

# EARLY SOFT TISSUE OPERATION IN THE MANAGEMENT OF CLUBFOOT

By Kamal Bose

## SYNOPSIS

The problem in the management of clubfoot is to differentiate between the easy and the more resistant type. Numerous methods of conservative and operative treatment have been described for correcting the resistant type of deformity. The purpose of this paper is to emphasize early recognition of such resistant type and correcting it by a total soft tissue release preferably before the age of six months. The technique of the operation is described and its advantages and disadvantages discussed. Early results have been encouraging.

## INTRODUCTION

In 1894 Sir Robert Jones summed up the problem of club foot as follows:— "The foot with congenital talipes is not cured until the patient can voluntarily place it in the position of valgus, and that he should not be allowed to walk until the foot had so far recovered that each step taken tended to improve the position of the foot". This still remains the aim of the orthopaedic surgeons treating club feet. However the goal is not always reached by conservative means. It is the purpose of this paper to emphasize that intelligent and timely use of surgical procedures can be less traumatic than vigorous manipulation.

Operative treatment of club foot is resorted to, when conservative treatment has failed to correct the deformity. Numerous operations have been described both on soft tissues and bony structure. Yet today there is still a lack of agreement on simple but important questions like the indications for operation, the age at which it should be performed and the nature and extent of the operation.

## MATERIAL AND METHODS

The present series consists of data obtained from patients with congenital talipes equinovarus. Similar deformities associated with neurological abnormalities like Spina bifida, cere-

bral palsy and arthrogryphosis are excluded. Also those with postural "C.T.E.V." in whom correction of all deformities at the first treatment could be achieved are excluded. The cases presented here are those who had moderate to severe degree of deformity.

50 such new cases of club foot were seen in the year (1971-72) at the clinic for congenital deformities at the University Department of Orthopaedic Surgery in Singapore. There were 30 boys and 20 girls. Of these 33 were bilateral and 17 unilateral.

TABLE I

Number of Patients : 50			
Male 30	Unilateral	Right	6
		Left	4
	Bilateral		19
Female 20	Unilateral	Right	4
		Left	3
	Bilateral		14

All cases were treated initially by correcting the deformity in stages by manipulation and corrective plaster casts. The plaster casts were changed every week. If manipulation failed to correct the deformity after an average of 10 to 12 weeks, surgery was undertaken. In patients who responded to initial conservative treatment, the correction was maintained, until the child commenced to walk, by daily manipulation and night plaster splints. The use of retentive night splints was continued until there was no

Department of Orthopaedic Surgery, University of Singapore.

KAMAL BOSE, M.Ch., F.R.C.S. Ed.

Reprints from:

Dr. K. Bose,

Orthopaedic Department, Singapore General Hospital, Singapore 3.

prospect of the deformity relapsing, indicated by the maintenance of the foot in the corrected position. When children with corrected deformities were allowed to walk, they did so with some adjustment in their shoes like broadening and elongation of the outer side of the heel and an outside flapper on the sole of the shoe.

RESULTS AND DISCUSSION

In the present series eighty percent of cases responded to conservative treatment. Twenty percent of the cases failed to correct with conservative measures: the factors responsible for the deformity had not been overcome.

TABLE II  
CONSERVATIVE TREATMENT

Result	Number	Percent
Good	40	80%
Fair	10	20%

No two cases of club foot are identical. Even when bilateral they are seldom alike regarding the severity of the deformity and the response to treatment. While the mild ones respond well to conservative means, in the 'resistant' feet correction is most difficult to obtain and even when correction is obtained initially and maintained for some months, recurrence is common. Although in practice it is not always easy to recognise the resistant types at birth, the following features indicate a poor prognosis:

1. The deformity is severe and the foot feels firm and rigid to all corrective manoeuvres.
2. A small heel with the hind foot much smaller compared to the forefoot.
3. A deep crease on the inner border of the foot and on the back of the heel.
4. A wasted, flat calf and a long tendo-Achilles.

It is the practice in our clinic that if a fair trial of conservative treatment fails to achieve correction within 10 to 12 weeks from birth the foot should be considered as resistant and there should be no hesitation to resort to operative methods to correct the deformity even at this early stage.

The club foot is a fixed exaggeration of the normal equino-varus position and it is important



Fig. 1. 'Resistant type' of club foot deformity.

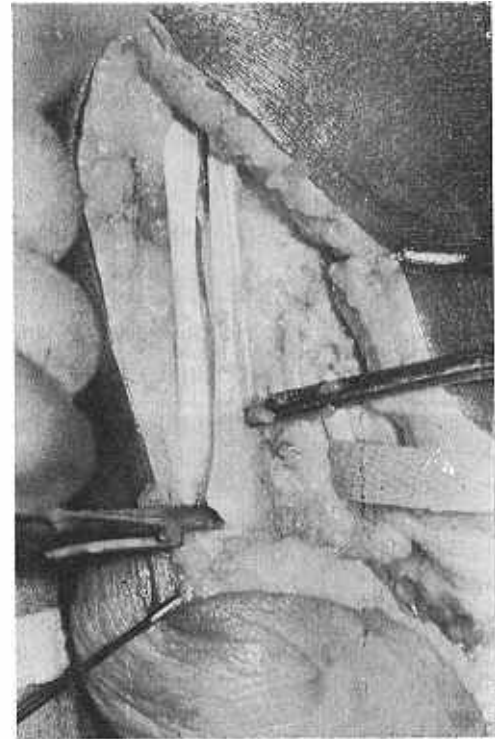


Fig. 2. Calcaneal tendon is split in the sagittal plane and the medial half dissected from its insertion.

to remember that equino-varus and adduction occur simultaneously. The resultant soft tissue contractures are therefore in the posterior, medial and subtalar regions. Soft tissue operations in general attempt to deal with individual elements of these extensive contractures. In the present series the type of Soft tissue operation performed attempted to deal with all contractures present in club foot at one stage thus avoiding multiple operations.

10 feet were treated by soft tissue operation before the age of one year. The youngest age

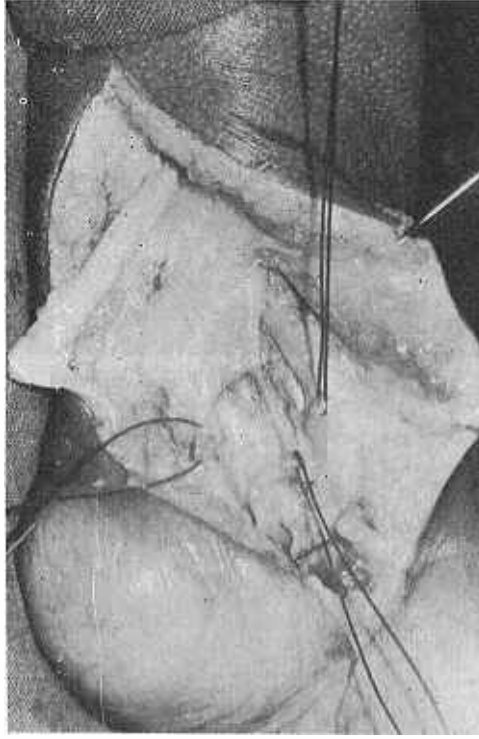


Fig. 3. A Z-lengthening of the tibialis posterior, flexor digitorum longus and flexor hallucis longus is carried out to achieve full correction.



Fig. 5. Six months after soft tissue release.



Fig. 4. Post operatively the foot is immobilised in neutral position without any tension to the suture line.

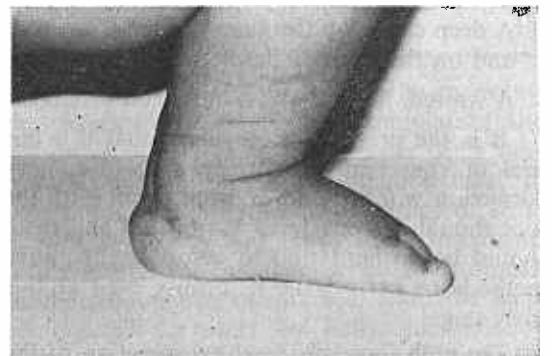


Fig. 6. Thirty-six months after soft tissue release.

for operation was 12 weeks. This was the minimum period of trial with stretching before operation. This to some extent ensures against undue forcible traction on the vessels and nerves. The same applies to the skin on the medial side which is usually very taut and contracted.

#### The Soft Tissue Operation—Technique

The incision starts in the midline posteriorly well above the heel and sweeps down midway between the heel and the medial malleolus to end on the inner border of the foot. The posterior flap is left undisturbed. The anterior flap is dissected gently with the subcutaneous tissue to expose the tendon of tibialis posterior, flexor digitorum longus and the calcaneal tendon. The calcaneal tendon is split in the sagittal plane and the medial half is dissected from its insertion. The lateral half is divided just below the musculo-tendinous junction. By avoiding dissection of the posterior heel flap the calcaneal branches of the posterior tibial artery are left undisturbed and this ensures good skin healing. A Z-lengthening of the tibialis posterior, flexor digitorum longus and flexor hallucis longus is carried out to achieve full correction. Usually it is not necessary to open the talonavicular or posterior talo-calcaneal joint and it is better to avoid it in these young infants as otherwise, it invariably leads to a very stiff foot.

Post-operatively the foot is immobilised in neutral position for two weeks until the stitches are removed. Further correction in plaster casts is continued till such time when the foot is manipulated to full eversion and dorsiflexion.

The advantages of early soft tissue operation are as follows:—

1. The deformity is fully corrected at an early stage so that the mutual position of the bones is normalised. This allows the joints to develop normally, maintaining mobility and function.
2. Since the operation only includes the soft tissues, it does not affect the growth or the articular cartilage of the joints. The latter is unavoidable if foot joints are opened.
3. Since the foot is corrected before the infant starts walking the weight bearing forces further help to maintain the correction.
4. The question of whether the muscles are weakened by the lengthening procedure can only be answered partially on the

basis of the present material. At follow up there was invariably atrophy of the lower leg muscles, which seems to be due to the severity of the condition rather than the lengthening of the tendons.

The usual criticism of this operation is poor wound healing. This can be avoided if:

1. the skin incision is planned carefully as suggested
2. the dissection is done gently and carefully avoiding damage to the blood supply of the heel flap
3. complete or over-correction is avoided before the skin wound has healed.

The average follow up period for the 10 operated cases is not long enough to draw any definite conclusions but 9 of them are now in the walking age group and their feet are plantigrade and supple. In one case the wound broke down because of post operative infection. The deformity recurred requiring further operative correction.

TABLE III  
CONSERVATIVE TREATMENT AND  
SOFT TISSUE RELEASE

Result	Number	Percent
Good	9	90%
Fair	1	10%

In conclusion: it is felt that a fair trial of conservative treatment should be made in all cases of club foot but should not be unduly prolonged. If sufficient correction is not obtained within three months, a soft tissue release even at an early age offers a good prognosis.

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