduce prolonged diagnostic delay.

Abstract

Introduction: Glomus tumors are rare, benign neoplasms of the glomus body, most often occurring in the subungual region of the digits. Their small size and nonspecific symptoms frequently lead to delayed diagnosis and patient suffering.

Materials and Methods: A retrospective review of seven histopathologically confirmed cases of glomus tumors treated at a tertiary center was performed. Clinical features, diagnostic tools, surgical approaches, and outcomes were analyzed. Pain severity was assessed using the Visual Analog Scale (VAS) before and after surgical excision.

Results: The cohort included five females and two males, mean age 42 years (range 32–51). Tumors were right sided in five patients and located in the subungual region (n = 3), lateral nail fold (n = 2), pulp (n = 1), and arm (n = 1). Pain was universal; Love's test was positive in all patients, cold sensitivity in 71.4%, and Hildreth's test in 57.1%. The mean duration of symptoms before diagnosis was 17.5 months. Magnetic resonance imaging (MRI) revealed characteristic hyperintense T2 lesions in all imaged cases. All patients underwent surgical excision (transungual or direct approaches). Pre-operative mean VAS pain score was 8.7, improving to 2.0 postoperatively. No recurrences were observed during a mean 7-month follow-up. One patient developed minor nail deformity.

Conclusion: Digital glomus tumors, though rare, should be strongly suspected in patients with focal fingertip pain and positive Love's test. MRI supports localization, but simple clinical tests remain highly effective, particularly in resource-constrained settings. Surgical excision remains the treatment of choice, providing excellent pain relief with minimal complications and no recurrence in this series.

Keywords: Glomus tumor, subungual tumor, fingertip pain, love's test, Hildreth's test, surgical excision.

Introduction

Glomus tumors are rare, benign tumor that originates from the glomus body, a specialized arteriovenous anastomosis involved in blood flow regulation within the dermis and in thermoregulation of digits [1]. These tumors are most frequently found in the digits, particularly beneath the nails, where glomus bodies are most concentrated [1,2]. The earliest

description of the clinical features of these tumors can be traced back to 1812, when William Wood detailed cases of painful subcutaneous nodules – now understood to be glomus tumors in the Edinburgh Medical and Surgical Journal [3,4].

Typically affecting young to middle-aged adults, digital glomus tumors most commonly arise in the subungual region, especially of the fingers, and exhibit a striking clinical triad: Paroxysmal

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Author's Photo Gallery



Dr. Abhishek Sharma



Dr. Akshay Kumar



Dr. Kuldeep Singh



Dr. Iti Jain



Dr. Preksha Sharma



Miss. Eashnoor Singh

¹Department of Plastic Surgery, Pandit Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences, Rohtak, Haryana, India.

²Pandit Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences, Rohtak, Haryana, India.

Address of Correspondence:

Dr. Akshay Kumar,
Department of Plastic Surgery, Pandit Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences, Rohtak, Haryana, India.
E-mail: plasticsurgeonakshaykumar@gmail.com

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Figure 1: Intraoperative steps of subungual glomus tumor excision: (a) Nail plate elevation, (b) tumor exposure and dissection, (c) excised tumor specimen (~0.5 cm), and (d) post-operative closure. Personal clinical case, 2024.

pain, tenderness to pressure, and hypersensitivity to cold [4,5,6,7]. Despite this classic symptoms, diagnostic delays are common, often extending for years, primarily due to the tumor's small size, deep location, and overlap with other multiple differential diagnoses as neuroma, arthritis, or chronic pain syndromes [8,9].

Magnetic resonance imaging (MRI) has emerged as a highly sensitive modality for detecting these small sized tumors, especially in the early or ambiguous cases [6,8]. T2-weighted images typically reveal a well-defined, hyperintense lesion beneath the nail bed, providing essential pre-operative localization. MRI consistently showed hyperintense signals on T2-weighted images, supporting the diagnosis in all patients [4,10]. Tumor sizes vary from 0.3 cm to 0.9 cm. Additional tools such as X-rays' ultrasound and clinical tests – including Love's pin test and Hildreth's test – also contribute to early diagnosis [9,11]. Recent literature shows the value of dermoscopy and cytological evaluation in select cases [12].

Histologically, glomus tumors are composed of uniform, round glomus cells aligned with capillary-sized vessels, while the majority are benign, atypical. Malignant variants, although rare, have been described and require thorough histopathological assessment [2,13]. Malignant forms may show infiltrative growth, mitotic activity, and nuclear atypia and require more aggressive surgical management and reliability.

Surgical management varied, including transungual and direct approaches, with one patient undergoing wide local excision. Post-operative outcomes were favorable, with minimal complications; only one patient experienced a nail deformity. The pre-operative pain scores, assessed by the Visual Analog Scale (VAS), ranged from 7 to 10.

Surgical excision remains the gold standard of treatment, with approaches such as transungual, lateral subperiosteal, or direct nail bed incision depending on tumor location and surgeon preference [12,14,15,16]. The transungual approach offers direct visualization of subungual lesions and is associated with excellent symptom relief and minimal recurrence if the tumor is completely excised [15]. Alternatively, lateral subperiosteal dissection provides comparable outcomes with potentially better nail bed preservation [14,16].

Importantly, several clinical studies document dramatic reductions in pain postoperatively, as measured by the VAS. In a retrospective series of 23 patients, pre-operative mean VAS was 8.7, which declined to 0.8 following complete excision ($P < 0.01$) [17]. Similarly, a case series of four digital glomus tumors reported a mean VAS decrease from 7.75 to 1.0 after surgery ($P = 0.0028$) [18].

Glomus tumors of the hand are rare and misdiagnosed as there is multiple differential diagnosis of fingertip pain. There is diagnostic delay due to small size, atypical locations, and non-specific symptoms. Persistent localized digital pain, tenderness,



Figure 2: (a-d) Intraoperative images showing lateral subperiosteal approach for excision of subungual glomus tumor of the finger. Personal clinical case, 2024.



Figure 3: (a-c) Pre-operative marking for wide local excision, intraoperative excision, and excised specimen from the upper arm. Original clinical photograph.

and cold sensitivity may be overlooked despite the availability of simple bedside tests described in this study. The resulting diagnostic delay can lead to prolonged pain and unnecessary investigations or treatment and financial burden to medical facility or patients.

Therefore, this study was undertaken to evaluate the diagnostic value of simple clinical tests, early referral in concerned department and outcomes following surgical excision, with the aim of promoting early diagnosis and effective management, particularly in resource-limited settings. This study also contributes additional clinical data on glomus tumors from an Indian tertiary care center.

Objectives

This study aims to further delineate the clinical presentation, diagnostic strategies, make algorithm, and surgical outcomes of digital glomus tumors, contributing to improved recognition and management of the glomus tumor yet often overlooked yet highly treatable condition.

Materials and Methods

A retrospective review was conducted at the Department of Plastic Surgery, PGIMS, Rohtak, India. The study included seven patients with histopathologically confirmed glomus tumors of the hand diagnosed between 2021 and 2024.

Inclusion criteria were clinical presentation consistent with glomus tumor, confirmation by histopathology, and availability of complete clinical records.

All patients underwent surgical excision with either a transungual (Fig. 1) or lateral subperiosteal approach (Fig. 2) and with wide local excision (Fig. 3), depending on tumor location. Perioperative and post-operative observations, complications, and follow-up data (minimum 7 months) were recorded. Pain was evaluated pre- and postoperatively using the VAS. Recurrence was monitored at regular outpatient visits.

Data were analyzed using descriptive statistics. Continuous variables were expressed as mean and range, while categorical variables were presented as frequencies and percentages. Pre-operative and post-operative VAS scores were compared to assess improvement in pain following surgery.

Results

A total of seven patients with histopathologically confirmed glomus tumors were included in the study. Among the seven patients, five were female and two were male, with a mean age of approximately 42 years (range: 32–51 years). The tumors were more commonly located on the right side in five out of seven cases. Anatomical distribution included subungual ($n = 3$), pulp of the finger ($n = 1$), lateral nail fold ($n = 2$), and lateral aspect of the arm ($n = 1$). Right side more commonly affect (5 cases) then left side (2 cases).

Clinically, all patients presented with pain as the primary symptom. Tenderness was reported in six patients, and five experienced cold sensitivity. The average duration of symptoms before diagnosis was approximately 17.5 months. On clinical examination, Love's test was positive in all patients (100%),

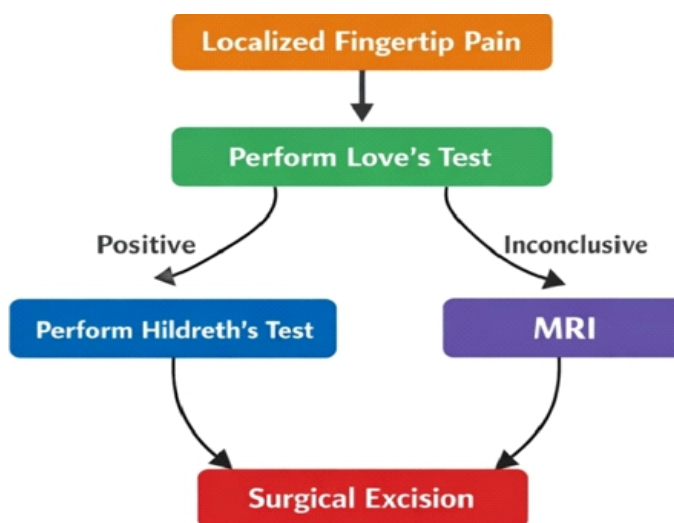


Figure 4: Proposed diagnostic algorithm for suspected glomus tumor.

Table 1: Clinical profile and surgical outcome of all seven patients

Patient ID	Age (years)	Sex	Location of tumor	Side	Symptoms	Duration (months)	Love test	Hildreth test	Cold sensitivity test	Pre-op VAS score	Tumor size (cm)	Surgical approach	Post-op complication	Follow-up (months)	Post-op VAS score	Recurrence
GT-01	32	F	Index finger Subungual	Rt.	Pain, tenderness, cold sensitivity	15	Positive	Positive	Positive	8	0.3	Transungual	None	7	2	No
GT-02	45	F	Ring finger Pulp of Finger	Lt.	Pain, cold sensitivity	24	Positive	Positive	Positive	10	0.9	Direct	None	7	3	No
GT-03	51	F	Thumb, subungual	Rt.	Pain, tenderness, nail discoloration	12	Positive	Positive	Positive	8	0.5	Transungual	Nail Deformity	7	1	No
GT-04	39	M	Index finger, subungual	Rt.	Pain, tenderness	18	Positive	Positive	Positive	10	0.6	Direct	None	7	2	No
GT-05	45	F	Index finger Lateral Nail Fold	Lt.	Pain, tenderness, cold sensitivity	24	Positive	Negative	Positive	9	0.4	Direct	None	7	3	No
GT-06	34	F	Thumb, lateral nail fold	Rt.	Pain, tenderness	12	Positive	Negative	Negative	7	0.4	Direct	None	7	1	No
GT-07	45	M	Arm lateral, aspect	Rt.	Pain, tenderness, cold intolerance	12	Positive	Negative	Positive	9	0.8	Wide local excision	None	7	1	No

F: Female, M: Male, OP: Operative, VAS: Visual analog scale, Rt: Right, Lt: Left

indicating high diagnostic significantly improved postoperatively to scores between 1 and 3. All excised lesions were confirmed as solid glomus tumors on histopathology.

All patients were followed up for 7 months, during which no tumor recurrence was observed. Postoperatively, all patients reported significant pain relief. The mean VAS score improved from 8.7 before surgery to 2.0 after surgery. No recurrences were observed during the follow-up period (Table 1).

One patient (14.3%) developed post-operative nail deformity following transungual excision. No other complications or tumor recurrences were observed during the 7-month follow-up period.

Discussion

Glomus tumors are rare, benign neoplasms arising from the glomus body, typically located in the digits, particularly the subungual region as in our study, we have only one case which is at different site. In this case series, a strong female predominance (five out of seven cases) was observed, which is

consistent with previously published data indicating that glomus tumors occur more frequently in women, especially in the fourth to fifth decades of life [4, 19, 20].

Pain was a universal symptom in this study, with most patients also exhibiting point tenderness and cold sensitivity – features that comprise the classical clinical triad. The Love's pin test, a highly sensitive clinical test for glomus tumors, was positive in all patients in this series, confirming its diagnostic utility. However, the Hildreth's test and cold sensitivity test, while supportive, were not positive in all patients, indicating some inter-patient variability in clinical signs [4, 21].

Surgical excision was curative in all cases, with substantial improvement in symptoms and no recurrence observed during follow-up. The transungual approach, although effective for subungual tumors, did result in nail deformity in one case a known risk of this technique [22]. All other tumors were approached directly, avoiding nail disruption. This reinforces the importance of selecting a surgical approach based on tumor location and size [23].

Table 2: Comparison of present study with previously published studies on glomus tumors

Study	Number of patients	Mean age (years)	Female (%)	Mean diagnostic delay	Diagnostic methods	Surgical approach	Recurrence	Key findings
Assmus and Dombert (2002)	36	51–52	64%	8 years	Clinical exam+MRI (selected cases)	Mostly transungual triangular incision	1 case	Majority in distal phalanx; pain and cold intolerance common
Van Geertruyden <i>et al.</i> (1996)	51	59	19%	10 years	Clinical suspicion (90%), X-ray changes (36%)	Direct transungual excision	2 cases	Blue discoloration 29%; nail deformity/pulp nodule 33%
Dhingra <i>et al.</i> (2022)	4	39.2	75%	5.75 years	Clinical tests (Love, Hildreth)+MRI	Transungual/lateral approach	None	VAS improved from 7.75 to 1 ($P=0.0028$)
Present study	7	42	71%	17.5 months	Clinical tests + MRI	Transungual (3) and direct excision (4)	None	VAS improved from 8.7 to 2.0; Love's test positive in 100%

MRI: Magnetic resonance imaging, VAS: Visual Analog Scale



In terms of symptomatic relief, patients demonstrated significant improvement in pain scores. The mean VAS score improved from 8.7 preoperatively to 2.0 postoperatively, indicating excellent surgical outcomes. However, the mean duration of symptoms before diagnosis was notably long (17.5 months), reflecting a common delay in recognizing this condition (Table 2).

International literature frequently reports diagnostic delays of 3–7 years due to the subtlety of symptoms and the rarity of the condition. However, in this series, the mean delay in diagnosis was 17.5 months, significantly shorter than reported globally. This may reflect greater clinical suspicion, improved diagnostic pathways, or better healthcare access at the treating center. This diagnostic delay has been consistently reported in literature, often leading to unnecessary treatments and investigations [18]. These findings offer valuable insight into how the recognition and management of glomus tumors may be evolving within the Indian healthcare system. It also suggests that regional differences in healthcare infrastructure and awareness can significantly impact time to diagnosis and, subsequently, patient outcomes.

Limitations

The sample size was relatively small, reflecting the rarity of glomus tumors and multiple differential diagnosis. In addition, the study was retrospective in nature and conducted at a single tertiary care center. The follow-up duration was limited, and longer follow-up would be required to fully evaluate recurrence rates. Despite these limitations, the study provides useful clinical insights into the diagnosis, early, and effective diagnosis due to early referral system and management of glomus tumors in a tertiary care setting.

Conclusion

Glomus tumors of the hand are uncommon but should be

considered in patients presenting with persistent, localized digital pain, particularly when associated with tenderness and cold sensitivity. On the basis of this study, every localized fingertip pain should follow a Proposed Diagnostic Algorithm (Fig. 4) for glomus tumor and referred to proper department.

In this study, simple bedside clinical tests, especially Love's test, demonstrated high diagnostic utility and may facilitate early recognition, while MRI provided useful pre-operative localization. Surgical excision resulted in substantial pain relief, with the mean VAS score improving from 8.7 to 2.0, no tumor recurrence during follow-up, and minimal post-operative morbidity and complications. These findings emphasize the importance of clinical suspicion and systematic evaluation to reduce diagnostic delay and enable effective treatment of glomus tumors as soon as possible to improve patient quality of life and prevent prolonged suffering, particularly in resource-limited settings. There is limited literature from Indian tertiary centers specifically analyzing glomus tumors. My study adds regional data and reflects the effectiveness of clinical diagnostic tools even without routine MRI use – relevant for cost-conscious setups.

Our study highlights the diagnostic value of simple clinical tests, particularly Love's test, which showed high positivity in our series. The findings also demonstrate that accurate diagnosis can often be achieved through careful clinical evaluation, which is especially relevant in resource-limited settings where routine MRI may not always be feasible.

Clinical Message

"Glomus tumor should be considered in patients with persistent, severe, localized digital pain, particularly when Love's test is positive. Early clinical recognition can reduce diagnostic delay and financial burden, while complete surgical excision provides definitive treatment and significant pain relief."

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Conflict of interest: Nil **Source of support:** None

References

1. Van Geertruyden J, Lorea P, Goldschmidt D, De Fontaine S, Schuind F, Kinnen L, et al. Glomus tumours of the hand. A retrospective study of 51 cases. *J Hand Surg Br* 1996;21:257-60.
2. Mravic M, LaChaud G, Nguyen A, Scott MA, Dry SM, James AW. Clinical and histopathological diagnosis of glomus tumor: An institutional experience of 138 cases. *Int J Surg Pathol* 2015;23:181-8.
3. Wood W. On painful subcutaneous tumours. *Edinb Med Surg J* 1812;8:283-91.
4. Bhaskaranand K, Navadgi BC. Glomus tumour of the hand. *J*

Hand Surg Br 2002;27:229-31.

5. Drapé JL, Idy-Peretti I, Goettmann S, Wolfram-Gabel R, Dion E, Grossin M, et al. Subungual glomus tumors: Evaluation with MR imaging. *Radiology* 1995;195:507-15.

6. Singh D, Garg RS, Vikas, Garg Y, Arora V. Glomus tumor - a rarity; M.R.I- a big help in early diagnosis. *J Orthop Case Rep* 2016;6:38-9.

7. Morey VM, Garg B, Kotwal PP. Glomus tumours of the hand: Review of literature. *J Clin Orthop Trauma* 2016;7:286-91.

8. Seo JH, Lee HS, Kim SW, Jeong JJ, Choi YR. Subungual glomus cell proliferation in the toe: A case report. *J Foot Ankle Surg* 2014;53:628-30.

9. aisanSmilevitch D, Chaput B, Grolleau JL, Rongieres M, Mansat P. Improvement in quality of life after surgery for glomus tumors of the fingers. *Chir Main* 2014;33:330-5.

10. Muramatsu K, Ihara K, Hashimoto T, Tominaga Y, Taguchi T. Subungual glomus tumours: Diagnosis and microsurgical excision through a lateral subperiosteal approach. *J Plast Reconstr Aesthet Surg* 2014;67:373-6.

11. Biswas D, Sikdar S, Islam T. Outcomes of the transungual approach in 56 consecutive digital subungual glomus tumours. *J Hand Surg Asian Pac Vol* 2024;29:240-7.

12. Falcone MO, Asmar G, Chassat R. Subungual glomus tumor. *Hand Surg Rehabil* 2024;43S:101607.

13. Folpe AL, Fanburg-Smith JC, Miettinen M, Weiss SW. Atypical and malignant glomus tumors: Analysis of 52 cases, with a proposal for the reclassification of glomus tumors. *Am J Surg Pathol* 2001;25:1-12.

14. Mukherjee S, Bandyopadhyay G, Saha S, Choudhuri M. Cytodiagnosis of glomus tumor. *J Cytol* 2010;27:104-5.

15. Dhingra M, Niraula BB, Regmi A, Bansal S, Singh V,

Phulware RH. Glomus tumour of hand--a commonly misdiagnosed pathology: A case series. *J West Afr Coll Surg* 2022;12:39-45.

16. Schiefer TK, Parker WL, Anakwenze OA, Amadio PC, Inwards CY, Spinner RJ. Extradigital glomus tumors: A 20-year experience. *Mayo Clin Proc* 2006;81:1337-44.

17. Lee DW, Yang JH, Chang S, Won CH, Lee MW, Choi JH, et al. Clinical and pathological characteristics of extradigital and digital glomus tumours: A retrospective comparative study. *J Eur Acad Dermatol Venereol* 2011;25:1392-7.

18. 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;54:691-703.

19. Singal A, Bisherwal K, Agrawal S, Bhat S, Diwakar P. Clinico-epidemiological profile and management outcome of subungual digital glomus tumor-Indian experience. *Dermatol Ther* 2022;35:e15745.

20. Fabro M, Fabro SR, Klitzke BB, De Araújo GL, Machado CA. Glomus tumor: Revitalizing concepts. *Radiol Bras* 2015;48:269-70.

21. Stewart DR, Sloan JL, Yao L, Mannes AJ, Moshlyedi A, Lee CC, et al. Diagnosis, management, and complications of glomus tumours of the digits in neurofibromatosis type 1. *J Med Genet* 2010;47:525-32.

22. Vinay K, Narang T, Roshini N, Baskaran N, Reddy A, Patel S, et al. Clinico-epidemiological characteristics and long-term surgical outcomes in patients with glomus tumor: A retrospective study. *Indian Dermatol Online J* 2025;16:426-31.

23. Patel T, Meena V, Meena P. Hand and foot glomus tumors: Significance of MRI diagnosis followed by histopathological assessment. *Cureus* 2022;14:e30038.

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