

To Assess the Functional Outcome After V-Y Flap in Fingertip Injuries: An Institutional Based Study

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ABSTRACT

Background: The treatment choice for fingertip injuries is surgical treatment may be primary closure, or the importation of new tissues to restore the lost tissues as; skin grafting, local soft tissue flaps (VY flaps, rotation and volar advancement flaps and homodigital island flaps) or regional soft tissue flaps. The present study was conducted to assess the functional outcome after V-Y flap in fingertip injuries.

Materials and Methods: This observational study was carried out over a period of 6 months. 40 patients with fingertip injuries aged above 18 years of age of both sexes were included in this study. Detailed information was collected. Data were collected, compiled, and tabulated according to key variables and functional assessment scoring. Permanent sensory changes may be noted, including paresthesias, hyperesthesia or a sensation of coldness. The recorded data was compiled, and data analysis was done.

Results: In the present study total cases were 40, out of 40 cases 72.5% cases were due to machinery injury and 27.5% were due to road traffic accident. Maximum injuries were on thumb (55%) followed by index (20%). 25(62.5%) patients having two - points discrimination at 2 mm distance. The

functional outcome was satisfactory good in 87.5% cases and fair in 12.5% cases.

Conclusion: The present study concluded that the functional outcome after V-Y flap in fingertip injuries was satisfactory good in maximum cases.

Keywords: V-Y Flap, Fingertip Injuries, Functional Outcome.

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Article History:

Received: 07-02-2019, Revised: 02-03-2019, Accepted: 29-03-2019

Access this article online

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|--|--|
| Website: www.ijmrp.com | Quick Response code  |
| DOI: 10.21276/ijmrp.2019.5.2.065 | |

INTRODUCTION

Hand is a highly specialized organ as it has grasping, pinching and hooking function, carried out by musculotendinous units. It can give information about the position, size and shape of an object by its highly developed sensory mechanism and described as third eye.¹ The fingertip is a specialized structure that permits fine motor activity, precise sensation and contributes to hand aesthetics.² Fingertip injury is defined as injury distal to the insertion of the flexor and extensor tendons and is among the most common traumatic injuries that present for acute care.³ Finger injuries are becoming more common with the increasing use of mechanical, industrial and household appliances. Several million cases occur each year, some of which are avulsions of the tactile pad.⁴ There are six main types of repair for this injury: primary closure by shortening of the bone, free split-thickness skin grafts, free full thickness skin grafts, palmar flaps, cross-finger

flaps and pedicle flaps from the chest or abdomen.⁵⁻⁷ The primary goals of digital reconstruction are to preserve digital length and maintain full mobility of the digit while providing adequate protective cover of the deeper vital structures with soft tissue and skin of good quality. The skin must not only be durable but of adequate sensibility for the normal function of that part of that particular digit. Treatment of fingertip amputations is either surgical or conservative. The boundary between surgical and conservative treatment depends on the extent of involvement of the pulp, nail, and bone. Various surgical methods are used for amputation injuries including simple revision amputation, full- or partial-thickness skin grafts, local flaps, distal flaps, kite flaps, and neurovascular island pedicle flaps.⁸ The present study was conducted to assess the functional outcome after V-Y flap in fingertip injuries.

MATERIALS AND METHODS

This observational study was carried out in the Department of Burns and Plastic Surgery, AMC MET Medical College, L G Hospital, Maninagar, Ahmedabad, Gujarat (India) over a period of 6 months. Before the commencement of the study ethical approval was taken from the Ethical Committee of the institute and written consent was taken from the patient after explaining the study. 40 patients with fingertip injuries aged above 18 years of age of both sexes were included in this study. Patients below the age of 18 years, patients with diabetes mellitus, trophic ulcer and neurological deficit were excluded from the study. Detailed information from history, clinical examination, investigations, pre-operative findings and postoperative follow-up were collected. Data were collected, compiled and tabulated according to key

variables and functional assessment scoring. The patients were operated by digital block. Tourniquet was applied at the base of the finger. Tissue sloughing can occur if excess tension is applied or if the blood supply is disrupted by undermining the flap. Permanent sensory changes may be noted, including paresthesias, hyperesthesia or a sensation of coldness. Sensory changes are experienced by more than 50 percent of patients with fingertip amputations but often subside with time.⁹ Infection rarely occurs at this highly vascular location. While not all fingertip amputations are amenable to the use of the V-Y plasty, wounds closed with this technique usually have favorable outcomes. The recorded data was compiled, and data analysis was done using SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA).

Table 1: Mode of injury (N=40)

| Mode of injury (n=40) | Number of patient Percentage (%) |
|-----------------------|----------------------------------|
| Machinery injury | 29(72.5%) |
| Road traffic accident | 11(27.5%) |
| Total | 40(100%) |

Table 2: Site of injury

| Site of injury (n=40) | Number of patient Percentage (%) |
|-----------------------|----------------------------------|
| Thumb injuries | 22(55%) |
| Index finger | 8(20%) |
| Middle finger | 6(15%) |
| Ring finger | 4(10%) |
| Total | 40(100%) |

Table 3: Two-point discrimination (n=40)

| Distance | Number of patients Percentage (%) |
|----------|-----------------------------------|
| 6mm | 12(30%) |
| 4 mm | 3(7.5%) |
| 2 mm | 25(62.5%) |
| Total | 40(100%) |

Table 4: Outcome of V-Y plasty

| Functional outcome | Clinical outcome | Number of patients Percentage (%) |
|--------------------|------------------|-----------------------------------|
| Satisfactory | Good | 35(87.5%) |
| | Fair | 5(12.5%) |
| Unsatisfactory | Poor | 0(0%) |
| Total | | 40(100%) |

RESULTS

In the present study total cases were 40, out of 40 cases 72.5% cases were due to machinery injury and 27.5% were due to road traffic accident. Maximum injuries were on thumb (55%) followed by index (20%). 25(62.5%) patients having two-points discrimination at 2 mm distance. The functional outcome was satisfactory good in 87.5% cases and fair in 12.5% cases.

DISCUSSION

Fingertip injuries are among the most common injuries that occur in the upper limb and that presenting for acute hospital care. Management of fingertip injuries had undergone tremendous changes over the course of the years. Numerous treatment options are available now, but without a recommended standard reference for management.¹⁰

The soft tissue defect in a digit may be due to variety of causes. Whereas Sun et al had most of the digital soft tissue defects because of the crush injury (6 fingers) followed by electric saw (5 fingers) and burnt scar removal (4 fingers) among 13 patients.¹¹ Abood and daood (2007) showed 10 patients were male, 3 were female. The mode of injury is machinery injury was found 11(73.3%), as garments industry is blooming, and more and more jobs are creating in this sector.¹²

In the present study total cases were 40, out of 40 cases 72.5% cases were due to machinery injury and 27.5% were due to road traffic accident. Maximum injuries were on thumb (55%) followed by index (20%). 25(62.5%) patients having two-points discrimination at 2 mm distance. The functional outcome was satisfactory good in 87.5%cases and fair in 12.5% cases.

V-y plasty even though superior to cross-finger flap in better cosmesis, 2-point discrimination, lesser time lost from work is feasible only for fingertip injuries involving zone I and ii transverse or dorsal plane amputations and these type of injuries are not very common, compared to crush injury of the finger.¹³

Post operatively one case developed marginal necrosis of the flap which was managed conservatively. Partial wound dehiscence was seen in 2 patients which was managed conservatively. Superficial flap necrosis was noted in 4 percent (2/56) of volar V-Y plasties, and Freiberg & Manktelow (1972) found postoperative complications such as flap necrosis and/or infection in 18 per cent (4/22) of bilateral V-Y plasties.¹⁴

CONCLUSION

The present study concluded that the functional outcome after V-Y flap in fingertip injuries was satisfactory good in maximum cases.

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Source of Support: Nil.

Conflict of Interest: None Declared.

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Cite this article as: Moolchand Prajapat, Suyash Singodiya. To Assess the Functional Outcome After V-Y Flap in Fingertip Injuries: An Institutional Based Study. Int J Med Res Prof. 2019 Mar; 5(2): 284-86. DOI:10.21276/ijmrp.2019.5.2.065