

Atypical Presentation of Gout: Idiopathic Retrocalcaneal Pain in 400 Patients

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Abstract

Introduction: Idiopathic retrocalcaneal pain is frequently linked to overuse injuries or inflammation around the Achilles tendon and surrounding bursae. However, systemic conditions such as gout, characterized by monosodium urate crystal deposition, can also present as retrocalcaneal pain. Gout commonly affects the first metatarsophalangeal joint, but atypical presentations, such as retrocalcaneal involvement are increasingly recognized. This study aims to assess the presentation, diagnosis, and treatment outcomes of gout in patients presenting with idiopathic retrocalcaneal pain.

Materials and Methods: This retrospective study analyzed clinical data from 400 patients diagnosed with gout and presenting with idiopathic retrocalcaneal pain between 2019 and 2023 at a tertiary care center. Diagnosis was based on clinical examination, serum uric acid levels, imaging, and in some cases, synovial fluid analysis. Patient demographics, diagnostic methods, and treatment outcomes, including pain Visual Analog Scale (VAS) and functionality Foot and Ankle Disability Index (FADI) scores, were evaluated.

Results: Of the 400 patients, 290 (72.5%) were male, and 110 (27.5%) were female, with a mean age of 56.8 ± 12.3 years. Pre-existing gout was present in 58% of patients, and serum uric acid levels were elevated in 75%. Synovial fluid analysis performed in 65 patients, confirmed monosodium urate crystals in 92.3% of cases. Treatment resulted in significant reductions in pain (VAS: 7.8 ± 1.4 to 3.2 ± 1.1 , $P < 0.05$) and improved functionality (FADI: 58.4 ± 5.7 to 85.7 ± 6.3). Recurrence of symptoms occurred in 25% of patients, particularly in those who did not adhere to urate-lowering therapy.

Conclusion: This study emphasizes the importance of considering gout in the differential diagnosis of idiopathic retrocalcaneal pain. Early diagnosis and appropriate management can lead to favorable outcomes and lower recurrence rates. Clinicians should remain vigilant for atypical presentations of gout to prevent prolonged discomfort and functional impairment.

Keywords: Idiopathic retrocalcaneal pain, gout, hyperuricemia, monosodium urate crystals, Achilles tendon, atypical gout, urate-lowering therapy.

Introduction

Retrocalcaneal pain, often attributed to overuse injuries or local inflammation of the Achilles tendon, is a common clinical complaint. However, in some cases, idiopathic pain in this region may be a manifestation of underlying systemic conditions, including metabolic disorders such as gout [1, 2]. Gout is characterized by the deposition of monosodium urate

crystals in the joints, leading to acute inflammation and pain. While gout commonly affects the first metatarsophalangeal joint, atypical presentations, including retrocalcaneal involvement, are being increasingly recognized [3, 4].

This study analyses 400 patients presenting with idiopathic retrocalcaneal pain, where subsequent evaluation revealed gout as the underlying cause. By focusing on clinical features, diagnostic methods, and treatment outcomes, we aim to improve the recognition and management of gout in such atypical presentations.

Materials and Methods

Study design

A retrospective cohort study was conducted on 400 patients who presented with idiopathic retrocalcaneal pain at a tertiary

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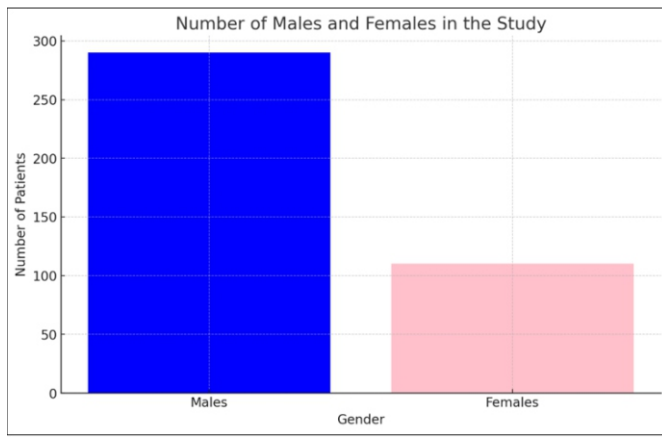


Figure 1: The bar graph shows the number of males and females in this study. The data reflects that there were 290 males and 110 females.

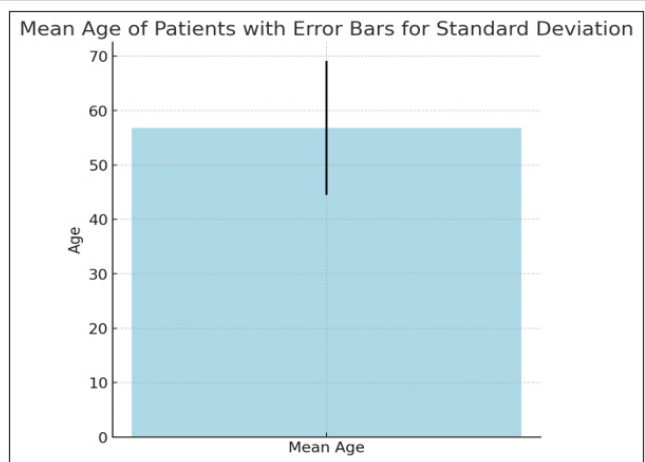


Figure 2: The bar graph shows the mean age of patients (56.8 years) with error bars representing the standard deviation (± 12.3 years).

care center between 2019 and 2023. The inclusion criteria were: (1) idiopathic retrocalcaneal pain at initial presentation, (2) diagnosis of gout based on clinical, laboratory, and imaging findings, and (3) no prior history of Achilles tendon injury or retrocalcaneal bursitis. No patients were directly contacted for this study, and only retrospective data were used.

Data collection

Data were collected from patient medical records and included:

- Demographics: Age, sex, BMI, and medical history (e.g., hyperuricemia, hypertension, diabetes, renal disease, alcoholism, and dietary habits).
- Clinical presentation: Duration and characteristics of retrocalcaneal pain, physical examination findings, and systemic symptoms.
- Diagnostic methods: Serum uric acid levels, synovial fluid analysis (if performed), imaging (ultrasound, MRI, X-ray), and adherence to American College of Rheumatology (ACR) diagnostic criteria.

- Treatment: Non-pharmacological (e.g., rest, footwear modification), pharmacological (NSAIDs, colchicine, corticosteroids, urate-lowering therapy), and surgical interventions (if necessary).

The treatment goals included controlling pain and inflammation through NSAIDs, colchicine, or corticosteroids in the Acute phase. Chronic management included initiation and maintenance of urate-lowering therapy to reduce uric acid levels and prevent recurrence. Further Preventive measures involved the use of prophylactic colchicine or NSAIDs during the early phases of ULT to avoid flare-ups. Thereby, this protocol emphasized the importance of addressing both acute symptoms and long-term management of gout through pharmacological and lifestyle interventions. The outcome measures were pain (VAS), functional improvement Foot and Ankle Disability Index (FADI), and recurrence rates.

Statistical analysis

Descriptive statistics were used to summarize demographic and

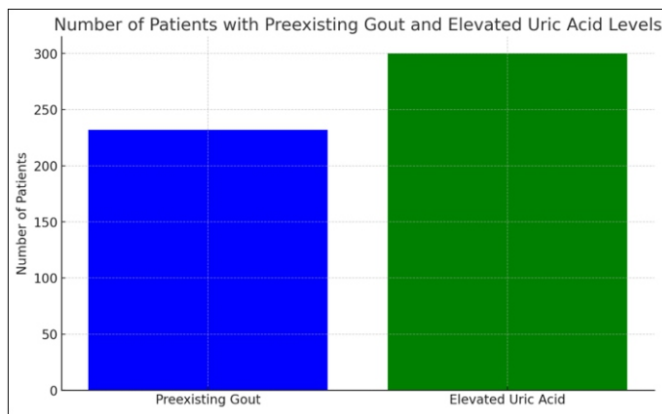


Figure 3: The bar graph shows the number of patients with pre-existing gout and elevated uric acid levels in the study. Pre-existing Gout: 58% of patients, that is, 232 out of 400. Elevated Uric Acid: 75% of patients, that is, 300 out of 400.

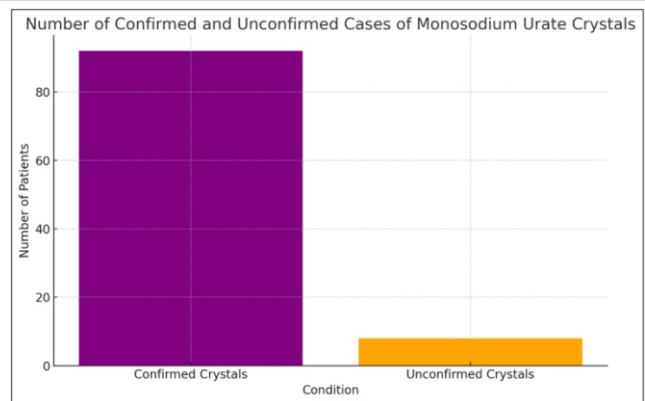


Figure 4: The bar graph showing the number of confirmed and unconfirmed cases of monosodium urate crystals from the 100 patients who underwent joint aspiration in the study. Confirmed Crystals: 92 cases. Unconfirmed Crystals: 8 cases.

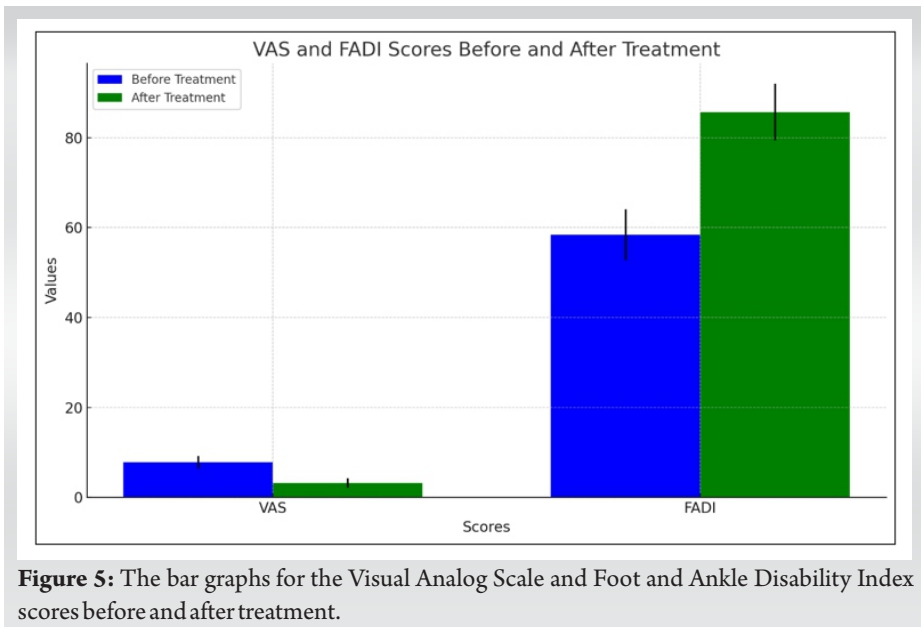


Figure 5: The bar graphs for the Visual Analog Scale and Foot and Ankle Disability Index scores before and after treatment.

clinical data. Mean values with standard deviations were calculated for continuous variables, while percentages were used for categorical variables. Treatment outcomes were compared using chi-square tests, with a significance level set at $P < 0.05$.

Results

Demographics

Among the 400 patients, 290 (72.5%) were males and 110 (27.5%) were females (Fig. 1), with a mean age of 56.8 ± 12.3 years (Fig. 2). The mean BMI was $28.4 \pm 4.5 \text{ kg/m}^2$. Pre-existing gout was documented in 58% of the cohort (Fig. 3), 35% had hypertension, and 25% had diabetes. No significant differences were found between males and females regarding these comorbidities.

Clinical presentation

The average duration of retrocalcaneal pain was 8.2 ± 3.4 weeks. Most patients described their pain as a dull ache, with 40% reporting flare-ups characterized by intense pain. Classic signs

of gout, such as erythema and warmth, were observed in only 40% of cases. Systemic symptoms such as fever were rare, occurring in 10% of patients.

Diagnostic findings

Elevated serum uric acid levels were detected in 75% of patients, with a mean level of $8.9 \pm 1.2 \text{ mg/dL}$ (Fig. 3). Synovial fluid analysis performed in 65 patients, confirmed monosodium urate crystals in 92% of cases (Fig. 4). Joint aspiration is often performed when a patient has acute joint inflammation or swelling, which allows the collection of synovial fluid for analysis. If the retrocalcaneal pain in some patients was not accompanied by significant joint effusion or visible swelling, the opportunity to aspirate

fluid may not have been present.

Imaging studies revealed tophi in 20% of patients on ultrasound, while MRI showed retrocalcaneal bursa and Achilles tendon inflammation in 45% of cases.

Treatment outcomes

- **Pharmacological Therapy:** NSAIDs were prescribed to 90% of patients, colchicine to 45%, and corticosteroids to 30%. Urate-lowering therapy (allopurinol or febuxostat) was initiated in 60% of patients. Colchicine was primarily used for acute gout attacks, followed by long-term urate-lowering therapy.
- **Non-pharmacological Therapy:** Rest, ice, and footwear modifications were recommended for all patients. These interventions, combined with pharmacological treatments, led to a significant reduction in pain (VAS: 7.8 ± 1.4 to 3.2 ± 1.1 , $P < 0.05$) (Fig. 5). A paired sample t-test was used to assess the significance of the reduction in VAS scores, which confirmed that the improvement in pain scores after treatment was statistically significant.

Pharmacological Treatment	Non-Pharmacological Treatment	Surgical Intervention (if necessary)	Long-Term Follow-Up and Adherence to ULT (Urate Lowering Therapy)
<p>NSAIDs (Non-Steroidal Anti-Inflammatory Drugs): NSAIDs were prescribed to 90% of patients for acute pain management. Commonly used NSAIDs include ibuprofen, naproxen, and indomethacin.</p> <p>Colchicine: Colchicine was administered to 45% of patients during acute gout flare-ups for short durations (1–2 weeks) to reduce inflammation and pain.</p> <p>Corticosteroids: Corticosteroids were used in 30% of patients who either could not tolerate NSAIDs or had contraindications. Administered orally or through intra-articular injections for acute pain control.</p> <p>Urate-Lowering Therapy (ULT): 60% of patients were started on urate-lowering therapy, either:</p> <ul style="list-style-type: none"> • Allopurinol (most commonly used): Starting dose of 100 mg/day, gradually increased based on serum uric acid levels. • Febuxostat: For patients intolerant to allopurinol or with contraindications. <p>ULT was initiated once acute inflammation subsided, with the goal of reducing serum uric acid to below 6 mg/dL.</p> <p>Prophylactic Colchicine or NSAIDs: During the initiation of ULT, low-dose colchicine or NSAIDs were prescribed to prevent flare-ups, given the risk of gout attacks when urate levels fluctuate.</p>	<p>Rest and Immobilization: Patients were advised to rest the affected foot and limit activities that aggravated symptoms.</p> <p>Footwear Modification: Cushioned footwear or heel lifts were recommended to reduce pressure on the Achilles tendon and retrocalcaneal area.</p> <p>Ice Application: Local application of ice was advised to control pain and inflammation, particularly during acute flare-ups.</p> <p>Dietary and Lifestyle Changes: Patients were educated on dietary modifications to lower purine intake (e.g., reducing red meat, alcohol, and seafood consumption). Weight management and regular physical activity (as tolerated) were encouraged to improve long-term outcomes.</p>	<p>Only 10 patients (2.5%) required surgery, primarily for Chronic tophi excision or Achilles tendon repair in cases of severe damage due to crystal deposition.</p>	<p>Regular follow-up visits were conducted to monitor serum uric acid levels and adjust ULT dosages accordingly.</p> <p>Patients were counseled on the importance of adhering to urate-lowering therapy to prevent recurrence.</p> <p>Non-compliance with ULT was noted as a significant factor in the 25% recurrence rate of symptoms within one year.</p>

• **Surgical Interventions:** Only 2.5% (10 patients) required surgery, mostly for chronic tophi excision or Achilles tendon repair. Among the 65 patients who underwent joint aspiration, the identification of monosodium urate crystals was significantly associated with a more definitive diagnosis of gout ($P < 0.01$). Patients with MRI-confirmed inflammation of the Achilles tendon had a significantly higher mean VAS score pre-treatment ($P < 0.05$), indicating that inflammation was associated with more severe pain at presentation.

• **Functional Improvement:** The FADI score improved from 58.4 ± 5.7 to 85.7 ± 6.3 after treatment (Fig. 5). Another paired sample t-test was used to evaluate the difference in FADI scores before and after treatment. The improvement was statistically significant, indicating that treatment had a considerable positive effect on the functional ability of the patients. Table 1 shows the Treatment Protocol used in this study of 400 patients with Idiopathic Retrocalcaneal Pain Due to Gout.

Specific treatment protocol that led to a reduction in VAS score

Acute phase

Tablet Colchicine twice a day for 10 days (keeping a check on loose stools). Selective COX-2 inhibitors (preferred Etoricoxib 120 mg once a day). Corticosteroids (preferred Deflazacort 6 mg) twice a day for 3 days, tapered to once a day for 3 days. Only in sudden gout attacks and non-diabetic patients, Hb1Ac levels and random blood sugar was checked. Topical application of Diclofenac 1% ointment. No heat fomentation. Ice fermenting was done.

Chronic phase

Tablet Febuxostat 40 mg twice a day for 2–3 months with monthly monitoring of serum uric acid level. Selective COX-2 inhibitors with tapering dose from 120 mg once a day to 90 mg once a day to 60 mg by 3–4 weeks. Then if pain persisted, it was converted to tablet Etodolac 400 mg twice a day.

Recurrence

Logistic regression analysis was conducted to evaluate the association between key factors (age, BMI, serum uric acid levels, and adherence to urate-lowering therapy) and the recurrence of symptoms. Significant predictors of recurrence included non-adherence to urate-lowering therapy ($P < 0.01$) and elevated serum uric acid levels ($P < 0.05$).

Recurrence of symptoms occurred in 25% of patients (100 out of 400), with non-adherence to urate-lowering therapy as a significant factor ($P < 0.05$). A chi-square test was used to compare recurrence rates between patients who adhered to urate-lowering therapy and those who did not. The results indicated a statistically significant difference, with higher recurrence rates in non-compliant patients. A moderate positive

correlation ($r = 0.43$) was found between elevated serum uric acid levels and recurrence, indicating that higher uric acid levels were associated with increased recurrence risk.

The average follow-up period was 12 months, during which patients were monitored for recurrence.

Discussion

This study highlights the diagnostic challenges of identifying gout in patients presenting with idiopathic retrocalcaneal pain. Retrocalcaneal involvement is an atypical presentation of gout, often leading to delayed diagnosis due to its resemblance to more common Achilles tendon pathologies. Our findings underscore the importance of considering gout in patients with unexplained retrocalcaneal pain, particularly in those with a history of hyperuricemia or metabolic syndrome.

Diagnosis can be challenging due to the absence of classic signs of gout in many cases, necessitating a high degree of clinical suspicion.

Compared to other studies, our findings align with previous reports of gout involving atypical locations, such as the Achilles tendon and retrocalcaneal bursa. Pascual et al. (2007) similarly reported cases of retrocalcaneal bursitis caused by tophaceous gout, reinforcing the need to consider gout in the differential diagnosis of unexplained retrocalcaneal pain [5]. Another study done by Sarkar et al. (2019) reported high serum uric acid concentration was significantly associated with retrocalcaneal bursitis [2].

Early recognition and appropriate management, including urate-lowering therapy, were crucial in reducing pain, improving function, and preventing recurrences. Our results showed that long-term adherence to therapy are essential, as non-compliance significantly increases the risk of recurrence.

Conclusion

Gout should be considered in the differential diagnosis of idiopathic retrocalcaneal pain, especially in patients with metabolic risk factors. Early diagnosis and treatment, including the use of urate-lowering therapy, can significantly improve clinical outcomes and reduce the risk of recurrence. Future studies should focus on long-term outcomes and preventive strategies in atypical gout presentations.

Clinical Relevance

The clinical relevance of this study lies in its identification of gout as a possible cause of idiopathic retrocalcaneal pain, an atypical presentation often mistaken for overuse injuries. It emphasizes the importance of considering gout in differential diagnoses, especially in patients with hyperuricemia or metabolic syndrome. The study shows that urate-lowering therapy significantly reduces the risk of recurrence, with non-compliance linked to higher recurrence rates. Effective

treatment, combining pharmacological and non-pharmacological strategies, resulted in substantial improvements in pain and functionality for the patients.

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

Conflict of Interest: NIL; **Source of Support:** NIL

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