MANAGEMENT OF TRAUMATIC DISORDERS OF THE KNEE IN CHILDREN AND ADOLESCENTS

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CONTENTS

LIST OF ABBREVIATIONS

ACL ..... Anterior Cruciate Ligament

AP ..... Anteroposterior

CT ..... Computed Tomography

JOCD ..... Juvenile Osteochondritis Dissecans

LCL ..... Lateral Collateral Ligament

MCL ..... Medial Collateral Ligament

MFLs ..... Meniscofemoral Ligaments

MPFL ..... Medial Patellofemoral Ligament

MRI ..... Magnetic Resonance Imaging

NSAIDs ..... Nonsteroidal Anti-Inflammatory Drugs

OCD ..... Osteochondritis Dissecans

OSD ..... Osgood-Schlatter Disease

PCL ..... Posterior Cruciate Ligament

PFJRF ..... Patellofemoral Joint Reaction Force

Q-angle ..... Quadriceps Angle

SLJD ..... Sinding-Larsen-Johansson Disease

LIST OF FIGURES

LIST OF TABLES

TABLE **PAGE**

INTRODUCTION AND AIM OF THE STUDY

INTRODUCTION

During the past 20 years, there has been a progressive increase in the number of young people participating in organized sports. With the increase in sports participation, more young athletes are presenting for diagnosis and treatment of musculoskeletal injuries. In pediatric athletes, the knee is the most frequent site of sports-related injury.[1]

Traumatic forces applied to the immature knee result in fracture patterns different from those in adults. The relative abundance of cartilage in the knee of the growing child may make the diagnosis of certain injuries more challenging. If plain radiographs fail to reveal a fracture, a stress radiograph, computed tomography scan, or magnetic resonance imaging study may help to establish the diagnosis. Certain fractures, such as hyperextension injuries to the distal femoral or proximal tibial epiphysis, or displaced tibial tuberosity fractures, may be especially susceptible to neurovascular problems.[2]

Knee ligament injuries in children were once believed to be extremely rare. Before the 1980s, it was thought that complete ligament disruption in children occurred only after growth plate closure, because injury to the physis and long bones tended to occur prior to ligament damage. Several biomechanical studies have also shown the ligaments to be generally stronger than the growth plate. More recently, it has become apparent that ligamentous injury can occur in the pediatric population. In addition, multiple recent articles have documented the incidence of anterior cruciate ligament (ACL) injuries in children, and a smaller but substantial number of articles have discussed the occurrence of posterior cruciate ligament (PCL) injuries in skeletally immature patients. Studies documenting injuries to the collateral ligaments and their treatment in children have also been published.[3]

Meniscal injuries to Children and adolescents were previously, considered to be extremely rare and were said to not occur in

menisci of normal shape. Meniscal injury in patients younger than 9 years of age is still quite rare in morphologically normal menisci. However, meniscal tears in previously normal menisci are seen with increasing frequency in children older than 9 years.[4]

In addition to the common acute injuries that occur about the knee, such as patellar dislocation and ligamentous and meniscal damage, sports-related musculoskeletal injuries caused by overuse are seen frequently. Overuse injury results from unresolved, submaximal stress in previously normal tissues. Normal physiologic adaptation occurs in response to use, and reasonable amounts of stress are essential for normal connective tissue function. However, when this system is overwhelmed and an adequate time frame for stress resolution is not provided, overuse injuries occur.[5]

Osteochondritis dissecans (OCD) is a relatively common cause of knee pain and dysfunction in children and adolescents.[6] Osteochondritis dissecans (OCD) of the knee is a condition in which a fragment of bone and its overlying articular cartilage have become separated from the underlying bone. The etiology of OCD is controversial and remains unclear. Theories include ischemia, repetitive microtrauma, familial predisposition, and accessory centers of ossification. Of these, repetitive microtrauma, seems to be the most possible cause.[7]

The physical examination, imaging studies, and treatment options carry different implications for children than for adults. The orthopaedic surgeon must understand these differences and apply them in his or her clinical practice.[8]

AIM OF THE STUDY

The aim of this study is to delineate different traumatic knee disorders that affect children and adolescents, and to clarify diagnostic methods and treatment options for each of them.

ANATOMY
OF THE KNEE JOINT