

THE RESULTS OF TREATMENT IN TALIPES EQUINOVARUS

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SUMMARY

We retrospectively investigated the cases of 98 children having 128 talipes equinovarus. Their conservative and surgical treatment were performed at the Department of Orthopaedics and Traumatology, Faculty of Medicine, Selçuk University between 1983 to 1991. Overall average age was 9.4 months. The mean age of conservatively and surgically treated groups were 46 days and 34 months, respectively. Conservative treatment was used for 93 feet of 69 children. Surgical treatment with and without conservative treatment was done on 47 children with 58 feet. The average follow-up period was 37 months. The results were evaluated by the criteria of Main et al (1). The success rates of the conservative, conservative plus surgical and surgical treatment were 59 %, 82 % and 91 %, respectively.

Key Words: Talipes equinovarus, manipulation and casting, posteromedial release

INTRODUCTION

Talipes equinovarus (TEV) is one of the commoner deformities of the musculoskeletal system. TEV is a complex deformity involving all bones and soft-tissue structures. Equinus deformity of the foot accompanied by an varus of the heel, adduction and inversion of the forefoot. The medial border of the foot is concave and its palantar surface faces upward (2, 3, 4, 5).

TEV do vary in severity. Generally, it may be

ÖZET

Talipes Ekinovarusun Tedavi Sonuçları

Bu makalede, 98 çocuktaki 128 talipes ekinovarus deformitesinin tedavi sonuçlarını retrospektif olarak inceledik. Bu ayakların konservatif ve cerrahi tedavileri, 1983 ve 1991 yılları arasında Selçuk Üniversitesi Tıp Fakültesi Ortopedi ve Travmatoloji kliniğinde yapılmıştır. Tedavisi yapılan çocukların yaş ortalaması 9.4 aydır. Konservatif tedavi yapılan çocukların yaş ortalaması 46 gün olup, bu yaş ortalaması, cerrahi tedavi gören çocuklarda 34 ay olmuştur. Konservatif tedavi 69 çocuğun 93 ayağına uygulandı. Konservatif ve cerrahi tedavinin beraber yapıldığı grup ile sadece cerrahi tedavi yapılan grupta 47 çocuğun 58 ayağı tedavi edildi. Tedavi sonrası ortalama takip süresi 37 aydır. Sonuçlar Main ve ark. (1) uyguladığı kriterlere göre değerlendirildi. Bu kriterlere göre konservatif tedavi ile %59, konservatif ve cerrahi tedavi ile %82 ve yalnız cerrahi tedavi ile %91'lik başarı sağlanmıştır.

Anahtar Kelimeler: Talipes ekinovarus, manipulyasyon ve alçı, posteromedial gevşetme

classified into two distinct group. The first group, commonly referred to as postural TEV. The foot presents the usual deformities which accounts for approximately 70-75 % of cases. In the second type, the foot is short and rather stiff, as well as resistant to conservative treatment which represents the minority of TEV deformities (3, 4, 5).

TEV occurs in approximately one in 1000 newborns. It is more often unilateral. The exact cause of TEV has not been determined, although many teo-

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ries have been proposed. However, it is difficult to isolate the inheritance of TEV from its etiology. It is believed that multifactorial condition with diverse genetical make-up concerted with environmental factors lead to indistinguishable abnormalities (2, 3, 4, 5, 6).

Numerous investigators studying the pathogenesis have found fairly consistent result in anatomical dissection of TEV with respect to bone. The physiological events are responsible, even though, the precise physiological pathogenesis of the disorder remains unclear. TEV is far more complex than a mere primary bone deformity (3, 4, 5, 7).

The goal of the treatment is to obtain long-lasting correction of a "functional, pliable, cosmetical foot" in the shortest treatment time, and with the least disruption of the family, and child life. Currently, all agree that initial treatment should consist of gentle manipulation of affected foot, followed by plaster casting or taping. When conservative treatment fails to give progressively improved alignment, surgery is scheduled. The exact timing of the procedure varies with the surgeons' opinions. In recent years, many varied surgical techniques have been introduced. Initial surgical treatment involves in the release and lengthening of soft tissues. Varied procedures implies that correction of TEV is still an unsolved problem (3, 4, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19).

In this article, we are presenting the follow-up results of the cases with TEV who had conservative, and conservative plus surgical, and surgical treatments.

MATERIALS AND METHODS

Between 1983 and 1991, a total of 162 children with 240 talipes equinovarus deformities were treated

with conservative and surgical method at the Department of Orthopaedics and Traumatology. Among these 98 children with 128 affected feet were included and the rest of them did not keep up with follow-up program period. The average age at the initial treatment was 9.4 months ranging from one day to 6 years (Table 1). Among these children 57 were boys and 41 were girls.

Sixty-nine children with 93 feet had conservative treatment. Twenty-four of them had bilateral TEV and the remaining 45 children had unilateral TEV. Conversely, 29 children underwent surgical treatment. Of those 29 children, six had bilateral and the other 23 had unilateral TEV. Of the children who were less than 6 months of age were treated by conservative method with manipulation and serial casting. The cast was changed at weekly intervals. The treatment was continued until complete correction was achieved and then the foot was kept in a corrected position by vitraten orthoses. When child reaches to walking age, tarsopronator shoe was used to maintain the correction. The average length of time in casting was 3.2 months. This group were from one day to 6 months of age, averaging 46 days old.

The remaining 47 children were operated either because of failure in conservative treatment or the children were older than 6 months of age at the day of admission. Posteromedial release is the usual surgical treatment for this purpose. Following the operations, the foot was placed either in vitraten orthoses or in a tarsopronator shoe, following 6 weeks above-knee casting. The age of the children was ranged from 6 months to 6 years, averaging 34 months of age in this surgical program.

In order to compare our results with other studies,

Table 1. The age distribution of children at the time of treatment.

Age	Sex		Total	%
	Male	Female		
0-2 months	31	15	46	46.9
3-6 months	15	8	23	23.4
7 months- 2 years	15	4	19	19.3
3-6 years	7	3	10	10.2
Total	68	30	98	100.0

we used the criteria of Main et al (1). Clinical evaluation was considered to be cosmetic appearance and the function of the foot. The assigned clinical results were: excellent to good and poor. The mean follow-up period is 37 months (range 1 year to 8 years).

RESULTS

Among the feet that were treated by conservative method, 55 of them (59.1 %) had excellent to good grading and the remaining 38 feet (40.9 %) had poor grading during follow-up program. 23 feet of the poor grading group were subjected to surgical correction and 19 feet (82.6 %) showed recognizable improvement. Their grading was excellent to good, only 4 feet (17.4 %) resistantly remained poor during further follow-up program.

Children older than 6 months with 35 feet were subjected to direct surgical correction. Such foot before the surgical treatment and one year after surgery during follow-up is shown in Figures 1 and 2. Almost all of them (91.4 %) showed an exceptional improvement and were graded from excellent to good. The overall results, shown in Tablo 2, indicated that 106 feet (83%) were responded satisfactorily to conservative and surgical intervention. Among the feet, neither overcorrection nor serious complication was found. Post-operatively, wound infections and skin necrosis were developed only in 4 feet.

DISCUSSION

Conservative treatment was the method of choice at early infancy and up to 6 months of age, and showed 59.1 % success rate in this Department. These feet represented the mildest (postural) form of deformity which responded well to manipulation and casting. Conversely, the feet that were classified as severe (rigid) had uncorrected elements that cause failure in conservative treatment. Many authors have reported different percentage of succes rate with

conservative treatment, ranging from 19 % to 94 % (3, 4, 18, 19, 20, 21). The series that were reported by Harold and Walker (22) showed 10-50 % success rate. Kite (19) in his experience obtained 90 % succesfull results by manuplation and serial casting. Ghali and his coworkers (21) stated that the response of feet to conservative treatment is related to stages of infancy and earliest intervention is necessary to achive correction by conservative treatment. As they reported, 94 % of the infants younger than 4 weeks old had the correction whereas infants older than 4 weeks showed 75 % successful response to conservative treatment. The negligence and ignorance of the parents is decisive to whom counselling and guidance is needed to avoid delay and irregularly following-up the treatments. Also, rigidity of deformity, surgeon's personal experience were the contributing factors for obtaining unsatisfactory results.

Those 38 feet were rigid and unresponsive to conservative treatment. Twenty- three of 38 feet underwent surgical treatment and the parents of remaining children with 15 feet decided not to have surgical intervention. Of those 23 feet, 19 versus to 4 feet showed exceptional improvements after the surgical treatment.

Twenty -nine children older than 6 months to 6 years of age constituting 35 feet were admitted to surgical treatment. 91.4 % of feet had good or excellent success rate in the duration of follow-up period. Only 3 feet (8.6 %) were poor in grading.

Both surgical treatments with and without conservative treatment, when combined, 88 % success rate was obtained with a grading of excellent to good. Unsatisfactory results of 7 feet (12 %) can be attributed to incomplete surgical correction or failure of postoperative care. The results of conservative and surgical treatments varries from center to center because the preoperative severity of feet in different

Tablo 2. The evaluation of the treatments for the feet.

Results	Conservative treatment		Conservative +operative treatment		Operative treatment	
	n	%	n	%	n	%
Satisfactory (excellent to good)	55	59.1	19	82.6	32	91.4
Unsatisfactory (poor)	38	40.9	4	17.4	3	8.6
Total	93	100.0	23	100.0	35	100.0

studies may be different and also there is no unanimously accepted evaluation criteria for grading the corrections. Additionally, different centers use different surgical techniques which include soft-tissue releases, tendon transfers, and bony operations. The reported failure rate of surgical treatment can vary from 5% to 15% (16).

Among different soft-tissue release techniques are Turco's posteromedial release with its variants (2,3,4), and the circumferential soft-tissue release utilizing the Cincinnati incision advocated by Simons and McCay (9,10). In 88 % of the feet we have obtained satisfactory results with the posteromedial release without having serious complications. Similar results using posteromedial release were reported by Turco (2) and Thompson et al. (23) However, Levin et al. (16) have reported only 66% success rate.

There is also no consensus for timing of surgical

correction but, usually there is a tendency to perform early surgical treatment (1, 5, 8, 13, 14, 24, 25, 26). A significant success rate is associated with early intervention regardless of the surgical techniques (12). Although, presently, most surgeons incline to perform operation at the age 2 to 6 months (9, 12, 23, 24, 25), but all agree that correction must be adequate and that is best achieved at the first attempt.

In conclusion, treatment with manipulation and serial casting should be done as early as possible prior to development of contractures. The children who failed to show positive response to conservative treatment can be treated surgically after 6 months of age. Overall, accurate bony realignment during surgery and a careful postoperative management will help to achieve a functional, pliable, and cosmetically acceptable foot.



Figure 1. TEV deformity of a six years old child before the surgical treatment.



Figure 2. The appearance of the same foot one year after the surgical intervention during follow-up.

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