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Plastic Surgery

A STUDY ON OUTCOMES OF HYPOTHENAR GRAFT FOR FINGER TIP INJURIES

V. Sriram — Postgraduate, Department of Plastic Surgery, Chengalpattu Medical College

K. Boopathi* — Professor, Department of Plastic Surgery, Chengalpattu Medical College.
*Corresponding Author

ABSTRACT Finger tip injuries occurs more commonly due to industrial accidents and produces significant patient morbidity [1,2].This paper suggests the use of the hypothenar eminence as a logical donor site for such grafts, simplifying the procedure and producing an excellent end resultpatients with fingertip injuries who underwent full-thickness hypothenar grafts were taken up for the study. The results were evaluated objectively and subjectively at an average of 9.5 months after operation for sensibility, durability, and appearance.The average age of the patients was years 8 to 60 years)37 patients (92.5%)gave a score of 4 or 5 (good) for appearance and 3 patients(7.5%) told it is acceptable. The donor site was cosmetically acceptable .When tested for light touch, 38 patients(95%) had similar number of responses to touch stimuli over grafted skin when compared to the normal fingers of other hand. In 36 patients(90%) the Two-point discrimination was less than 6 mm and hence was found to have normal sensibility. 2 patients had two-point discrimination of 8mm . In 2 patients the two-point discrimination was judged to be only protective. All patients could differentiate betweencoarse and smooth textures. In20 patients(50%) the texture discrimination was identical to that of the uninjured hand.17 patients(42.5%)complained of hypersensitivity to touch over hypothenar grafted skin.The grafted site and donor site was cosmetically acceptable. The procedure is simple to execute .The use of hypothenar full-thickness grafts provides an acceptable and easier method for finger tip reconstruction. The sensation and texture discrimination was good. Thick hypothenar graft is a good alternative method for fingertip reconstruction with good outcome.

KEYWORDS : hypothenar graft, appearance, Two point discrimination,texture discrimination, alternative method, good outcome

INTRODUCTION

fingertip injury is any soft tissue, nail or bony injury distal to the insertions of the long flexor and extensor tendons of a finger or thumb. Finger tip injuries are commonly seen by family and emergency physicians. Finger tip injuries occurs more commonly due to industrial accidents and produces significant patient morbidity [1,2].This paper suggests the use of the hypothenar eminence as a logical donor site for such grafts, simplifying the procedure and producing an excellent end result. It works best where there is loss of fingertip skin and fat but, when indicated, one can use this method to repair skin losses elsewhere in the hand[3]

OBJECTIVES:

To assess the outcomes of hypothenar graft for finger tip injuries

DURATION OF STUDY : 1 year (November 2016-November 2017)

POPULATION TO BE STUDIED : 40

STUDY GROUP :

40 Patients
Adult Male – 19
Adult Female –17
Male Child – 3
Female child – 1
Age Group- 8 yrs to 60 yrs
Followed up for 12 months

STUDY SETTING :

Dept of Plastic surgery, Chengalpattu Medical College and Hospital , Chengalpattu

INCLUSION CRITERIA:

Finger tip injuries involving palmar and lateral pulp
Age between 8 to 60 years

EXCLUSION CRITERIA:

Injuries with exposed bone

TECHNIQUE:

Digital block is given for the injured finger, any sharp bonetipis rongeured to a levelwhich is slightly shorter than that of the surrounding soft tissue.Tumescent is injected in to hypothenar area such that the surface is flat to take a nice graft .full-thickness skin graft is taken using a 20 size blade.Minimal meshing is done and graft is anchored using ethilon sutures. These sutures are leftlong and are tied over as a bolus dressing. The bolus dressing is removed after 3 daysfor first look and the donor area is visualized after 15 days.

METHODS AND MATERIALS:

patients with fingertip injuries who underwentfull-thickness hypothenar grafts weretaken up for the study. The results were evaluated objectively and subjectively at an average of 9.5 months after operation for sensibility, durability, and appearance.The average age of the patients was years8 to 60 years). The injuries involved 18 index fingers of which 10 patients had injury in their dominant hand and 8 of them had injury in non dominant hand, 3 patients had injury in dominant hand thumb where as 8 patients had injury in the dominant hand mid finger,11 patients had injury in the dominant hand ring finger. At the follow-up evaluation the area of skin graft which was taken was around 12mm horizontally and16 mmvertically.Patients were enquired about hypersensitivity over fingertips and over donor area to touch and cold sensation. They were asked to grade hypersensitivity as mild, moderate, or severe.

The appearance of the hypothenar graft wasassessed basedon a scale from 0 to 5.

5 - ifmatched exactly with surrounding skin and if patients was very satisfied with the appearance. 0 -when the graft looked markedly different. patient was greatly displeased with the appearance.
4 to 5- rated as good, 3 – acceptable Less than 3-poor.

Graft was evaluated for durability and forany ulcer. The objectives evaluated were 2 point discrimination, light touch, texture discrimination. patient was asked to close the eyes and the finger tip was touched with a wisp of cotton to check the light touch sensation.

Five simulations were given and the number of responses for stimulations was recorded and it was compared with responses in the normal fingers of other hand. If the difference in the responses between the normal and the injured finger was more than two the finger is identified as having poor lighttouch sensibility.Napier in his study stated that the return of sensibility in the grafted skin was based on the nature of the skin graft. Thenerve plexuspattern just below the basal layer of epidermis is responsible for the extent of its reinnervation[4].In 2 point discrimination, Calipers were applied in the longitudinal axis of the digit. The dis tance was recorded at the point at which the two stimuliwere felt as two separate points. the American Society for Surgery of theHand Clinical Assessment Committee suggested a rating criteria: normal, less than 6 mm; fair, 6 to 10 mm; poor,11 to 15

mm; the finger is protective, if one point is perceived; and it is said to be anesthetic, if no point is perceived.

Five different texture surfaces were mounted in different sequences in 3 rulers for evaluating texture discrimination. The patient was asked to feel thetextures with the fingertips of uninjured hand and with hypothenargrafted hand. The injured fingertip was compared with the normal counterpart of the other hand and was graded asnormal if it was comparable to the injured finger, goodif one texture was not identified, and said to be poor,if two or moretextures were not identified.

RESULTS:

37 patients (92.5%)gave a score of 4 or 5 (good) for appearance and 3 patients(7.5%)told it is acceptable. The donor site was cosmetically acceptable .When tested for light touch, 38

Fig-1 Pre Op

Fig-2 Post Op

patients(95%)had similar number of responses to touch stimuli over grafted skin when compared to thenormal fingers of other hand.In 36patients(90%) the Two-point discrimination was less than 6 mm and hence was found to have normal sensibility.2 patients had two-pointdiscriminationof8mm . In 2 patientsthe two-point discrimination was judged to be only protective. All patients could differentiate betweencoarse and smooth textures. In20 patients(50%) the texture discrimination was identical to that of the uninjured hand.17 patients(42.5%)complained of hypersensitivity to touch over hypothenar grafted skin.

DISCUSSION:

Fingertip injuries are more common and it is commonamong hand injuries. Improper and inadequate management can cause significant loss of skilled hand function. Fingertip injuries results in significant morbidity and it affects the occupational and social activities. Finger tip injuries account for approximately 10% of all accidents preserving to casualty and two-thirds of hand injuries occurs in children[1].In adults patients cause is occupational injury, consistent with our study[1,2]. Goals of treatment in fingertip injuries include preservation of useful sensation, maximizing functional length, preventing joint contractures, providing satisfactoryappearance, painless, early recovery and avoiding donor site disfigurement (in case of reconstructive flaps) and functional loss.Fingertip reconstruction should result in a stable pain free, adequately padded skin coverage with adequate function and with good acceptable appearance.There are several classifications which describes about fingertip injuries[5-7]

Management of fingertip injuries depends upon the severity of injury, size and shape of the defect, tendon and bone cover, age, sex, dominant function, severity of injury, patient expectation, cosmesis. Options for skin cover includes a graft, flap and at last shortening. Among grafts full thickness hypothenar grafts has been used in this study rather than a split thickness grafts taken else where from the body.Skin of palms and soles differs from hair-bearing skin of the rest of the body in several ways.Palmar skin has got a thickened epidermis with a particularly thickened keratin in its outer surface. Pigment cells containing melanin are very less in number, and the sebaceous glands are absent. In addition to this, connective tissue is arranged in a compact manner and hence the skin is less elastic. These properties gives more resistance to pressure, friction, and Replacement of this specialized skin ideally be by skin of identical characteristics, and from the hypothenar area provide skin with good characteristics and appearance.

skin grafts have been used to resurface superficial skin defects. The transplanted skin protects the host bed from further trauma and it provides a good barrier to infection. Thin ssg will have a good "take" of the graft and can be used under unfavorable conditions whereas thicker split-skin grafts or fullthickness graftsresults in failure of take in unfavorable condition. Thin STSGs will shrink more, pigmentation occurs abnormally, and areeasilygives way to trauma[8] In contrast, full-thickness grafts will require a well-vascularized recipient bed until graft perfusion has been reestablished. Full thickness skin graft will contract less after healing, it will resist trauma better, and it will look more natural after healing than STSGs. The biologic events that take place in a skin graft and its bed was reviewed by Rudolph and Klein[8]An ungrafted wound bed is definitely a healing wound which when left alone, will undergo a typical processes of granulation, contraction, and reepithelialization to seal the surface. When a skin graft is placed on a wound bed, these processes are altered by the presence of the graft[9] .Biochemical changes in a skin graft after placement on a wound was studied by Marckmann[10]and he noted similarities with normal skin in its response to physical or chemical injury and aging. The changes in wound healing brought by the skin graft can be described as a general adaptation and modification of connective tissue to a decreasedblood supply[10] By considering the above mentioned facts we have applied hypothenar grafts in our study and we have found that, the procedure is simple, patient has earlier recovery, appearance is good both for finger tip and the donor area, sensation is good and it is durable.

CONCLUSION : The grafted site and donor site was cosmetically acceptable . The procedure is simple to execute .The use of hypothenar full-thickness grafts provides an acceptable and easier method for finger tip reconstruction.The sensation and texture discrimination was good. Thick hypothenar graft is a good alternative method for fingertip reconstruction with good outcome

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