

CASE REPORTS

RECURRENT SUBUNGUAL EXOSTOSIS OF THE THUMB IN A CHILD: A CASE REPORT

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ABSTRACT

Introduction: Subungual exostosis is a benign osteocartilaginous lesion that predominantly affects the toes and is uncommon in the pediatric population, particularly when involving the hand. Juxta-physeal localization in children poses diagnostic and therapeutic challenges due to recurrence risk and potential growth plate injury.

Case Presentation: We report the case of a 6-year-old girl presenting with a progressively enlarging subungual mass of the left thumb associated with nail deformity and minimal pain. Radiographic evaluation demonstrated a bony outgrowth arising from the dorsal aspect of the distal phalanx, consistent with subungual exostosis. Surgical excision was performed, and histopathology confirmed the diagnosis. Despite an uneventful postoperative course, radiographic recurrence occurred within the first year, with the lesion remaining juxta-physeal. Given the absence of pain or functional limitation, a conservative strategy with prolonged clinical and radiological surveillance was adopted. Progressive nail dystrophy persisted, but the patient remained functionally asymptomatic and well-adapted. At 11 years of age, due to lesion progression and inflammatory changes, a second surgical excision was undertaken, achieving complete resection. Following physeal closure, no further recurrence was observed, and long-term follow-up demonstrated preserved thumb function with residual nail deformity.

Conclusion: This case highlights the high recurrence risk of subungual exostosis in skeletally immature patients and supports a cautious, individualized approach to management. Long-term follow-up is essential, and attention to functional and psychosocial outcomes is crucial in pediatric patients.

Introduction

Subungual exostosis is a benign osteocartilaginous proliferation arising from the dorsal aspect of the distal phalanx, most commonly affecting the toes of adolescents and young adults.^{1,2} In the pediatric population, it is an uncommon entity and is even more rarely reported in the hand, particularly involving the thumb.³ Clinically, it presents as a slow-growing subungual mass that may cause nail plate deformity, pain, or local inflammation, frequently leading to delayed diagnosis or misdiagnosis as infectious or traumatic nail pathology.²

Although plain radiography is usually sufficient to establish the diagnosis, management in children can be challenging due to the close relationship between the lesion and the growth plate, especially when the exostosis is juxta-physeal.⁴ Complete surgical excision remains the treatment of choice; however, recurrence rates are higher in pediatric patients, particularly when resection is incomplete or performed before physeal closure.⁵

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ARTICLE HISTORY

Received 03 June 2026

Accepted 15 July 2026

KEYWORDS

Subungual exostosis, Pediatric, Thumb, Nail deformity, Recurrence, Case report.

We report a pediatric case of subungual exostosis of the thumb with local recurrence and progressive tumor growth and deformity over several years, highlighting the diagnostic challenges, surgical decision-making, and long-term follow-up required in skeletally immature patients.

Case Report

A 6-year-old girl was referred to pediatric orthopedic consultation for a progressively enlarging subungual mass of the left thumb, present for more than one year. The lesion had developed following repeated local trauma, including a crush injury, and was associated with nail plate deformity but minimal pain. Her medical history was significant for hereditary angioedema due to C1 esterase inhibitor deficiency, diagnosed in early childhood based on family history and laboratory confirmation. She had no previous angioedema crises but required perioperative prophylaxis.

On physical examination, a firm subungual mass was observed on the dorsal aspect of the distal phalanx of the left thumb, causing elevation and dystrophy of the nail plate. There were no signs of infection, neurovascular compromise, or functional limitation of the hand. Plain radiographs demonstrated a bony outgrowth arising from the dorsal aspect of the distal

phalanx, in close proximity to the physis, consistent with subungual exostosis (Figure 1a).

Given progressive enlargement, surgical excision was performed. The lesion was resected, bone wax applied to the resection bed, and the nail plate preserved for protection. Histopathological examination confirmed the diagnosis of subungual exostosis. Postoperative recovery was uneventful, with preserved thumb mobility.

During follow-up, progressive nail dystrophy persisted, and radiographic recurrence of exostosis was identified within the first year after surgery, with the lesion remaining juxta-physeal (Figure 1b). Due to the absence of pain or functional impairment and the risk of physeal injury, a conservative approach with clinical and radiological surveillance was adopted. Over several years, the lesion demonstrated slow growth, while nail deformity became more pronounced (Figure 2a-b). The patient remained functionally asymptomatic and fully engaged in daily and school activities.

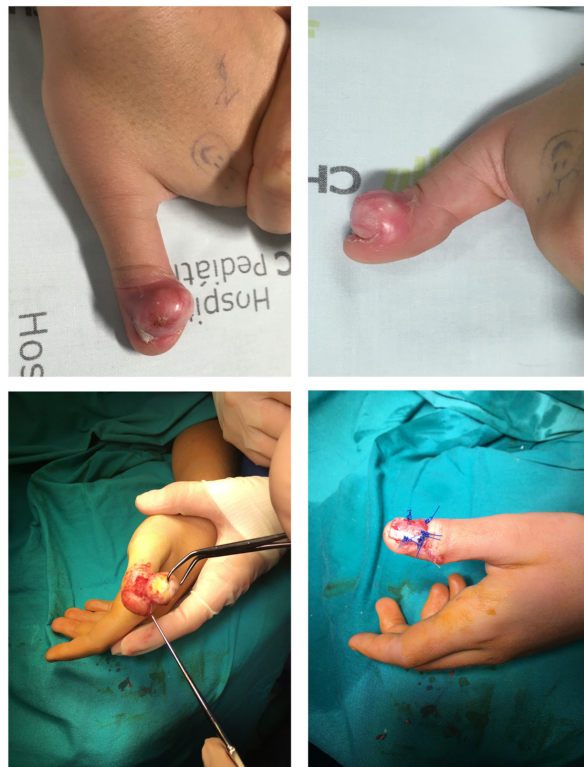
Despite the child's good functional adaptation and expressed acceptance of the nail deformity, significant parental anxiety persisted, largely related to cosmetic appearance and fear of progression. The psychosocial impact of nail deformity during late childhood and early adolescence was discussed with the family, emphasizing realistic expectations regarding nail normalization and recurrence risk.¹⁻²

At 11 years of age, due to progressive enlargement, inflammatory changes, and episodic pain, a second surgical excision was undertaken with careful resection to the base of the lesion (Figure 1c, 2c-d). Histopathology again confirmed complete excision of subungual exostosis. Subsequent follow-up demonstrated progressive healing of the nail bed, absence of further recurrence after physeal closure, and stable radiographic findings (Figure 1d).

Figure 1. Sequential radiographs of the affected digit illustrating the course across two surgical interventions. (a-b) Pre- and post-operative imaging from the initial excision. (c-d) Pre- and post-operative imaging performed 4 years later, demonstrating persistence of the lesion and subsequent re-excision.



Figure 2. Clinical findings and surgical management at the time of the second operation. Upper panels show the pre-operative appearance with significant nail plate distortion and enlargement. The lower left picture demonstrates intra-operative excision of the lesion. Lower right picture shows the immediate post-operative result after complete removal and reconstruction.



At final follow-up in adolescence, the patient remained asymptomatic, with preserved thumb function and a residual dystrophic nail. She reported no social avoidance behaviors and expressed satisfaction with hand function and appearance, while the family demonstrated improved acceptance following long-term stability.

Discussion

Subungual exostosis is an uncommon lesion in the pediatric population, and involvement of the hand – particularly the thumb – is rare, which may contribute to diagnostic delay and limited management data.¹⁻³ The present case illustrates challenges specific to children, including juxta-physeal localization, recurrence risk, and the functional and psychosocial implications of nail deformity.

In skeletally immature patients, interpretation of imaging may be complicated by the close relationship between the lesion and the growth plate. Juxta-physeal exostoses pose a therapeutic dilemma, as aggressive resection increases the risk of physeal injury or growth disturbance, whereas conservative excision is associated with a higher likelihood of recurrence.^{4,6} This balance influenced both the initial surgical approach and the decision to delay reintervention despite radiographic recurrence.

Recurrence after surgical excision is more frequent in

pediatric patients and is associated with incomplete resection and skeletal immaturity.^{5,7} Several authors advocate delaying definitive surgery until physeal closure when feasible, particularly in asymptomatic patients, to reduce recurrence risk and avoid growth plate damage.^{4,8,9} In the present case, prolonged surveillance was chosen due to minimal symptoms and preserved hand function, ultimately resulting in definitive resolution after physeal closure.

Beyond surgical considerations, nail deformity represents a relevant but often underestimated outcome in children. Nail dystrophy may persist even after complete excision and can have psychosocial consequences, particularly during late childhood and adolescence. Children may adapt well functionally and socially to nail deformities, while parental anxiety may drive repeated consultations and requests for intervention.¹⁰ Addressing expectations and incorporating the child's perspective into decision-making are therefore essential components of management.

The favorable long-term outcome in this patient supports a conservative, individualized approach when symptoms are mild, function is preserved, and careful follow-up can be ensured.

Conclusion

Subungual exostosis of the thumb is an uncommon condition in children and may pose diagnostic and therapeutic challenges when located in close proximity to the physis. This case highlights the risk of recurrence associated with early surgical intervention in skeletally immature patients and supports a cautious, individualized approach that balances symptom severity, functional impact, and the risk of growth plate injury. Prolonged clinical and radiological follow-up is essential, as lesion behavior may evolve over time. Despite persistent nail deformity, children may demonstrate good functional adaptation and psychosocial acceptance, emphasizing the importance of incorporating the patient's perspective and maintaining clear communication with families regarding expected outcomes.

Compliance with Ethical Standards

Funding: None

Conflict of Interest: None

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