ORIGINAL RESEARCH PAPER

Volume-8 | Issue-8 | August - 2019 | PRINT ISSN No. 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

OUTCOME OF SIMPLE SYNDACTYLY RECONSTRUCTION WITH Z-PLASTY AND M-V PLASTY AT EARLY AGE GROUP

Plastic Surgery

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ABSTRACT

Background: Syndactyly is congenital deformity which requires surgical procedure for separation of fingers and to get functional hand.
Patients and method: 50 case of simple syndactyly operated in our institute in period of July 2016 to July 2018. 35 male and 15 female child, with age group of 1yr to 5yrs. We have evaluated the outcome of Z-plasty for syndactyly release and M-V plasty in web space reconstruction at early age group as early postoperative and in long term result.
Result: 4 cases of graft faliure, 6 cases of web creep and 1 case of hypertrophic scar in early postoperative period. On followup 6 month to 2 years no patient had malrotation or angulation.
Conclusion: Simple syndactyly released with Z-plasty and M-V plasty for web space reconstruction, it reduces early postoperative complication and In long term malrotation and angulation prevented and get the normal growth of fingers.

KEYWORDS

Simple syndactyly, Web creep, Skin graft, M-V plasty

INTRODUCTION

Congenital syndactyly is estimated to affect 1 in every 2000 newborns and accounts for approximately 20% of all congenital hand malformations.[1]. Syndactyly occurs most frequently in males and can affect any web space with a bilateral presentation in half of all cases. Simple syndactyly denotes a web made up of only skin and connective tissue, whereas complex syndactyly involves some degree of osseous fusion. Complete syndactyly denotes a web that extends to the tip of the digit, whereas incomplete syndactyly involves fusion proximal to the distal phalanx [2].

Normally, webbing between the digits regresses during 6 to 8 weeks of gestation in a distal to proximal direction. This process is dependent on apoptosis of some portions of the apical ectodermal ridge, and is mediated by cytokines such as bone morphogenetic proteins, transforming growth factor-β, fibroblast growth factors, and retinoic acid. As a result, the normal web space develops, sloping at 45 degrees in the dorsal to palmar direction from the metacarpal head to midproximal phalanx. The web extends approximately two-thirds the length of the proximal phalanx.[3] The most commonly involved interspace in isolated syndactyly is between the middle and ring finger, followed by the interspace between the ring and little finger. Syndactyly is moreover a feature of at least 28 syndromes. The most common are Apert syndrome, Poland syndrome, amniotic band syndrome and multiple craniofacial syndromes. In syndromic cases, the spaces between the thumb and index finger and between the index and middle finger are more frequently affected.

Surgery is indicated for nearly all cases of syndactyly, surgical release of simple syndactyly that does not impair function, but medical conditions that preclude surgery, or complex syndactyly that risks further functional impairment with attempted separation. The goal of surgery is to create a normal webspace and improve the appearance of the involved fingers. Our study shows that, the good function of fingers can be achieved by release of syndactyly with Z-plasty and palmar split thickness skin graft and M-V plasty for web space.

METHODS

We had 50 case of syndactyly operated in our institute in period of July 2016 to July 2018. We had included all 50 case of simple syndactyly (complete and incomplete) and excluded complex and complicated syndactyly. All patient of syndactyly were 1yr to 5yrs of the age group. 35 cases were of male child and 15 cases of female child. Preoperatively, a physical examination is performed that includes the entire affected upper limb, contralateral hand, chest wall, and feet to search for additional anatomical anomalies. Radiographs of the hand are taken to confirm the skeletal deformities and detect any concealed extra digits or articular deformities. After written and informed consent, Surgery is performed under general anesthesia with a tourniquet and loupe magnification. In supine position, Z-plasty incision marked on syndactyly fingers and M-V pattern for web space on dorsal and volar aspect of the hand. Skin flap raised and sutured with 4-0 ethilon suture and M flap made on dosal side and V flap on volar side of hand fits in each others. Small raw area left behind, which was covered with split thickness skin graft on side of fingers. Graft harvested from palm. Dry dressing and splint applied. In postoperative period, antibiotics and analgesics given and hand elevation advised. Patient was discharged on 2nd postoperative day and follow up on 10th post op day and then 3wks, 3month, and 6month. We have evaluated the outcome of this procedure in early postoperative period (graft faliure, contracture, web creep, hypertrophic scar) and late postoperative period (malrotation and angulation).

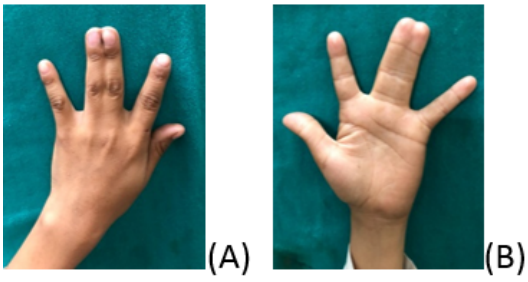

Figure 1(A)&(B):Left Hand Third Web Space Simple Syndactyly

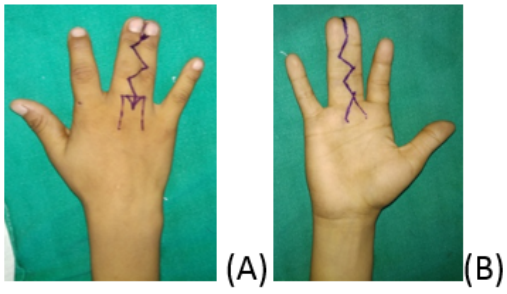

Figure 2(A)&(B): Marking Showing Z-Plasty And M-Flap On Dorsum And V-Flap On Palmar Aspect Of Hand For Web Space Reconstruction

Figure 3: Picture of syndactyly release and flap insetting done

RESULT

All 50 cases had Z-plasty and palmar slpit thickness skin grafting for simple syndactyly and M-V plasty for web space. In early postoperative period, patients were evaluated, 4 cases (8%) had graft faliure, 6 cases (12%) had web creep and 1case (2%) had hypertrophic scar. Patients were followup for period of 6 month to 2 years, and long term result evaluted. None of the patients had malrotation or angulation of fingers and growth of the fingers were in proportion to other finger of the hand.

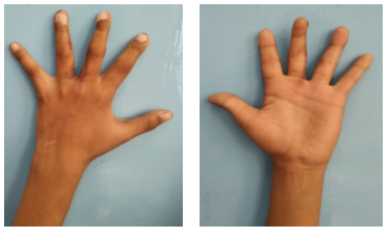

Figure 4: post operative result of procedure after 5months

DISCUSSION

Normal function of the digits requires proper location and depth of the webspace. Therefore, the goal of surgery in syndactyly is to create a normal webspace and improve the appearance of the involved fingers. Surgery should be performed early enough to allow for normal growth, but late enough to avoid postoperative complications. Surgery before 12 months of age is generally associated with a higher incidence of scar contracture.[9] However, waiting too long can result in asymmetric growth of the involved fingers and angulation of the joints. This is especially true for syndactyly between fingers of greater size difference, such as between the ring and little finger and between the thumb and index finger. Release of these spaces may be performed as early as 3 to 6 months of age, as the potential for deformities outweighs the risk of scar contractures in these cases.[10] Earlier intervention may also be considered for cases of complex syndactyly involving distal phalanges and cases of significant flexion contracture.[11] If the defect is bilateral, procedures should be performed on both hands simultaneously in nonambulatory children younger than 12 to 14 months.[12]The incision location and pattern must also be determined, though most surgeons prefer a zigzag pattern. Cronin's technique of matched zigzag incisions on the flexor and dorsal surfaces was developed after his observation that all postoperative contractures arose from straight incisions on the flexor surface.[13] The modified Cronin method uses dorsal and volar triangular flaps with oblique zigzag skin incisions. The most common reconstructive design for the web space, and involves a rectangular, proximally-based dorsal flap. Numerous geometrical designs have been used for this flap, including rectangular, triangular, omega and multilobed shapes. Flap design is heavily dependent on training and surgeon preference, and can be easily modified to attempt a more anatomical web space reconstruction. Overcompensation of the web space by recessing the web space more proximally can help avoid web creep. Dorsal skin is preferred for web as it is easier to mobilize and achieves a more natural slope. Therefore, in our study we have use the Z-plasty for finger and M-V plasty incision for webspace and small remaining raw area to be covered by palmar split thikness skin graft that will reduce the web creep formation and contracture.

CONCLUSION

Simple syndactyly reconstructed with Z-plasty and plamar split thickness skin graft and M-V plasty for web space, it reduces early postoperative complication and In long term follow up, complication like malrotation and angulation prevented and get the normal growth of fingers.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil

Acknowledgements

Nil

Conflicts of interest

There are no conflicts of interest.

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