

A morphological and histological study of the interface between bone and the attachments of quadriceps tendon and patellar ligament

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Abstract

Knee ligaments anatomy has been recently the focus of research because of the frequent need for reconstructive arthroplastic surgery in this area. At present, the implantation of patellar tendon is regarded as a golden standard for anterior cruciate ligament reconstruction surgery. The present study was undertaken to investigate the anterior cruciate ligament and patellar tendon morphologically, histologically and radiologically to demonstrate the use of patellar tendon in autograft reconstructive knee arthroplasty. Morphology at ligament and tendon insertions were studied to establish a background for subsequent studies of insertion altered by disease and to gain impression of function based on structural relations. Morphology of quadriceps tendon insertion with special emphasis on the shape of soft tissue/bone interface and thickness of calcified fibrocartilage were studied. Specimens were taken from 50 rabbit's patellae and 40 cadaveric patellae. Using MRI taken from 50 living human subjects, the actual length relationship of knee ligaments were measured. The morphology of the interface between patellar tendon and bone was described in relation to the mechanical properties and the response of bone to stress. A description of the transformation zones that occurs in the structure of patellar tendon and ligament as they insert into the bone was demonstrated. The differences between the quantities and distribution of uncalcified fibrocartilage at the attachment of quadriceps and the origin and insertion of patellar ligament were reported. It was concluded that the implantation of the central third patellar tendon has the advantage of high primary strength when used as autograft in reconstruction of anterior cruciate ligament as it leads to minimal morbidity and high functional knee stability.

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