

Study of Anterior Tibial Laxity Using GNRB[®] in Healthy Knees in Children Aged 8 to 15

Damien Marmouset, Alves A, Laurent R, Kabbaj R, Vialle R and Bachy Razzouk M

Department of Orthopedic Pediatric Surgery, CHU Trousseau 26 Avenue du, Paris, France

*Corresponding author: Damien Marmouset, Department of Orthopedic Pediatric Surgery, CHU Trousseau 26 Avenue du, Paris, France, Tel: +33 649926079; E-mail: damienmarmouset@gmail.com

Received date: February 28, 2019; Accepted date: March 27, 2019; Published date: April 02, 2019

Copyright: © 2019 Marmouset D, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License; which permits unrestricted use; distribution; and reproduction in any medium; provided the original author and source are credited.

Abstract

Introduction: The ruptures of the anterior cross ligament are increasing in the child. The risk of minuscular injury and premature arthrosis degradation, therefore, explain the evolution of ligamentoplasty in the growing child. The GnrB device is used in clinical practice in the preoperative evaluation of anterior cross ligament ruptures in adults and in the postoperative assessment of ligamentoplasties. The child has an evolutionary intrinsic peripheral laxity with growth.

The objective of this study is to analyze anterior tibial translational physiology in a healthy population of children to obtain reference values and to assist in the analysis of the pre-or post-operative assessment of past cross ligament ruptures in a growing child.

Material and Methods: 60 children under the age of 15 were included in this monocentric prospective study conducted between November 2017 and April 2018. The inclusion criteria were: age between 8 and 15 years, no history of pathology or knee surgery, no muscular pathology. 30 girls and 30 boys, divided into three age groups 8-10 years, 10-12 years and >12-15 years were included on a voluntary basis during an orthopedic consultation.

A laximetry test by the GnrB device was carried out at various successive thrusts (134, 150 and 200 N). A Student test was used for statistical analysis

Results: The average age was of 11,21 years \pm 2,14. The youngest children presented pains during the pushes of 200 N, leading to a stop of the test. The values of travel on the set of the children were respectively in 134 N, 150 N and 200 N of 7,01 mm \pm 2,7 mm; 7,34 mm \pm 2,59 mm and of 9,03 mm \pm 2,57 mm. There was no significant difference between the left and right knees at each press ($p=0,09$; $0,11$ and $0,31$). There was no significant difference between girls and boys. The values of three age groups for every push were compared. There is no significant difference in the travel neither between the groups >12-15 years old and 10-12 ans and 8-10 ans nor between the groups 10-12 ans and 8-10 ans.

Discussion: By comparing the results with the literature, the laxity at the child seems superior to the adult. The device GnrB is a technique for diagnosing rupture and postoperative evaluation of previous cruciate ligament rupture in adults with a valuable defined threshold. If the device GnrB is available for clinical practice in an 8-year-old child, the presence of physiological relaxation must be considered when interpreting the results.

Keywords: Pediatric; Anterior cross ligament; GnrB

Introduction

In the past few years, the incidence of knee sprains, especially in children, has increased, mainly in exercise children [1]. These children develop important complications in adulthood such as instability, associated meniscal lesions, and gonarthrosis.

The diagnosis of rupture of the Anterior Cross Ligament (ACL) is mainly clinical by Lachman Tests and the pivot shift test [2-6]. However, these maneuvers are reviewer-dependent, imprecise, and not reproducible. The sensitivity of these tests for total breaks is excellent (96% for the Lachman and 86% for the pivot shift test, but poor for partial breaks (68% and 67%) [7,8]

Imaging examinations such as MRI have excellent sensitivity and specificity in children (97.9% and 98.6% for radiologists, 100% and 98.6% for orthopedists, respectively) in the diagnosis of LCA rupture. However, these examinations are costly and cannot be used for the measurement of anterior tibial laxity and for post-operative monitoring [9]. For these reasons, measurements objectifying the anterior tibial translation have been developed: Telos, KT-1000, Rollimeter and more recently GnrB. These devices are useful in adults for objectively quantifying anterior tibial translation in ACL rupture diagnosis and postoperative follow-up [3]. The GnrB system showed that it had a better intra and inter reviewer reproducibility compared to KT 1000 [4] and Telos [8], and was more efficient in diagnosis. Applied femoropatellar pressure can influence results.

However, there is limited data in children regarding GnrB measurements of normal 3 values of anterior tibial laxity. It would,