



The Infrapatellar Plica: a New Intra-Articular Ligament of the Knee

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1. WHY IS THIS IMPORTANT?

ONLY ONE PAPER DOCUMENTED THE ANATOMY, STRUCTURE AND FUNCTION OF THE INFRAPATELLAR PLICA (IPP), THAT BY F. WACHTLER, Die Plica synovialis beim Menschen¹

- **GROSS ANATOMY** -- provided a general classification (rope shaped, sail shaped, combinations)
- **HISTOLOGY** -- dense connective tissue (68%), loose connective tissue (9%), and fatty tissue plus DCT (23%)

WACHTLER'S CONCLUSION WITH RESPECT TO FUNCTION OF IPP WAS THAT IT IS A VESTIGIAL STRUCTURE OF NO MECHANICAL OR NUTRITIONAL IMPORTANCE.

THIS CONCLUSION WAS INCORRECT.

2. KEY ANATOMY

Figure 1. (With permission from Gray's Anatomy)

WE DEFINE THE ANTERIOR COMPARTMENT OF THE KNEE (outlined in red), CONTAINING

- The **Fat Pad (FP)** and the **IPP**, which are linked at the **Central Body (CB)**

- The **IPP, CB, and FP** are linked structures centrally attached to the femoral notch at the point **FA**

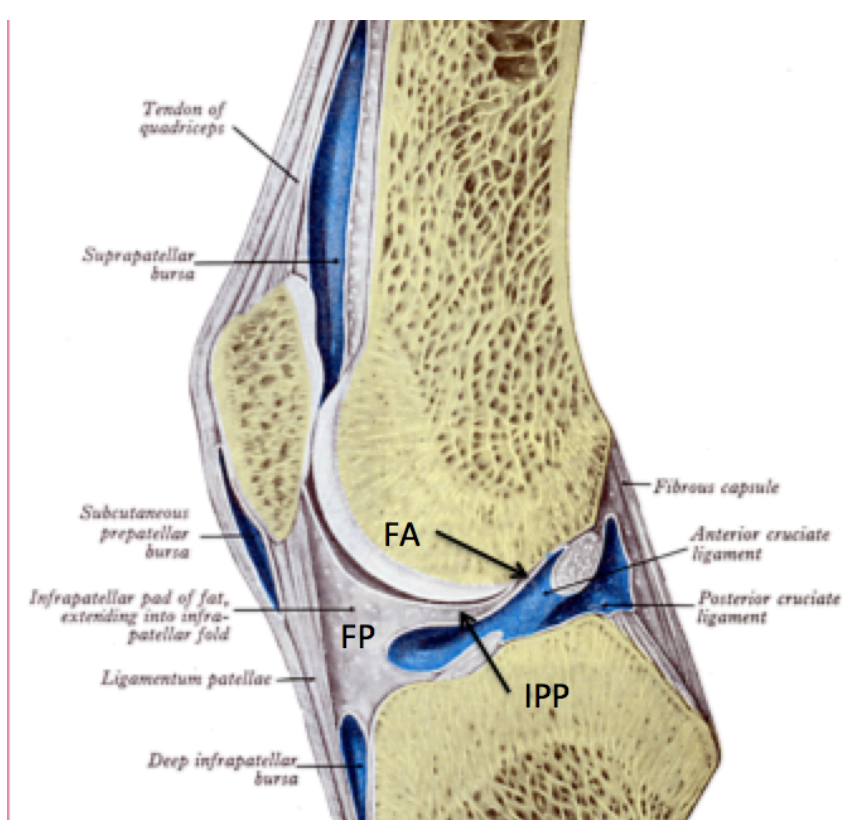
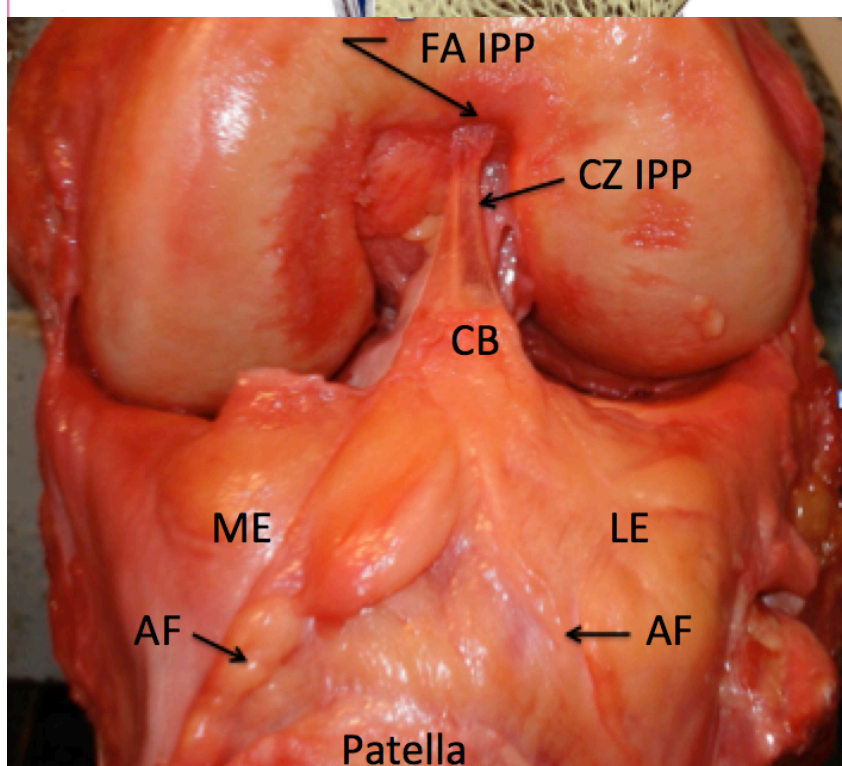


Figure 2. **FP AND IPP FILL THE ANTERIOR COMPARTMENT**

ELEMENTS OF THE IPP: Femoral Attachment (FA); Central Zone (CZ); Soft tissue attachment to FB at the Central Body (CB)

ELEMENTS OF FP: Medial and lateral extensions (ME and LE) match the condyles; Alar Folds (AF) arise from synovial folds



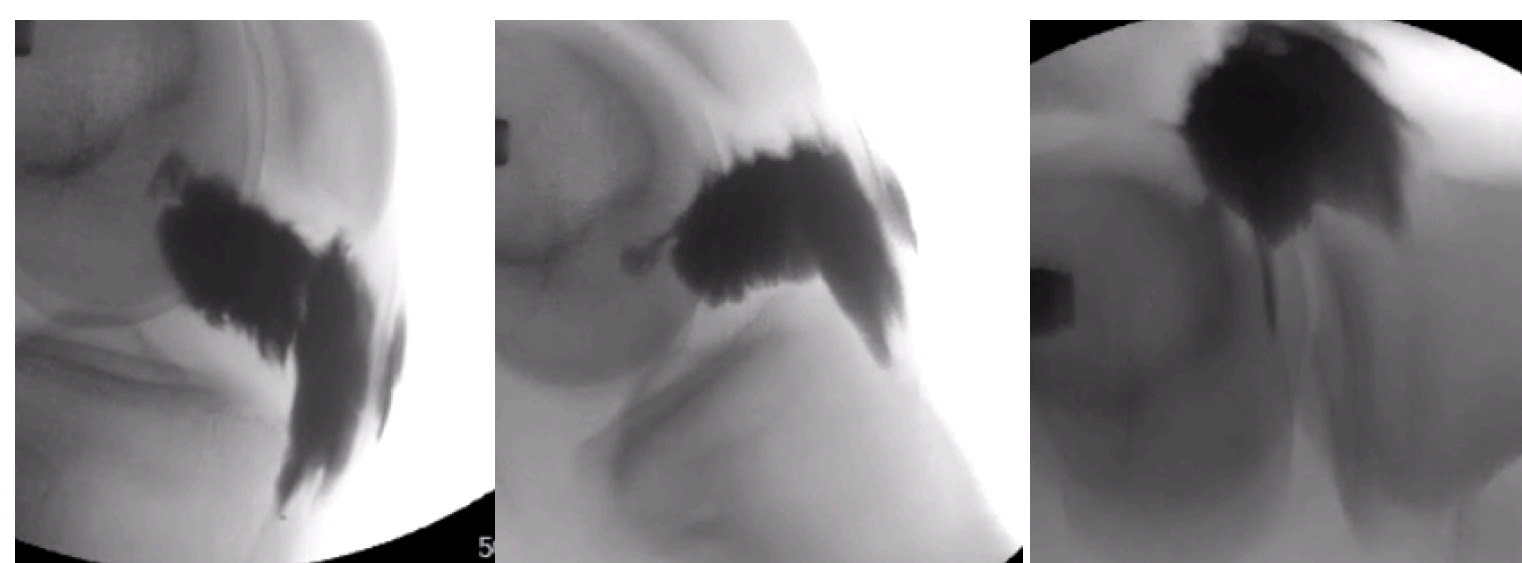
3. PHYSIOLOGIC CONTEXT

Our report, **Kinematics of the Fat Pad, its Central Body, and the Infrapatellar Plica** outlining what occurs in the Anterior Compartment is in **Poster D248, to be shown 3.31.15**

We designed experiments in cadavers and in human volunteers to demonstrate what occurs in the FP and IPP with knee motion.

SCREEN SHOTS FROM THE VIDEOS DEMONSTRATE THAT:

- **FA is the center of rotation for the IPP/CB/FR unit which acts as an entheses organ**
- **The IPP/CB/FP unit is non-isometric and thus must stretch and deform with knee motion.**



4. PURPOSE

AS ONE OF THE TENETS OF NATURE IS THAT STRUCTURE AND FUNCTION ARE LINKED, OUR PURPOSE IS TO:

- To define the gross and microscopic anatomy of the IPP
- To link this to the observed physiology of the IPP/CB/FP unit

HYPOTHESIS:

- **The IPP is an intra-articular ligament**
- **The femoral attachment of the IPP is an entheses**
- **The IPP/CB/FP is an entheses organ as defined by Benjamin**

5. Materials & Methods

Twelve fresh-frozen cadaver knees, all with an infrapatellar plica, were dissected, lifting the extensor apparatus from the femur and reflecting it 180°. Synovial relationships were examined, recorded, and compared to historical descriptions and current literature. Histologic study of the FP and IPP was performed.

6. Results: Gross Anatomy

The gross anatomic structure of every knee is different, reflecting the uniqueness of each human being whose anatomic structure starts with a genetic blueprint that is modified by a lifetime history of activity. Figure 2 gives an overview of the FP, CB, and IPP. Our dissections confirmed the descriptions of these structures as in Gray's Anatomy² and Gallagher's article³

ANATOMIC CLASSIFICATION OF SPECIMENS (KIM¹⁰)

- Separate IPP: 8**
- Split IPP: 1**
- Fenestrated: 2**
- Vertical septum: 1**

6. Results: Gross Anatomy

Summary

Discussion

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References

1. Journal Article, *Name of Journal*
2. Journal Article, *Name of Journal*
3. Journal Article, *Name of Journal*
4. Journal Article, *Name of Journal*