Low Profile llizarov Frame in Correction of Varus Deformity in Patients With Adolescent Blount's Disease

Thesis

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Contents

List of abbreviations

ACL	**anterior cruciate ligament.**
AP	anteroposterior.
CORA	centre of rotation of angulation .
EFT	external fixation time.
FDO	focal dome osteotomy.
FshA	femoral shaft axis.
JLCA	joint line convergence angle.
LAT	lateral.
LCL	lateral collateral ligament.
LDFA	lateral distal femoral angle.
LDTA	lateral distal tibial angle.
LLD	limb length discrepancy.
LOTV	late onset tibia vara.
MAD	mechanical axis deviation.
MAF	mechanical axis of the femur.
MA-LE	mechanical axis of lower extremity.
MAT	mechanical axis of the tibia.
MCL	medial collateral ligament.
MPTA	medial proximal tibial angle.
PCL	posterior cruciate ligament.
PPTA	posterior proximal tibial angle.

S	Significant.
SD	standard deviation.
SCO	straight cut osteotomy.
TFA	thigh foot angle.
TSF	Taylor spatial frame.
TshA	tibial shaft axis.
TTT	total treatment time.

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ABSTRACT

Introduction: Adolescent Blount disease or late onset tibia vara constitutes the most common cause of pathologic genu varum in late childhood and adolescence. It is a developmental condition characterized by disordered endochondral ossification of the posteromedial part of the proximal tibial physis resulting in multiplanar deformities of the lower limb

Aim of the work: The aim of this study wasto evaluate the results of acute correction of Adolesent Blount disease by using low profile Ilizarov frame.

Patients and Methods: Equipment used It is a prospective study for 10 patients who had adolescent Blount disease treated by acute correction using low profile Ilizarov frame . We looked principally into the following variables to evaluate the results of the treatment: Deformity correction (expressed as mechanical axis restoration), the average normal values were used as a reference (medial proximal tibial angle, 85–90; posterior proximal tibial angle, 77–84; thigh–foot angle, +10 external rotation)

Keywords: Blount disease , Low profile Ilizarov , acute correction

Introduction

Adolescent Blount disease or lateonset tibia vara constitutes the most common cause of pathologic genuvarum in late childhood and adolescence.It is a developmental condition characterized by disordered endochondral ossification of the posteromedial part of theproximal tibialphysis resulting in multiplanar deformities of the lower limb[(1)].

In 1922, Erlacher[(2)] is credited with the first description of progressive tibialvarus deformity in otherwise healthy children.

In 1937, Blount[(3)] reviewed previous reportsadding his own cases. He was the first to identify two forms of this disorder; infantile and adolescent (late onset)and coined the term "osteochondrosisdeformans tibiae" . However, the conditionalso referred to as "tibia vara" in the literature, is often referred to as Blount disease.

Langenskiold[(4)] made significant earlycontributions to the identification and management of infantile Blount disease in 1964. He described a prognostic radiographicclassification system.

Although Blount coined theterm tibia varaimplying a solely frontal plane deformity, subsequentauthors noted that multiplanar deformities are commonlyseenwith this condition. Secondary to the asymmetricalgrowth with relativeinhibition of the posteromedial portion ofthe proximal tibial growth plate, a three dimensional deformityof the tibia with varus, procurvatum (apex anterior), and internalrotation develops, along with possible limb shorteningin unilateral cases[(5,6)].

This entity can lead to a progressive deformitywith gait deviations, limblength discrepancy, and prematurearthritis of the knee[7,8].

Two clinically distinct forms ofBlount disease; earlyonset(infantile) and lateonset have been described, with the classifications based on whether the limb deformity develops before or afterthe age of four years[3,4,9].

Thompson and Carter[9] further classifiedlateonset Blount disease as a juvenile type (onset at theage of four to ten years) and an adolescent type (onset after theage of ten years).

Bilateral involvement is common, particularlywith an earlyonsetpresentation[6]. Although there are clinical and radiographic differences between early and lateonsetBlount disease, there are several similarities, including apredisposition for obese black children. Also, there are comparable histologic findingsat the proximal tibial growth plate[9-11].

The prevalence ofadolescent Blount disease may be as high as2.5% in the population at greatest risk, obese black males [12,13]. Incidence mayfurthermore be escalating because of the increasing prevalence of morbid obesityin western society[14]. Male:female ratio of 4:1 and over 90% of patients obeseand black[15-16].

It is postulated that the medial femoral physis also suffers growth inhibition due to the high loads through the medial knee joint particularly in older obese patients with a fat thigh gait[17].

Several treatment modalities were described for these cases as proximal tibialosteotomy, growth modulation, and medial plateau elevation that are either carried out as an isolated procedure or in combination with other osteotomies[18-20].

Proximaltibial osteotomy is still the standard surgical management for late onset cases where the researchers observed that the proximal tibialphysis typically grow symmetrically following this osteotomy [21,22, 26].Methods of fixation of the osteotomy have changed, from plaster alone to include limited internal fixation with Steinmann pins, stable internal fixation with compression plates or external fixation.

Due to the difficulties associated with obesity in lateonset Blount disease, external fixators have become a popular fixation method, including monolateral and circular fixators. The deformity correction using external fixation can be done either acutely or gradually[23,24,25].While the gradual correction strategy using distractionosteogenesis has its crucial indication in certain situations like addressing severe deformity or a coincident significant anatomical limb length discrepancy,as it requires a high degree of patient compliance and still has its recorded complications[27,28]. Conversely, patientsshoud bemore compliant toacute correction strategy andrequires less regular follow up visits, but it needs proper case selection