

Bipartite Nail Deformity Due to Seymour's Fracture in a Pediatric Patient

Ahmadreza Afshar, Ali Tabrizi, Hassan Taleb

Department of Orthopedics, Imam Khomeini Hospital, Urmia University of Medical Sciences, Urmia, Iran

ORCID:

Ahmadreza Afshar: 0000-0002-3676-5932

Ali Tabrizi: 0000-0002-4385-6445

Hassan Taleb: 0000-0002-0576-075X

Abstract

Seymour fractures occur in the form of juxta-epiphyseal fractures in the distal phalanx bone of children, which are often accompanied by nail bed injuries. These fractures are also associated with complications such as nail deformity, infection, and growth disturbance. This report introduces a 6-year-old boy whose Seymour fracture occurred with the interposition of the nail bed on the fracture site, resulting in nonunion and nail deformity in the form of bipartite growth. Nail bed injuries could be accompanied by Seymour fractures and their treatment is independent of the fracture treatment. Nail bed repair can prevent subsequent deformities.

Keywords: Nail bed, nail deformity, Seymour's fracture

INTRODUCTION

Nail bed and fingertip injuries are among the most common pediatric hand traumas accounting for two-thirds of pediatric hand injuries. Seymour's fracture refers to the avulsion or injury of the nail bed is avulsed or injuries induced by direct trauma. These injuries are often due to sharp injuries as a result of clean laceration and mostly blunt trauma.^[1,2] Nail plate injuries include subungual and avulsion, crush injuries, simple or stellate laceration, and hematomas.^[3]

Pediatric nail plate and bed injury management play a decisive role as they can influence the function, cosmetics, and psychological aspects.^[1-3] In this report, a 6-year-old child suffering from a Seymour fracture in the distal phalanx bone is presented. Incorrect management of the injury resulted in nail growth disturbance.

CASE REPORT

The patient was a 6-year-old boy who was referred to the hand surgery clinic due to a thumb deformity. The injury in the distal phalanx of the thumb had occurred 4 months before caused by the fall of a heavy object. The prior injury

had no ulcer but the hematoma under the nail was treated with hematoma drainage with multiple needling and 2-week immobilizations with the splint. At present, the vertical nail growth can be seen in the central and proximal parts and one nail with horizontal growth was visible so that bipartite nail deformity was presented [Figure 1]. Radiography of the distal physical injury was in the form of Seymour fracture as a nonunion [Figure 2]. During surgery, a part of the nail bed, including the germinal and sterile matrix, was trapped at the fracture site, resulting in nonunion and malformed vertical nail growth. The nail bed was repaired after release from the fracture site using meticulously with 5-0 monofilament absorbable sutures [Figure 3]. The fracture was then fixed longitudinally with K-wire [Figure 4]. Immobilization was performed with a finger splint for 4 weeks.

Address for correspondence: Dr. Ali Tabrizi,

Department of Orthopedics, Imam Khomeini Hospital, Urmia University of Medical Sciences, Urmia, Iran.

E-mail: ali.tab.ms@gmail.com

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Figure 1: Clinical photo of the thumb with bipartite nail deformity

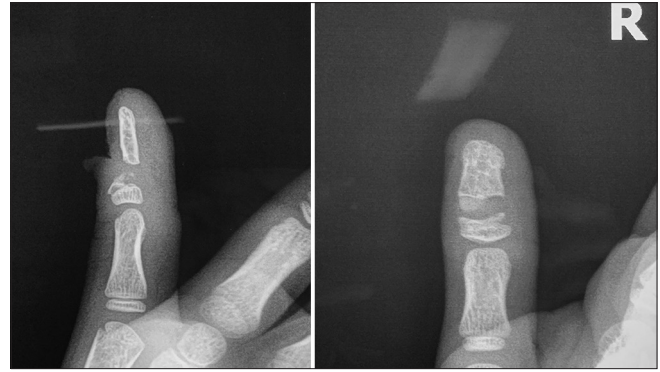


Figure 2: Conventional radiography suggests chronic Seymour's fracture and nonunion



Figure 3: Operation time photo indicated nail bed injury and interposition on the fracture site

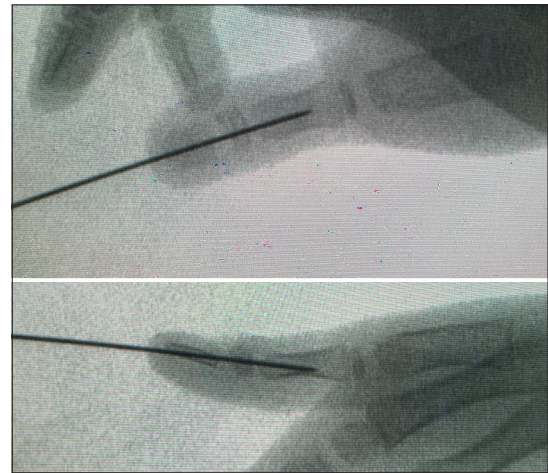


Figure 4: Distal phalanx physal injury reduced and fixed with percutaneous K-wire

DISCUSSION

Seymour fractures occur as juxta-epiphyseal fractures in the distal phalanx of children's fingers and are often associated with nail bed injuries. These fractures are accompanied by complications such as infection, nail deformity, and growth disturbance.^[4] This injury could be misdiagnosed with other distal ligament injuries, such as simple nail plate or mallet finger. The distal phalanx is completely attached to the germinal matrix layer and is covered with thin skin around the dorsal surface.^[1-4] Therefore, direct trauma to the distal ligament can be accompanied by damage to the nail bed and physis. In the distal phalanx, the extensor tendon connects to the epiphysis, whereas the flexor tendon is attached to the metaphysis. Therefore, distal phalanx injury can lead to rupture of extensor mechanism manifested as mallet finger, which might be misdiagnosed as Seymour fracture.^[4,5] Accurate imaging can help differentiate between these two injuries. Seymour fractures are often underestimated. Some authors believe that nail deformity is caused by damage to the nail bed and has nothing to do with the treatment method. In Seymour fractures, complete or partial

removal of the nail may be more problematic as it may further promote fracture instability.^[4] Proper treatment and repair of the nail bed are of crucial significance in preventing nail deformity. The placement of soft tissue at the fracture site of the distal phalanx causes nail deformity and disrupts the union process.^[4] Seymour fractures are often treated with percutaneous pinning leading to satisfactory outcomes.^[4] No report can be found based on our research in the literature about nail bed placement at the fracture site, which caused bipartite nails. Thus, the present report is the first case. Khairnar *et al.* reported a 13-year-old child with a Seymour fracture and a nail bed injury, in which the initial treatment prevented deformity.^[1] Accurate preliminary assessments of Seymour fractures and their associated injuries are highly important. In a study by Al-Qattan *et al.* on five patients with fractures, treatment with K-wire stabilization led to growth disorder and mild nail deformity in two cases.^[6] Therefore, it seems that nail deformity is independent of fracture treatment. Nail bed treatment should be performed accurately in these lesions.

CONCLUSION

Nail bed injuries can be associated with Seymour fractures, and their treatment is independent of fracture treatment. Nail bed

repair can prevent subsequent deformities. This report aims to present the importance of nail bed injury and treatment during fracture of the distal phalanx of pediatric.

Ethical issues

The case report was confirmed by the Ethics Committee of Urmia University of Medical Sciences.

Patient consent

Written informed consent was obtained from the patient for publication of this case report.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the legal guardian has given his consent for images and other clinical information to be reported in the journal. The guardian understands that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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