



Long Term Results of the Fingertip using the Thenar Flap

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Abstract

Permanents posttraumatic deformities of the fingertip may result in troublesome hand appearance mainly for young women and children. The thenar flap intended primarily as an aesthetic reconstruction is the perfect solution even for the middle, ring, and little finger. The long lasting outcomes were evaluated in a group of 8 individuals with regard to appearance, function, and patient perception.

Keywords: Thenar flap; Fingertip deformation; Aesthetic outcome

Introduction

Fingertip injuries are very frequent. Not only is the function of the finger affected but also trauma may cause permanent deformity and unaesthetic appearance [1-3]. It is necessary to point out that the hand; its movement and aesthetic look, is the main instrument of nonverbal communication besides facial appearance and mimics. It is asserted especially in women, because they use their hands more in communication than men. Additionally, their fingers are often highlighted by nail polish or jewellery decoration. Also, the hands play a big role in children community, because of naked manipulation with toys or other activities. Therefore every deformity becomes rather difficult and problematic. Afflicted individuals hide their hand in front of other people. They feel being ashamed and lose their self-esteem. Unfortunately a lot of simple soft tissue injuries result in unsightly scarring with visible shape deformity and volume loss. The cause may be due to underestimation of original injury, insufficient treatment and/or patient's will to undergo complex surgery [4-6]. A wide scale of reconstruction surgeries have been described, from simple skin grafts and local flaps to sophisticated microsurgical approach. One of the most popular local flaps is the thenar flap, very well suited for young females and children. It was described by Gatewood in 1926, and later worked out by Flatt in 1957. The thenar flap is indicated for volar skin avulsions over the pulp of the finger (eg. volar oblique amputations); however, its use can also be extended to cover dorsal defects over the nail bed. It has been described many times and in many indications as an acute treatment, however there is still a low number of long term follow ups and evaluation of long term results. Usually, it is used for isolated defects of index and/or the middle finger, but exceptionally for the ring or little finger. The cosmetic impact of the deformity may be, however, stressful even in these fingers.

Materials and Methods

In 2010 to 2016 6 females and 2 males (age range 5 to 42 years) were treated for the injury of middle or ring finger tip (five cases with middle finger involvement, 3 cases with ring finger involvement) shown in Table 1. All the reconstructions were performed using the thenar flap. The flap was composed of the palmar glabrous skin and its underlying subcutaneous tissue. This composite tissue was used for resurfacing soft tissue fingertip defects. Secondary defects may be closed by shift only in four cases or using a skin graft also in four cases. When the flap had been disconnected, the unused part of elevated tissue was put back to the harvest site shown in Table 2.

Results and Discussion

The healing passed without any problem in all patients. The mobility rehabilitation lasted 3 months in average. The average time of evaluation was 62.4 months since complete healing. Objectively there were noticeable sequelae in all cases, however minimal. From the patient view all characteristics of function and appearance were classified as 1= poor, strong problem, 2= acceptable, sometimes problem and 3= perfect, without problem. Three patients had perceived problem with appearance. None realised change of function, either mobility either sensitivity shown in Table 3 and (Figures 1 to 8). This approach was found as a simple effective method useful in the following indications:

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Table 1: Survey of followed group.

Patient	Age in time of injury	finger	Defect of soft tissue	Loss of bone	Mechanism of injury	Hand dominant
1	35	4	Volar side	0	Scalp	No
2	15	3	Complete tip	0	Scalp	No
3	5	3	Complete tip	0	Scalp	Yes
4	42	4	Volar side	0	Scalp	No
5	27	3	Complete tip	Loss of proc.unguicularis	Cutting	Yes
6	16	3	Volar side	0	Scalp	No
7	31	3	Volar side	0	Scalp	No
8	24	4	Complete tip	Loss of proc.unguicularis	Cutting	No

Table 2: Used method.

Patient	Pedicle	Closure of second. defect	Healing complications	Unused part of pedicle in disconnection back to the harvest site	Difficult healing after disconnection
1	prox	shift	0	+	0
2	prox	Skin graft	0	+	0
3	prox	Skin graft	0	+	0
4	prox	shift	0	+	0
5	prox	Skin graft	0	+	0
6	prox	shift	0	+	0
7	prox	shift	0	+	0
8	prox	Skin graft	0	+	0

Table 3: Individual outcome.

Patient	Time from the injury	Finger mobility/length of rehabilitation	Tip scarring	Tip deformity	Tip sensitivity	Donor area sensitivity	Nail growth	Patient satisfaction
1		Full/2 months	Fine	Minimal	+	No change	+	3
2		Full/3 months	Fine	Minimal	+	No change	+	3
3		Full/4 months	Fine	Noticeable	-	No change	+	2
4		Full/2 months	Fine	Minimal	+	No change	+	3
5		Full/4 months	Fine	Noticeable	-	No change	deform	2
6		Full/3 months	Fine	Minimal	+	No change	+	3
7		Full/3 months	Fine	Minimal	+	No change	+	3
8		Full/4 months	Fine	Noticeable	-	No change	deform	2



Figure 1: Primary injury.



Figure 2: Elevated flap.

1. Volar pulp injury- for length and fullness preservation
2. Visible deformities of the index and/or middle finger (mostly), ring and little finger (exceptionally)

Isolated injury in young female or children Contraindication:

1. Major skeletal loss with regard to the aesthetic aim

2. Additional joint involvement (injury itself, degenerative disease resulting in joint stiffness, etc.)

It has particular advantages compared to the skin graft, cross finger flap or V-Y flap, i.e. better colour and texture match, highly functional, durable and glabrous shell, good sensitivity and aesthetic outcome, less scarring, minimal donor harm [7-11]. However also



Figure 3: Injured part of the tip covered by flap.



Figure 4: Three years after the injury.
Figure 1 to 4 show basic steps of the approach and final result.



Figure 5: X-ray of the primary injury.

it has disadvantages: limited flap extend, two stage procedure, need of intensive rehabilitation and close patient compliance [12,13]. The only problem of the majority of followed patients was little sensibility disorder in the flap area. Nevertheless all patients display a high satisfaction with the outcome. The described disadvantage the propensity of PIP joint contracture and finger stiffness was not found in observed group. Perhaps due to the composition of young women and children, who tend to have more supple joints and are therefore good candidates for the thenar flap. It must be pointed out there were only two patients with the injury located on dominant hand. In conclusion, it may be pronounced that motivated patients are glad to cooperate; anyhow they pass two stage surgery and rehabilitation. Elaborated and well done surgeries have perfect outcome even in long



Figure 6: Appearance with synthetic nail at site.



Figure 7: Naked appearance from the dorsal view.



Figure 8: Naked appearance from the palmar view.
Figure 5 to 8 long lasting result from aesthetic view.

term results with regard to both appearance and function, bringing high satisfaction to patients without any limit.

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