Patellar Maltracking in the Skeletally Immature

A study submitted for partial fulfillment of
master degree in ***Orthopedic surgery***

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2017

﴿وَقُل رَّبِّ زِدْنِي عِلْماً﴾

سورة طـــه الآيـــــه رقم ١١٤

Acknowledgement

First of all, all gratitude is due to **God** *almighty for blessing this work, until it has reached its end, as a part of his generous help, throughout my life.*

Really I can hardly find the words to express my gratitude to **Prof. Dr. Mohammed Nabil Khalifa,** Professor of orthopedic surgery, *faculty of medicine, Ain Shams University, for his supervision, continuous help, encouragement throughout this work and tremendous effort he has done in the meticulous revision of the whole work. It is a great honor to work under his guidance and supervision.*

Really I can hardly find the words to express my gratitude to **Prof. Dr. Maged Mohamed Samy Abou Elsoud**, *Professor of orthopedic surgery, Faculty of Medicine, Ain Shams University for his continuous directions and meticulous revision throughout the whole work. I really appreciate his patience and support.*

Last but not least, I dedicate this work to my family, whom without their sincere emotional support, pushing me forward this work would not have ever been completed.

Ahmed AbdelAziz Attia

Contents

List of Abbreviations

AM	:	Adductor Magnus.
AT	:	Adductor tubercle.
CT	:	Computed tomography.
EMG	:	Electromyography.
IT	:	Iliotibial.
LAN	:	Lateral articular nerve.
MAN	:	Medial articular nerve.
MCL	:	Medial collateral ligament.
MPFL	:	Medial patellofemoral ligament.
MPML	:	Medial patellomeniscal ligament.
MPTL	:	Medial patellotibial ligament.
MRI	:	Magnetic resonance image.
MRP	:	Medial retinaculum plication
PAN	:	Posterior articular nerve.
PFJ	:	Patellofemoral joint.
PFJR	:	Patellofemoral joint reaction.
PFPS	:	Patellofemoral pain syndrome.
Q	:	Quadriceps.
ROM	:	Range of motion.
TT-TG	:	Distance between tibial tuberosity trochlear groove.
VL	:	Vastus lateralis.

List of Abbreviations (Cont.)

VM	:	Vastus medialis.
VML	:	Vastus medialis longus.
VMO	:	Vastus medialis obliquus.

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Abstract

Patellar maltracking is one of the most common causes of anterior knee pain in the skeletally immature. Multiple reasons like genu valgum, patella alta, rotational deformities, trochlear dysplasia and generalized laxity, might be the major cause of patellar instability. An exact identification of the exact reason is important to plan for a proper management (conservative or surgically).

This essay describes the definition, etiology, diagnosis and treatment options for maltracking of patella in the skeletally immature. And focuses on the soft tissue surgical procedures which more likely to be appropriate in the skeletally immature, and the great role of MPFL anatomic reconstruction.

Keywords

-Patellar maltracking.

-Skeletally immature.

-Physeal sparing procedures

-Medial patellofemoral ligament reconstruction.

Introduction

Patellofemoral alignment refers to static relationship between patella and femoral trochlea at a given degree of knee flexion.

Patellofemoral tracking refers to dynamic patellofemral alignment during knee motion. Patelofemoral malalignment and maltracking refers to condition in which there is an imbalance on the forces on the patella that produce abnormities of alignment and tracking.[1]

This imbalance may result from combination of variables in bony geometry,function of active and passive soft tissue restrains (passive, patellar ligament medial and lateral patellar retinaculae) (active quadriceps muscle) and functional demands.[1]

The results of patellofemoral maltracking and malalingment are unfavorable stresses on shearing forces that exceeds the physiological threshold of tissue and may result in cartilage damage, degenerative changes, and strain of ligamentous structure, mechanical failure or patellar dislocation.[1]

Repeated minor trauma and over use play an important role in development of lesions in Hoffman's pad, extensor mechanism, medial and lateral restrains on cartilage surface. However an increased or change in activity is also playing a role.[2]

That anatomy and biomechanics of patellofemoral joint is complex and symptoms are often unspecific and patient usually complains of anterior knee pain and given away.[2]

The link between anatomical or pathological finding and symptoms are variable and many surgical procedures used for patellofemoral disorders have variable results especially after long-term follow up. This important because patellofemoral relationships are usually measured in supine resting knee and failure occurs in loaded functioning knee.[1]

The most common mechanism of first-time patellar dislocation is a flexed position of the knee with internal rotation on a planted foot with a valgus component. [2]

In the presence of maltracking and patellar instability there is no single structure which can be surgically attended,

repaired or reconstructed in all cases to expect a satisfactory result as it is multifactorial in etiology. [3]

A number of surgical options are available to treat patients with patellar dislocation, and proper diagnosis is decisive for selecting the most promising treatment. [4]