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Study of Variation in the Length of Menisco-Femoral Ligament in North Indian Population

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ABSTRACT

Introduction: menisco-femoral ligament connects fibro-cartilagenous menisci of the knee to the intercondylar area of femur. Menisco-femoral ligament are two ligaments that connect posterior horn of lateral meniscus to the lateral aspect of medial femoral condyle. It act in synergy with the posterior cruciate ligament. It has protective influence on lateral meniscus. The proposed study was carried out on 50 knee joint, in two age groups ranging from 20-40 years and 41-60 years in department of Anatomy on the human cadaveric knee joint. In present study the length of posterior menisco-femoral ligament was found to decreased with increasing age and p value was found to be statistically significant (< 0.05).
Keywords: Posterior horn; Posterior cruciate ligament; Posterior menisco-femoral ligament.

Introduction

Menisco-femoral ligament was first discovered by Poirier and Charpy but defined it as 3rd cruciate ligament[1]. It connects fibro-cartilagenous menisci of the knee to the intercondylar area of femur. Menisco-femoral ligament are two ligaments that connect posterior horn of lateral meniscus to the lateral aspect of medial femoral condyle. One of these passes anterior to the posterior cruciate ligament is known as ligament of humphry or anterior menisco-femoral ligament. It is closely related to the anterior surface of the posterior cruciate ligament. Other ligament passes posterior to posterior cruciate ligament and is known as ligament of wrisberg or posterior menisco-femoral ligament[2,3]. Amis *et al* reported that anterior menisco-femoral ligament on an average is smaller than posterior menisco-femoral ligament having tensile strength of 302.5N and 300.5N. Amis *et al* reported that menisco-femoral ligament act in synergy with the posterior cruciate ligament[4]. Amadi *et al* reported that in addition to their known function in assisting the posterior cruciate ligament to resist tibiofemoral posterior drawer, the menisco-femoral ligament also have a significant role in reducing contact stress in lateral compartment[6]. Kusayama *et al* reported similar strength for menisco-femoral ligament of 297N[7]. Radioevitch proposed menisco-femoral ligament as "third cruciate ligament[7]".

Material and Methods

The present study was conducted in department of Anatomy Pt. B. D. Sharma Post Graduate Institute of Medical Sciences Rohtak. The proposed study was carried out on 50 knee joint, in two age groups ranging from 20-40 years and 41-60 years in department of Anatomy on the human cadaveric knee joint . Cadavers in which any obvious traumatic injury to the knee joint. or any distortion. or with any surgical scar marks on the knee joint were excluded.

The anterior menisco-femoral ligament is posterior to anterior cruciate ligament and anterior to the posterior cruciate ligament so it could be visualized only when the knee joint is exposed from anterior aspect. The posterior menisco-femoral ligament is posterior to the posterior cruciate ligament and hence could be visualized best when knee joint is exposed from posterior aspect.

So both anterior and posterior approach was used for dissection.

After dissection length of the ligament was measured using Vernier caliper from the midpoint of two points of its attachment.

Figure 1. Showing the measurment of the length of the posterior menisco-femoral ligament

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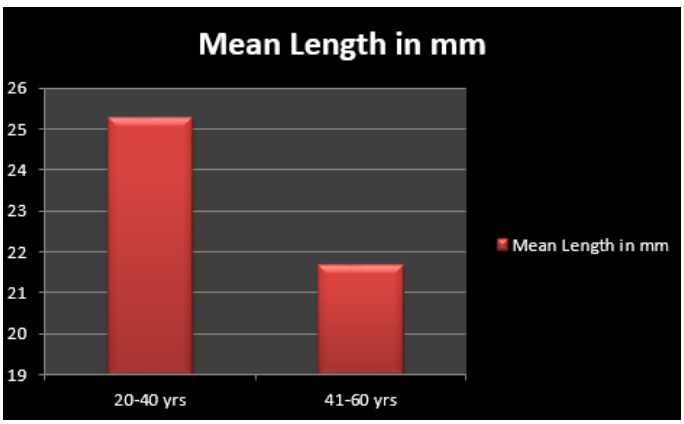
Observation And Results

Mean length of menisco-femoral ligament was measured in two age group. Then the results were compared in both the age group which came out be statistically significant.

Dimensions of posterior meniscofemoral ligament (PMFL)



Graph 1. Showing the mean length of posterior menisco-femoral ligament in two age groups studied.

Table 1. Mean length of posterior menisco-femoral ligament (PMFL) in two age groups.

Length and thickness of posterior menisco-femoral ligament (PMFL)	Age group 20-40 years	Age group 41-60 years	p value
Mean length of PMFL (mm).	25.29±4.8	21.68±4.3	< 0.05

The mean length of posterior menisco-femoral ligament was 25.29±4.8 mm in 20-40 years age group while it was 21.68±4.3 mm in 41-60 years age group showing that the length of posterior menisco-femoral ligament decreased with age and p value was found to be statistically significant (< 0.05).

Discussion

Knee joint is one of the most important joint of our body. Vast amount of literature is available regarding this ligament. Review of literature reveals no unanimity of opinion. This ligament is significant biomechanical structure in the knee joint because of its size and it has protective influence on the posterior horn of lateral meniscus. it prevents the posterior of lateral meniscus from injury by pulling it backwards, that's why medial meniscal injuries are more common than lateral meniscus. The ligament has important relation with posterior cruciate ligament, popliteus muscle and lateral meniscus. So it is important for orthopedic surgeon to know about menisco-femoral ligament and its important relation, its variations.

Gupte *et al* reported the mean length of posterior menisco-femoral ligament to be 23±4.2mm[8]. In present study the mean length of posterior menisco-femoral ligament was found to be 25.29±4.8mm in younger age group while it was 21.68±4.3mm in older age group.

Present study show that the length of posterior menisco-femoral ligament decreases with increasing age and p value was found to be statically significant (0.05) which was in accordance to Lee-Minor who proposed that posterior menisco-femoral ligament is a regressive structure where as anterior menisco-femoral ligament is progressive structure[9]. Hence this decrease in the length of ligament with the increasing age could be due some degeneration changes occurring with the age.

Conclusion

Present study showed that the length of posterior menisco-femoral ligament decreases with increasing age hence posterior menisco-femoral ligament is a regressive structure.

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