A STUDY OF CONGENITAL TALIPES EQUINO-VARUS

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Talipes Equino-Varus (commonly called Club Foot) is one of the commonest defects with which children are born. Though its treatment is very easy, yet a few cases are left with some residual defect in spite of the best possible treatment at the best hands, and these form the bulk of the cases reported in the literature. This congenital defect was described by Hippocrates, who also treated it by manipulation. Plaster for its treatment was first used by Guerin in 1836. Thomas invented a wrench, called after his name, for forcible manipulation. This instrument is too brutal to use and is only of historical importance. In 1930 Kite described his modified technique of wedge plaster and it is still used in some places especially in selected cases. Operative treatment for Congenital Talipes Equino-Varus was introduced in 1782 but with the advancement in surgical knowledge several operative procedures have been described in the literature each claiming good results.

This work consists of a series of 220 cases of congenital talipes equino-varus studied and treated at G.S.V.M. Medical College hospital, Kanpur, India, during the last $2\frac{3}{4}$ years. An attempt has been made to study this subject clinically and to evaluate the results of the various types of treatment. In every case a detailed history was taken and a positive finding if any was recorded. In one case the mother was diabetic and in two other cases there was a history of abnormal delivery.

There was twin delivery in two cases. A history of similar affliction in the family was present in nine cases. Clinical examination of the patient was carried out to exclude the possibility of other associated congenital defects and to assess the severity of the club foot. Several associated defects were found which are given in Table VI. Footprints were taken in every case and repeated every month. X-rays were done whenever found necessary.

Conservative treatment gives a good result in the majority of cases but a few cases are still left with some residual deformity. In 73.6% of the cases in the present series, conservative treatment consisted of manipulation and plaster. A below knee plaster was given as a routine, but in chubby patients, the knee was included. There were still some children who used to wriggle out of their plaster. For these a leucoplast strapping was applied on the back of the leg extending from just above the prominance of the calf to 2" beyond the ball of the toes after full manipulation, and the plaster was applied as usual. The distal 2" of the strap was then turned back and was incorporated in the plaster. This technique was used in 8 of the cases in the present series and was found to be very helpful. Manipulation was repeated after 7 to 10 days and 5 to 6 manipulations were sufficient for full correction. This correction was maintained by an orthopaedic shoe (modified Denis Browne) till the child started walking. Patients were followed up at regular intervals. A Denis Browne splint was used in frail children and in these correction was also obtained by manipulation and splintage. In the 10 cases who were brought for treatment rather late, Kite's technique of wedge plaster was practiced.

23 cases were operated upon and several different types of operations were performed, as shown in Table IV. In 5 cases in addition to other soft tissue operations the Tibialis Anterior Tendon was split and the lateral slip was given a new insertion on the lateral border of the foot. Patients who were brought in late or with a relapse with bony defects and callosities were subjected straight away to operative treatment. The observation and the results are tabulated below.

TABLE No. I

SEX INCIDENCE

Sex	Number of cases
Male	166
Female	54

The 220 cases showed a male to female ratio of 3 : 1.

TABLE No. II
SIDE INCIDENCE

Side	Number of cases	Percentage
Bilateral	140	63.63
Unilateral	80	37.37
Right	47	
Left	33	
Total	220	100.00

TABLE No. III
AGE AT WHICH PATIENT WAS BROUGHT

Period	Number of cases	Percentage
Within a month	75	34.10
1 to 3 months	46	21.00
4 to 6 months	38	17.20
7 to 12 months	40	18.20
1 to 5 years	18	8.20
Over 5 years	3	1.30
Total	220	100.00

TABLE No. IV
TYPE OF TREATMENT

Treatment	Number of cases	Percentage
CONSERVATIVE	197	89.55
Manipulation and Strapping (Splintage)	17	7.75
Manipulation and Plaster	162	73.63
Leukoplast strapping and Plaster	8	3.64
Kite's wedge Plaster	10	4.55
OPERATIVE	23	10.45
Lengthening of Tendo Achillis plus Brockman's medial release	14	6.36
Above plus tendon transplantation of Tibialis Anterior	5	2.27
Bony Operations (Cuneiform wedge osteotomy)	4	1.82
Total	220	100.00

TABLE No. V
RESULT

Type	Number of cases	Percentage
Good	154	70.00
Fair	23	10.50
Bad (Relapse or Poor)	8	3.60
Lost to followup	12	5.45
Incomplete treatment	17	7.72
Deaths (4 due to Small-pox, I due to Bronchopnuemonia & 1 due to Meningitis	6	2.73
Total	220	100.00

Note: In table V.

Good: means that there is residual deformity, all the movements are normal, the foot is supple and there is no relapse.

Fair: means that there is a slight adduction deformity left, all the movements are normal and there is no relapse.

Bad (Relapse or Poor): means that the deformity has recurred.

TABLE No. VI
ASSOCIATED LESIONS

Associated Lesion	Number of cases	Percentage
Arthrogryposis Multiplex Congenita	5	2.27
Spina Bifida	2	0.91
Bilateral Inguinal Hernia	2	0.91
Syndactyly	1	0.45
Tongue Tie	1	0.45
Contracture both Knees	1	0.45
Total	12	5.44

DISCUSSION

Hippocrates propounded the theory of foetal malposition and recently it was supported by

Denis Browne. He called this one of the moulding defects like spina bifida and syndactyly. He believed in foetal malposition, raised intra-uterine pressure and the presence of congenital bands. Heredity though blamed several times could not be labelled as a definite cause. Fried (1959) held that the tibialis posterior was responsible for its recurrence. He showed that the Tibialis Posterior tendon was abnormally thickened and consisted mainly of fibrous tissue. It divided into several slips in the sole of the foot and these were attached to the calcaneum, navicular, plantar fascia, plantar ligaments etc. Some workers thought it was due to defective muscle development and on dissection they showed defects in various muscles and tendons. A bio-chemical theory has also been introduced and club foot was produced experimentally by injecting teratogenic drugs like Sulphonamides, Thallium salts, Cortisone, 3-Acetyl pyridine and Lead salts. Duraiswami (1952) produced club feet in chickens by injecting Insulin and Benzyl-alcohol. Beehtol and Mossman (1950) have described defects at different age groups in the foetus. All these discussions show that the exact aetiology is unknown.

In the beginning, there is only a soft tissue contracture but later on bony changes also appear and the defects progress with age. The Tibialis Anterior, the Tibialis Posterior and the Tendo Achillis are shortened, while the Peronei are lengthened. The short muscles, the ligaments of the foot and the capsule of the ankle joint are also contracted.

The bones of the affected foot are also small compared to the normal side. The talus is tilted and lies almost out of the socket. Its neck is longer and with the head is pointed medially. The calcaneum is also rotated and tilted thus making the concavity on its medial surface prominant. Later the axis of the superior articular facet of the calcaneum rotates medially, and the posterior end of bone remains small thus reducing the size of heel. The navicular is either absent or lies medial to the head of talus. The cuboid is also displaced medially. There is medial rotation of the tibia thus producing a medial facing of the ankle joint.

The results of a series of 329 cases of congenital club foot were published by Ponseti and Smoley (1963) and they too found other congenital abnormalities like arthrogryposis multiplex congenita, meningomyelocoele, absence of the sacrum and congenital constrictions in the legs. The majority of these cases were treated at other clinics and were later on sent to their clinic and only 67 cases were followed up out of which 57 were males. 40% of the cases had bilateral affection and among the 60% of the unilateral cases the left side was slightly more affected than the right. In this series mostly the late cases were included and the authors found a high recurrence rate of 56%. 18% of the cases of the 56% recurred after 14 months to 5 years and were treated by manipulation and soft tissue operation. 1% of the cases still recurred and they were treated by a soft tissue operation and Tibialis Anterior transfer to the third cuneiform. The authors attributed this high recurrence mainly to incomplete correction initially and to poorly developed muscles of the leg.

Kite (1963) re-described his technique of manipulation and conservative treatment. He studied a series of 1500 cases of congenital club foot, and treated them successfully with plaster-cast alone. He recommended conservative treatment. In the present series conservative treatment also was preferred and gave good results.

SUMMARY

1. 220 cases of congenital club foot were studied and treated at the medical college hospitals, Kanpur during the last 2¾ years.
2. 185 cases were fully treated, followed up and the results were noted.
3. Manipulation and plaster was tried in 162 cases and proved very useful in all except a few resistant, relapsed and late cases.
4. A slight modification in the plaster technique was used in 8 cases where the children were chubby and used to wringle out of the plaster.
5. 23 cases were operated upon. The additional procedure of tendon transfer was found to be useful.

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