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التوثيق الالكتروني والميكروفيلم

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بالرسالة صفحات لم ترد بالأصل

THE USE OF EXTERNAL FIXATOR IN THE MANAGEMENT OF RESISTANT AND RELAPSED CLUBFOOT

Thesis

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Of Orthopaedic Surgery

By

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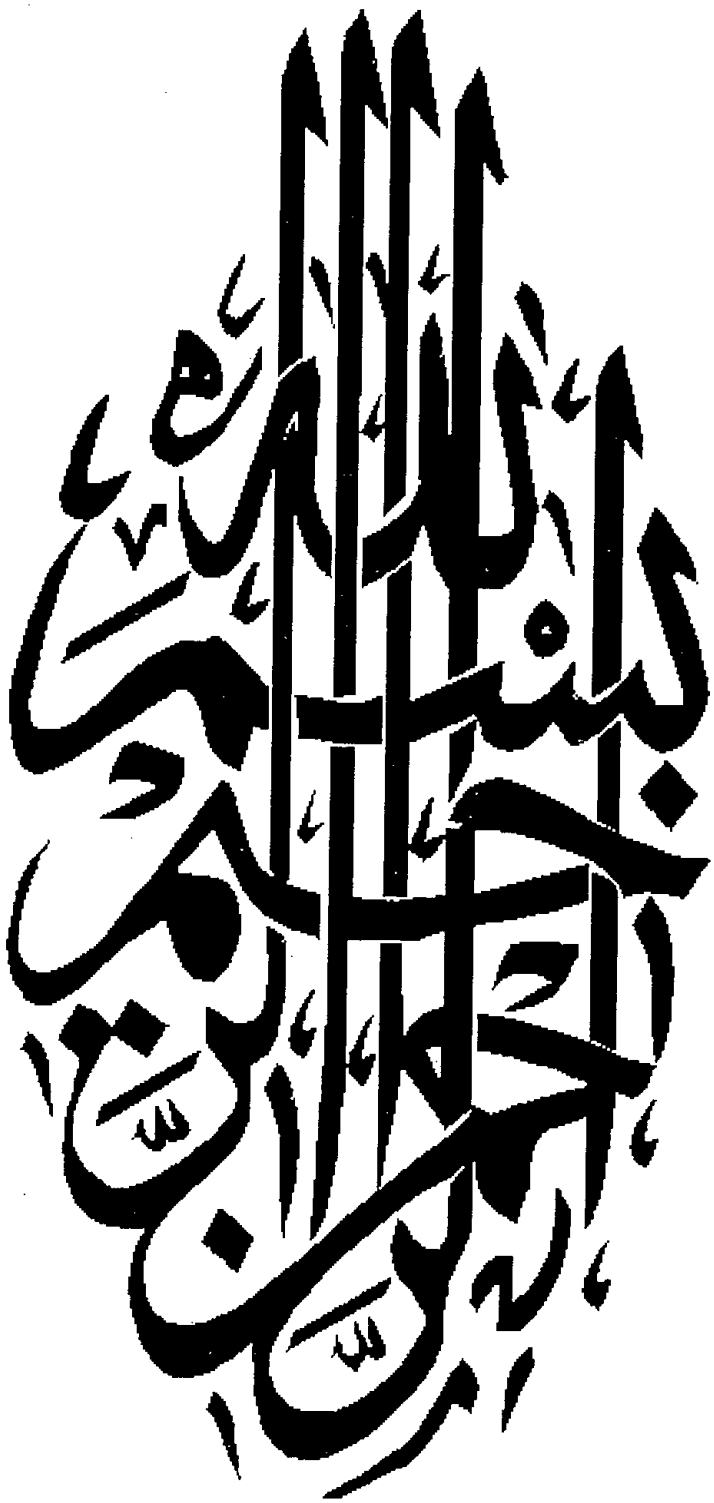

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INTRODUCTION

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The structure and anatomy of the foot can be affected by different diseases, among, these are the congenital diseases.

A congenital clubfoot by far the commonest congenital abnormality of the foot. Congenital idiopathic clubfoot comprises 25 percent of all foot deformities in any major orthopaedic centre ***(Turco, 1981)***.

Most anatomical studies of clubfoot of new born infant show the different pathological changes as osseous changes, articular malalignments and soft tissue changes ***(Ippolito and Pornset, 1988)***.

Relapsed clubfoot presupposes that a complete correction has been obtained and had subsequently been lost. However, it is evident from previous studies that the relapsed clubfeet are feet that have never been completely corrected, in which the different iatrogenic causes and patho-anatomical change have resulted in revision to the earlier stage of equinovarus ***(Sharrard, 1979)***.

In spite of good initial correction, evidence of recurrent deformity and loss of correction is noted within the first year after surgery and evaluation of results of management of clubfoot is influenced by preoperative variables, including the age of patient, severity of deformity, previous non-operative and operative treatment ***(Beatson, Pearson, 1966)***.

Management of relapsed and neglected clubfoot carried out by two methods :

1. Operative treatment.
2. Distraction technique.

The operative procedures are divided into two categories :

A. Procedures that involve soft tissue release and tendon transfer.

B. Procedures that involve bony correction.

The amount of soft tissue release should be decided by the amount of residual deformity that requires correction, Hence, the surgical treatment vary from close tenotomy and limited posterior release to extensive radical postero-medial release and subtalar release ***(Cumming and Lovoll, 1988)***.

After the second year, secondary structural adaptive bone changes play an increasing part in failure to obtain full correction. By the age of 3 or 4 years, correction of one or more of the bony elements of the deformity is indicated. It consists of realignment of the bone articular surface of the tarsus with minimal bone resection.

The correction of neglected and relapsed clubfoot by an external distraction is an alternative to a major operations which may involve osteotomies and tripple arthrodesis and in cases with skin problems. The distraction techniques have the advantage of avoiding the shortening of the foot that resulted from wedge osteotomies. The principle used is to balance the discrepancy in length between the lateral and medial side of the foot by distraction ***(Grill and Frank, 1987)***.

There are two types of external fixator used in the correction of the deformities, ring fixator ***(Ilizarov)*** and unilateral fixator.

The ***Ilizarov*** apparatus can be used to create soft tissue distraction or used in conjunction with osteotomies. The choice of approach depends on the age of the patient the presence of fixed bony deformities, and the stiffness of the foot ***(Paley, 1988)***.

In spit of good results of ***Ilizarov*** it is a complex apparatus, needs an experienced and trained surgeon and it is an expensive apparatus.

Our apparatus has been developed primarily for the paediatric age group, though its large version used in adolescents. It provides precisely controlled distraction and direction at the site of the deformity with six adjustable axes in three planes for gradual elongation of the soft tissues under radiological control. At the end of the distraction the foot is supple and pliable, like a bag of bones and cartilage in an envelope of soft tissues, and is amenable to precise molding in casts or external fixation.

The apparatus used in this study had the same idea of ***Ilizarov*** which is gradual stretching technique and also correction occurs in different planes and all components of the deformity of C.T.E.V. can be corrected at the same time but this apparatus differs from ***Ilizarov*** in the following :

a. Its assembly is easy.
b. Its application is so simple and orthopaedic surgeon can uses this fixator simply.
c. Economically is more cheep than ***Ilizarov***.

lower tibia and with the lateral and medial malleoli. The under surface of the body has a large oblique concave facet, for articulation with the calcaneus.

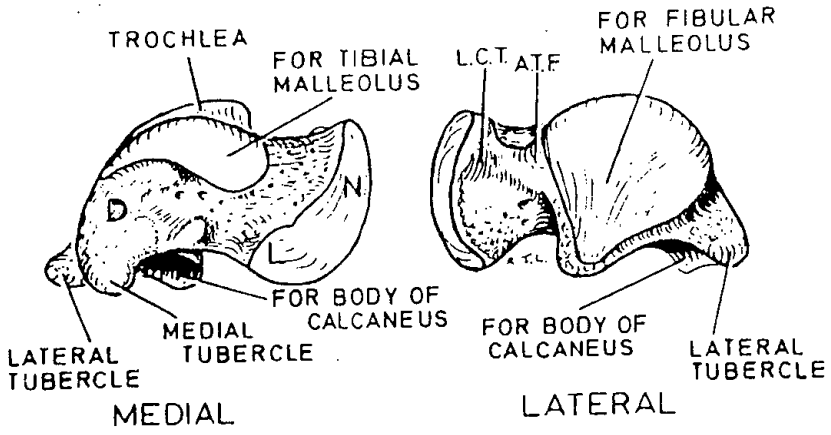

Fig. (3) : Medial and lateral views of the left talus (After Giannestras N.J. : Foot disorders : Medical and Surgical Management 2nd Ed. Philadelphia lea Fibiger, 1973)

The neck of the talus is the short, constricted, and narrow portion of the talus. It is directed forward and medially. It has a deep groove on the medial planter surface, which forms the roof of the bony canal when articulated with the calcaneus (sinus tarsi).

The head of the talus is capped by a large articular surface, facing forwards and downwards. Anteriorly, the surface, is convex for articulation with the navicular. Inferiorly, it is flattened for articulation with the sustentaculum tali and the body of the calcaneus. Both are separated from each other by triangular convexity for the spring ligament and the deltoid ligament attachment.

C. The navicular :

It is located between the talus and three cuneiforms. Proximally, concave articular surface accommodates and covers the head of the talus. Distally, three separate concavo-convex facets are present for the three

cuneiforms. Laterally, a small facet for the cuboid is usually present. A prominent medial planter projection, the tuberosity, provides the insertion of the tipialis posterior.

D. The cuboid :

It is wedge-shaped, being narrow at the lateral margin and broad medially. It articulates with the calcaneus proximally and with the fourth and fifth metatarsal bones distally. The medial surface has an oval facet for articulation with the lateral cuneiform, and frequently with the navicular. On the planter surface, there is a groove for the peroneus longus tendon.

II. The muscles of the lower leg and foot :

The muscles of the lower leg and foot can be divided into two groups : the extrinsic muscles, which are a group of muscles that originate in the leg and insert on the bones of the foot, and the intrinsic muscles, which arise from the tarsal bones and insert on the bones of the foot or tendons of the extrinsic muscles (Fig. 4).

A. Extrinsic muscles :

The *triceps surae* forms the greater part of the calf. It consists of the gastrocnemius and the soleus. Both act together on the tendo-calcaneus. It is the largest and the strongest human tendon. It is inserted into a smooth transverse area on the middle third of the posterior surface of the calcaneus. It is the powerful planter flexor of the foot. When it contracts, it pulls the posterior tuberosity of the calcaneus upwards, and because it inserts on the calcaneus medial to the subtatar axis, it also inverts the foot ***(Last, 1985)***.