



A STUDY OF CONGENITAL TALIPES EQUINO VARUS [CTEV] WITH POSTEROMEDIAL SOFT TISSUE RELEASE

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ABSTRACT **AIM OF THE STUDY:** Assess the deformity and to verify the attainment of function of the limbs after correction with posteromedial soft tissue release in congenital talipes equino varus patients. **MATERIAL & METHODS:** This prospective study was conducted on 30 cases of idiopathic congenital talipes Equinovarus during the period of 2 years from November 2017 to March 2019 in the Department of Orthopedics, Osmania General Hospital, Hyderabad. **RESULTS:** In this prospective study 30 patients with 50 idiopathic CTEV underwent PMSTR. There were 22 male children with 15 bilateral & 7 unilateral involvement, 8 female children with 5 bilateral & 3 unilateral involvements. In unilateral cases right foot was involved in 6 (60 %) cases and left in 4 (40%) cases. In majority first born child was affected. **CONCLUSIONS:** One stage PMSTR enables child to walk early leading to development of normal milestones. One stage posteromedial soft tissue release, correcting all components of deformity gives consistent satisfactory results. Radiological evaluation before and after surgery was useful. One stage PMSTR has the advantage of low recurrence, near normal foot and fewer complications.

KEYWORDS : Congenital Talipes Equinovarus, Calcaneo Forefoot Block, Tarso Metatarsal Angle

INTRODUCTION

The clubfoot is one of the most common congenital deformities of foot in orthopedics. Many cases are associated with neuromuscular diseases, chromosomal abnormalities, mendelian and non-mendelian syndromes.

In this study, we are limiting ourselves to the study of the idiopathic congenital clubfoot deformity, occurring in otherwise normal infants. The congenital clubfoot appears to be of genetic origin.¹

The term talipes was proposed by Little in 1839, derived from Latin word talus (ankle) pes (foot). Most of the investigators have reported an incidence of 1 to 2 per 1,000 live births.

The congenital clubfoot is a complex three-dimensional deformity having four components, equinus, varus, adductus and cavus. The degree of deformity varies from a very mild mobile passively correctable foot, to a very severe rigid foot.

The problems of management increase with severity of deformity, delay in treatment and with increasing age. Treatment of clubfoot by manipulation and corrective cast depends on severity and usually takes longer time and results in spurious correction.²

Number of cases will not respond to conservative treatment. Early operative management has now gained credibility. Surgery concentrating on pathogenesis of deformity enables eversion and dorsiflexion force applied to foot, to influence joints of foot in normal planes of movement, so that tarsal bones and joints are neither compressed abnormally nor dislocated.³

Hence, we took a soft tissue procedure, posteromedial soft tissue release in management of idiopathic congenital talipes equinovarus of foot.

AIMS & OBJECTIVES

- To assess the deformity
- To verify the attainment of function of the limbs after correction
- To follow up the patients and note the complications and analyze them

MATERIALS AND METHODS

The present study is a prospective study conducted in department of orthopedics, Osmania general hospital, Hyderabad during the period of 2 years from November 2017 to March 2019.

Totally 30 children with idiopathic clubfeet were evaluated and operated between the ages of 6 months and 2 years and this formed clinical material for our study.

METHOD OF COLLECTION:

- Sample size: 30 patients.
- Follow up: All the patients to be followed up for 6 months by pirani score, clinical photograph and x rays were taken for comparison of results at 6, 12- and 24-weeks postoperative period.

INCLUSION CRITERIA:

- All the patients who present with failure of conservative treatment
- Idiopathic clubfoot age between 6 months to 2 years
- Size of foot length more than 10 cm.

EXCLUSION CRITERIA:

- Neglected clubfoot.
- Rigid clubfoot.
- Relapsed clubfoot.
- Patients with systemic and local infections.

RESULTS

Table: 1 SEX INCIDENCE

Case studied	Number	Percentage (%)
MALE	22	73.4%
FEMALE	8	26.6%
TOTAL	30	100%

Table: 2 LATERALITY

	Male	Female
Bilateral	15	5
Unilateral	7	3
Total	22	8

Table: 3 SIDE DISTRIBUTION OF UNILATERAL PATIENTS

UNILATERAL	MALE	FEMALE	TOTAL	PERCENTAGE %
RIGHT	4	2	6	60
LEFT	3	1	4	40
TOTAL	7	3	10	100

Table: 4 OBSTETRIC HISTORY

FIRST CHILD	SECOND CHILD	THIRD CHILD	FOURTH CHILD	TOTAL
16	9	4	1	30

Table: 5 AGE AT SURGERY

AGE AT OPERATION	NO. OF CASES	PERCENTAGE
<12 MONTHS	21	70
>12 MONTHS	9	30

Table: 6 RESULTS ACCORDING TO SEX DISTRIBUTION

SEX	TOTAL	EXCELLENT		GOOD		POOR	
MALE	22	15	68%	5	27%	2	9%
FEMALE	8	4	50%	2	25%	2	25%
	30	19		7		4	

TABLE 7- RESULTS ACCORDING TO AGE AT OPERATION

AGE AT TIME OF SURGERY	EXCELLENT	GOOD	POOR	TOTAL
< 12 MONTHS	15	5	1	21
>12 MONTHS	6	2	1	9

RESULTS ACCORDING TO RADIOGRAPHS (AP-TCA)

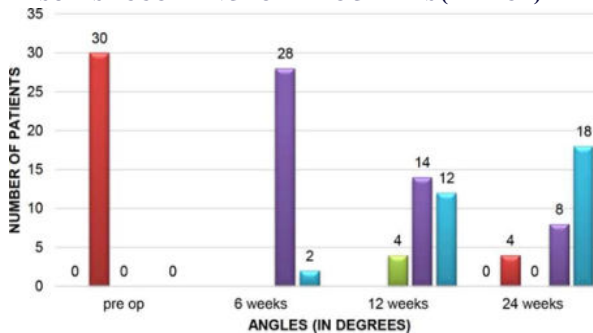


TABLE 8: RESULTS ACCORDING TO RADIOGRAPHS (LAT-TCA)

ANGLE	PRE-OP	6 WEEKS	12 WEEKS	24 WEEKS
0 - 10				0
11 - 20	30			4
21 - 30			4	0
31 - 40		30	14	8
41 - 50			12	18

DISCUSSION

The problems of management increase with severity of deformity, delay in treatment and with increasing age.

The orthopedic surgeons goal is to obtain anatomically and functionally normal feet in all patients. Idiopathic talipes equinovarus is still an enigma to the surgeon.

There are various modalities of treatment like

- a. Repeated stretching and bandaging.
- b. Manipulation and plaster cast application.
- c. Various soft tissue release procedures.
- d. Various bony operations.
- e. External fixation devices like Ilizarov fixator, JESS (Joshi's External Stabilization System) etc.

Early operative treatment has now gained credibility. Hence, we took a soft tissue release procedure, posteromedial soft tissue release in management of idiopathic congenital talipes equinovarus of foot.

In our study there were 22 males and 8 females i.e. 73.4% and 26.6% respectively. Incidence of males and females in our series is not very different from other reported series. Kite in the series of 1,509 cases reported 70% males and 30% females. Turco in his series of 468 patients reported 71.36% males and 28.64% females.

The deformity was bilateral in 20 cases and unilateral in 10 cases i.e. out of 30 patients with deformity, 67% were bilaterally involved and 33% were unilaterally involved. Majority investigators have reported that over 50% of cases are bilateral deformities. Chung reported bilaterality in 55.75% of cases. Turco reported bilaterality in 56.76% of cases. Ponseti found 40% bilateral cases. Of 22 males, 15 were bilateral and 7 were unilateral cases. i.e., 68.2% had bilateral deformity and 31.8% had unilateral deformity. Of 8 females, 5 had bilateral deformity accounting for 62.5% and 3 had unilateral deformity accounting for 37.5%.

Among 10 unilateral cases right limb was affected in 6 cases (4 males and 2 females) accounting for 60% and left limb was affected in 4 (3 males and 1 female) cases accounting for 40% of cases. Chung, and Palmer also have reported a slight preponderance of right-side

involvement.

In his series Kite found 419 right sided and 345 left sided involvement revealing 54.8% right sided involvement. Thus, the preponderance of right-side involvement coincides well with other series mentioned in literature.

Family history: Positive family history was seen in 3 cases (10%). Review of literature reveals that percentage of family history varies from 5% to 50%. In his series Turco⁵ observed 17.9% of family history.

Heredity plays an important role in etiology of clubfoot, however manner in which heredity contributes is unclear.

Many investigators agree that causation is multifactorial. Wynne-Davis and Heidelberg⁶ propose that some intrauterine factor in conjunction with hereditary predisposition causes a disturbance in development at a critical stage of embryonic development of the foot, thereby causing an arrest of normal fetal development.

Obstetric history: There was increased incidence in primiparous women, 16 out of 30 patients were first born children. Hippocrates's assumption is that, foot is held in equinovarus position by rigid uterine wall, as in primigravida.

But absence of increased incidence in pregnancies with an overcrowded uterus (twinning, large babies, hydramnios and primiparous uteri) would negate the theory, that increased intrauterine compression is an important factor.

We didn't have any twins in our series. All children were delivered by vertex presentation, and there was no history of infection during pregnancy. Preterm delivery was noted in one patient only.

Consanguinity: Consanguinity of first degree was noted in 2 patients (6.6%), second degree in 2 patients (6.6%). No similar review concerning consanguinity is available in the literature.

Criteria for rigidity: A commonest criterion for rigidity was stiff foot which all thirty cases had. Stiffness referred to deformity manually impossible to correct.

Age at surgery: Out of 30 cases 21 were operated below the age of 12 months and 9 were operated after the age of 12 months. In bilateral cases interval between 2 surgeries were 2 - 4 weeks.

Attenborough⁷ operated between 2-4 months of age. Hersh prefers soft tissue release at 2 months of age. Turco carried out one stage posteromedial release with internal fixation at one year of age.

Main et al perform early surgery within 6 months of age. Lloyd Roberts et al⁸ perform surgery within first 6 months of age by posterior release.

Bose K. emphasizes the importance of recognition of resistant types and early soft tissue release before the age of 6 months. Jeffrey F.

Hoasbeek et al operated with posteromedial release within 2 years of age in them study and obtained good results. Jerry B Magone et al in their study operated 35 clubfeet at an average age of 1 year 1 month. Tuncay Centel et al in their study performed one stage posteromedial release at 10 months of age or younger.

Reinman and Anderson⁹ prefer operation around age of three months for 2 reasons-At this age a number of mild feet which would be corrected by conservative treatment are excluded and within 3 months of conservative treatment soft tissue are softened and risk of undue traction on skin, nerves and vessels after operation are minimized.

Technique of surgery - Our technique compared with others.

One stage posteromedial soft tissue release was carried out in all cases. Incision - Posteromedial incision was taken. I I

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The tendo calcaneus was elongated. After identification and protection of neurovascular bundle, tendons of tibialis posterior, flexor digitorum longus, and flexor hallucis longus were lengthened by 'Z' fashion.

Care was taken to prevent retraction of proximal and distal ends of flexor hallucis longus tendons. In selected cases, tenotomies of flexor hallucis longus and flexor digitorum longus digitorum were done.

Spring ligament, deltoid ligament and capsule of talonavicular joint were incised. Posterior ankle and subtalar joint capsulotomies were done. No internal fixation was done.

Wound was closed in layers. A long leg cast was applied with ankle dorsiflexed only to neutral position without putting sutures into undue pressure.

Release of medial half of the tendo calcaneus insertion is based on the observations of Dwyer and Incaln. Attenborough carries out Z-plasty lengthening of tendoachilles, divides tibialis posterior, flexor hallucis longus, flexor digitorum longus and posterior capsule of ankle joint.

Main et al lengthen the calcaneal tendon, divide posterior tibialis within its sheath and incise posterior capsule of ankle joint strip medial ligament of ankle and plantar fascia with underlying muscles forwards from their attachments and divide flexor hallucis longus if tight.

Turco carries extensive posterior, medial, plantar and subtalar releases but primarily fixes the talocalcaneal and talonavicular joints with kirschner wires.

Mc Kay's¹⁰ concepts is that calcaneus is rotated medially. He releases subtalar joints laterally and also peroneal, lateral talonavicular capsule and calcaneocuboid joints.

Simons¹¹ described complete subtalar release. He releases the interosseous talocalcaneal ligament, calcaneofibular ligament, the lateral subtalar capsule and capsule of lateral aspect of talonavicular joint, through Cincinnati approach, in addition to all the structures released through the conventional posteromedial release.

Attenborough concluded that primary abnormality is plantar flexed talus, held by short musculotendinous units of tendoachillis, posterior tibialis tendon and long flexors.

Settle, Irani and Sherman¹² demonstrated that the major deformity is excessive medial and plantar deviation of talar neck.

The ligaments of joint capsules, muscles and tendons contract as the foot and ankle accommodate to the deformed talar neck with resultant equines and varus.

Irani and Sherman found tibialis anterior tendon passed more anteriorly in relation to medial malleolus.

Fried found that tibialis posterior tendon was thickened, showed fibrosis and attachments were hypertrophied.

McCauley¹³ states: "clubfeet tend to recur for at least 7 years". Adams in 1856 stated that we must either assume existence of inherent tendency to relapse or believe that tendency to relapse depends on some defect in primary or after treatment.

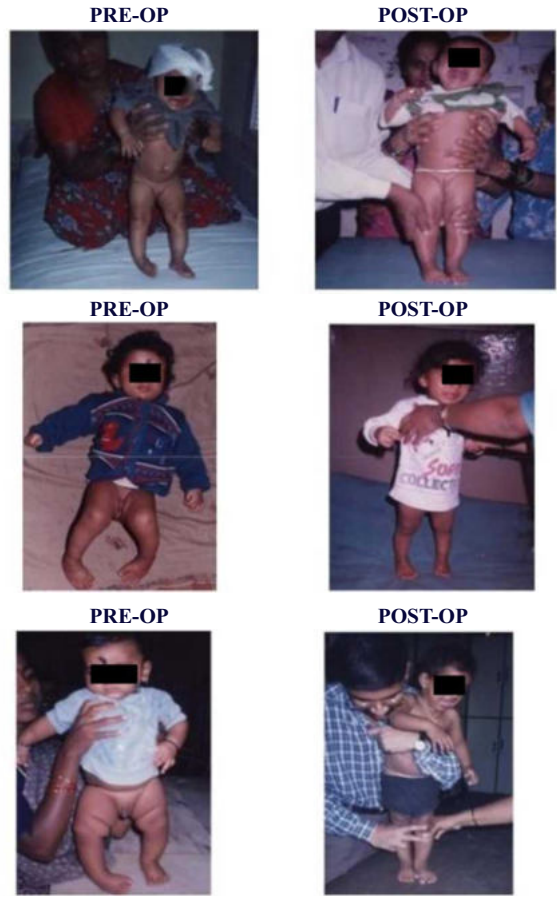
Brockman considers that relapsed clubfoot was one, in which the deformity had not really recurred, but in which it had never been corrected.

Vincent Turco stabilizes correction by transfixing the talocalcaneal and talonavicular joints with percutaneous Kirschner which were retained for more than 6 weeks.

Bleck¹⁴ uses ordinary shoes and no corrective apparatus following 8 weeks of postoperative immobilization.

Main and Lloyd Roberts³ et al favor Robert Jones strapping for pre-operative and postoperative correction and use Denis-Browne boot splint with cross bar, once full correction is achieved.

CLINICAL RESULTS



- Out of 22 males operated we got excellent result in 15 cases (68.2%), good result in 5 cases (22.7%) and poor result in 2 cases (9.1%).
- Out of 8 females we got excellent result in 4 cases (50%), good result in 2 cases (25%) and poor result in 2 cases (25%).
- Out of 21 cases which we operated at an age of less than 12 months we got excellent result in 15 cases (71.5%), good result in 5 cases (23.8%) and poor result in 1 case (4.7%).
- Out of 9 cases operated at an age of more than 12 months we got excellent result in 6 cases (66.6%), good result in 2 cases (22.2%) and poor result in 1 case (11.2%).
- Turco has excellent and good results in 86% of cases and 9% fair results and failure in 5% of cases.
- Jorring and Christiansen report a satisfactory result in 81% of cases and poor result in 9% of cases following early soft tissue release.
- Derosa. G.P et al, carried out one stage posteromedial release in resistant clubfoot and reported excellent and good results in 80% of cases, fair in 13% and failure in 7% of cases.

Our results are comparable to various studies mentioned in literature.

CONCLUSIONS:

1. Optimum age for posteromedial soft tissue release is less than 12 months that too 6-12 months.
2. Skin necrosis and infection were the most common complications.
3. Heel varus is the most common residual deformity followed by equinus.
4. Calf atrophy invariably occurs after radical posteromedial release especially in unilateral cases.
5. Four months of immobilization in plaster casts and there after corrective shoes was adequate post op care.
6. Radiological evaluation of feet with standard X-rays are quite helpful in evaluation of deformity and results of operations.
7. Our follow up period is too short to comment on late recurrence.

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