

A Prospective Study on the Prevalence of Nail Bed Injuries and Surgical Repair in Children

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ABSTRACT

Introduction: Nail bed injury is one of the most common hand injuries in children. Although, controversy exists regarding the management of minor nail injuries. It is universally known that severe nail bed injuries should be repaired to minimize long time deformities.

Methodology: 252 total number of nail bed injury cases were included in this study. This study conducted in the department of Orthopaedics, Era's Lucknow Medical College and Hospital. The duration of study over a period of two years.

Results: We suggested that mechanism of injury occur mostly by door crush injuries (71.4%) in this study followed by other injuries. In 68.2% cases nail were reviewed and 31.7% nail were lost out of 252 cases.

Conclusion: This study concludes that, in children, surgical repair of the nail bed gives a reliable good functional and cosmetic outcome.

Keywords: Nail Bed Injuries, Surgical Repair, Distal Finger Injury.

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INTRODUCTION

Nail is a specific structure found only in primates. Though, other mammals have modification of these. The nail helps to increase the sensory perception in the pulp. It also helps in picking up small objects. The loss or deformity of nails are not only unaesthetic in appearance but can be functionally devastating. Well understanding of nail anatomy is very much essential for proper treatment of various conditions affecting it. Nail forms at approximately 10 weeks of intrauterine life from sole plate appearing on dorsum of each finger.¹ A well-grown nail indicates maturity of the foetus at birth. From the epidemiological point of view, most fingernail injuries are caused by crush trauma. It involves children and young adults.²⁻⁴ Around in 50% of cases, fingernail injuries are linked with phalangeal fractures. It has been observed that when a trauma occurs, nail generation stops for about 21 days. Following this phase, an increase in growth rate is observed for the next 50 days and a decrease is found for 30 subsequent days. Nail growth is normal after 100 days following trauma.⁵ At this time, a transversal thickening of the nail represents signs of the pre-existing trauma. In primary care, it is very important to achieve a smooth nail bed without scars. Therefore, the wound must be precisely sutured in order to

prevent any other malformations. If there is a scar on the dorsal roof then it leaves an opaque streak on the nail plate. A germinal matrix scar leaves a split or no nail growth whereas if the scar is on the sterile matrix, a detachment of the nail may occur distal to the injury. The final result should be evaluated after 1 year of the trauma. Fingertip injuries are the most common traumatic conditions presenting to surgeons and emergency departments. Nail bed repair with fine, absorbable suture has been the treatment of choice for removal of the nail plate injuries.⁶⁻⁸ The cyanoacrylate group of tissue adhesives has been used widely in both traumatic and surgical wound closures. This material polymerizes with a basic substance creating a strong, stable bond. It has been reported by several studies that cyanoacrylate tissue adhesives are as effective as suture in the management of lacerations, producing a fast and cosmetic closure.⁹⁻¹³ There are no controlled trials comparing the use of 2-octylcyanoacrylate, more commonly known as Dermabond (Ethicon, Inc., Somerville, NJ), versus suture to repair nail bed lacerations. Stanislas et al and Richards et al observed good results using a tissue adhesive to secure the nail plate under the eponychial fold after suture repair of nail bed injuries.¹⁴⁻¹⁵

MATERIALS & METHODS

Study Population

252 total number of nail bed injury cases were included.

Study Area

This study conducted in the department of Orthopaedics, Era's Lucknow Medical College and Hospital.

Study Duration

The duration of study over a period of two years.

Data Collection

Injuries were separated into those involving the nail alone and those with more extensive trauma to the soft tissue of the fingertip or with distal phalanx fracture. The area of nail bed involved was defined anatomically as distal, middle, or proximal nail bed and dorsal or palmar nail fold. Nail bed repairs were performed under loupe magnification and tourniquet control.

Data Analysis

Data were analyzed by using Microsoft excel.

RESULTS

In this study we were included total 284 cases of nail injuries. Among the all cases we get 88.8% cases of nail bed injury and rest from distal finger injury. In our study, 57.9% were male and 42.1% female. This study showed, 59.5% cases were belongs to 0-4 age group followed by 5-8 (19.1%), 9-12(21.4%) age group. We suggested that mechanism of injury occur mostly by door crush injuries (71.4%) in this study followed by other injuries. In 68.2% cases nail were reviewed and 31.7% nail were lost out of 252 cases. We suggested the grading according to Zook e.g.et al which showed in figure 1.

Table 1: Distribution of cases according to injury

Injury	n	%
Distal Finger Injury	32	11.2%
Nail Bed Injury	252	88.8%
Total	284	100%

Table 2: Distribution of cases according to gender

Gender	n	%
Male	146	57.9%
Female	106	42.1%
Total	252	100%

Table 3: Distribution of cases according to age group

Age Group	n	%
0-4	150	59.5%
5-8	48	19.1%
9-12	54	21.4%
Total	252	100%

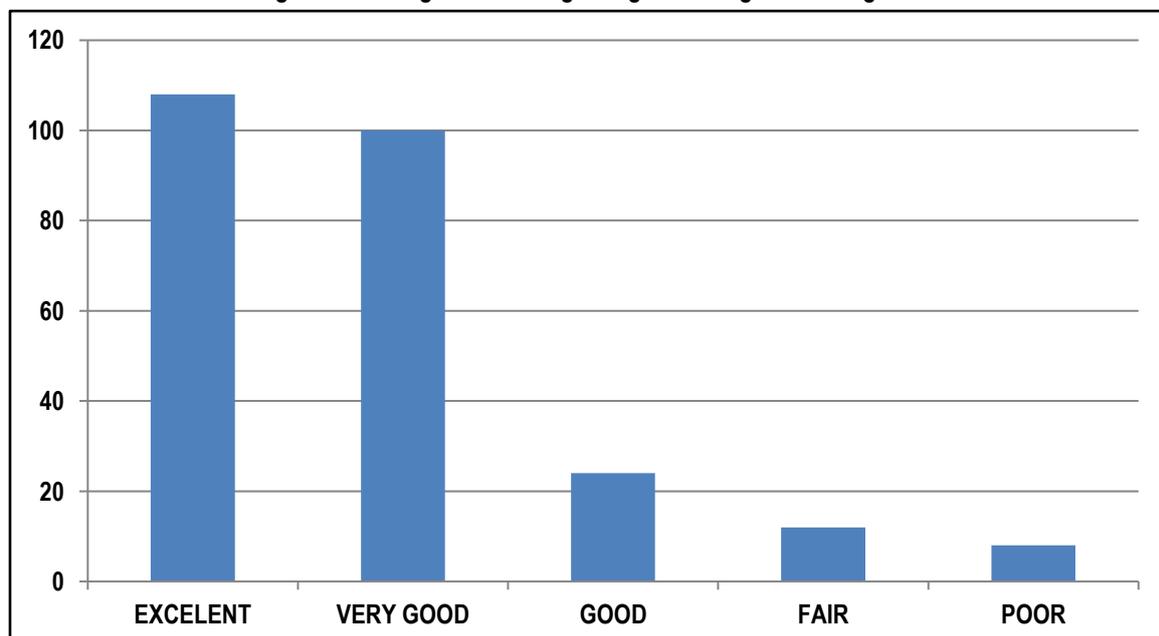
Table 4: Distribution of cases according to mechanism of injuries

Mechanism Of Injuries	n	%
Door Crush Injury	180	71.4%
Crush Between Objects Like Bricks, Stones	38	15.2%
By Sharp Object Like Glass, Knife	22	8.7%
Others	12	4.7%
Total	252	100%

Table 5: Distribution of cases according to nail reviewed and lost

Nail	n	%
Were Reviewed	172	68.2%
Were Lost	80	31.7%
Total	252	100%

Figure 1: This figure showed grading according to Zook e.g.et al



DISCUSSION

Nail bed injury is one of the most common hand injuries in children. Although, controversy exists regarding the management of minor nail injuries. It is universally known that severe nail bed injuries should be repaired to minimize long time deformities. The long finger was most commonly injured as it extends beyond the other fingers. The distal and middle third of the nail bed was also mostly injured for the same reason. Crush injury between two heavy objects seems to be the most common injuries of fingers. It is happened when children tend to hold the doors to stand up and the doors closes suddenly due to various reasons. It is reported that male children seem to more commonly injure in the ratio of 3:2. The result of simple lacerations with intact nail plate was much better than crushed, avulsed nail bed with nail plate. Most of the deformities are seen in nail bed. It was just approximated as the vascularity of the fingertip was inactive. Fracture of the distal phalanx was 70% much higher than the accepted incidence in other studies. This can be explained on the basis of the severity of the nail bed injuries. It is surprising that most of the finger tips which had slow circulation recovered and survived.

Results that appeared to be most important to the patients fell into functional and cosmetic categories. It is found by patient complaints that nail splitting was the most serious problem. Other major complaints are nail roughness, which caused snagging and enough lack of adherence to gather dirt and cause catching, and bending. If the nail was greater than two thirds adhered then significant problems were not encountered and the deformity was primarily cosmetic.

CONCLUSION

This study conclude that

1. In children, surgical repair of the nail bed gives a reliable good functional and cosmetic outcome.
2. Nail plate replacement and fixation are as important as the repair.
3. In most of the injuries, nail plate need to be just elevated from the nail bed.
4. Severe nail bed injuries can be prevented by care full fold and nail bed repair.

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