THE EFFECT OF BASKET BALL PLAYING ON KNEE EXTENSOR MECHANISM

Thesis

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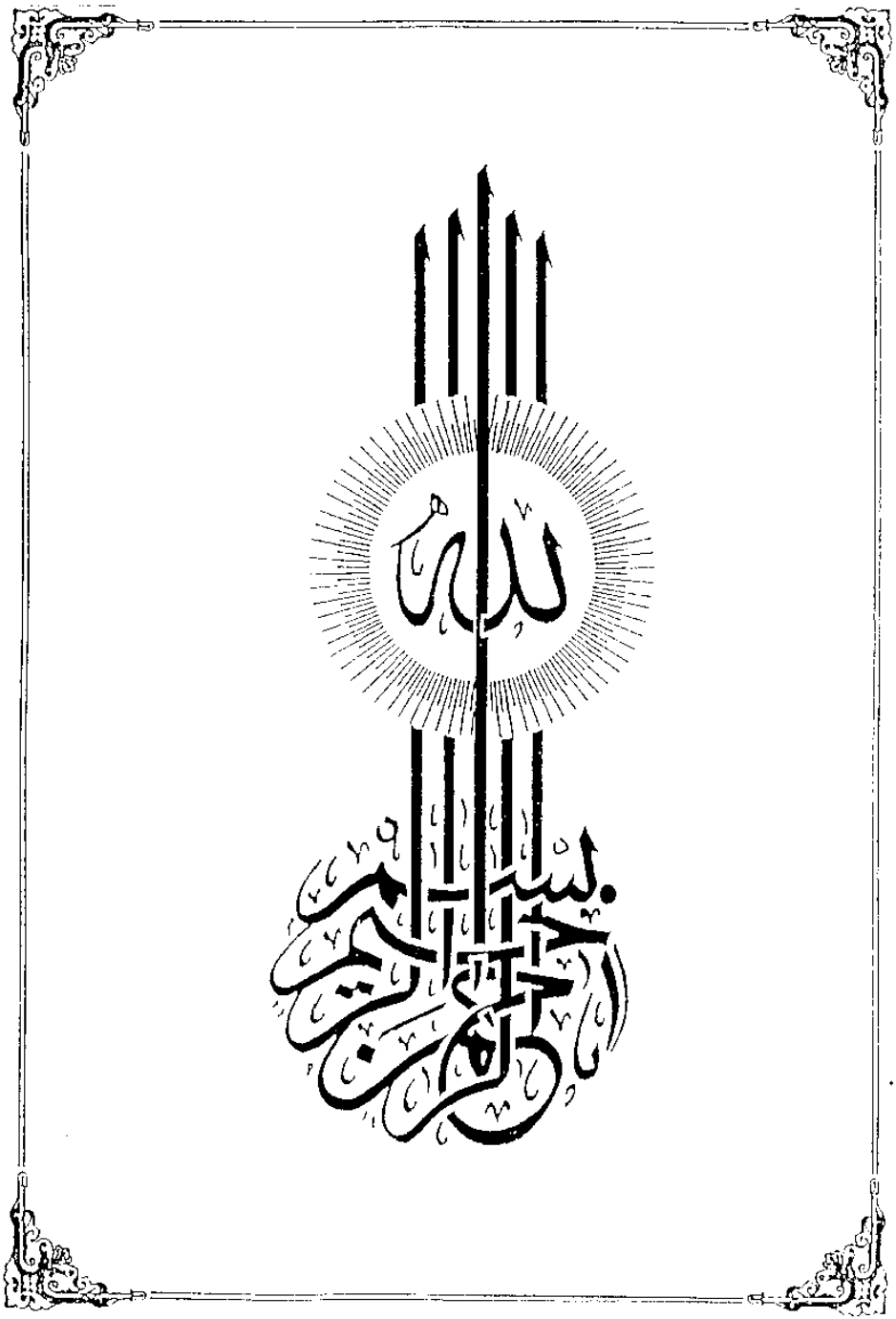

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CONTENTS

Chapter I.

INTRODUCTION

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Injuries to the knee extensor mechanism are common in athletes, especially among Basketball and Volleyball players .

The most common reason for anterior knee pain, in sports activities needing repeated jumping (repeated vigorous contraction of quadriceps muscle), is the so called "*Jumper's Knee Syndrome*". Jumper's knee is characterized by inflammatory and degenerative changes of both distal quadriceps and the patellar tendon (tendinitis), with their insertions to the patella (apicitis). The pathological changes are most often located at the insertion areas. Microruptures and/or macroruptures, caused by repeated jumping, are often seen. A high lying atella (patella alta) has been shown to predispose subjects to patellar dislocations and subluxations; and in some studies also, to patellar chondromalacia and patellar apicitis. It is not known if repeated forceful traction (caused by excessive jumping) during growth can lead to patella alta (Kujala, 1989).

David et al (1989) found that in adolescents who engaged in jumping sports, at an earlier age, injuries to the lower extremities are becoming more common.

Although the knee is vulnerable to acute traumatic injury, repetitive stress also causes an increasing number of problems. The adolescent athlete involved in jumping sports is particularly prone to compromising the extensor mechanism. The common stress injuries to the extensor mechanism in the active adolescent athletes are chondromalacia patellae, jumper's knee syndrome, Osgood Schlatter's disease, and , to a lesser extent, quadriceps tendinitis and avulsion fractures of the proximal pole of the patella or avulsion of quadriceps mechanism. Recently, however, with increased participation in jumping sports, stress fractures of the adolescent patella have been reported by an increasing number of authors (Kurt et al, 1989) .

Although physical examination is necessary in the evaluation of the patellofemoral joint, basic radiological evaluation, including antero-posterior, lateral and axial views, are very helpful in the diagnosis (Kurt et al, 1989) .

In 1988, Fritschy found that the use of ultrasonographic examination can give new and precise information that help in the diagnosis, choice of treatment, and monitoring of the evolution of jumper's knee.

Chapter II.

AIM OF THE WORK

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The aim of this work was to :

1- Review the literature on the effects of repeated jumping on the knee extensor mechanism .

2- Conduct a clinical study on basketball professional athletes, in order to guide young beginners and professional players to protect them from the occurrence and complications of such injuries .

REVIEW OF LITERATURE

EMBRYOLOGY OF KNEE EXTENSOR MECHANISM

DEVELOPMENT :

Gray and Grander (1950) , the patella analge is distinguishable within the quadriceps condensation by close aggregation of rounded cells in the 20 mm. embryo. By the time the embryo reaches 30 mm., it is clearly a cartilaginous analge.

In the embryo, the knee develops in a position of 90 degrees flexion before motor units exist to induce movement. This means that the patella initially conforms to the distal aspect of the femoral condyles. The patella acquires a free articular surface by the formation of a primitive joint plate in common with the distal femur.

The patella increases in relative size, up to the sixth month of the fetal life; after which it increases at the same rate, as the other bones of the lower limb. Initially, the medial and the lateral facets are equal in size. However, by the 192 mm. stage (23 weeks), the patella has a larger lateral facet.

ANATOMY OF KNEE EXTENSOR MECHANISM

The vastus medialis, the vastus lateralis, and the rectus femoris muscles form an intermediate layer, that inserts proximally on the patella ; and also continues distally as tendinous expansions over the anterior patella , to complete the patellar tendon or ligament , and inserts on the anterior tibial tuberosity . The deep layer of the quadricpes is formed by the rectus intermedius, which is aligned parallel to the femur, and inserts proximally on the patella . The arciform layer forms the most superficial layer (medial and lateral retinacula).

The vastus medialis muscle fibers are predominantly sagittally oriented, normally, with a smaller oblique portion at a greater angle to the sagittal plane (Lieb, 1968). The oblique portion of the vastus medialis muscle originates from the adductor tubercle at a 50 to 55 degree angle to the sagittal plane .

On the lateral side of the knee, the vastus lateralis also has a predominant longitudinal muscle orientation of 12 to 15 degrees to the sagittal plane , with a small oblique portion

similar to that of the vastus medialis obliqus (Figure 1)

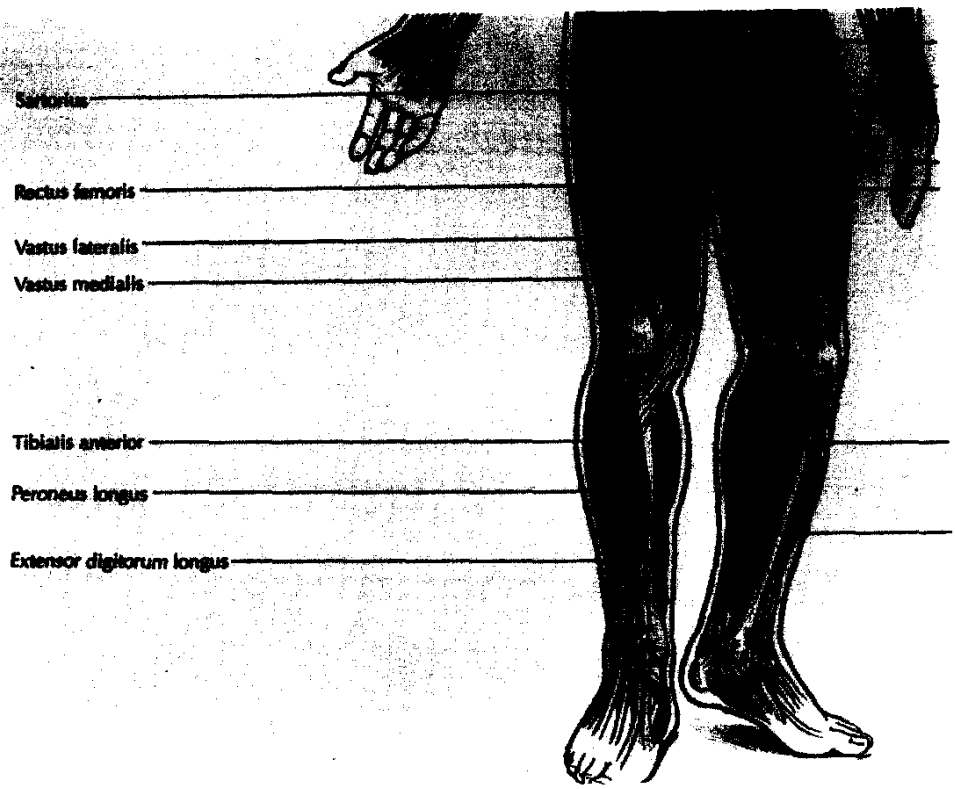

Figure 1 : Muscles of knee extensor mechanism .

PATELLAR MORPHOLOGY

The patella is the largest sesamoid bone in the body, which lies in front of the knee joint, embedded in the back of the tendon of the quadriceps femoris.

It is flattened and triangular below , curved above , and has anterior and posterior surfaces, three borders, and an apex. In the living subject, in the erect attitude, its lower limit lies more than one centimeter. above the line of the knee joint.

THE ANTERIOR SURFACE :

The anterior patellar surface is easily palpable, slightly convex in all directions, and is divided into 3 parts. The rough superior third, which forms the base of the triangle, receives the insertion of the quadriceps tendon. The superficial portion of this tendon continues over the anterior surface, to form the deep fascia which is densely adherent to the bone. The middle third reveals numerous vascular orifices, and is crossed by numerous vertical striations. The inferior third terminates in a V-shaped point, which is enveloped by the patellar tendon (Ficat and Hungerford, 1977).