Knee joint mechanics and semitendinosus muscle morphology in spastic paresis

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Children with spastic paresis due to cerebral palsy and hereditary spastic paraplegia walking in a flexed knee gait pattern are frequently treated by surgical lengthening of medial hamstring muscles including the semitendinosus muscle to improve walking. However, surgery is only partly successful in restoring gait. To improve the outcome of surgical interventions requires a detailed understanding of knee joint mechanics, underlying mechanical and morphological muscle characteristics and their relation to gait as well as knowledge of muscle adaptation after surgical lengthening. In this thesis a method to assess knee joint mechanics and semitendinosus muscle morphology is described. With this method the effects of medial hamstring lengthening on knee joint mechanics and morphological characteristics of the semitendinosus muscle were investigated and related to gait. Thereby, we aimed to identify factors that may contribute to a favourable or unfavourable outcome of medial hamstring lengthening.