SURGICAL MANAGEMENT OF POST TRAUMATIC KNEE STIFFNESS

Essay

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وَقُلِ اعْمَلُوا فَسَيَرَى اللَّهُ
عَمَلَكُمْ وَرَسُولُهُ وَالْمُؤْمِنُونَ

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Dedication

My Family

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Introduction

Post- traumatic knee stiffness is a disabling problem because it causes pain and limited function. This is specially concerning when walking on a level surface requires knee flexion; Arising from the seated position or climping stairs needs90° of flexion[1]

There are many different causes of post traumatic knee stiffnes which can be categeorized into two main groups : intra-articular and extra-articular causes . The Extra articular causes include : stiffness after fractures of shaft of the femur which may be due to damage and subsequent adherence of quadriceps with subsequent fibrosis of some parts which prevent knee flexion . Intra articular causes include: adhesion between fibrous capsule, synovium and bone or they may bind synovium to synovium as in suprapatellar pouch. There may be adhesion between menisci and fat pad of tibia.

Also knee stiffness usually result's as a complication of knee trauma, surgery and prolonged immobilization of knee in cast and slabs[1].

The treatment of this problem is either operative or non operative. The non operative treatment include : Excessive post operative physiotherapy, manipulation of knee joint which should be done gradually[1].

Operative treatment include : quadricepsplasty for quadriceps muscle loss, scarring and adherence to femur after femoral shaft fracture.

Arthroscopic surgical techniques used to visualize adhesion and excise them under direct vision with effectiveness in managing arthrofibrosis of the knee.

By use of adapted Ilizarov external ring fixator and gradual distraction is applied to loosen the stiff knee joint and followed after loosening by a period of exercise during distraction[1].

AIM OF THE WORK

The aim of this essay is to review and study literature regarding the aetiology of post traumatic knee stiffness with particular emphasis on the recent advances in operative techniques and evaluation of the outcome and complications.

ANATOMY OF KNEE JOINT

The knee joint is the largest and most complicated joint in the body. Basically, it consists of two condylar joints between the medial and lateral condyles of the femur and the corresponding condyles of the tibia and a gliding joint, between the patella and the patellar surface of the femur.

The joint between the femur and-tibia is a synovial joint of the hinge variety, but some degree of rotatory movement is possible. The joint between the patella and femur is a synovial joint of the plane gliding variety.

The osseous structures of the knee (Fig. 1 a,b) consist of the femoral condyles, the tibial-plateau and the patella [(2)].

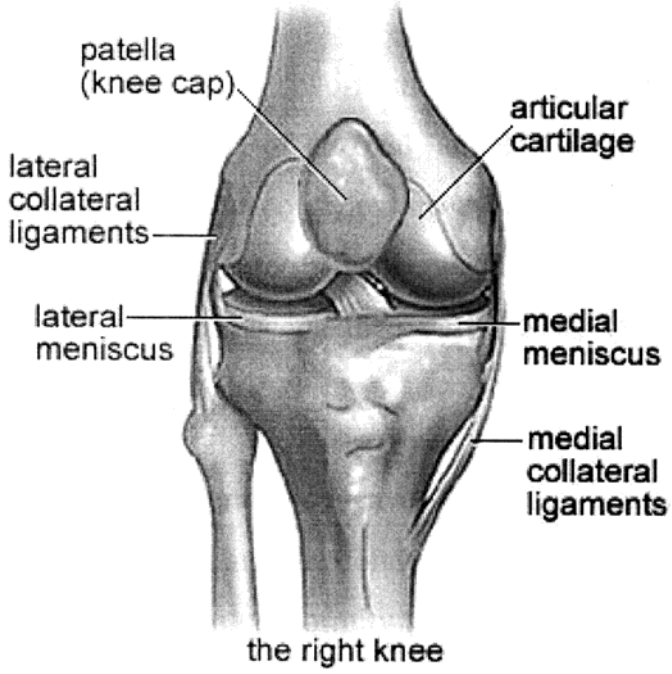

Fig. (1a) : The knee joint anterior view[(2)]

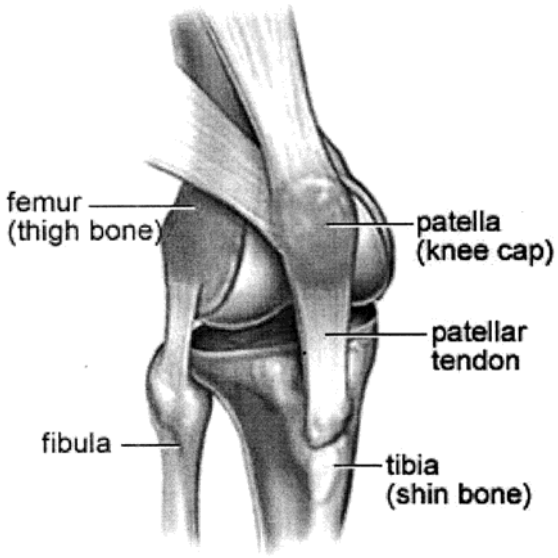

Figure (1b) : The knee joint, anterolateral views. [2]

Femoral Condyles:

The femoral condyles are two-rounded prominences. The anterior portion of the condyle is part of an oval, and the posterior portion is a section of a sphere. Thus the condyles are more curved anteriorly than posteriorly. The groove anteriorly between the condyles is the patellofemoral groove, which accepts the patella. [1]

The Tibial Plateau:

Shows a pair of gently concave condylar articular areas for articulation with the menisci and the condyles of the femur. The surface of the medial condyle is oval in conformity with the medial femoral condyle and meniscus. The surface of the lateral condyle is a little smaller and more nearly circular in conformity with the lateral femoral condyle and meniscus. Between the condylar surfaces the plateau is elevated into the intercondylar eminence with its non-

articular areas in front and behind it show well-marked facets for attachment of the horns of the menisci and the cruciate ligaments. [2]

The Patella:

The patella is a triangular-shaped sesamoid bone that is wider at the proximal border than the distal pole. The articular surface of the patella is divided by a vertical ridge creating a smaller medial and larger lateral articular facets. [2]

The Capsule:

The fibrous capsule is complex, partly deficient and partly augmented by expansions from adjacent tendons. Its posterior fibres are attached proximally to the posterior margins of the femoral condyles and inter-condylar fossa and distally to the posterior margins of the tibial condyles and inter-condylar area. Proximally on each side it is blended with attachments of gastrocnemius and centrally strengthened by the oblique popliteal ligament.

Lateral capsular fibres, attached to the femur above the popliteus, descend over its tendon to the lateral tibial condyle and the fibular head.

Anteriorly the capsule does not extend proximally to the patella, elsewhere it blends with expansion from vasti medialis and lateralis; these are attached to the patellar margins and ligamentum patellae, extending backwards to the corresponding collateral ligaments and distally to the tibial condyles. They form medial and

lateral patellar retinaculae, the lateral being augmented by the iliotibial tract. Proximal to the patella, the absence of the capsule allows continuity of the suprapatellar bursa with the joint. [2]

The Ligaments

The arcuate popliteal ligament

It arches over the popliteus tendon as it emerges from the capsule, with some popliteus muscle fibres being attached to it. From its attachment to the styloid process of the head of the fibula it can be traced upwards to blend with the capsule, sometimes as far as the lateral condyle of the femur; other fibres join the part of popliteus that are attached to the lateral meniscus. [2]

The oblique popliteal ligament

Extends from the semimembranosus muscle, blends partly with the capsule and ascends laterally to the lateral part of the inter-condylar area and lateral femoral condyle. [2]