

# TURCO'S POSTERO-MEDIAL RELEASE FOR CONGENITAL TALIPES EQUINO-VARUS

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## ABSTRACT

**Background:** Talipes equino-varus is the most common congenital orthopaedic anomaly. There are various methods for its management. This study was conducted to determine the efficacy of Turco's one stage postero-medial release in children with congenital talipes equinovarus.

**Material and Methods:** This observational study was conducted from January 2004 to December 2005 in Orthopaedic Unit, Hayatabad Medical Complex Peshawar, Pakistan. Forty patients of less than 3 years age, with moderate to severe deformity were treated by Turco's one stage postero-medial release. They were followed for one year. The results were drawn according to the modified McKay rating system.

**Results:** Out of forty patients, 21 (52.5%) were males and 19 (47.5%) females. Twelve (30%) patients had bilateral while 28 (70%) unilateral deformity. Five (12.5%) of these patients had family history of clubfoot. Post-operatively after one year only 30 (75%) patients were available for evaluation. On McKay rating system, 18 (60%) patients had excellent results, 6 (20%) good results, 1 (3.3%) fair results, 3 (10%) poor results and 2 (6.6%) patients were labeled as failure.

**Conclusion:** Patients with congenital talipes equino-varus can be successfully treated in most of the cases by Turco's one stage postero-medial release.

**Key words:** Clubfoot, Talipes equino-varus, Turco's Procedure, Postero-medial release.

## INTRODUCTION

Congenital clubfoot (talipes) is a gross deformity of the foot present at birth. The word talipes is derived from talus (ankle) and pes (foot). Clubfoot denotes the club-like appearance of the foot. Talipes equino-varus (TEV) is the most common variety of clubfoot. It describes a foot that is plantar flexed and inverted.<sup>1</sup> It has an incidence of approximately 1.24 per 1000 live births.<sup>2</sup> The deformity can be quite severe, with sole of the foot pointing backwards. The dorsum of the foot becomes the weight-bearing surface so that the child walks on the head and neck of the talus. Clubfoot results in severe handicap unless managed early. Untreated patients not only develop progressive increase in deformity associated with late adaptive changes but also have poor function even after surgical correction. TEV affects both sexes, males more frequently than females. It may be unilateral or bilateral. It is often associated with other hereditary conditions, such as myelodysplasia, arthrogryposis multiplex congenita and congenital dislocation of hip.<sup>3</sup>

Regarding treatment of this deformity, most orthopaedic surgeons agree that appropriate management of children with congenital TEV should begin with conservative measures i.e. manipulation and serial casting in position of correction.<sup>4,5,6</sup> One or more surgical procedures are often required in patients who had incomplete correction and recurrent deformities after repeated manipulations and casts.<sup>7</sup>

Dissatisfaction with the results of non-operative treatment and various soft tissue procedures provided the incentive to develop one stage operation, which should provide lasting correction, described by Turco as the postero-medial release. In this procedure, the posterior, medial and subtalar soft tissue contractures are released to permit the realignment of abnormal anatomy of bones and the corrected alignment is secured with Kirschner wires. First reported by Turco in 1971, it soon became the operative procedure of choice for most surgeons.<sup>8,9</sup>

The aim of this study was to determine the efficacy of Turco's one stage postero-medial release in children with congenital talipes equinovarus.

## MATERIAL AND METHODS

This hospital-based observational study was conducted from January 2004 to December 2005, in Orthopaedic Unit, Hayatabad Medical Complex Peshawar, Pakistan.

Children of either sex with age less than 3 years, having idiopathic clubfoot of moderate to severe deformity were included in the study. While those with clubfoot secondary to some other disorder such as poliomyelitis, cerebral palsy or associated with other congenital anomalies such as arthrogyrosis multiplex congenita, myelodysplasia or congenital dislocation of the hip were excluded from the study. Patients previously operated were also excluded.

These patients were evaluated and graded according to the criteria of Cummings.<sup>3</sup> A detailed history, including pre-natal history, birth history and family history of congenital anomalies was taken. Detailed orthopaedic examination of hips, spine and extremities and analysis of gait was performed. Severity of the deformity and calf circumferences were recorded. The length and width of the feet were measured. Radiological assessment was performed by antero-posterior (AP) and lateral radiographs of ankle and foot, measuring the following angles:

- Talo-calcaneal (TC) angle on AP and lateral views.
- Talo-first metatarsal angle on AP view.
- The values of TC angle measured on AP and lateral views were summated to yield talo-calcaneal index, and an index of >40 degree was taken as normal.

The need for surgical correction was discussed thoroughly with the parents and they were informed about the post-operative complications and chances of recurrence of deformity. All the patients had Turco's one stage postero-medial release. After two weeks the casts were changed, stitches removed and new long leg casts applied with the foot in more dorsi-flexion. At six weeks the casts and the Kirschner wires were removed. New long leg casts were then applied with foot held in full correction. These casts were removed at 10 weeks and the feet measured for night splints to be worn for 2 years. The patients were then followed up monthly for the next three months and every third month for one year. At each visit, the feet were thoroughly examined. The success of correction and results were drawn according to the modified McKay rating system at one-year follow up after the procedure.

## RESULTS

The study included 40 patients with grade II or III deformity. Out of these patients, 21 (52.5%) were males and 19 (47.5%) females, with an average age of 13.6 months ranging from 6 to 33 months. (Table-1)

**Table-1: Sex distribution of patients.**

Sex	Number of patients	Percentage
Male	21	52.5%
Female	19	47.5%
Total	40	100%

Twelve (30%) patients had bilateral deformity; 5 (12.5%) males and 7 (17.5%) females. The remaining 28 (70%) patients had unilateral deformity; 16 (40%) males and 12 (30%) females. (Table-2)

**Table-2: Distribution of patients according to the unilateral or bilateral involvement.**

Limb involvement	Number of patients	Percentage
Unilateral	28	70%
Bilateral	12	30%
Total	40	100%

The family history of clubfoot in these patients is given in Table-3.

**Table-3: Family History of clubfoot.**

Family History of Clubfoot	Number of patients	Percentage
Patients with Family History of Clubfoot	5	12.50%
Patients with no Family History of Clubfoot	35	87.50%
Total	40	100%

The demographic distribution showed that 12 (30%) of patients were from district Peshawar, 14 (35%) from the nearby areas such as Nowshera, Charsaddah, Swabi, Warsak, Jamrud and Dara Adamkhel, 9 (22.5%) from remote areas of NWFP such as Tribal Areas and Southern Districts like Bannu, Lakki Marwat, Tank, Dera Ismail Khan and 5 (12.5%) patients were Afghan refugees. (Table-4)

Fifteen (37.5%) patients had no history of any previous treatment, while 25 (62.5%) patients had history of serial casting.

**Table-4: Demographic distribution of patients with clubfoot.**

Address of the patients	Patients	Percentage
District Peshawar	12	30%
Nearby Districts	14	35%
Remote Areas of NWFP	9	22.50%
Afghanistan	5	12.50%
Total	40	100%

Radiologically, the average talo-calcaneal angle was 12.5 degree (Ranging from 0–20 degree) on AP view and 13 degrees (ranging from 9-25 degrees) on lateral view. Average Talo–first metatarsal angle was 50.2 degree (ranging from 25–90 degree). The foot bi-malleolar angle i.e. the angle formed by bi-malleolar plane and the long axis of foot was 55.5 degrees in average (Ranged from 40-65 degrees).

Post-operatively 17 (56.60%) patients developed swelling of the toes. In these patients the casts were split and augmented by applying crepe bandages. Four (13.3%) patients got wound inflammation with redness and edema around the wound on the first post-operative visit, but no pus collection was noted. In these patients after applying Tulle dressing, well-padded casts were given along with antibiotics and anti-inflammatory agents for 10 days. In all these four patients edema and inflammation subsided by the next visit after 15 days.

During follow-up, the main problem was poor compliance. We lost 5 patients for follow-up after the third cast i.e. at 6 weeks and another 5 patients did not turned for follow-up (3 patients after 3 months and 2 patients after 6 months).

By the end of one-year only 30 (75%) patients of the 40 operated ones for TEV were available for evaluation. They were graded according to the modified McKay Rating System. In this short term follow up of one year, the following results were observed. Eighteen (60%) patients had excellent results, 6 (20%) patients good results, 1 (3.4%) patient had fair results, 3 (10%) patients poor results and 2 (6.6%) patients were labeled as failure. (Table-5)

The mean angle of maximum dorsiflexion was 16 degree (range 10–25 degree) and of plantar flexion 46 degrees (range 43–59 degrees) in 24 of the patients, while maximum dorsiflexion was 14 degrees (range 10–18 degrees) in six patients and the maximum plantar flexion was 19 degrees in

**Table-5: Functional results using the rating system of McKay.**

Results	Number of patients	Percentage
Excellent	18	60%
Good	6	20%
Fair	1	3.4%
Poor	3	10%
Failure	2	6.6%
Total	30	100%

one patient and 16 degrees (range 14–20 degrees) in 5 patients.

The angle of bi-malleolar plane to longitudinal axis of foot was 83-90 degrees in 18 patients, 76-82 degrees in 6 patients and 50-75 degrees in the remaining 6 patients.

The forefoot was in neutral position in 18 patients, with 5 degrees adduction in 6 patients and was in more than 5 degrees adduction in the remaining 6 patients.

The heel was in varus in 6 patients while neutral in the remaining 24 patients. Flexor hallucis longus was functional in all the feet. Shoe wear was normal in 24 patients while normal shoe wear was difficult in 6 feet.

**DISCUSSION**

TEV is the most common orthopaedics anomaly.<sup>2</sup> Male to female ratio in our study was 1.1 to 1, while this ratio was 2 to 1 in a study conducted by Ponseti IV.<sup>10</sup> Bilaterality was noted in 30% patients in our study while in Otremski I<sup>11</sup> study it was about 50% and Yamamoto reported it as more than 30%.<sup>12</sup>

In our study there were 12.5% patients with family history of clubfoot while family history was present in 8% of patients in a study conducted by Harolld A J et al.<sup>13</sup>

In our study 62.5% patients had received conservative treatment (i.e. serial casting) right from the initial months of life, while 37.5% of the patients had no conservative treatment till the time of presentation. This is mainly because of low socio-economic and educational status of the parents.

The compliance of the patients was poor in our patients and even in this short time of one year, we lost 10 patients out of 40, thus the follow up rate was 75% at the end of one year, while Hutchins PM et al presented a follow up rate of 70% after a mean follow up of more than 15 years.<sup>14</sup>

Harrold A J et al had about 95% follow up rate in patients treated for clubfoot deformity.<sup>13</sup>

The degree of correction i.e. the results were measured according to the McKay rating system. In our study, 60% patients had excellent results, 20% good results and 3.3% had fair results. While in the remaining 16.6% patients, 10% had poor results and 6.6% were considered as failure. Turco VJ reported 83% satisfactory results, 12% fair results and 5% failure with his surgical procedure.<sup>7</sup> Thompson GH et al achieved excellent results in 86% of cases corrected with Turco's postero-medial release.<sup>15</sup> Hoque MF got excellent to good results in 75% rigid clubfeet and had 11% fair and 13% poor results with Turco's postero-medial release.<sup>16</sup>

With Turco's postero-medial release, in patients of 9 months to 4 years of age, Otremski I achieved full correction, of equinus in 98%, heel varus in 91%, cavus in 85% and forefoot adduction in 91% of cases.<sup>11</sup>

In our study the main residual deformity was forefoot adduction. It was about 5 degrees in 6 patients and more than 5 degrees in another 6 patients while Otremski I<sup>11</sup> achieved full correction of equinus in 98%, heel varus in 91%, cavus in 85% and forefoot adduction in 91% of cases. Heel varus was present in 6 patients, while it was neutral in the remaining 24 patients.

The results of our study remained excellent to good in about 80% which are comparable to studies by Turco VJ et al,<sup>8</sup> Munshi S et al,<sup>17</sup> Edmondson MC et al,<sup>18</sup> and Macnicol MF et al.<sup>19</sup>

The cause of relapse in most of the cases is primarily mismanagement or non-compliance. Severity of the deformity and natural history of the disease also contribute to the recurrence of various components of the deformity.

## CONCLUSION

Patients with congenital talipes equino-varus can be successfully treated in most of the cases by Turco's one stage postero-medial release.

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