# TEN YEARS EXPERIENCE OF WINDOW PROCEDURE FOR TREATMENT OF CLUB FOOT AT DUHS & CHK, KHARACHI

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***ABSTRACT***
***Objective:*** *To assess the result of window procedure for congenital talipes equino varus.*
***Study Design:*** *Prospective study.*
***Setting & Duration:*** *Department of Orthopaedic, Unit II, Dow University of Health Sciences and Civil Hospital, Karachi from January 1998 to December 2008.*
***Methodology:*** *408 patients with mild to moderate CTEV according to Dimeglio classification. The patients were treated by Window procedure under general anaesthesia and tourniquet control. Patients were followed fortnightly for 03 months and monthly till 1-1/2 year after surgery.*
***Results:*** *408 patients, aged 06 to 18 months were included in this study. Amongst them 270 (66%) boys and 138 (34%) girls. Out of 408 patients treated with this new procedure 37 were excluded from this study due to loss in follow-up and not obeying post operative instructions. Amongst the remaining 371 cases (90.88%) were functionally good. 27(7.44%) patients had fair results and needed re-manipulation under general anaesthesia, while 8 (2.48%) were functionally poor. Amongts them 6 needed revision of Achilles tendons tenotomy while 02 needed revision surgery i.e. extended posteriomedail release.*
***Conclusion:*** *We conclude that window procedure is better due to good results and fewer complications, shorter operating time, lesser blood loss, decreased recurrence rate, less fibrosis and less stiffness of ankle and knee joint.*

***KEYWORDS:*** *Congenital Talipes Equino Varus, Foot Deformity, Surgical Technique*

## INTRODUCTION

Congenital talipes equino varus (CTEV) is a common deformity that involves the foot, with an incidence of 1-2/1000 life births.[1] Boys are affected twice than the girls.[2] In 30% the condition is bilateral.[3] The etiology of CTEV is unclear.[4] Although studies on population, families and twins suggest a genetic component. The mode of inheritance does not fit classic pattern.[5] All segregation analysis on populations with club foot support a single, major genetic factor.[6-9] The deformity of CTEV has been classified into various grades, depending upon the severity, by various authors like Attenborough[10, 11], Waisbrod[12], Lehman[13], Somppi[14] and Dimeglio.[15]

CTEV can be successfully treated non-operatively, but if handled improperly, then about 33% patients will have to undergo surgery.[16] The reasons of failure of conservative treatment are negligence by the parents especially in our region, improper immobilization, lack of stretching exercises, failure of application of splint and shoes. There is controversy regarding the preferred operating procedure for CTEV, as there are several methods are available,[17] but no one is ideal. The choice of the procedure varies, depending upon the age, the degree of deformity, experience and preference of the surgeons, expectations of the patient's attendants and the expected reliability of the follow up.

For decades the Turco procedure[19] was very popular for surgical treatment of club foot (CTEV) because it permits direct visualization of the structures, and the

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dissection, and correction of deformities can be carried out with surety, however there has been a trend away from this approach and in favor of the window procedure[21] that was introduced by our department since 1997. The purpose of the present study was to evaluate the results of our new technique i.e. window procedure in patients with mild to moderate CTEV, that did not respond to conservative management.

## METHODOLOGY

This prospective study was conducted in Orthopaedic Unit II Civil Hospital, Karachi from January 1998 to December 2008. On 408 children presented with mild to moderate CTEV as per the Dimeglio[15] classification (Table I). All patients under went on window procedure.

**Window procedure, The New operative technique**
Unlike the previous operating techniques in which long incisions were given, we give six small stab incisions:

1. First of all we perform the tenotomy of the long planter ligament near its insertion through a small stab incision.
2. This was followed by lengthening of the tendoachilles (TA) by making three stab incisions over it, by stretching, lengthening of the TA achieved, and after posterior capsulotomy the foot can fully plantigrade, thereby correcting the equinus deformity.
3. Next a 2-2.5cm incision is made over the medial malleolus and the tendinous portions of the tibialis posterior, flexor digitorum longus and flexor hallucus longus are identified, isolated and tenotomies done. During this procedure the neurovascular bundle can be easily identified and kept out of harms way with the help of a retractor.
4. This was followed by capsulotomy of the telonavicular joint on the medial side through the stab incisions.

Following the surgery (Figs. 1-2) full correction of the deformity was achieved, and maintained by a TEV cast. The sutures were removed after 15 days under general anaesthesia and the cast re-applied for another two weeks, after which a below knee POP cast was applied for a further period of two weeks.

The patient were followed up fortnightly for three months and then monthly for a total period of 18 months, with the advice of stretching exercises during feeding and application of night splints, and surgical shoes if the child is in walking age group.

**Assessment Criteria[18]**
The criteria for post operative clinical assessment is:
**Good:** Feet demonstrate complete or almost complete correction of deformity i.e. the feet are in dorsiflexion beyond plantigrade position, with minimal or no residual deformity.
**Fair:** Plantigrade feet with some residual deformity.
**Poor**: These feet had residual or recurrent deformity and requires revision surgery.

## RESULTS

Between January 1998 and December 2008, 408 children with mild to moderate deformity of congenital talipes equino varus were treated surgically at the department of Orthopaedic Surgery DUHS and Civil Hospital, Karachi. Amongst these 270 boys (66.18%) and 138 (33.82%) girls, their ages varied from 06 to 18 months, with an average age of 9.5 months. One hundred and forty seven (36.03%) patients had mild and two hundred and sixty one (63.97%) had moderate degree of CTEV. All patients were treated with surgery using the window procedure.

27 patients were excluded from the study due to irregular follow up, while 10 did not followed the instructions of usage of splints, stretching exercises, surgical shoes, etc and were also excluded. Hence, only 371 patients completed 1 and a half years follow up period.

Out of the 371 patients, in 336(90.08%) the results were good (Table II). In 27(7.44%) cases the results were fair, as there was stiffness and rigidity due to improper application of POP, improper care of POP and irregular stretching exercises. This problem was overcome by manipulation under anaesthesia and re-application of POP cast for another six weeks. In 8(2.48%) cases the

**Table I. Dimeglio classification of CETV**

| Grade | Degree of Deformity |
|---|---|
| Mild TEV | > 90% reducible |
| Moderate TEV | > 50% reducible |
| Severe TEV | < 50% reducible |
| Very Severe TEV | < 10% reducible |

**Table II. Reults of window procedure**

| Results | Number | Percentage |
|---|---|---|
| Good | 336 | 90.08 |
| Fair | 27 | 7.77 |
| Poor | 8 | 2.48 |
| Total | 371 | 100.00 |

**Fig. 1 & 2. Foot appearance after completion of the Window Procedure**

**Fig. 3. Foot appearance after completion of the Turco Procedure**

results were poor. Amongst these 06 patients needed tenotomy of tendoachilles and posterior capsulotomy, while 02 underwent extended posteriomedial release surgery. There were no other complications in our series, apart from infection of few sutures in three cases.

## DISCUSSION

The goal of the operative treatment of congenital talipes equino varus is to achieve a plantigrade, stable and pain free foot with good function. Several operations have been devised to achieve this, the most commonly used being the Turco[20] procedure[19] i.e. extended posteriomedial release. The new technique i.e. window procedure was adapted in our department from 1997 uptil now more then 650 patients have been operated. In the last eleven years with satisfactory results. This technique i.e. window procedure has several advantages. First of all it is cosmetically superior, because instead of a long incision, six small stabs are made, which are barely visible later on the window procedure takes about 15-20 minutes, which is much less than any corrective procedure for CTEV which averagely takes 45-60 minutes. Hence, we can easily operate on both the limbs at one sitting. Another advantage is that being a less invasive procedure we can fully correct the deformity in first POP, while in the Turco approach we have to wait for 15 days. The danger of edema is also less so we avoid splitting of the POP which may cause loosening and thus recurrence of the deformity.

Now we are also applied this technique in moderate to rigid club foot but we are much careful postoperatively. We also slit the POP and duration of post-operative POP application enhance till eight weeks, with fair to good results, although we did not include such cases in our study. We also observe that if the patient's attendants are cooperative the recurrent rate is zero. In this connection we counsell the patient's attendants preoperatively regarding post operative follow up requirements i.e. stretching exercises, application of night splints and surgical shoes. We also counsell mother to delay next

**Fig. 4. Moderate to severe CTEV (bilateral) corrected by Window Procesure right foot**

**Fig. 5. Left foot after Turco and right foot after Window Procedure**

delivery since deformity completely corrected.

The window technique has a very low infection rate; we saw superficial infection of few stitches in three cases only. The Turco procedure, however, has a reported infection rate of 5-10%. As there is less fibrosis and a shorter period of immobilization, followed by early manipulation by mother and stretching exercises in our technique, hence the stiffness and recurrence rate is negligible. We saw recurrence in two (0.8%) of our cases only, while the recurrence rate in Turco and other procedure[22] is around 5-10%.

## CONCLUSION

This surgical procedure should be considered on a priority basis over other techniques, which are in common use uptil now, as it is minimally invasive with little tissue damage, fibrosis and stiffness, cosmetically better and have fewer complications and recurrences, besides giving excellent results (90%).

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