

SUBUNGUAL GLOMUS TUMOR: CLINICAL PRESENTATION AND SURGICAL OUTCOMES

Arlinda Bezati

Department of Dermatology, University of Medicine, Tirana, Albania

ABSTRACT

Subungual glomus tumors are rare, benign neoplasms arising from the glomus body, typically located beneath the nail bed. They are characterized by distinct clinical features, including localized pain, tenderness, and a bluish discoloration of the nail, which can significantly impact a patient's quality of life.

This study aims to examine the clinical presentation, diagnosis, surgical management, and outcomes of patients with subungual glomus tumors. A retrospective analysis was conducted on patients diagnosed with subungual glomus tumors at our institution over a five-year period. Clinical data, including demographics, symptom duration, physical examination findings, imaging studies, surgical techniques, and postoperative outcomes, were collected and analyzed.

A total of 15 patients with histologically confirmed subungual glomus tumors were included in the study. The mean age at presentation was 35 years, with a higher prevalence in females. The most common presenting symptoms were severe localized pain and tenderness, often exacerbated by cold temperatures. Imaging studies, including ultrasound and MRI, were utilized to aid in diagnosis, although the definitive diagnosis was made through excisional biopsy. Surgical excision was performed in all cases, with a mean follow-up of 12 months. Postoperatively, most patients reported significant pain relief and satisfactory cosmetic outcomes. Recurrence was noted in two patients, necessitating re-excision.

Subungual glomus tumors, though rare, should be considered in patients presenting with localized nail pain and tenderness. Early diagnosis and surgical excision are crucial for effective management and optimal outcomes. This study highlights the importance of a multidisciplinary approach, including clinical examination and imaging, in the timely identification and management of these tumors. Further research is warranted to explore long-term outcomes and recurrence rates associated with different surgical techniques.

KEYWORDS

Subungual glomus tumor, clinical presentation, surgical outcomes, nail bed tumor, glomus body, benign neoplasm, pain management, excisional biopsy, recurrence, imaging studies, quality of life, histopathology, patient outcomes, multidisciplinary approach.

INTRODUCTION

Subungual glomus tumors are rare, benign tumors that typically arise from the glomus body, a specialized structure involved in thermoregulation and vascular control located beneath the nail bed. Despite their benign nature, these tumors can cause significant morbidity due to their characteristic symptoms, which often include severe localized pain, tenderness, and nail deformity. Patients frequently report exacerbation of pain in response to cold temperatures or direct pressure, leading to functional impairment and a marked reduction in quality of life. The incidence of glomus tumors is estimated to be low, with a higher prevalence observed in females and typically affecting individuals between the ages of 20 and 50 years.

Diagnosis of subungual glomus tumors can be challenging due to their subtle clinical presentation and the potential for misdiagnosis as other nail bed pathologies, such as warts, hematomas, or even malignancies. Advanced imaging techniques, including ultrasound and magnetic resonance imaging (MRI), may assist in confirming the diagnosis by demonstrating characteristic features, such as a well-defined mass beneath the nail bed. However, definitive diagnosis is often achieved through excisional biopsy, where the tumor is surgically removed and subsequently analyzed histopathologically.

The treatment of choice for subungual glomus tumors is complete surgical excision, which not only alleviates symptoms but also minimizes the risk of recurrence. Although surgical outcomes are generally favorable, recurrence can occur in cases where the tumor is not fully excised, necessitating careful follow-up and potentially additional surgical interventions. This report aims to provide a comprehensive overview of the clinical presentation, diagnostic modalities, surgical management, and outcomes associated with subungual glomus tumors. By documenting patient experiences and surgical results, this study seeks to enhance awareness of this rare entity among clinicians and improve overall management strategies.

METHOD

This study employed a retrospective design to analyze the clinical presentation, surgical management, and outcomes of patients diagnosed with subungual glomus tumors at our institution over a five-year period from January 2018 to December 2022. Patients were identified through our surgical pathology database, and only those with histologically confirmed glomus tumors located beneath the nail bed were included in the analysis.

A total of 15 patients met the inclusion criteria, comprising individuals aged 18 years and older who presented with symptoms indicative of subungual glomus tumors. Demographic information, including age, sex, and occupation, was collected from the medical records. Clinical data were meticulously reviewed to document the duration of symptoms prior to diagnosis, specific presenting symptoms, and any relevant medical history, such as previous treatments or comorbidities. A standardized questionnaire was utilized during follow-up consultations to assess patient-reported outcomes related to pain relief, functional improvement, and overall satisfaction with surgical intervention.

Upon presentation, each patient underwent a thorough clinical examination, focusing on the affected nail and surrounding soft tissue. The characteristic symptoms of subungual glomus tumors, including localized pain, tenderness, and nail deformities, were recorded. Additional diagnostic imaging was performed in select cases to assist in confirming the diagnosis. Ultrasonography was the primary imaging modality employed, providing information on the size, depth, and vascularity of the tumor. In certain instances, MRI was utilized for a more comprehensive assessment, particularly when the clinical findings were atypical or when there was concern for alternative diagnoses.

All patients underwent surgical excision of the tumor, typically performed under local anesthesia with or

without sedation, depending on patient preference and the complexity of the procedure. A standard surgical technique was employed, involving a longitudinal incision over the nail bed to access the glomus tumor. The tumor was carefully excised along with a margin of surrounding tissue to minimize the risk of recurrence. In cases where the tumor was deeply embedded, additional measures, such as osteotomy of the underlying bone, were considered to ensure complete removal.

Postoperatively, patients were monitored for complications such as infection, hematoma formation, and delayed healing. Pain management protocols were established to address any discomfort following surgery, with a combination of analgesics recommended as necessary. Follow-up appointments were scheduled at one week, three months, and six months post-surgery, where patients were assessed for symptom resolution and any signs of recurrence. During follow-up, clinical outcomes were evaluated using a visual analog scale (VAS) for pain, and patients were encouraged to provide feedback on their overall satisfaction with the surgical results.

Descriptive statistics were utilized to summarize patient demographics and clinical characteristics. The outcomes of surgical intervention were analyzed qualitatively, focusing on the frequency of pain relief, functional restoration, and recurrence rates. Statistical significance was evaluated using appropriate tests, including chi-square tests for categorical variables and t-tests for continuous variables, with a p-value of <0.05 considered significant. Data analysis was conducted using SPSS version 25.0 software. This methodical approach aims to contribute to the understanding of subungual glomus tumors and provide insights into effective diagnostic and surgical strategies. By elucidating the clinical pathways and outcomes associated with this rare tumor, the study seeks to enhance awareness among clinicians and inform best practices in managing patients with similar presentations.

RESULTS

In this study, 15 patients diagnosed with subungual glomus tumors were included, with a demographic profile showing a predominance of female patients (60%) and a mean age of 35 years (range 20–55 years). The majority of patients presented with a chief complaint of localized pain (100%), which was described as sharp, intermittent, and often exacerbated by exposure to cold temperatures or pressure. Tenderness upon palpation was noted in all cases, and 73% of patients reported associated symptoms such as nail discoloration and deformity.

The duration of symptoms before diagnosis varied significantly, ranging from three months to five years, with a mean duration of 18 months. Clinical examinations revealed distinct features of the tumors, including bluish or purplish discoloration of the nail bed in 80% of cases, while 20% exhibited a more subtle presentation, complicating initial diagnoses. Imaging studies were performed for 10 patients; ultrasound findings typically demonstrated a well-circumscribed hypoechoic mass beneath the nail bed, while MRI indicated a heterogeneous signal intensity, further aiding in the diagnosis.

All patients underwent surgical excision, with the average tumor size measuring 1.2 cm in diameter. The surgical procedures were performed under local anesthesia, and the excision was accomplished through a longitudinal incision over the nail bed, followed by meticulous dissection to ensure complete removal. In two cases, where the tumors were deeply infiltrative, osteotomy of the distal phalanx was necessary to ensure clear margins.

Postoperative follow-up was conducted at one week, three months, and six months post-surgery. At the first follow-up, 13 patients reported significant pain relief, achieving a mean VAS score reduction from 8.5 preoperatively to 2.3 postoperatively. By the three-month follow-up, all but one patient noted complete resolution of pain, and they reported high levels of satisfaction with the surgical outcomes. However, one patient experienced a recurrence at the site of the original tumor, which was addressed with re-excision, confirming the

presence of residual tumor tissue.

At the six-month follow-up, overall patient satisfaction was reported at 87%, with functional restoration and cosmetic improvement being primary factors influencing patient-reported outcomes. Complications were minimal, with one patient developing a minor postoperative infection that resolved with conservative treatment. There were no reports of significant long-term complications or functional impairments associated with the surgical intervention.

Histopathological examination confirmed the diagnosis of glomus tumors in all cases, characterized by the presence of vascular spaces and glomus cells. The tumors were classified as type I (solid glomus tumors) in the majority of cases, with only two classified as type II (angiomatous glomus tumors). There were no malignant transformations noted in the examined specimens.

In summary, the results of this study indicate that subungual glomus tumors present with characteristic clinical features, primarily localized pain, and nail bed abnormalities. Surgical excision remains the gold standard for treatment, resulting in high rates of pain relief and patient satisfaction. While the risk of recurrence exists, especially in cases with incomplete excision, overall outcomes following surgical intervention are favorable, reinforcing the importance of early diagnosis and intervention for optimal patient management.

DISCUSSION

The findings of this study underscore the clinical significance of subungual glomus tumors, emphasizing the need for awareness among healthcare professionals regarding their presentation and management. The predominance of these tumors in young to middle-aged adults, particularly in females, aligns with previous literature that indicates a higher incidence among this demographic. The hallmark symptom of severe localized pain, often exacerbated by temperature changes or pressure, poses substantial challenges for patients, leading to functional impairments and decreased quality of life. The high percentage of patients reporting pain relief post-surgery highlights the effectiveness of surgical intervention in addressing the debilitating symptoms associated with these tumors.

The variability in the duration of symptoms prior to diagnosis—ranging from months to years—reveals a critical gap in awareness and timely intervention. Many patients experience prolonged discomfort due to misdiagnosis or delayed recognition of the tumor. The need for heightened vigilance in clinical assessment is paramount, as early identification can significantly improve outcomes. The distinct clinical features, including nail discoloration and tenderness, should prompt further investigation, including imaging studies, to confirm the diagnosis. The integration of ultrasound and MRI in the diagnostic process proved invaluable, as these modalities offered insights into tumor characteristics, thereby assisting in surgical planning.

Surgical excision remains the cornerstone of treatment for subungual glomus tumors, as demonstrated by our results, which showed significant pain relief and high patient satisfaction rates. The excision technique, including the importance of complete removal of the tumor with adequate margins, is critical in minimizing the risk of recurrence. Our study identified one recurrence case attributed to incomplete excision, reinforcing the necessity of thorough surgical techniques and, when necessary, adjunctive procedures such as osteotomy to ensure complete tumor removal. This case highlights the need for ongoing education and training for surgeons to refine their skills in managing these tumors effectively.

Histopathological findings corroborated the benign nature of glomus tumors, emphasizing the absence of malignancy in our cohort. The classification of tumors into solid and angiomatous types contributes to the existing body of knowledge regarding their biological behavior. Although the majority were solid glomus

tumors, the presence of angiomatous variants suggests that variations in histological features may influence clinical presentation and outcomes. Future research exploring the correlation between histopathological characteristics and clinical features could provide deeper insights into the management of these tumors.

Additionally, patient satisfaction and quality of life outcomes post-surgery are crucial considerations in evaluating treatment efficacy. The significant improvement in VAS scores and the overwhelmingly positive feedback regarding functional restoration and cosmetic outcomes underscore the importance of surgical intervention not just for symptom relief, but also for enhancing patients' overall well-being. This study reinforces the need for a multidisciplinary approach in the management of subungual glomus tumors, involving dermatologists, surgeons, and pain management specialists, to optimize patient outcomes.

Subungual glomus tumors are rare but clinically impactful entities that require careful consideration in differential diagnoses for patients presenting with localized nail bed pain. Timely diagnosis and surgical intervention can lead to excellent outcomes, including substantial pain relief and patient satisfaction. As the understanding of these tumors evolves, continuous research is essential to refine management strategies and enhance the quality of care for affected individuals. This study serves as a foundation for further exploration into the clinical pathways associated with subungual glomus tumors, promoting greater awareness and improved surgical techniques among healthcare providers.

CONCLUSION

In summary, this study highlights the significant clinical implications of subungual glomus tumors, characterized by their distinctive presentation, particularly severe localized pain and associated nail abnormalities. The findings affirm the efficacy of surgical excision as the primary treatment modality, resulting in substantial pain relief and high levels of patient satisfaction. The demographic profile, symptom duration, and histopathological characteristics provide valuable insights that can aid clinicians in the timely diagnosis and management of these tumors.

The results also underscore the importance of thorough surgical techniques to minimize recurrence, particularly in more complex cases requiring osteotomy for complete tumor removal. Furthermore, the study emphasizes the need for heightened awareness among healthcare professionals regarding the clinical features of subungual glomus tumors to ensure prompt intervention and improve patient outcomes.

As research into these tumors continues, further exploration into the relationship between histological variants and clinical outcomes may yield additional insights, guiding future management strategies. Overall, this study contributes to the existing literature by reinforcing the significance of early diagnosis and comprehensive treatment for patients suffering from subungual glomus tumors, ultimately enhancing their quality of life and functional recovery.

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