



Original Article

Oblique popliteal ligament – an anatomical study^{☆,☆☆}

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ARTICLE INFO

Article history:

Received 8 May 2012

Accepted 3 July 2012

Keywords:

Anatomy

Cadaver

Knee

ABSTRACT

Objective: To study the anatomy of the oblique popliteal ligament, as regards its dimensions, expansion and anatomical relationships.

Methods: Eleven cadaver knees were dissected in order to study the anatomy and take measurements of anatomical structures and relationships of the oblique popliteal ligament. The dissection was for posterior access to the proper exposure of the oblique popliteal ligament, the semimembranosus muscle and its expansions. For measurement of dimensions, 40 × 12 needles were used for marking the specific points and a caliper. The angles were calculated using the software ImagePro Plus®.

Results: The distance from the origin of the oblique popliteal ligament to the tibial plateau was 7.4 mm, the thickness at its origin was 7.3 mm, length was 33.6 mm and the tibial plateau angle 34.8°. The length of the expansion of the proximal oblique popliteal ligament was 39.2 mm, thickness 7.8 mm and angle of the oblique popliteal ligament with its expansion 32.2°.

Conclusion: The oblique popliteal ligament is thick, rises in the semimembranosus and protrudes proximally forming an acute angle with the joint interline, crossing the popliteal fossa. In some cases it has a proximal expansion.

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[☆] Please cite this article as: Fam LPD, et al. Estudo anatômico do ligamento poplíteo oblíquo. Rev Bras Ortop. 2013;48:402–405.

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Estudo anatómico do ligamento poplíteo oblíquo

R E S U M O

Palavras-chave:

Anatomia
Cadáver
Joelho

Objetivo: Estudar a anatomia do ligamento poplíteo oblíquo no que se refere às suas dimensões, expansões e relações anatómicas.

Métodos: Onze joelhos de cadáveres foram dissecados com o intuito de se estudar a anatomia e fazer medições das estruturas e das relações anatómicas do ligamento poplíteo oblíquo. A dissecação foi por acesso posterior até a exposição adequada do ligamento poplíteo oblíquo, do músculo semimembranoso e de suas expansões. Para aferição das medidas, foram usados agulhas 40 × 12 na marcação dos pontos específicos e um paquímetro. Os ângulos foram calculados com o auxílio do software ImagePro Plus®.

Resultados: A distância da origem do ligamento poplíteo oblíquo ao platô tibial foi de 7,4 mm, a espessura na sua origem foi de 7,3 mm, o comprimento foi de 33,6 mm e o ângulo com o platô tibial foi de 34,8°. O comprimento da expansão proximal do ligamento poplíteo oblíquo foi de 39,2 mm, a espessura foi de 7,8 mm e o ângulo do ligamento poplíteo oblíquo com sua expansão foi de 32,2°.

Conclusão: O ligamento poplíteo oblíquo é espesso, nasce no músculo semimembranoso, projeta-se proximalmente, forma um ângulo agudo com a interlinha articular e cruza a fossa poplíteia. Em alguns casos apresenta uma expansão proximal.

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Introduction

The oblique popliteal ligament (OPL) is one of the five insertions of the semimembranosus muscle and forms part of the posterior anatomy of the knee.¹⁻³ This ligament crosses the popliteal fossa from medial to lateral and is considered to be primary limiter of *genu recurvatum* and thus avoid hyperextension of the knee.⁴

The posterior anatomy of the knee consists of a network of structures and has uniquely complex biomechanics. Controlling knee hyperextension due to soft-tissue *genu recurvatum* is one of the functions of the posterior structures, especially the OPL. Hyperextension may alter gait and may lead to difficulty in walking across uneven ground.

Despite the great importance of the posterior structures of the knee, including the OPL, few studies in the literature have given emphasis to these structures, because no techniques for reconstructing them have been described.

The aim of this study was to examine the anatomy of the OPL with regard to its dimensions, expansions and anatomical relationships.

Materials and methods

This study was conducted in the Department of Anatomy of the Biological Sciences Sector of the Federal University of Paraná, in April and May 2011. Eleven knees from cadavers were dissected with the aims of studying their anatomy and making measurements on the structures and on the anatomical relationships of the OPL.

The inclusion criteria specified that only knees from cadavers with undamaged posterior structures, including the joint capsule, without previous arthrotomy, should be used. Eleven knees fulfilled the criteria. The dissection was performed by

means of posterior access and was done such that sufficient exposure of the semimembranosus muscle, the OPL and their expansions was obtained. All the knees were conserved in 10% formol.

To make the measurements, 40 × 12 needles and metal calipers (*Aero Space* – 150 mm) were used to mark out specific points.⁵ Measurements were made of the distance from the origin of the OPL to the tibial plateau (O-P), the thickness of the OPL at its origin (Th-O), the length of the OPL (L), the thickness of the semimembranosus muscle at the point where the OPL arises (Th-S), the thickness of the OPL at the origin of its proximal expansion (Th-OPL-Exp), the thickness of the proximal expansion of the OPL (Th-Exp) and the length of the proximal expansion of the OPL (L-Exp).

The angles of the OPL with the tibial plateau (A-P) and of the OPL with its expansion (A-Exp) were calculated with the aid of the ImagePro Plus® software, version 4.5 for Windows (Media Cybernetics, Inc., USA) (Fig. 1).

Results

The mean and standard deviation results from the measurements made are presented in Table 1.

Proximal expansion of the OPL, with a mean length of 39 ± 7 mm (L-Exp), was observed in four of the eleven cases. It was found to be absent in the other seven anatomical specimens (Fig. 1).

Discussion

Unlike studies on the medial, lateral and central pivot structures of the knee, anatomical and biomechanical studies on the OPL are rare. This lack of interest probably comes from the

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