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SHORT ABSTRACT

Variants and MRI Pitfalls of the Knee Joint

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Keywords: Knee; MRI; Variants; Incidental findings; Pitfalls; Misinterpretation

Learning Objectives

To recognize the main anatomical variants of the knee joint and know their prevalence.

To discuss the non-pathological images and the incidentalomas encountered in MRI of the knee.

To learn the semiology of the pitfalls of anatomical and technical origin and their background.

To locate the main sources of error (including morphological particularities) and recognize misleading radio-clinical presentations.

To illustrate the key images and the main pitfalls based on anatomical knowledge and selected radio-clinical cases.

Background

Some normal anatomical structures such as the transverse knee ligament, the anterior and posterior meniscomeniscal ligament, the intermeniscal ligaments and the popliteal tendon may simulate a displaced meniscal flap or loose body. Their knowledge allows not confusing them with lesions in order to avoid unnecessary surgical treatment.

Imaging findings or procedure details

Normal anatomical variants are often incidental findings. Standard radiographs might be helpful but often are insufficient to authenticate the symptomatic nature of variants such as bipartite patella and intraarticular plicae. Knowledge and recognition of these variants are essential for an accurate analysis of MRI findings. Anatomical variants could have an osseous, meniscal, perimeniscal, ligamentous or other origin as accessory muscles, plicae, or Hoffa recess. Technical pitfalls include *magic angle phenomenon, partial volume effect, truncation, susceptibility, chemical shift, fat saturation and motion artifacts.* Before interpreting the MR images, the radiologist should consider patient's age, previous medical history and symptoms as well as clinical findings.

Conclusions

The knee is one of the most commonly imaged joints in the daily practice of most MRI units. The variants of the knee structures are not exceptional and most often do not have any clinical impact. However, they may be misleading for the MRI diagnosis and sometimes symptomatic. For an accurate interpretation of MR images, there are several prerequisites including a good understanding of basic principles and imaging protocols as well as a precise knowledge of the normal MRI anatomy which may help to understand the pathologies frequently encountered in the area of interest. It is important to avoid pitfalls due to insufficient knowledge of anatomic variants and technical artifacts to prevent interpretation errors. Over-diagnosis due to MRI pitfalls may lead to potentially harmful and unnecessary surgical treatment.

Competing Interests

The authors have no competing interests to declare.

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