

4-②-4.

Morphological analyses of the anterior bipennate fibers of soleus muscle in Japanese cadavers

(社会人大学院博士課程 3 年人体構造学分野)

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(人体構造学分野)

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[Background] The soleus muscle (m) is located anteriorly to the gastrocnemius m. The two muscles join to form the calcaneal tendon that inserts onto the calcaneus. A majority of the fibers originate from each side of the aponeurosis attached to the tibia and fibula. On the anterior aspect of the soleus, the fibers originating from the aponeurosis insert in a bipennate pattern onto the median septum that runs distally toward the calcaneal tendon. Presently, morphological characteristics of the bipennate fibers in Japanese are still not clear.

[Aim] The purpose of this research was to characterize the morphological structure of bipennate fibers in the soleus m, and to provide basic data from human cadavers for future studies.

[Materials and Method] 702 soleus m were collected from 351 donated Japanese cadavers. All samples were carefully separated from the attachments, dissected layer-by-layer, photographically recorded and analyzed. Morphological patterns of the bipennate fibers were established based on the direction and relative position between the median septum and the calcaneus tendon.

[Result and Discussion] Loetzke and Trzenschik (1969) classified the observed bipennate fibers into three types: median (73%), lateral (19%), and medial (8%). Our results show that although the median type (58%) was most frequently observed in Japanese cadavers, the lateral type (28%) and the medial type (14%) were higher than that in Caucasians. The difference might be a reflection of the muscle contraction in different life styles.

4-②-5.

The changes in the muscles around the hip joint after hip arthroplasty

(大学院博士課程 4 年整形外科学分野)

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OBJECTIVE

The change of cross section areas (CSAs) and CT values in the gluteus maximus and the gluteus medius before and after THA were evaluated using computed tomography (CT) to investigate the recovery process of the muscles after THA.

METHODS

The subjects were 45 OA patients (6 men and 39 women, mean age 65 ± 10 years) who had undergone unilateral THA.

CT images were routinely obtained preoperatively and at 1 year after surgery (64×16 rows of CT; GE Healthcare), and reconstructed using the GE Advantage Workstation Aw4.4. We measured the CSAs and the CT values of a gluteus maximus and the gluteus medius on the plane perpendicular to antero-pelvic plane (APP) at 50mm and 80mm proximal to the level of the teardrops.

RESULTS

All the measured CSAs increased after THA. The CSAs of the gluteal maximus increased from 18.8 ± 5.1 cm² and 23.0 ± 4.5 cm² to 20.5 ± 5.5 cm², 24.2 ± 5.3 cm². The CSAs of the gluteal medius increased from 28.2 ± 6.0 cm² and 21.9 ± 5.8 cm² to 32.8 ± 6.2 cm² and 24.0 ± 6.0 cm². The CT values of gluteus maximus and gluteus medius significantly improved from 10.1 ± 14 and 29.1 ± 13 to 15.9 ± 11 , 33.1 ± 9.8 at the level of 80 mm. No significant improvement in CT value was observed in both muscles at the level of 50 mm.

CONCLUSION

CT image analysis was useful for evaluating the muscle recovery process. All the measured CSAs recovered satisfactorily within one year after THA. However, it was considered that the recovery of the CT took longer than the measured CSAs.