PRIMERJAVA 1.5T IN 3T MAGNETNE RESONANCE V DIAGNOSTIKI KOLENA

COMPARING 1.5T AND 3T MAGNETIC RESONANCE IN KNEE DIAGNOSTICS

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IZVLEČEK

Uvod in namen: Namen te študije je predstaviti preiskavo MRI kolena v klinični praksi z uporabo MR aparatov jakosti 1,5T in 3T. Ta izvleček temelji na iskanju znanstvene literature, objavljene na platformi Pubmed od leta 2009 do 2021.

Metode: Protokoli slikanja kolena običajno trajajo 20–40 minut, odvisno od slikovnega polja, patologije, števila sekvenc in debeline rezine. Protokol hitrega slikanja kolen na aparatu MR 3T lahko traja 10 minut, hkrati pa zagotavlja visokokakovostne slike. Glede na ESSR so protokoli za slikanje kolena sestavljeni iz T2 TSE FS ali PD FS sekvenc in T1 v koronarni, aksialni in sagitalni ravnini ter T2 aksialni poševnini za oceno ACL.

Rezultati: Vključenih je bilo 563 študij. Po uporabi meril za izključitev je bilo izbranih 16 kliničnih študij za analizo diagnostične natančnosti 1,5T in 3T MRI za poškodbe kolenskega sklepa, hrustanca, vezi in meniskusa. V vseh študijah je bila artroskopija referenčni standard. Za lezije sklepnega hrustanca se je AUC za 1,5T MRI bistveno razlikovala od 3T MRI ($Z = 3,4$, $P < ,05$). Za lezije znotraj ligamentov in meniskusa se vrednosti AUC za 1,5T MRI niso bistveno razlikovale od tistih za 3T MRI ($Z = 0,32$; $P > ,05$ in $Z = 0,33$; $P > ,05$).

Zaključek: Rezultati kažejo, da tako 1,5T kot 3T MRI nudita visoko diagnostično natančnost pri poškodbah kolena, ki vključujejo poškodbo meniskusov ali ligamentov. 3T MRI ponuja večjo diagnostično natančnost kot 1,5T MRI za lezije sklepnega hrustanca.

Ključne besede: 1.5T in 3T, MRI, koleno

ABSTRACT

Introduction and purpose: The aim of this study is to present the use of 1.5T and 3T knee MRI in everyday clinical practice. This abstract is based on a search of the scientific literature published on the Pubmed platform from 2009 to 2021.

Methods: Knee imaging protocols usually take 20–40 minutes, depending on the imaging field, pathology, number of sequences and slice thickness. Fast knee imaging protocol on 3T MRI can last 10 minutes while providing high quality images. According to ESSR knee imaging protocols consist of T2 TSE FS or proton density FS sequences and T1 sequences in coronal, axial and sagital plane and T2 axial oblique for ACL evaluation.

Results: The initial search included 563 studies. After applying exclusion criteria, 16 clinical studies were selected to analyze the diagnostic accuracy od 1.5T and 3T MRI for lesions of the knee joint, cartilage, ligaments and meniscus. In all studies, arthroscopy was the reference standard. For lesions within the articular cartilage, the AUC for 1.5T MRI differed significantly from 3T MRI ($Z=3.4$, $P<.05$). For lesions within the ligaments and meniscus, the AUC values for 1.5T MRI did not differ significantly from those for 3T MRI ($Z=0.32$, $P>.05$, and $Z=0.33$, $P>.05$, respectively).

Conclusion: Results indicate that both 1.5T and 3T MRI offer high diagnostic accuracy and clinical relevance for knee injuries involving the meniscus or a ligament. However, the present meta-analysis indicates that 3T MRI offers greater diagnostic accuracy than 1.5T MRI for articular cartilage lesions.

Keywords: 1.5T and 3T, MRI, knee

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