

Surgical Nail Bed Repair in Pediatric Patients

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ABSTRACT

Fingertip injuries are frequently seen in young children, with crush injury by door being the most common mechanism. This type of injury often results in nail bed injury, which requires attention from the plastic surgeon. Surgical nail bed repair is an important step in avoiding unwanted long term nail deformity. In this article we will review the results of nail bed repair in children done in our institute as compared to other available publications. An internet search was performed on PUBMED, PMC, EUROPE PMC, Google Scholars and SAGE journals using the phrases “nail bed repair children”, “nail bed injuries children”, and “nail bed injury children”. Overall, the results of 3 articles on surgical repair of nail bed injuries in children were compared to the results obtained in our hospital. There were a total of 146 patients in the reviewed articles and 108 that were treated in our institution. The reviewed articles mentioned 26 patients (16.7%) overall who suffered from nail deformity post repair as compared to 1 patients (0.92%) by our surgeons. The conclusion of this review is that the meticulous surgical technique described by our surgeons seems to have a better outcome compared to the other available studies up to date.

Keywords: Nail bed repair, Nail bed injury, Hand injury in children, Hand surgery, Hand trauma in children, Nail bed injury pediatric, Surgical nail bed repair

INTRODUCTION

Young children’s curiosity and constant need to explore their surroundings makes them vulnerable to injury; especially hand trauma and fingertip injury. Many studies have reported that crush injury by door seems to be the most common mechanism of nail bed injury in children [1-3]. If not treated correctly nail bed injuries can result in permanent nail bed scarring and nail plate deformity. Plastic surgeons are often consulted for nail bed repair, especially in young children where repair generally requires sedation or general anesthesia. We were interested to see how the surgical technique in our institution compares to other centers mentioned in the available research papers.

METHODS

An internet search was performed on PUBMED, PMC, EUROPE PMC, Google Scholars and SAGE journals using the phrases “nail bed repair children”, “nail bed injuries children”, “nail bed injury children” and “outcome of children nail bed repair”. Only articles focused on surgical repair of nail bed injuries were accepted. Articles which included adults and those where conservative management was the treatment of choice were excluded in order to

achieve a fair comparison in our review. Overall, the results of 3 articles on surgical repair of nail bed injuries in children were compared to the results obtained in our hospital.

DISCUSSION

In the 3 articles which were reviewed, there was very little detail to the surgical technique and dressing used for the cases.

In the article published by Pearce and Colville [3] they followed 46 cases of nail bed injuries over a 6 month period. The repair was performed under general anesthesia in most

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cases as day care admissions. All surgeons but one used 6-0 or 7-0 Vicryl-Rapide in the nail bed repair; one surgeon used 7-0 PDS. In the majority of cases the nail or an analog was used for splinting. They mentioned that a splint was not used in 2% of the cases. They reported nail bed deformity in 3 patients (7%) with appearance score of 9.2 out of 10.

Salazard et al. [4] retrospectively reviewed 81 children with 91 fingers with a minimum follow-up of one year. The data from the medical file allowed us to specify all the initial lesions, all the therapeutic gestures, as well as any early complications. At the last follow-up, we evaluated the sensitivity disorders, the aspect of the pulp and the nail, as well as the subjective opinion of the parents. There have been four infectious and subnotic complaints and two necrotic complications. One child developed a bone infection that required surgery and antibiotics. At last follow-up, seven patients (8%) had sensorial disorders, six (7%) anesthetic pulp and 23 (25%) dystrophic nails (minor=19, major=4). The parents felt the result was very good for 80% of the children. Pulp sensitivity disorders were more frequent when the nail bed was injured. Nail dystrophy was more common after initial pulp amputation.

We observed 4 infectious complications and 2 necroses. At last follow-up, we noted 7 sensitivity disorders (8%), 6 cases of unsightly pulp (7%), 19 cases of minor nail dystrophy (21%) and 4 cases of major dystrophy (4%). The parents' final opinion was very good in 80% of cases.

On the other hand, Inglefield et al. [5] described 19 children with 22 injuries involving the nail bed. All achieved normal nail growth and the overall result of the repair was good in 91%. Complications were few and parental satisfaction with the management was high. Every effort should be made to perform a meticulous primary repair of all nail bed injuries.

In the paper done by Al Lahham et al. [6], the management included admission to the plastic surgery unit and administration of a preoperative prophylactic dose of intravenous antibiotics. The surgery was then performed under deep sedation combined with a local digital block.

The surgeon removed the nail plate with a periosteal elevator and irrigation of the wound was done with normal saline and povidone iodine solution. Under 4x loupe magnification, the surrounding skin was sutured with 5-0 rapid vicryl suture followed by interrupted simple suturing of the nail bed with 6-0 vicryl with round body needle.

The nail plate was replaced, but not secured in place, to prevent adhesions between the dorsal fold and nail bed. Dressing was done with fusidic acid ointment and non-adherent paraffin gauze which was wrapped around the finger to keep the nail plate in place. A Plaster of Paris slab was in children less than 8 years old or metallic finger splint in those who were 8 years or above. Patients who had a fracture of distal phalanx were given oral antibiotic for 3

days postoperatively. The wound was evaluated and redressed on the 6th post-operative day and the dressing was changed twice weekly thereafter.

CONCLUSION

Avoidance of nail bed deformity in children is an important outcome which all surgeons performing nail bed repair should strive for. Meticulous repair should be done in all pediatric patients to avoid lifelong deformity. The technique used in our hospital seems to be very adequate, especially in comparison with other studies. In conclusion, the methodological approach during surgery, as well as the post-operative care mentioned in the article by Al Lahham [6], leads to superior cosmetic outcomes and patient satisfaction.

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