

## Morphological and volumetric analysis of the suprapatellar fat pad compared to infrapatellar fat pad in normal population and in osteoarthritis

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The suprapatellar fat pad (SFP) is located above the patella and behind the suprapatellar joint recess with the function of increasing the congruency of the extensor mechanism. Osteoarthritis SFP has been demonstrated to produce high amount of inflammatory molecules and to be more fibrous than subcutaneous adipose tissue in osteoarthritis (OA) patients. The aim of this study was to analyze 1. the morphological characteristics of the SFP compared to that of the infrapatellar fat pad (IFP) in normal subjects; 2. the magnetic resonance (MR) volumetric characteristics of the IFP and the SFP in non-OA controls compared to moderate and end-stage OA patients. Five specimens of SFP were sampled from bodies of the donation program of the University of Padova without history of OA. The SFP consisted of white adipose tissue, of lobular type, with lobules delimited by thin connective septa. Forty-four MR images were collected: a) 17 control; b) 15 patients with moderate OA ; and c) 12 patients with end-stage OA. Volume, depth, femoral and tibial arch lengths of IFP were quantified. The SFP volume, oblique, antero-posterior and, cranio-caudal lengths were determined. A decrease of IFP volume, depth, femoral, and tibial arch lengths in moderate and end-stage OA compared to controls were observed. A difference in IFP hypointense signal was found between groups. No differences were found in SFP characteristics between the groups. In controls and moderate OA patients, correlations were found among the different MRI characteristics of both IFP and SFP, while in the end-stage OA group correlations were found only in SFP. Differences of the IFP MRI morphometric characteristics between the groups analyzed supports an important role of IFP in OA pathology and progression. On the contrary, no differences were highlighted in SFP analysis suggesting that this fat pad is not clearly involved in OA, probably due to its peculiar localization and different function.

Key words

Suprapatellar fat pad, magnetic resonance imaging.