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Original Article

Anatomical relationships between Wrisberg meniscofemoral and posterior cruciate ligament's femoral insertions☆,☆☆

Heetor Campora de Sousa Oliveira[a,*], *Julio Cesar Gali*[b], *Edie Benedito Caetano*[c]

[a] *Former Resident at the Sorocaba School of Medical Sciences and Healthcare, Pontifícia Universidade Católica de São Paulo (FCMS-Sorocaba/PUC-SP); Voluntary Attending Physician in the Orthopedics and Traumatology Service, FCMS-Sorocaba/PUC-SP, Sorocaba, SP, Brazil*

[b] *PhD in Orthopedics and Traumatology from the School of Medicine, University of São Paulo; Voluntary Attending Physician in the Orthopedics and Traumatology Service, FCMS-Sorocaba/PUC-SP, Sorocaba, SP, Brazil*

[c] *Full Professor and Head of the Orthopedics and Traumatology Service, FCMS-Sorocaba/PUC-SP, Sorocaba, SP, Brazil*

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ABSTRACT

Objective: To evaluate the frequency and morphometry of the Wrisberg's ligament and its relationships with the posterior cruciate ligament's femoral insertion.
Study design: Controlled laboratory study.
Methods: 24 unpaired knee pieces, 12 right and 12 left were submitted to a deep dissection of the Wrisberg and posterior cruciate ligaments. The pieces were photographed with a digital camera and ruler; the Image J software was used to measure the ligaments' insertion areas, in square millimeters.
Results: The Wrisberg ligament was present in 91.6% of the studied pieces. In those its shape was elliptical in 12 pieces (54.54%). In 68% of the knees, the WL insertion was proximal to the medial intercondilar ridge, close to the PCL posteromedial bundle. The average area for the WL was $20.46 \pm 6.12\,mm^2$. This number corresponded to 23.3% of the PCL's average area.
Conclusions: WL ligament is a common structure in knees. There is a wide variation of its insertion area. Proportionally to the PCL's insertion area the WL ones suggests that it may contribute to the posterior stability of the knee joint.

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* *Corresponding author at*: Av. Eugênio Salerno, 387, CEP 18035-430, Sorocaba, SP, Brazil. Fax: +15 3229 0202.
E-mail: hectormed@bol.com.br (H.C.d.S. Oliveira).

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Relações anatômicas entre as inserções femorais dos ligamentos meniscofemoral de Wrisberg e cruzado posterior

Palavras-chave:
Fêmur
Ligamento cruzado posterior
Meniscos tibiais

RESUMO

Objetivo: Avaliar a frequência e a morfometria do ligamento meniscofemoral de Wrisberg e a relação de suas inserções femorais com aquelas do ligamento cruzado posterior (LCP).
Desenho do estudo: Estudo laboratorial controlado.
Métodos: Foram feitas dissecções minuciosas das inserções femorais dos ligamentos de Wrisberg (LW) e do LCP em 24 peças anatômicas de joelhos. As peças foram fotografadas com uma câmera digital e marcador milimetrado; o programa Image J foi usado para medir a área das inserções ligamentares, em milímetros quadrados.
Resultados: O LW esteve presente em 91.6% das peças estudadas. Nessas, seu formato foi elíptico em 12 peças (54.54%). Em 68% dos joelhos a inserção do LW esteve proximal à crista intercondilar medial, próximo à banda posteromedial do LCP. A área média da inserção femoral do LW foi de $2046 \pm 6.12\,mm^2$, o que correspondeu a 23.3% da área de inserção do LCP.
Conclusões: O LW é estrutura frequente nos joelhos, com grande variabilidade de sua área média. Proporcionalmente ao LCP, sua área média sugere que esse ligamento pode contribuir para a estabilidade posterior do joelho.

Introduction

The posterior meniscofemoral ligament, or Wrisberg ligament, goes from the lateral aspect of the medial femoral condyle to the posterior cornu of the lateral meniscus. It has a posterior location that is very close to the posterior cruciate ligament (PCL), with a slightly more oblique direction (Fig. 1). Its frequency of occurrence in humans ranges from 90% to 93%.[1–3]

The first description of the meniscofemoral ligament in the medical literature was made by Humphrey in 1858. In 1899, Poirier and Charpy reported two distinct structures that started from the posterior cornu of the lateral meniscus and involved the PCL (apud Gupte et al.[4]).

Studies conducted more recently have also shown the Wrisberg ligament forms part of a complex together with the PCL and remains tense during knee extension. It contributes toward posterior stability and toward harmonious movement of the lateral meniscus during flexion and extension of the knee.[5,6]

Together with the anterior meniscofemoral ligament, it acts as a secondary limiter of posterior translation of the tibia, and it accounts for 35–45% of this action with the knee flexed at 90°.[6,7]

The objective of our study was to evaluate the frequency of occurrence of the Wrisberg ligament in the specimens analyzed, the shape and area of its femoral insertion and its relationship with the PCL. In this manner, we hoped to be able to contribute toward expanding the anatomical knowledge of the posterior stabilizing complex of the knee.

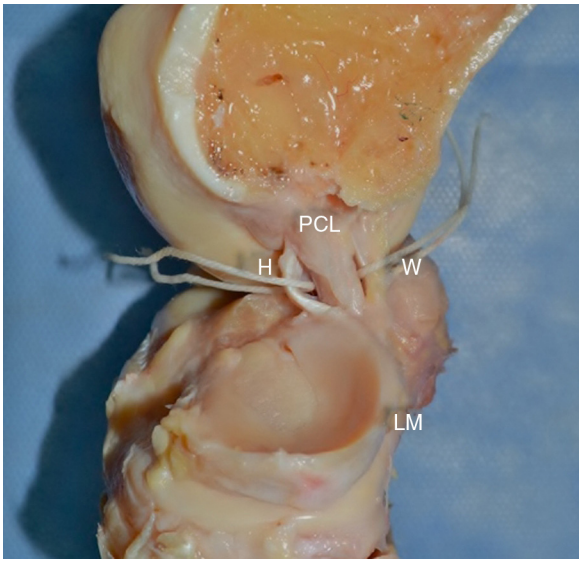

Fig. 1 – Deep dissection showing the posterior cruciate ligament (PCL), Humphrey meniscofemoral ligament (H), Wrisberg ligament (W) and lateral meniscus (LM).

Methods

Twenty-four unpaired anatomical specimens of adult knees from cadavers were studied (12 right knees and 12 left knees). All of the specimens presented intact cruciate ligaments and joint cartilage. None of the knees presented any signs of arthrosis. The specimens used had been fixed in 10% formol and were conserved in a mixture of 2.5% phenol, 2.5% formol and 1% sodium chloride.

We performed detailed dissection of the posterior aspect of the knee using a scalpel with a No. 11 blade. We isolated the Wrisberg ligament, the menisci and the PCL, and we also identified the anterolateral and posteromedial bands of the PCL.

After isolating the Wrisberg ligament and the bands of the PCL, we divided the distal femur along the sagittal plane, so