

Healing of Posterior Transverse Ankle Incision with Medial Fasciocutaneous Flap for Club Foot Surgery

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Background: This is a report of healing of posterior transverse ankle incision with medial fasciocutaneous flap of twenty seven club feet in twenty one patients.

Study Design: Prospective longitudinal study design was used.

Sample size: There were 21 patients with 27 club feet.

Targeted Population: All the patients with club foot deformity presented in outpatients Department of Orthopedics Surgery and Traumatology Unit-I, King Edward Medical University/ Mayo Hospital Lahore were included in this study.

Results: There were 15 males and 6 females. Among 21 patients six had bilateral club foot deformity. The mean length of follow up was six months. All the feet were regularly evaluated during this period in terms of wound healing, appearance of scar and correction of the deformity. At the end of follow up, majority of wound healed satisfactorily, scar was cosmetically acceptable and the deformity was fully corrected.

Conclusion: According to this study, Posterior transverse ankle incision with medial fasciocutaneous flap is the most suitable incision for club foot surgery.

Key Words: Club foot surgery.

Introduction

Club foot deformity is characterized by forefoot adduction, inversion of heel and plantar flexion of forefoot and ankle in such a way that planter surface of the foot faces medially.¹ Fasciocutaneous tissues on the medial side of the ankle become inelastic and fail to develop properly due to absence of movements at the ankle joint.

In cases of severe club foot deformity posteromedial soft tissue release is done. Usually posterior transverse ankle incision is employed for surgical correction of club foot deformity. This incision provides good transverse and a limited longitudinal exposure of the soft tissues to be released during surgery. In these patients primary wound closure with foot in corrected position is almost impossible due to inelastic and underdeveloped medial fasciocutaneous tissues. An attempt to close the wound under tension may result in high rate of wound complications like wound edge necrosis, infection^{2,3} scar broadening, keloid formation, relapse of the deformity, compartment syndrome, and amputation.^{4,5}

Many modifications in incisions and techniques for club foot surgery have been described in orthopaedic literature to overcome these problems⁶⁻⁹ but no one is universally accepted. Among these techniques use of tissue expanders^{4,5} partial wound closure¹⁰ and repeated postoperative manipulations under general anesthesia⁴ have been attempted to avoid these complications.

We have combined posterior transverse ankle incision

with medial rotation fasciocutaneous flap for adequate transverse and as well as longitudinal exposure of soft tissues to be released and to facilitate primary wound closure with foot in fully corrected position.

Objective

The objectives of this research project were to study Posterior transverse ankle incision with medial fasciocutaneous flap for surgical correction of club foot surgery in term of wound healing, cosmetic appearance and correction of the deformity.

Material and Methods

Study Design: Prospective longitudinal study design was used.

Settings: This study was done in the Department of Orthopedics Surgery and Traumatology Unit-I, King Edward Medical University / Mayo Hospital Lahore.

Duration: This study was completed in 12 months.

Sample Size: 21 patients with 27 club feet.

Targeted Population: All the patients with club foot deformity presented in out patients Department of Orthopedics Surgery and Traumatology Unit-I, King Edward Medical University / Mayo Hospital Lahore were included in this study.



Fig. 1:



Fig. 2:

Statistical Techniques: All the data was analyzed using SPSS. The metric data was presented in form of mean \pm S.D along its range (Max-Min). The qualitative data was presented in form of frequency and percentages.

Results

In this study the average age of patients was 4.78 ± 1.67 months with range of 3-5 months. There were 16 males and 5 females patients in this study. A total number of 21 patients with 27 severe club foot deformities were operated for posteromedial soft tissue release through posterior transverse ankle incision with medial fasciocutaneous flap. Twenty-six (26) wounds healed satisfactorily and only one patient developed marginal skin necrosis with infection which healed with oral antibiotic therapy.

Discussion

Posterior transverse ankle incision is commonly employed for surgical correction of club foot deformity. As fasciocutaneous tissues are underdeveloped on medial side of the ankle joint therefore, wound closure after surgical correction of severe club foot deformity is difficult.^{6,13,14} If this incision is closed at the end of the operation and plaster cast is applied in fully corrected position of the foot then serious wound complications like compartment syndrome, extensive soft tissue necrosis leading to failure of correction of the deformity or amputation have been reported.^{4,5,15}



Fig. 3:

To overcome these problems different combinations of flaps and soft-tissue releases have been suggested for the coverage of the posteromedial soft-tissue defect in clubfoot surgery.^{13,14} An ideal skin incision for club foot surgery provides adequate exposure to the contracted soft tissues to be released during surgery, it can be sutured without tension on skin edges at the end of the operation and has good cosmetic acceptance with full correction of the deformity. Selection of skin incision for club foot surgery is a matter of great importance for paediatric orthopaedic surgeons because it has great influence on prevention of wound complications and correction of the deformity.

Posterior transverse ankle incision provides excellent exposure to the soft tissues in its line along with a limited exposure in the longitudinal plane during surgical correction of club foot deformity. In cases of severe club foot deformity it is very difficult to expose the tendoachillis adequately in its longitudinal plane for elongation by 'Z' plasty. If it is done then excessive traction is to be applied on the wound edges which may damages dermal microvasculature and results in serious wound complications.

To develop medial fasciocutaneous flap its anatomical basis and surgical technique were extensively studied from orthopaedic literature.^{13,16} Mittal 1987 described a lateral calf flap to cover the medial soft tissue defect on the dorsum of the foot.¹⁴ D'Souza et al 1998 described a rotation fasciocutaneous flap to cover the soft tissue defect after the Turco's procedure.¹³ Lubicky and Altoik 2001 described a flap to manage the same soft tissue defect. They angulate their accessory vertical incision medially and laterally in 'Y' shape manner at its proximal end. In this technique medial and lateral flaps are formed separately at the proximal end of the accessory incision. Traditional V-Y plasty is required to slide the flap wings. As in severe club foot deformity fasciocutaneous structures on the medial side of the ankle are deficient therefore it is unnecessary to design a flap that releases fasciocutaneous tissues both on medial and lateral sides. Therefore, we designed a flap to cover the posteromedial soft tissue defect and primary closure of the wound without tension on the skin edges. The proximal incision of our flap turns to the medial side which does not decrease mobility of the flap on one hand and on the other hand provides easy wound closure. We performed 27 medial fasciocutaneous flaps with posterior transverse ankle incision in 21 patients with 27 club feet. 26 wounds healed satisfactorily. Only one patient developed marginal skin necrosis with infection which healed with oral antibiotic therapy.

Conclusion

Posterior transverse ankle incision can be combined with medial fasciocutaneous flap to cover the medial fasciocutaneous defect and facilitate primary wound closure in club foot surgery.

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