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Case Report

Management of a rare fifth metatarsal exostosis with pseudoarthrosis in a 29-year-old male

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ABSTRACT

Exostoses of the fifth metatarsal are uncommon, and their association with pseudoarthrosis is exceptionally rare. Such lesions can lead to chronic pain and functional impairment, often delaying diagnosis. Authors report the case of a 29-year-old male with longstanding lateral foot pain unresponsive to conservative treatment. Radiographic evaluation revealed a fifth metatarsal exostosis with pseudoarthrosis. Surgical excision and debridement were performed, with preoperative evaluation and planning aided by 3D bone models to better define the lesion and optimize the approach. Postoperatively, the patient experienced significant improvement in pain and function, achieving full return to normal activities and work. This case highlights the need to consider unusual bony pathologies in patients with persistent lateral foot pain.

Keywords: Fifth metatarsal, Exostosis, Pseudoarthrosis, Lateral foot pain

INTRODUCTION

Exostoses of the fifth metatarsal are uncommon, particularly those associated with pseudarthrosis formation.[1,2] Such lesions may present with chronic pain, altered gait, and functional limitation. Diagnosis is often delayed due to the rarity of the condition and its nonspecific symptoms.[3,4] Authors present a case of chronic lateral foot pain caused by a fifth metatarsal exostosis with pseudarthrosis, highlighting the diagnostic and therapeutic challenges encountered.

CASE REPORT

A 29-year-old male retail worker presented with a history of intermittent lateral right foot pain since the age of 9, which had progressively worsened over the preceding two years. The patient described difficulty with footwear, occasional limping, and an altered gait characterized by preferential weight-bearing on the medial side of the foot, leading to increased wear on the medial aspect of his shoes. He reported using codeine and paracetamol intermittently for pain relief. The patient was otherwise fit and healthy, with no prior surgeries, drug allergies, or history of smoking. He reported occasional alcohol intake and had a family history of deep vein thrombosis (aunt), though he had no personal history of thromboembolic events. On examination, the right foot demonstrated a dysplastic, shortened fifth toe with splaying of the lateral rays. There was focal tenderness over the lateral midfoot and forefoot junction, particularly around the fourth and fifth metatarsals. No tenderness was elicited elsewhere in the foot or ankle, and joint movements, including ankle and subtalar articulation, were pain-free. The peroneal and tibialis posterior tendons were non-tender, and neurovascular examination was unremarkable. The patient retained a normal medial arch and could perform heel and toe walking. Plain radiographs of the right foot (Figure 1) revealed a short, deformed fifth metatarsal with a bony outgrowth extending toward the proximal base of the fourth metatarsal, consistent with an exostosis and pseudarthrosis.[5] Contralateral foot imaging was

unremarkable MRI demonstrated a bulky exostosis arising from the proximal medial aspect of the fifth metatarsal head, abutting the proximal shaft of the fourth metatarsal, with associated pseudarthrosis formation and minimal marrow edema. Dysplastic features of the fifth metatarsal, including a short shaft and enlarged head, were also noted. There was mild splaying of the fourth and fifth metatarsals and minimal degenerative change at the first metatarsophalangeal (MTP) joint, though this was asymptomatic clinically. Due to the rarity of the condition, further assessment with a SPECT-CT (Figure 2) was arranged following review in the orthopaedic foot and ankle multidisciplinary team (MDT) meeting, to evaluate metabolic activity in the pseudarthrosis region.[6,7] The patient underwent image-guided steroid and local anaesthetic injection into the region of the fourth metatarsal pseudarthrosis, with no clinical improvement. Such diagnostic and therapeutic injections are frequently used in cases of uncertain etiology but may not be effective in structural deformities.[8]

Operative technique

A longitudinal incision was made over the dorsal aspect of the foot, centered between the 4th and 5th metatarsals, following preoperative demarcation using an image intensifier. The peroneal tendons were identified and protected. Dissection was carried out lateral to the extensor tendon of the fifth toe. A subperiosteal dissection was performed to expose the base and shaft of the 4th metatarsal, 5th metatarsal along with the intervening bony bridge. The boundaries of the bony bridge were clearly delineated and resected using a combination of oscillating saw and osteotome. Hemostasis was achieved, and bone wax was applied to the raw bony surfaces. The excised bony bridge (Figure 3) was sent for histopathological examination. The surgical site was thoroughly irrigated, and the wound was closed in layers. This approach aligns with current surgical recommendations for symptomatic exostoses and pseudarthrosis unresponsive to conservative treatment.[9,10]

Postoperative course

Histopathological analysis confirmed features consistent with a benign exostosis. Follow-up blood tests revealed normal inflammatory markers (CRP 6, ESR 5). The patient reported marked improvement in pain and function, with improved MOXFQ scores postoperatively. He resumed full weight-bearing and returned to work, using standard footwear. The surgical scar healed well without tenderness, and Tinel's sign at the incision site was negative. At follow-up, there was no functional limitation, and no further intervention was deemed

Outcome and follow-up plan

The patient is currently asymptomatic. He remains fully mobile and functionally active. A routine follow-up with right foot radiographs is planned in one year to monitor for any recurrence or complications.[11]

Figure 1 (a, b): Preoperative X-ray showing exostosis with pseudoarthrosis.

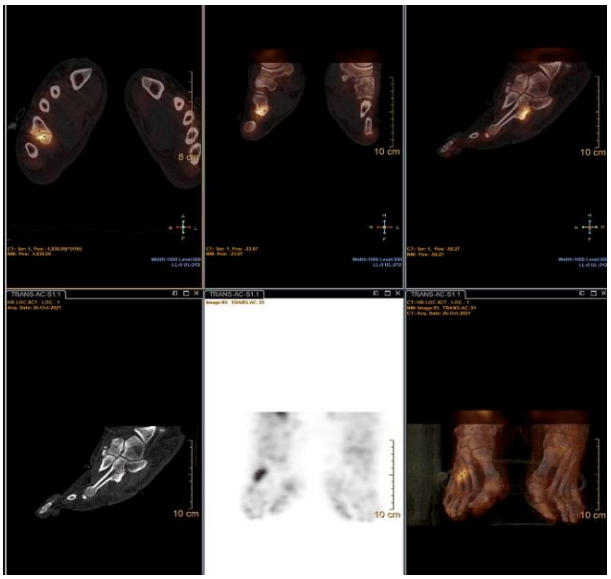

Figure 2: 3D reconstruction CT-scan and SPECT-CT.

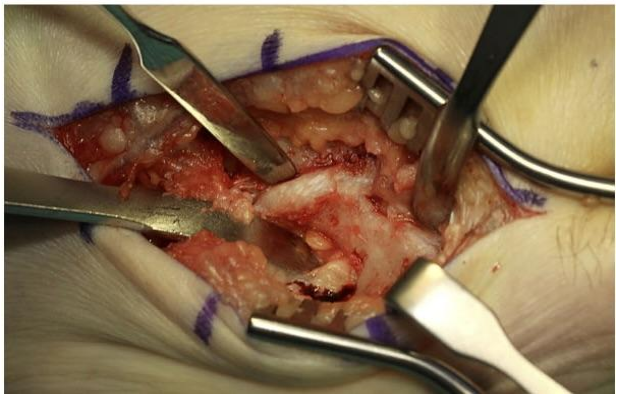

Figure 3: Intraoperative image showing exostosis with pseudoarthrosis.

Figure 4 (a, b): Postoperative X-rays showing removal of exostosis with no reoccurrence.

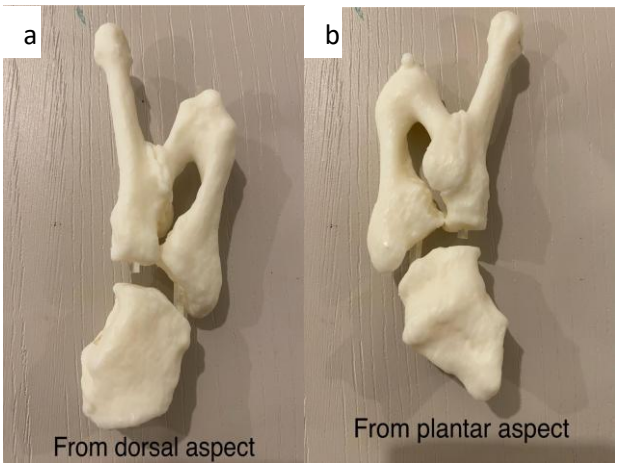

Figure 5 (a, b): 3D bone models showing exostosis from dorsal and plantar surfaces.

DISCUSSION

This case underscores the importance of considering structural anomalies, such as exostoses with pseudarthrosis, in patients presenting with chronic, unexplained lateral foot pain-particularly in the presence of anatomical deformities.[2,4,5] Advanced imaging techniques, including MRI, SPECT-CT, and 3D CT reconstructions, played a key role in diagnosis and preoperative planning.[6,7]

In the present case, the 3D model provided valuable insights into the exact direction and orientation of the exostosis, as well as the relationship between the pathological segments, which could not have been fully appreciated with conventional imaging alone. Previous studies have shown that 3D printing and virtual reconstructions improve the precision of osteotomies, reduce intra operative time, and lower the risk of residual deformity. These tools are particularly beneficial in rare or complex presentations where standard anatomical references are altered, as in cases of chronic pseudarthrosis or congenital deformities (Figure 5). Surgical excision and debridement provided effective symptom relief and restored normal function, consistent with prior case series and reports.[9,10]

CONCLUSION

Fifth metatarsal exostosis with pseudarthrosis is a rare but important differential in chronic lateral foot pain. Prompt diagnosis, aided by multimodal imaging, and timely surgical intervention can lead to excellent outcomes. Continued surveillance is recommended to ensure long-term resolution and monitor for recurrence.

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