

Glomus tumor management outcomes of the hand

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Article information	Abstract
<p>Key words: Glomus tumor; Subungual lesion; Finger pain; Nail deformity; Surgical excision; VAS score</p> <p>-----</p> <p>Received: 24-07-2025 Accepted: 27-07-2025 Available: 10-08-2025</p>	<p>Background: Glomus tumors are rare, benign, and painful vascular tumors arising from the glomus body, most found in the subungual region of the fingers. Despite their typical clinical presentation, diagnosis is often delayed for years.</p> <p>Methods: A retrospective case series was conducted on 7 patients treated at Misurata Medical Centre between June 2020 and October 2023. Clinical presentation, imaging, surgical technique, and postoperative outcomes were analyzed. Pain relief was measured using the Visual Analog Scale (VAS), and patients were followed up for 6 months to assess recurrence and nail deformity.</p> <p>Results: All patients (100%) reported pain and localized tenderness; 66% had cold sensitivity. The average delay in diagnosis was 73 months. Surgical excision using the transungual approach led to complete symptom relief in all patients. VAS scores improved from 9.3 preoperatively to 0.59 at 6 weeks. Nail regrowth was complete in all cases; minor deformities occurred in 2 patients. No recurrence was observed during follow-up.</p> <p>Conclusion: Glomus tumors of the fingers can be effectively diagnosed clinically and treated with surgical excision. Early recognition and precise surgical technique result in excellent functional and cosmetic outcomes with minimal recurrence.</p>

I) Introduction

Total knee arthroplasty (TKA) Glomus Tumors are benign, painful, and vascular tumors originating from glomus bodies (1, 2)., and their main responsibility is to control temperature and blood pressure through controlling blood flow (1, 3-5). The basis of the formation of these tumors, which can occur in all parts of the body, is glomus hyperplasia (6). The hand is the most frequent site for these tumors in the body, especially in the subungual region, and they account for 1 to 5% of all hand tumors in terms of prevalence (6-9). The typical triad of pinpoint tenderness, cold hypersensitivity, and paroxysmal pain identifies the clinical diagnosis. Usually, there is no need for imaging, but a magnetic resonance imaging (MRI) may be helpful.

Glomus tumors are rare neoplasms arising from the subcutaneous glomus apparatus. They account for 1 – 5% of all soft tissue tumors of the upper extremity 1, occurring in the hand in 75% 2 and in the nail bed in 50 – 90% of cases 2,3. This favorite anatomical location and the intense pain proper of these tumors, constrict the patient to limit the use of the affected hand, causing practical, professional and often emotional discomfort. The typical clinical

presentation with paroxysmal point pain and hypersensitivity to cold and the benign nature makes generally easy their diagnosis and treatment

The aim of study to document the clinical presentation of glomus tumors of fingers and evaluate the outcome of surgical excision in terms of relief of symptoms, any postoperative nail deformities and tumor recurrence over a period of one year.

II) Materials and Methods

The study was conducted at Misurata Medical Centre. Ethical committee approval and informed consent were obtained prior to the start of the study. The period of study was from June 2020 to October 2023.

A total of 7 cases were included in our study: 6 cases were females and 1 case was male, with a mean age of 38 years (range 29–44). All cases had glomus tumours localized in the fingers. All patients with glomus tumor of the fingers were treated in our institution during the last 3 years.

We retrospectively collected graphic, clinical, diagnostic, and therapeutic data. All of them presented with a single tumor. Four patients had right hand involvement (1st, 3rd, and 4th fingers), and one patient had a left-hand tumor (2nd finger). Five tumors were in a subungual location, and one in the fingertip. One patient had a tumor located at the tip of the finger. Diagnostic procedures employed to achieve diagnosis and preoperative planning included radiography and ultrasonography.

No magnetic resonance imaging (MRI) was employed. Plain radiography was used in all cases preoperatively, and ultrasonography of the hand was performed in 3 patients.

A) Surgical Technique

All the patients were operated upon as day-care surgery cases. Bier's nerve blocks with Xylocaine were performed for all patients. Loupe magnification was routinely employed during surgery.

For subungual lesions, the transungual approach was used. The nail plate was removed in a standard fashion. To raise the nail plate, a fine artery forceps was gently advanced progressively between the nail plate and the nail bed. The eponychium was separated with sharp dissection from the proximal part of the nail plate using a size 15 surgical blade. The nail was thus carefully lifted off without damaging the nail bed.

In cases where the tumor was located more proximally in the nail bed, one or two 1-cm long skin incisions were made at the junction of the lateral nail folds and eponychium. An eponychial skin flap was elevated to facilitate direct visualization and excision of the entire tumor.



Fig 1

A longitudinal incision was made in the nail bed directly over the tumor. The nail bed flaps were delicately elevated by sharply separating them from the tumor. The tumor was excised completely. Following tumor excision, the nail bed was meticulously repaired with 6/0 Vicryl sutures. The eponychial skin flap was sutured with Prolene 5/0 sutures. The nail plate was replaced to protect the nail bed and was secured temporarily with Prolene 4/0 suture.

In cases of tumors on the volar pulp, a direct incision was made through the volar pulp skin, and tumor excision was undertaken. The skin was closed with Prolene 4/0 sutures. All the resected tumor specimens were subjected to histopathological confirmation.

Postoperatively, hand elevation was advised to prevent edema and swelling. The first wound dressing was changed on the 5th postoperative day. Skin stitches were removed on the 15th postoperative day.

The VAS score for pain was recorded postoperatively at 2 weeks, 4 weeks, and 6 weeks. All the patients were followed up at 6 months postoperatively to rule out any recurrence at that point.

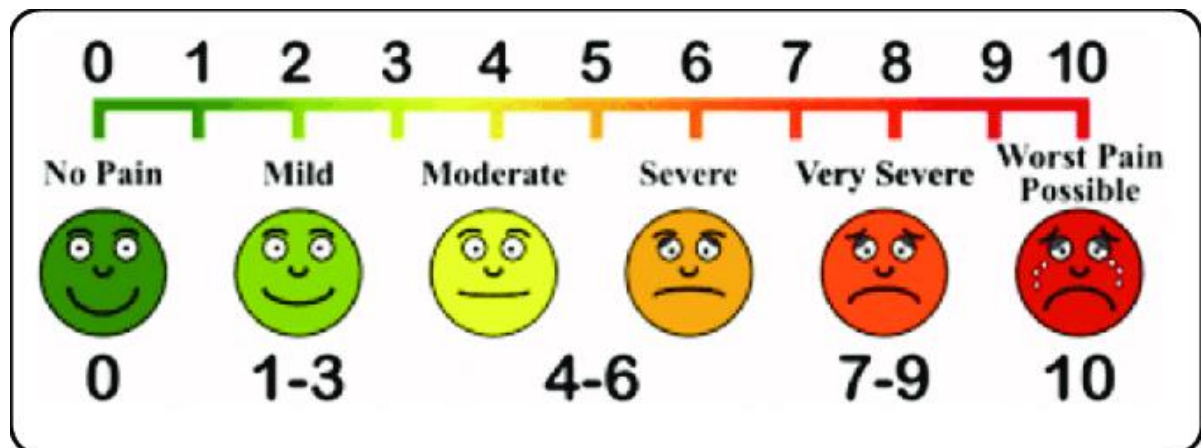


Fig 2

III) Results:

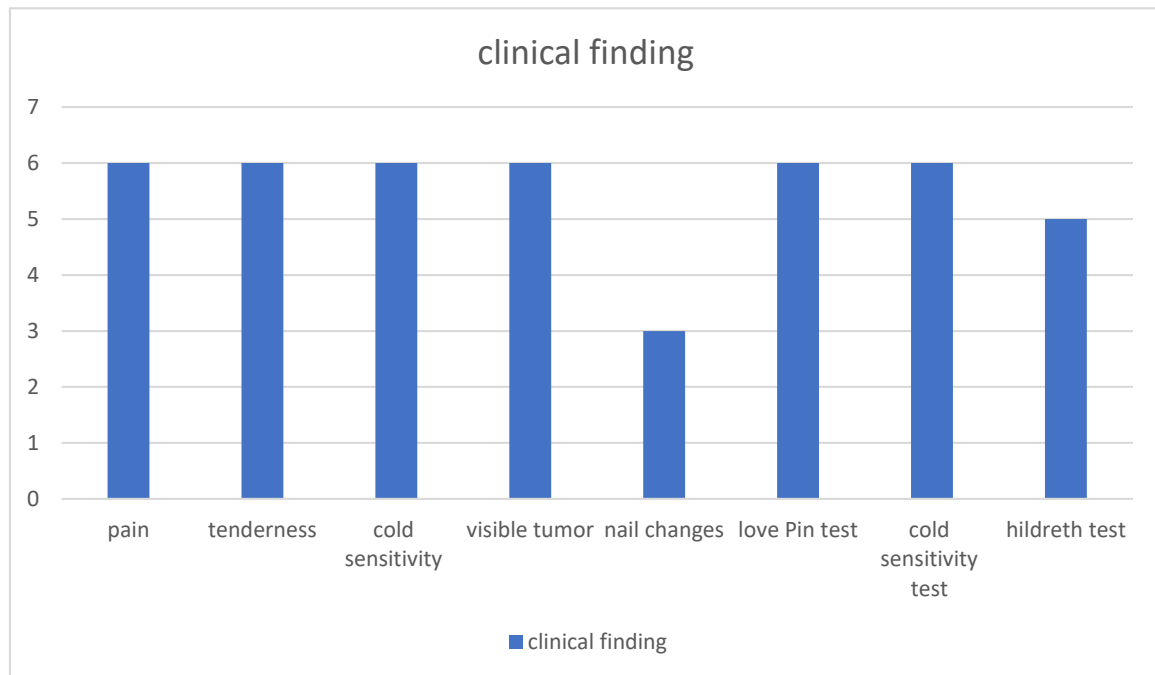
There were a total of 6 patients with 5 (83.33%) females and 1 (16.16%) male. The age ranged from 27 to 62 years with a mean age of 41.17 ± 13.7 years. There was involvement of the dominant hand in 4 (66.66%) patients, whereas the non-dominant hand was involved in 2 (33.33%) patients. The digits affected included the index finger (n=2; 33%), ring finger (n=1; 16%), little finger (n=2; 33%), thumb (n=0; 0%), and the middle finger (n=1; 16%).

There were 5 patients (83%) with subungual glomus tumors, whereas 1 (16%) patient had tumors found in relation to the distal phalanx (tip of finger).

The duration between the first appearance of symptoms and the correct diagnosis ranged from three months to 12 years, with a mean duration of 73 months.

The frequency of various presenting clinical findings was as follows: pain (n=6; 100%), tenderness (n=6; 100%), cold sensitivity (n=4; 66%), visible tumor (n=4; 66%), nail changes (n=3; 50%), Love's pin test (n=6; 100%), cold sensitivity test (n=6; 100%), and Hildreth's test (n=5; 83%).

The tumor size ranged from 2 mm to 1.1 cm with a mean size of volar pulp glomus tumors among all patients (n=6; 100%).

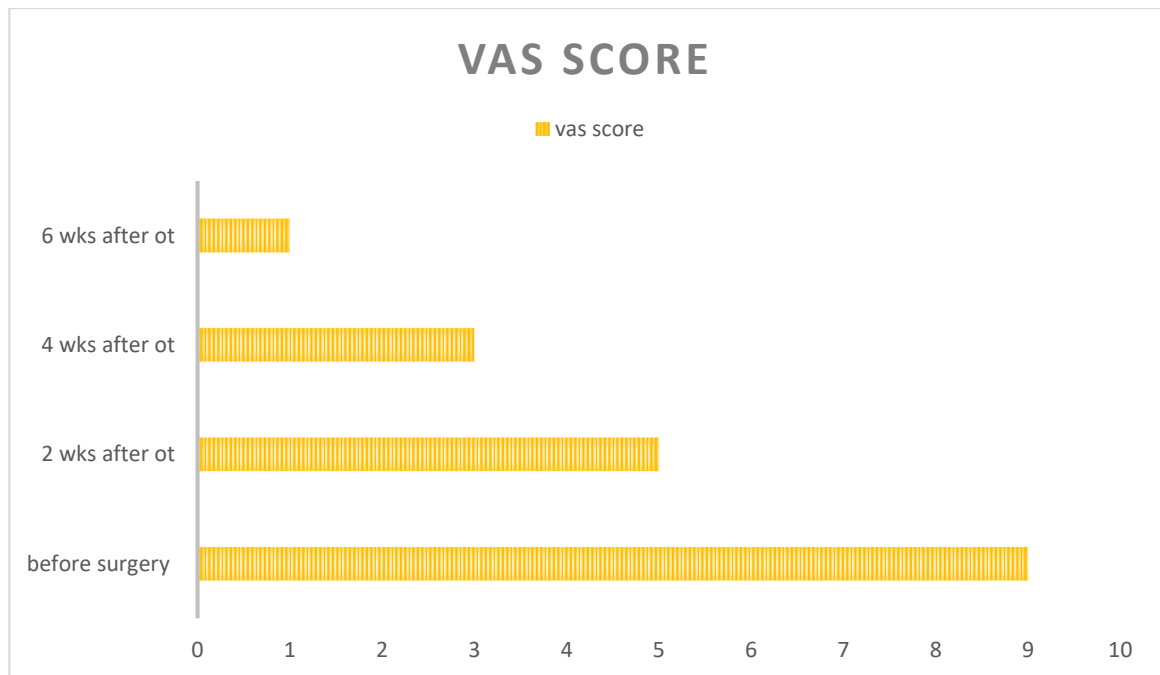


Test	Description	Reference
Love's pin test	compressing the digit above the tumor with the round head of a pin elicits severe pain and the patient would withdraw his or her hand	[6]
Hildreth's test	applying a tourniquet at the base of the painful digit reduces the pain	[6]
Cold sensitivity test	placing the extremity into cold water causes severe pain of the lesion	[6]

At presentation, the mean VAS score was 9.33 ± 0.65 (range 8–10). At 2 weeks, it improved to 4.45 ± 0.66 (range 3–5), and at 4 weeks it was further reduced to 2.59 ± 1.90 (range 2–4). Finally, at 6 weeks, after starting physiotherapy, the score was 0.59 ± 0.87 (range 0–3). All patients (n=17, 100%) experienced complete symptomatic relief within 2–4 weeks.

Among all patients (n=14, 100%) treated with the transungual approach, the new nail regrew over 12 weeks. There was no recurrence over a period of 6 months. There were small postoperative nail deformities, such as a small crack in 2 cases; otherwise, the nails were normal.

Case number	age	sex	Method of diagnosis	Location	Symptom duration	pain	Clod sensitivity	Nail or skin changes
1	42	f	Clinically and by ultrasound	Subinginal of ring finger (Rt Hand)	12 yrs	yes	yes	yes
2	39	f	clinically	Subinginal of little finger (Rt Hand)	2yrs	yes	yes	yes
3	37	f	clinically	Tip of middle finger (Rt Hand)	3 mounths	yes	yes	yes
4	29	m	Clinically and by ultrasound	Subinginal of little finger (LT Hand)	2 yrs	yes	no	yes
5	44	f	clinically	Subinginal of index finger (Rt Hand)	7 mounths	yes	yes	yes
6	39	f	clinICALLY	Subinginal of Index finger (LT Hand)	14 mounths	yes	no	yes



IV) Discussion

Glomus bodies are neuromyoarterial structures located within the reticular dermis (Bhaskaranand and Navadgi, 2002; Carroll and Berman, 1972; Kale et al., 2006; Sun et al., 1996). These structures consist of an afferent arteriole and efferent venules interconnected by multiple channels (Carroll and Berman, 1972; Kale et al., 2006). The arterial component, known as the Sucquet-Hoyer canal, is surrounded by glomus cells containing actin, which enables them to contract and regulate blood flow (Carroll and Berman, 1972; Sun et al., 1996). Although glomus bodies are distributed throughout the body, they are predominantly concentrated in the fingers and soles of the feet. Glomus tumors represent approximately 1–5% of soft tissue tumors of the hand, and nearly 75% of these are subungual (Rohrich et al., 1994; Tomak et al., 2003).

These tumors are more common in women, particularly in middle age (Moon et al., 2004; Sun et al., 1996; Van Geertruyden et al., 1996). Typically, glomus tumors measure 3–5 mm in diameter and may present as slightly raised, red, and painful nodules. When subungual, they may deform and discolor the nail (Sun et al., 1996). Several clinical tests can aid in diagnosis, including Love's pin test (Love, 1944), Hildreth's test (Giele, 2002), the cold sensitivity test (Chen et al., 2003; Kale et al., 2006), and transillumination (Bhaskaranand and Navadgi, 2002).

Clinically, patients often present with intense, localized pain, cold sensitivity, and point tenderness. These features alone are considered sufficient for diagnosis in up to 90% of cases. The pain is often spontaneous, without an identifiable cause, and tends to worsen as the tumor enlarges. Palpation may be intolerable due to the severe pain, which can sometimes radiate to the ipsilateral arm or shoulder. Unfortunately, due to misdiagnosis or delayed presentation, patients often endure symptoms for years before receiving appropriate treatment. The average time from symptom onset to surgical intervention has been estimated at 7–8 years (references 12,13); in our experience, the mean duration was 8.6 years. From a pathophysiological standpoint, it is believed that thermal or tactile stimuli provoke contraction of glomus cells, leading to pain. Cold hypersensitivity has been reported in 42–100% of cases.

In the current study, most patients were in their fourth and fifth decades of life. All were adults; none belonged to the pediatric population. Published studies have reported variable age ranges. Santoshi

JA et al. (India) observed a mean age of 38 years (range 16–55), Montandon C et al. (Brazil) reported 39 years (range 26–51), Ham KW et al. (Korea) found a mean of 48.4 years (range 36–78), Fazwi R et al. (Malaysia) reported 49.6 years (range 17–74), Bargon GA et al. reported 49 years (range 20–86), and Pandey CR et al. (Nepal) noted a mean of 36.66 years (range 22–53). Mravic M et al. (USA) noted most patients fell between the fourth and seventh decades of life. Although pediatric cases are rare, they tend to present with multiple rather than solitary lesions.

In our study, females outnumbered males, a trend consistent with multiple previous reports. Santoshi JA et al. observed 21 females vs. 16 males, Ham KW et al. had 17 females and 4 males, Fazwi R et al. noted 9 females and 6 males, and Mravic M et al. found a 64% female and 36% male distribution. However, some studies report different distributions, such as Montandon C et al. (male:female ratio of 7:1), and Fujioka H et al. (2 males and 2 females). Bargon GA et al., in a large cohort of 87 patients, found near-equal gender distribution (45 males, 42 females).

We observed more frequent involvement of the dominant hand, consistent with findings by Jawalkar H et al., who reported right-hand involvement in 7 patients and left-hand in 5. Similarly, Santoshi JA et al. found 21 patients with left-hand involvement and 16 with the right hand.

In our series, the index finger was the most commonly affected digit. This aligns with most published literature. Montandon C et al. found the index finger involved in 3 cases, middle finger in 2, little finger in 2, and thumb in 1. Jawalkar H et al. noted the index finger as the most commonly involved (n=5), followed by the middle and thumb (n=3 each), and the ring finger (n=1). Santoshi JA et al. reported the ring finger as most commonly involved (n=14), followed by the thumb (n=8), and 5 cases each involving the index, middle, and little fingers.

Surgical excision remains the definitive treatment for glomus tumors. We utilized a longitudinal excision of the nail bed or matrix following nail plate elevation in subungual tumors. After tumor removal, the bed and matrix were repaired, and the original nail plate was relocated. Ekin et al. proposed a windowing technique for subungual tumors, allowing access through a small opening in the nail. Tada et al. emphasized replacing the resected nail portion to prevent postoperative deformities, especially when the window remains small. However, this method may not be suitable for larger windows.

In another approach, Dailiana et al. described the lateral incision technique, which offers broader access to tumors in the nail bed and submatrix. This method also facilitates the detection of multiple tumor foci. While lateral intervention may reduce nail bed deformity, complete nail removal generally provides better visualization and access. Persistent postoperative pain may indicate recurrence, often due to incomplete excision or the presence of multiple lesions.

In our study, there were no cases of recurrence or multiple tumors. All patients experienced complete symptom resolution following surgical excision.

V) Conclusion

The diagnosis of glomus tumors in the fingers is generally straightforward when patients present with the classical clinical trial and supported by radiographic imaging and ultrasonography. However, smaller tumors, asymptomatic or minimally symptomatic lesions, and recurrent cases may pose diagnostic challenges. In such situations, advanced imaging modalities such as MRI should be considered, if available, to ensure accurate localization and characterization.

Surgical excision remains the definitive and curative treatment. It provides prompt and lasting relief of symptoms, effectively resolving the physical pain and alleviating the psychological or occupational limitations associated with impaired hand function.

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