International Journal of Scientific Reports
Brar KS et al. Int J Sci Rep. 2025 Jul;11(7):258-260
http://www.sci-rep.com
pISSN 2454-2156 | eISSN 2454-2164
DOI: https://dx.doi.org/10.18203/issn.2454-2156.IntJSciRep20251780

Case Report

Infected intraosseous epidermoid cyst in the right ankle: a case report

Karanbir Singh Brar[1], A. B. Prabhu[2]*, Harnoor Singh[1]

[1]Fortis Hospital, Mohali, Punjab, India
[2]Department of Plastic and Reconstructive Surgery, Fortis Hospital, Mohali, Punjab, India

Received: 04 April 2025
Accepted: 09 May 2025

***Correspondence:**
Dr. A. B. Prabhu,
E-mail: ab.prabhu@fortishealthcare.com

ABSTRACT

Epidermoid cysts, also known as follicular cysts, are benign tumors that typically arise from hair follicle infundibulum. These cysts are most commonly seen in subcutaneous tissues, though intraosseous epidermoid cysts (IEpC) are rare, with few reports of their occurrence in the phalanges and even more infrequently in the ankle. This case report discusses a 61-year-old male who presented with progressively enlarging swelling on the lateral aspect of his right ankle. Initially asymptomatic, the lesion became painful, inflamed, and discharged purulent material, prompting concern for an infection. Diagnostic imaging, including magnetic resonance imaging (MRI), suggested a possible infected ganglion or tumorous cyst. Laboratory tests confirmed mild leukocytosis and elevated inflammatory markers. Following unsuccessful drainage, surgical excision was performed, revealing a 7×5×2.4 cm cystic mass. Histopathological examination confirmed the diagnosis of an epidermoid inclusion cyst. The patient's recovery was uneventful, with no recurrence of symptoms.

Keywords: Epidermoid cyst, Follicular cyst, Bone cysts

INTRODUCTION

Epidermoid cysts, also known as keratin cysts, epidermal cysts, epidermal inclusion cysts, or epithelial cysts, are benign tumors originating from the infundibular portion of hair follicles. They can either be congenital, arising from the germinal epithelial layer, or acquired due to the inclusion of epidermal tissue following external injury or skin incision.[1] While they are more commonly found in subcutaneous soft tissues, intraosseous epidermoid cysts (IEpC), though rare, have been reported, particularly in middle-aged men following trauma or surgery.[2,3] These cysts most commonly occur within the phalanges of the fingers. While a congenital etiology involving the intraosseous inclusion of embryonic epithelial tissue has been suggested, post-traumatic and iatrogenic causes remain the most prevalent hypotheses.[3] Bone involvement is most commonly seen in the skull and phalanges, with much rarer occurrences in the maxilla, mandible, temporomandibular joint, vertebrae, tibia, and femur.[4]

Diagnosing an IEpC can be challenging due to its rarity and resemblance to malignancies or infections, making early histopathological analysis crucial to avoid unnecessary treatments.[3]

CASE REPORT

A 61-year-old male presented to the outpatient clinic with progressively enlarging swelling on the lateral aspect of his right ankle, which had been present for a year and was initially asymptomatic. The swelling grew to 6.5×4.0×2.0 cm and, 20 days prior to the visit, became painful, tender, erythematous, and warm, suggesting an inflammatory or infected process. He also experienced a low-grade fever and purulent discharge from the cyst. After an incision and drainage at a local hospital provided temporary relief, the swelling continued to discharge fluid and the fever recurred, prompting further evaluation.

The patient's medical history included obstructive sleep apnea and a prior orthopedic procedure involving a metal rod in his right thigh after a traumatic fracture. He denied recent trauma to the ankle, though a mild injury occurred six months earlier. Physical examination revealed a firm, tender, nodular mass was noted over the lateral malleolus of the right ankle, with mild erythema but no fluctuance. The skin over the lesion appeared tense, suggesting pressure from the underlying mass (Figure 1).

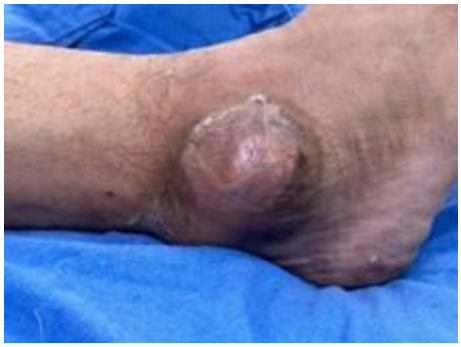

Figure 1: Clinical image showing a firm, tender nodular mass over the lateral malleolus of the right ankle.

Laboratory tests showed mild leukocytosis with WBC count of 13,000 cells/µl (reference range: 4,000–11,000 cells/µl), elevated C-reactive protein (CRP) at 5.2 mg/l (reference range: 0–3 mg/l), and increased erythrocyte sedimentation rate (ESR) of 38 mm/hour (reference range: 0–20 mm/hour), indicating inflammation or infection. Blood cultures were negative. A magnetic resonance imaging (MRI) of the right ankle revealed three closely placed multilobulated cystic lesions on the lateral aspect, likely subcutaneous, with moderate surrounding edema, raising suspicion for an infectious or inflammatory process. Differential diagnoses included an infected ganglion cyst or tumorous cyst.

Figure 2: Surgically excised cystic mass (7×5×2.4 cm) following wide local excision from the right ankle.

Given persistent symptoms, the decision was made to perform a wide local excision of the cyst under local anesthesia. The cyst, measuring 7×5×2.4 cm, was excised with a safe margin (Figure 2).

Intraoperatively, the cyst appeared firm and nodular, consistent with a chronic cystic lesion with potential secondary infection. The hemostasis was achieved using Clinicel Knitted (Healthium Medtech, India) and the incised wound was closed using Trusynth plus neo antimicrobial coated polyglactin 910 suture. The postoperative recovery was uneventful, with fever resolution and no recurrence of discharge. The excised specimen consisted of non-sutured, oriented soft tissue pieces. Externally, the specimen appeared unremarkable, with a greyish-white to greyish-brown cystic area filled with pultaceous material.

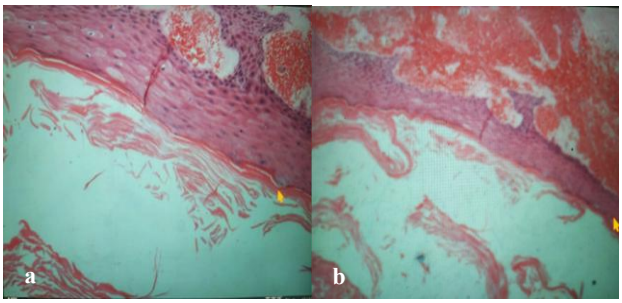

Figure 3 (a and b): Histopathological examination showing stratified squamous epithelium along with keratin flakes, hemorrhage, and fibrosis (Haematoxylin-eosin, ×200 and ×400).

Histopathological examination revealed microscopic findings of epidermal inclusion cyst lined by stratified squamous epithelium, with keratin flakes present on the luminal side (Haematoxylin-eosin, ×200). Higher magnification showed the cyst lining with stratified squamous epithelium and luminal keratin flakes (Haematoxylin-eosin, ×400) (Figure 3). The cyst also contained lamellated keratinous material, along with hemorrhage, fibrin, and cholesterol clefts. Multinucleated giant cell reactions were observed in some areas. Surrounding tissue showed fibrosis, hyalinization, inflammation, and collections of foamy macrophages. These features were consistent with an inclusion cyst, and no malignancy was noted. The wound healed well without complications.

DISCUSSION

Epidermoid cysts of the soft tissues were first reported by Masse in 1885 and are commonly considered benign soft tissue tumors located just beneath the skin. IEpC were first documented by Harris in 1930, with the majority of cases occurring in the digits.[3] The exact prevalence is unknown, and the etiology remains unclear. One hypothesis suggests that trauma leads to the implantation of epithelial cells into subcutaneous tissues, where they survive, proliferate, and

produce keratin.[2] Another theory proposes that intraosseous epidermoid cysts result from the proliferation of intraosseous inclusions of epithelial elements during embryogenesis.[3] A third possibility is that these cysts may arise as a result of previous surgical procedures.[5]

Diagnosing an IEpC is challenging radiographically, and a biopsy along with histopathological evaluation is required for confirmation. Once diagnosed, this benign tumor is typically treated by curettage, and in some cases, bone grafting may be necessary. Successful treatment depends on thorough curettage and complete removal of the cyst capsule to prevent recurrence.[4]

Kim et al. reported successful excisions of IEpCs in the phalanges of the fingers, with no recurrence at a three-year follow-up.[4] Blagova et al described an epidermoid cyst in the maxilla, while D'Andrea et al reported a case of an extradural-intraosseous epidermoid cyst successfully treated through a pterional approach.[6,7] These cases highlight the potential role of trauma in the development of IEpCs and demonstrate that, when completely excised, these cysts generally have a favorable prognosis.

CONCLUSION

This case of an infected epidermoid inclusion cyst in the right ankle emphasizes the importance of considering epidermoid cysts in the differential diagnosis of chronic swelling, particularly when complicated by infection. Surgical excision with complete removal and clear margins remains the treatment of choice, with histopathological confirmation critical for accurate diagnosis.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Kim CS, Na YC, Yun CS, Huh WH, Lim BR. Epidermoid cyst: A single-center review of 432 cases. Arch Craniofacial Surg. 2020;21(3):171-5.
2. Hoang VT, Trinh CT, Nguyen CH, Chansomphou V, Chansomphou V, Tran TTT. Overview of epidermoid cyst. Eur J Radiol Open. 2019;6:291-301.
3. Sugimoto H, Yasue K, Hara M, Takakuma S, Yumura W, Arai T, et al. Intraosseous epidermal cyst of the great toe that was difficult to distinguish from chronic osteomyelitis: A case report and literature review. Clin Case Rep. 2021;9(4):1890-5.
4. Kim DH, Noh JH. Intraosseous epidermoid cyst of distal phalanx—Report of two cases. Clin Case Rep. 2023;11(8):e7738.
5. Graham JG, McAlpine L, Medina J, Jawahier PA, Beredjiklian PK, Rivlin M. Recurrence of Ganglion Cysts Following Re-excision. Arch Bone Jt Surg. 2021;9(4):387.
6. Blagova B, Malinova L, Ivanova V. Intraosseous Epidermoid Cyst: a Case Report. J Oral Maxillofac Res. 2022;13(4):e4.
7. D'Andrea M, Musio A, Fuschillo D, Mongardi L, Riccioni L, Tosatto L. Epidermoid cyst of the anterior clinoid process: report of a unique finding and literature review of the middle cranial fossa locations. Clin Neurol Neurosurg. 2021;200:106381.

Cite this article as: Brar KS, Prabhu AB, Singh H. Infected intraosseous epidermoid cyst in the right ankle: a case report. Int J Sci Rep 2025;11(7):258-60.