

# Intraosseous Epidermoid Inclusion Cyst Within the Distal Phalanx Managed by Excision and Filling the Void with Gel Foam: A Case Report

## Abstract

The osseous involvement and destruction by an epidermoid inclusion cyst are uncommon and are limited to sporadic reports. The presentation with swelling may, at times, mimic a localized neoplastic lesion and, thus, warrants judicious use of clinical and imaging correlations. The excision and biopsy result in the final diagnosis, and the characteristic appearance of the lesion favors it. We present a case of a long-standing epidermoid cyst causing bony destruction of the fifth finger in a female. The case was finally managed by surgical excision, filling the resultant dead space with gel foam. The postoperative period was uneventful except delayed wound healing, but the follow-up at 9 months showed an excellent outcome without recurrence of the lesion. The intraoperative identification of the characteristic lesion and the histopathological examination confirmed the diagnosis of an epidermoid inclusion cyst. No complication of surgery and recurrence was noted in the follow-up of 9 months.

**Keywords:** Bone neoplasm, epidermal cyst, epithelial cyst, finger phalanges

## Introduction

The epidermoid cyst or epidermoid inclusion cyst (EIC) with bony involvement is an uncommon lesion with only 4% of cases found to be involving bone in a cohort of 101 cases of overall hand epidermoid cysts.<sup>[1]</sup> EIC presenting as a soft-tissue mass is commoner presentation, and a majority of those lesions involve palmar soft tissue in hand with male predilection.<sup>[1,2]</sup> Other common areas of involvement are subcutaneously over back, face, and chest.<sup>[2]</sup> The epidermoid cysts are lined with stratified squamous epithelium and filled with keratin, and a mass lesion with varying grades of pain is the usual feature.<sup>[3]</sup> These may also be misdiagnosed as pseudotumors, and the bony involvement is reported rarely in phalanges, skull, and toes.<sup>[4]</sup> Distal phalanx, however, is a common site of involvement in the hand, but interosseous location is still uncommon and limited to few reports in the literature.<sup>[3,4]</sup> History of an old antecedent minor trauma usually exists as a causative factor in their formation as the epithelial cells are driven deep into subcutaneous tissues following the trauma. The growth of the entrapped tissue produces keratin within the lesion. They are second only to ganglion

cysts, displaying tumefaction presentations in the hand.<sup>[5]</sup>

## Case Report

A 38-year-old-female homemaker presented to us with the complaint of pain and swelling at her right little fingertip for the last 5 months. She had a history of penetrative injury to the same region 5 years back, which was healed spontaneously. The pain increased on activity or direct pressure and relieved on rest and pain medication transiently. It had no diurnal variation or major functional limitation despite pain on pressure to the fingertip. On examination, tender swelling at the pulp space of the distal little finger was noted [Figure 1A and B]. There was no localized raised temperature nor any distal neuromuscular deficit. The distal interphalangeal motion was unaffected as the swelling was distal to the distal interphalangeal joint. The proper identification of margins was not possible, and pain limited the exact palpation of consistency. The overlying temperature was normal, and no vascular engorgement overlying the swelling was noted. The radiograph revealed the destruction and thinning of the distal phalangeal tip with no calcification or fracture [Figure 1C].

**Ganesh Singh  
Dharmshaktu,  
Ishwar Singh  
Dharmshaktu,  
Naveen Agarwal**

*Department of Orthopaedics,  
Government Medical College,  
Haldwani, Uttarakhand, India*

### Address for correspondence:

*Dr. Ganesh Singh Dharmshaktu,  
Department of Orthopaedics,  
Government Medical College,  
Haldwani, Uttarakhand,  
263139, India.  
E-mail: drganeshortho@gmail.  
com*

### Access this article online

#### Website:

<https://journals.lww.com/JUOA/>

DOI: 10.4103/juoa.juoa\_4\_22

#### Quick Response Code:



**How to cite this article:** Dharmshaktu GS, Dharmshaktu IS, Agarwal N. Intraosseous epidermoid inclusion cyst within the distal phalanx managed by excision and filling the void with gel foam: A case report. J Uttaranchal Ortho Assoc 2022;1:54-7.

**Received:** 10-Apr-2022, **Revised:** 09-Jan-2023,  
**Accepted:** 24-Mar-2023, **Published:** 09-Nov-2023

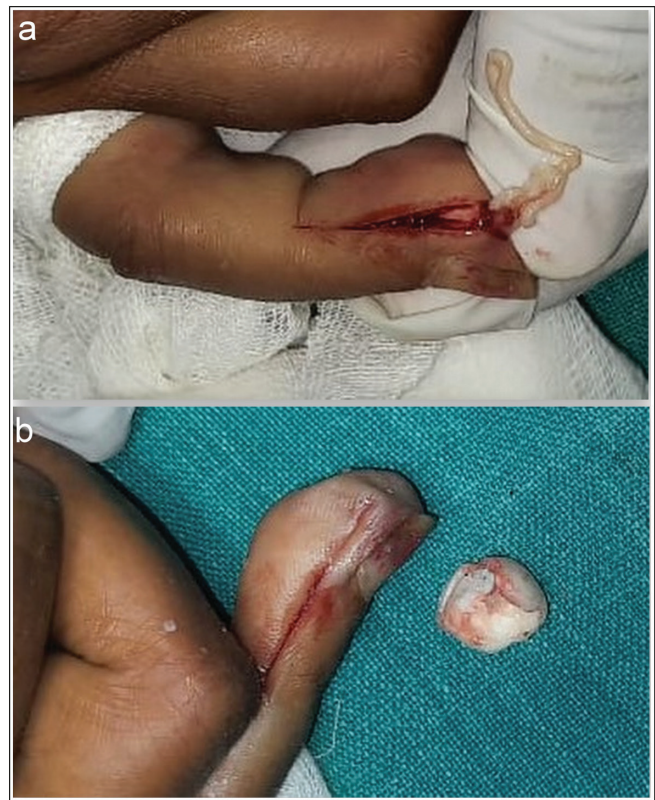
This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow\_reprints@wolterskluwer.com



**Figure 1:** The clinical image showing swelling over distal phalangeal region of the right little finger (A). The swollen pulp space is limited to distal phalanx area (B). The radiograph shows the destruction of the tip of terminal phalanx with residual deformity of the remaining bone (C)

Magnetic resonance imaging was advised but declined by the patient, and she chose exploration and biopsy for the final diagnosis. Exploration for specimen collection and debridement was planned. The distal finger was accessed through a small lateral mid-sagittal incision, and a thin white-walled cyst with white cheesy material inside was revealed [Figure 2A]. The cyst burst and cheesy material were kept for the specimen for culture and biopsy, both following which the cyst was carefully removed and bone was curetted [Figure 2B]. This resulted in a soft-tissue void, and wrinkling and thinning of the skin over the pulp space were noted. A piece of a sterile commercial absorbable gelatin sponge or gel foam (AbGel, Healthium Medtech Pvt. Ltd., Mumbai, India) was introduced to fill the void, and the wound was closed with nylon sutures. The dressing was done, and no splint age was given. The finger joint physiotherapy was encouraged all through the postoperative and follow-up periods to maintain interphalangeal joint movement. The postoperative period was uneventful, except delayed wound healing necessitating stitch removal at 3 weeks. The biopsy report showed an irregular cyst cavity lined by keratinizing stratified squamous epithelium located in the deep dermis. These contained keratin flakes in the center, and surrounding tissues showed dense fibrosis without cellular atypia. The diagnosis was suggestive of an epidermal inclusion cyst. The wound healed eventually, and there was no complication or recurrence noted [Figure 3] in the follow-up of 9 months.



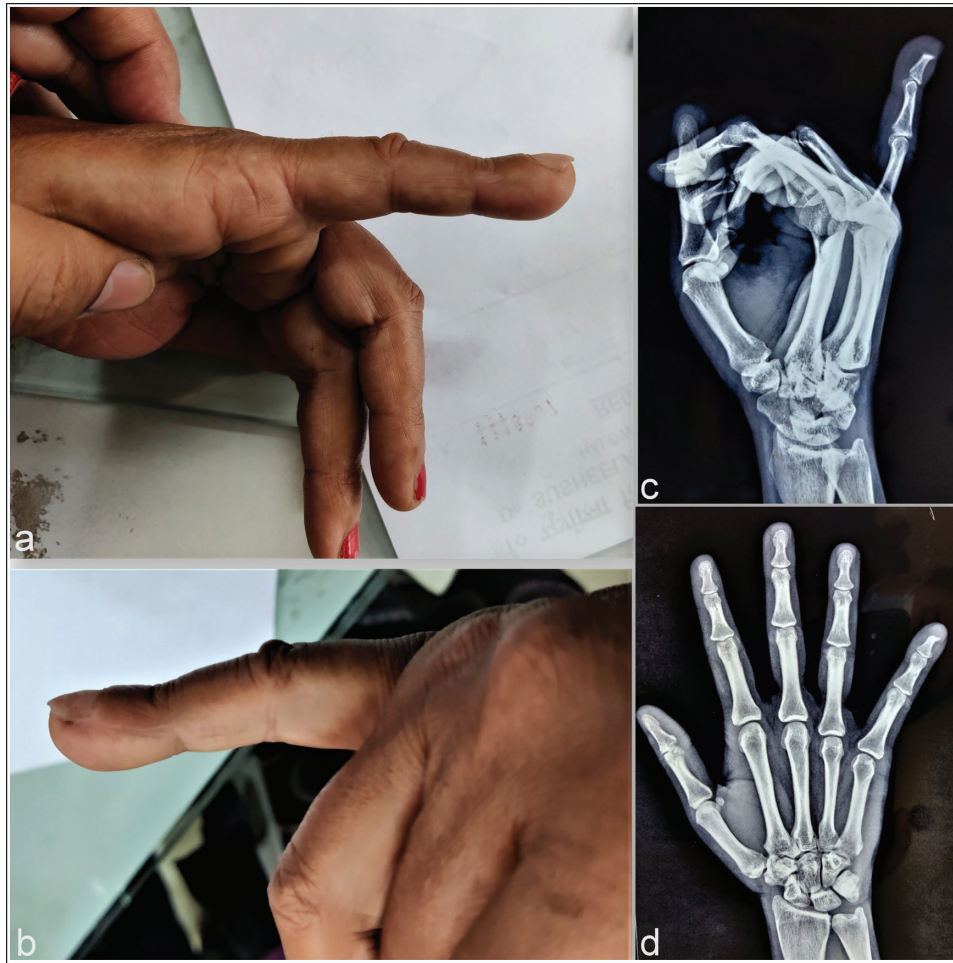
**Figure 2:** The intraoperative images showing the whitish cheesy material oozing out of the lesion (A) followed by the removal of a white thin-walled cyst (B)

### Discussion

The intraosseus EIC as a benign cystic lesion is an uncommon entity compared with the inclusion cysts over other subcutaneous regions. Only eight cases of EIC affecting terminal phalanx noted in a span of more than 25 years denote their uncommon occurrence.<sup>[6]</sup>

One of the two proposed theories for the causation of cyst formation is the traumatic one that underlines the traumatic implantation of epidermal cells, and the other one postulates faulty embryogenesis.<sup>[7]</sup> A well-defined cortical expansile lytic lesion is an usual presentation in phalangeal involvement.<sup>[8,9]</sup> The differential diagnosis may range from enchondroma, glomus tumor, chronic osteomyelitis, giant cell tumor, and acral metastasis. Sometimes referred to as keratin cyst, these lesions may be a differential in bone tumors or tumor-like lesions involving hand especially with a radiolucent defect with cortical thinning or bone loss.<sup>[10]</sup> Infection is another important mimic that needs to be ruled out in cases with associated edema and local tissue hyperemia.<sup>[11]</sup> The destruction caused by the lesion as in our case was severe and probably the result of the long-standing pressure of the lesion. A lucent, well-circumscribed lesion with a thin sclerotic cortical rim without calcification along with a precedent history of trauma and sparing of nailbed are important pointers to the diagnosis of EIC.<sup>[12]</sup> The knowledge of this variant epidermoid cyst is important to





**Figure 3:** The follow-up images showing healed wound over the finger with no complication from lateral (A) and medial (B) aspects. The radiograph also showing no recurrence of the lesion (C and D)

anticipate the problem and proper diagnosis. The standard treatment of exploration, excision, and histopathological diagnosis invariably results in a good outcome.<sup>[13]</sup> Sometimes, we may require to use an allograft-like synthetic graft in cases with substantial bone defects or may fashion autologous graft.<sup>[4,14]</sup> In one case with distal phalangeal involvement. The part of distal phalanx was excised and reconstructed with the iliac crest bone graft fashioned in the shape of phalangeal tip with the through-the-nail approach. Excellent bone fusion and clinical results were obtained. In an unusual report, the EIC, involving the fifth metacarpal bone, was found as a result of previous K-wire fixation of the metacarpal fracture.<sup>[15]</sup> This complication, though rare, should be kept in mind as the percutaneous fixation is a common procedure in orthopedic surgery. Overall, the prognosis is good, excision usually is curative, and no recurrence is seen if complete excision is ensured.<sup>[10]</sup>

#### Financial support and sponsorship

Nil.

#### Conflicts of interest

There are no conflicts of interest.

#### References

1. Lincoski CJ, Bush DC, Millon SJ. Epidermoid cysts in the hand. *J Hand Surg Eur Vol* 2009;34:792-6.
2. Sweed TA, El-Bakoury A, Mussa MA, El Ashry S, El Gamal TA. Intraosseous epidermoid cyst of the distal phalanx of a finger. *Curr Orthop Pract* 2016;27:477-99
3. Hamad AT, Kumar A, Anand Kumar C. Intraosseous epidermoid cyst of the finger phalanx: A case report. *J Orthop Surg (Hong Kong)* 2006;14:340-2.
4. Sasaki H, Nagano S, Shimada H, Nakashima T, Yokouchi M, Ishidou Y, *et al.* Intraosseous epidermoid cyst of the distal phalanx reconstructed with synthetic bone graft. *J Orthop Surg (Hong Kong)* 2017;25:2309499016684096
5. Lucas GL. Epidermoid inclusion cysts of the hand. *J South Orthop Assoc* 1999;8:188-92.
6. Simon K, Leithner A, Bodo K, Windhager R. Intraosseous epidermoid cysts of the hand skeleton: A series of eight patients. *J Hand Surg Eur Vol* 2011;36:376-8.
7. Hensley CD, Jr. Epidermoid cyst of the distal phalynx occurring in an eight-year-old child: A case repot. *J Bone Joint Surg Am* 1966;48:946.
8. McGraw P, Bonvento B, Moholkar K. Phalangeal intraosseous epidermoid cyst. *Acta Orthos Belg* 2004;70:365-7.
9. Memon F, Panjwani T, Patankar H. Intraosseous epidermoid cyst of distal phalanx: A rare entity. *J Clin Diagn Res* 2016;10:R101-2.

10. Toplu G, Altinel D, Leblebici C, Serin M. Intraosseus epidermoid cysts in distal phalanx. *Turk J Plast Surg* 2022;30:21-4.
11. Prasad R, Bhamidi A, Rajeswaran AK, Bhuvaneshwari R. Intraosseous keratin cyst of the distal phalanx. *Indian J Plast Surg* 2015;48:212-4.
12. Dumitru A, Costache M, Serban B, Japi IM, Anghelescu D, Condrea C, *et al.* Posttraumatich intraosseous epidermoid inclusion cyst. A case report and short literature review. *Roman J Orthop Surg Traumatol* 2020;3:3-8.
13. Rajkulasingham R, Azzopardi C, Murphy J, Davies M, Toms A, James S, *et al.* Lesions of the distal phalanx: Imaging overview. *Indian J Musculoskelet Radiol* 2019;1:47-56.
14. Kurosawa K, Kobayashi R, Takagishi K. Distal phalangeal reconstruction for recurrent intraosseous epidermoid cyst of the finger—A case report. *Hand Surg* 2011;16:375-7.
15. Park IJ, Kim HM, Lee JY, Park HW, Kang SH. An intraosseous epidermal cyst developing in a metacarpal bone after K-wire fixation: A case report. *Skeletal Radiol* 2015;44:1523-7.