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Case Report

Successful Replantation of Amputated Right Thumb in Resource Constrained Environment

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1. Abstract

A case of successful replantation of thumb at the proximal phalanx level is presented in this report. There were associated injuries of the index and middle fingers which were also managed with good functional outcome. The procedure was done with operating loupes and supra clavicular block with minimal facilities in a resource constrained environment of a rural hospital.

2. Keywords

Thumb replantation; Thumb amputation; Emergency replantation; Micro anastomosis

3. Introduction

Traumatic amputations of the digits are common in working population of developing nations. Lack of knowledge about personal safety, odd working hours and fatigue are common causes of digital amputations. Inspite of constraints in resources, replantation of the thumb should always be attempted owing to its versatile nature. One such case with injuries to the right middle and index fingers along with total amputation of the right thumb and was replanted successfully with minimal supporting facility is presented here.

4. Case report

A 39 years old gentleman presented with crush injuries to his middle and index fingers along with total crush amputation of the right thumb (Figures 1a & 1b). On examination, his general and systemic assessment was clinically normal. The right thumb was amputated at the base of the proximal phalanx with minimal contamination. The index finger had two small cut lacerated wounds over the distal and middle phalanges respectively and the middle finger had zone II flexor tendon injury. The patient was taken up for surgery after necessary investigations and consents were completed. Under supra clavicular block and tourniquet control, the index finger wounds were debrided and sutured followed by debridement and repair of zone II flexor injury in the middle finger. The right thumb stump wound was debrided and washed. The amputated distal part of the right thumb was also debrided, and the radial side digital artery and vein was found suitable for repair. Corresponding vessels were identified in the proximal part and were prepared. The cut ends of the digital nerve on the same side were also identified and prepared. The ulnar side digital nerve and vessels were destroyed and were not suitable for repair. Therefore, replantation sequence proceeded with bone fixation with K wire followed by repair of tendons, radial digital nerve, digital artery and vein. The circulation was restored, and the skin wound was closed partially, and rest of the wound was left open to heal with secondary intention (Figures 2a & 2b). The entire duration of the procedure was four hours. The replanted thumb and the repaired index and middle fingers also healed well enabling good functional recovery (Figures 3a, 3b & 3c). The patient was followed for a period of one year and though the replanted thumb survived, the patient had stiffness at the inter phalangeal joint, partial recovery of sensation and no restriction of daily functional activities.

Figure 1a: The right hand with amputated thumb stump and injured index and middle fingers

Figure 1b: The amputated thumb

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Figure 2a: The radial side digital artery being repaired

Figure 2b: Vascularity restored to the replanted thumb – Frank bleeding on sterile needle prick

Figure 3a: 1 week after replantation - Viable thumb with fresh bleeding on sterile needle prick

Figure 3b: 6 weeks after replantation

Figure 3c: 8 weeks after replantation

5. Discussion

In the era of microsurgery, it has become a routine practice to replant one or more digits inspite of unfavourable conditions [1]. Surgeons have defied the classical described criteria and have gone beyond the routine and have successfully replanted digits [2]. The thumb being the most mobile and versatile of all the digits gets priority over other digits in replantation. Ever since described by Tamai, it has become a standard practice to replant the amputated thumb as first priority and inspite of adverse conditions. Such is the importance of thumb that even amputated other digits are used as its alternatives so as to enable a functioning thumb [3].

Depending up on the level of amputation, there are a few classifications and reconstructive algorithms. But given a clinical situation there are more than few occasions were the described procedures have been defied enabling good replantation [4].

In our case, foucher's classification for thumb amputation was used and the type of amputation was II, which involves the proximal phalanx [4]. Though technically described as an easy zone for replantation it may not be easy always as in our case, where there were associated injuries of two other digits with poor infrastructure facilities. The microvascular anastomosis of the digital artery and vein were done with operating magnifying loupes under axillary block and in the emergency procedure room. The injury was so severe that the ulnar side digital neural and vascular elements were beyond repair and only the radial side neuro vascular elements were repaired.

In this case, the replanted thumb survived and technically was successful. But with stiffness of the inter phalangeal joint, partially mobile metacarpo phalangeal joint and with almost nil sensory recovery, the success in terms of function could be termed as partial. But inspite of that the patient adapted well to his replanted thumb and was able to continue with his routine activities and such is the positive psychological impact of the replantation.

To conclude, thumb replantation should always be attempted inspite of the odds being against conventional thinking and a successful replantation against the conventional odds improves the confidence of the surgeon and the morale of the patient.

6. Author Contribution: Conception, Design, Data collection, Writing – GI Nambi

Data Collection, Editing & Submission – A Krishnakumar

Data Collection, Editing & Submission – TK Arudra Varanambigai

7. Consent to Participate: The patient has consented for taking his photographs for publications in newspapers and conference presentations.

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