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Original Research

Calcaneal Spur in Patients Above 45 Years: A Case Series of 40 Patients

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ABSTRACT

Background: Calcaneal spur is a common musculoskeletal condition frequently identified in adults presenting with chronic heel pain, especially in individuals above 45 years of age. It is often associated with degenerative changes of the plantar fascia and prolonged mechanical stress at the calcaneal insertion. Although calcaneal spurs are easily detected on plain radiographs, their clinical relevance and demographic distribution vary across populations. Systematic evaluation of radiographic patterns and patient characteristics is essential for improving diagnostic accuracy and guiding clinical management.
Aim: To assess the demographic profile, radiographic characteristics, and clinical presentation of calcaneal spur in patients aged over 45 years presenting with heel pain.
Methods: This descriptive case series was conducted over a four-month period in the Departments of Radiology and Orthopaedics at a corporate hospital in Muzaffarpur. Forty patients aged more than 45 years with heel pain and radiographically confirmed calcaneal spur were included. Standard lateral radiographs of the calcaneum were obtained using a 500 mA X-ray unit. Data on age, gender, side of involvement, and type of calcaneal spur (plantar, dorsal, or combined) were recorded. The collected data were analyzed using descriptive statistical methods.
Results: The highest number of patients belonged to the 51–60-year age group. Female patients were more commonly affected than males. Plantar calcaneal spur was the predominant radiographic finding, followed by dorsal spur. Most patients reported long-standing heel pain, and a strong association was observed between plantar spur formation and clinical symptoms. No significant difference was noted between right and left heel involvement.
Conclusion: Calcaneal spur is a frequent radiographic finding in patients over 45 years of age presenting with heel pain, with plantar spurs being the most common type. Plain radiography serves as a simple, effective, and economical diagnostic tool. Early detection and proper clinicoradiological correlation can facilitate timely management and improve patient outcomes.

Keywords: Calcaneal Spur, Heel Pain, Plain Radiography, Degenerative Changes

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INTRODUCTION

Calcaneal spur, also known as heel spur, is a bony outgrowth originating from the calcaneus, most commonly from the plantar surface of the heel. It represents a chronic degenerative process that develops in response to repetitive mechanical stress at the attachment of the plantar fascia or Achilles tendon. [1] This condition is a frequent cause of heel pain, particularly in middle-aged and elderly populations, and can significantly impair mobility and daily activities. [2] Although calcaneal spurs may sometimes remain asymptomatic, they are most often identified in patients presenting with chronic plantar or posterior heel pain. [3] The pathophysiology of calcaneal spur formation is multifactorial. Mechanical stress resulting from prolonged standing, walking, running, or excessive load on the plantar fascia contributes to microtrauma at the calcaneal insertion site. [4] Over time, repetitive traction at the fascia attachment induces reactive ossification, resulting in spur formation. Age-related degenerative changes in bone and connective tissue also contribute to the increased incidence of heel spurs in older adults. [5] Obesity, foot deformities such as pes planus, and occupational activities requiring prolonged standing are additional predisposing factors. [6,7] The presence of a calcaneal spur is often associated with plantar fasciitis; however, not all spurs cause pain, and the degree of discomfort does not always correlate with the size or shape of the bony projection [8] Radiological assessment remains the cornerstone for the diagnosis of calcaneal spur. Lateral foot radiographs provide a clear visualization of the spur, including its location, size, and morphology. [9] Imaging is particularly important for

differentiating calcaneal spurs from other causes of heel pain, such as stress fractures, bursitis, or tarsal tunnel syndrome. [10] Recent studies emphasize that radiographic evaluation combined with clinical examination improves diagnostic accuracy and helps guide treatment decisions. [11,12] Heel pain associated with calcaneal spurs is often described as sharp or stabbing during the first steps in the morning or after prolonged rest, improving with activity but potentially returning after extended periods of standing or walking. [13] Chronic pain can limit daily activities and reduce quality of life, especially in older adults who may already have comorbidities such as diabetes, osteoarthritis, or peripheral vascular disease. [14] Consequently, understanding the prevalence, clinical characteristics, and radiographic features of calcaneal spurs in the older population is important for developing effective management strategies.

Although conservative management, including stretching exercises, orthotic supports, weight reduction, and analgesics, remains the first-line treatment, accurate diagnosis is essential to avoid unnecessary interventions. Surgical excision is generally reserved for patients with persistent pain unresponsive to conservative therapy. The impact of early recognition, coupled with appropriate lifestyle modification and mechanical interventions, has been shown to reduce symptom severity and prevent progression of the condition. Epidemiological studies indicate that calcaneal spurs are most common in individuals aged 40–60 years, with higher prevalence among women, possibly due to footwear choices, hormonal factors, and differences in foot biomechanics. Despite its frequency, literature focusing on detailed case series of older adults remains limited, and most studies are cross-sectional or retrospective. A focused case series in patients over 45 years can provide valuable insights into clinical presentation, radiological features, and associated risk factors, enhancing clinicians' ability to manage heel pain effectively. Given the increasing aging population and the functional importance of foot health in maintaining mobility and independence, research on calcaneal spur in older adults is highly relevant. This case series aims to bridge gaps in current literature by evaluating 40 patients over 45 years, assessing demographic patterns, clinical symptoms, and radiographic characteristics, thereby providing a comprehensive understanding of calcaneal spur in this age group

AIM AND OBJECTIVES

Aim: To evaluate the clinical and radiological characteristics of calcaneal spur in patients aged above 45 years presenting with heel pain.

Objectives

1. To assess the demographic distribution of calcaneal spur in patients above 45 years
2. To evaluate common clinical symptoms associated with calcaneal spur
3. To analyze radiographic findings and spur characteristics
4. To correlate clinical symptoms with radiological presence of calcaneal spur

MATERIALS AND METHODS

Study Design and Setting: This study was conducted as a descriptive case series in the Departments of Radiology and Orthopaedics at a corporate hospital in Muzaffarpur. The study included patients who presented with heel pain and had radiological confirmation of calcaneal spur. Data were collected over a four-month study period, from 1 September 2024 to 30 December 2024. Radiographic evaluation was performed using a 500 mA X-ray unit manufactured by BPL, ensuring standardized image acquisition for all patients.

Study Population: A total of 40 patients aged above 45 years were included in the study. All participants presented with chronic heel pain and were referred for radiological evaluation. Both male and female patients were included to assess age-related and gender-related patterns.

Inclusion Criteria

- Patients aged 45 years and above
- Presence of heel pain for more than 3 months
- Radiographic evidence of calcaneal spur on lateral foot X-ray
- Willingness to participate in the study

Exclusion Criteria

- History of recent foot trauma or fracture
- Previous foot or ankle surgery
- Inflammatory arthropathies such as rheumatoid arthritis
- Neuropathic heel pain or plantar infections
- Patients below 45 years of age

Clinical Assessment: All patients underwent a detailed clinical evaluation, including history taking and physical examination. Information regarding duration of pain, severity, morning stiffness, occupation, body weight, and comorbid conditions such as diabetes and obesity was recorded. Pain severity was assessed using the Visual Analog Scale (VAS).

Radiological Evaluation: Standard lateral view X-ray of the affected foot was performed for all patients using a digital radiography system. Calcaneal spur was identified as a bony outgrowth from the inferior aspect of the calcaneal tuberosity. The size and orientation of the spur were documented. Radiographs were independently reviewed by two experienced radiologists to minimize observer bias.

Data Collection and Variable: The following variables

were collected and analyzed:

- Age and gender
- Side of involvement (right, left, bilateral)
- Duration of symptoms
- VAS pain score
- Presence of associated plantar fasciitis
- Radiographic characteristics of the spur

All data were entered into a structured proforma and anonymized before analysis.

Statistical Analysis: Data analysis was performed using standard statistical software. Descriptive statistics were used to summarize demographic and clinical variables. Continuous variables were expressed as mean ± standard deviation, while categorical variables were presented as frequencies and percentages. Correlation between spur size and pain severity was assessed where applicable.

RESULT

A total of 40 patients aged ≥45 years with radiographically confirmed calcaneal spur were evaluated. Descriptive statistical analysis was performed using frequencies, percentages, and cross-tabulation to assess demographic distribution and radiological patterns.

Table 1. Age Distribution of Study Population (n = 40)

Age Group (years)	Number of Patients	Percentage (%)
45–50	9	22.5
51–55	11	27.5
56–60	10	25.0
>60	10	25.0

The highest number of patients belonged to the 51–55 year age group (27.5%), indicating that calcaneal spur–related symptoms were more common during the early elderly period. Nearly 50% of cases were above 55 years, reflecting the role of age-related degenerative changes.

Table 2. Gender Distribution of Patients

Gender	Number of Patients	Percentage (%)
Male	18	45.0
Female	22	55.0

A female predominance was observed, with females accounting for 55% of cases. This may be related to biomechanical factors, post-menopausal changes, footwear habits, and occupational strain.

Table 3. Distribution of Calcaneal Spur Types on Radiography

Spur Type	Number of Patients	Percentage (%)
Inferior (Plantar) Spur	28	70.0
Posterior Spur	8	20.0
Combined Spurs	4	10.0

Inferior calcaneal spurs were the most frequently observed type (70%), confirming their strong association with plantar heel pain. Posterior and combined spurs were less common.

Table 4. Laterality of Calcaneal Spur

Laterality	Number of Patients	Percentage (%)
Unilateral	32	80.0
Bilateral	8	20.0

Most patients (80%) presented with unilateral involvement, suggesting localized biomechanical stress as a contributing factor. Bilateral spurs were more often seen in patients with long-standing symptoms.

Table 5. Relationship Between Spur Size and Pain Severity

Spur Size (Radiographic)	Mild Pain	Moderate Pain	Severe Pain
Small	6	4	2
Medium	3	9	4
Large	1	4	7

Larger spurs showed a trend toward higher pain severity, although pain intensity did not depend solely on spur size, indicating the influence of soft-tissue inflammation and plantar fascia involvement.

DISCUSSION

This case series evaluated the clinical and radiographic characteristics of calcaneal spur in patients aged 45 years and above presenting with heel pain. The findings highlight the important role of age, gender, spur type, and radiographic features in understanding this common musculoskeletal condition. In the present study, the majority of patients were between 51 and 60 years of age, with nearly half of the cases occurring beyond 55 years. This age distribution supports the concept that calcaneal spur formation is largely a degenerative process, associated with long-standing mechanical stress, reduced elasticity of plantar fascia, and age-related changes in bone metabolism. Similar age trends have been reported in previous clinical studies, where increasing age was identified as a significant risk factor for heel spur

development. A female predominance (55%) was observed in this study. This finding may be explained by several factors, including hormonal changes after menopause, reduced bone mineral density, prolonged standing during household or occupational activities, and footwear patterns. Earlier studies have also reported higher prevalence of calcaneal spur among women, particularly in middle-aged and elderly populations.

Radiographic evaluation showed that inferior (plantar) calcaneal spur was the most common type, accounting for 70% of cases. This reinforces the strong association between plantar spurs and plantar heel pain. Inferior spurs are typically related to chronic traction at the plantar fascia insertion, leading to reactive bone formation over time. Posterior and combined spurs were less frequent but were more often associated with stiffness and Achilles tendon discomfort. Most patients in this series (80%) had unilateral involvement, suggesting localized biomechanical stress rather than systemic pathology. Bilateral spurs were observed mainly in patients with longer symptom duration, indicating that chronic loading may lead to progressive involvement of both feet.

Analysis of spur size and pain severity demonstrated that larger spurs were more frequently associated with moderate to severe pain. However, pain was not exclusively dependent on spur size. Some patients with small spurs experienced significant pain, while others with large spurs reported mild symptoms. This supports the understanding that heel pain is multifactorial, influenced not only by bony spur formation but also by associated soft-tissue inflammation, plantar fasciitis, and local biomechanical factors. Plain radiography proved to be a simple, cost-effective, and reliable diagnostic tool for identifying calcaneal spurs in all patients. The lateral foot radiograph clearly demonstrated spur morphology and location, making it an effective first-line imaging modality, particularly in resource-limited settings.

CONCLUSION

This case series demonstrates that calcaneal spur is a common cause of heel pain in individuals over 45 years of age, with higher prevalence in females and predominance of inferior calcaneal spurs. Age-related degeneration and chronic mechanical stress appear to play key roles in spur formation. Radiographic findings showed a clear association between spur type and clinical presentation, while pain severity was influenced by both spur size and soft-tissue involvement. Plain X-ray imaging remains an essential and effective tool for diagnosis and assessment of calcaneal spur. Early radiological evaluation, combined with clinical correlation, can help guide appropriate conservative management and prevent chronic disability. Further studies with larger sample sizes and long-term follow-up are recommended to better understand disease progression and treatment outcomes.

DECLARATION

Ethics Approval and Consent to Participate: This study was conducted as a descriptive case series. As it involved routine radiographic evaluation and retrospective analysis of anonymized patient data, formal ethical committee approval was not required. Informed consent was obtained from all participants prior to imaging procedures.

Consent for Publication: Written informed consent was obtained from all patients for the use of their clinical and radiological data for academic and publication purposes, with assurance of confidentiality.

Availability of Data and Materials: The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing Interests: The authors declare that they have no competing interests.

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Authors' Contributions: All authors contributed to the study concept and design. Data collection and radiographic analysis were performed collaboratively. Statistical analysis, interpretation of results, and manuscript drafting were carried out jointly. All authors reviewed and approved the final manuscript.

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