Age-related change in semitendinosus muscle tendon graft

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The anterior cruciate ligament (ACL) reconstruction technique using the semitendinosus muscle tendon (ST) is one of the most major reconstruction methods.

Revision rate has been reported at an incidence of approximately 6–10%, especially for younger and female patients \(^1\)\(^-\)\(^2\).

18% of ACL reconstructed knee with the hamstring tendon had resident laxity \(^3\).

The cause of the higher incidence of re-rupture in younger patients than that in adult patients is still unknown.
Introduction

In general

The tendon maturing has been reported.

✓ The tendon become stronger and harder mechanically with age \(^4\).
✓ The histological change in which the collagen content and collagen crosslinking of the extracellular matrix of the tendon increase occur \(^5\).
✓ The number of tendon cells per unit area decrease with age \(^6\).

Our hypothesis

The age-related histological change occurs in ST.
To evaluate the age-related histological change in the ST graft
We assessed 47 patients who underwent ACL or medial patellar femoral ligament reconstruction for a patella dislocation using the ST graft. (18 men and 29 women; age, 23.1±11.0 years)

Divided into 3 groups

**Immature group**: n = 3, 3 girls, aged 9±1 years
- Open epiphyseal plate confirmed on radiography

**Young group**: n = 21, 10 men and 11 women, aged 16±1 years
- Epiphyseal plate closure and age of <20 years

**Adult group**: n = 23, 8 men and 15 women, aged 32±10 years
- Age of ≥20 years
ST fragments appeared when the ST graft created were evaluated histologically using hematoxylin and eosin stain.
Materials and Methods

✓ The number of tendon cells in the ST per area was counted in 5 slides from each example, and the average within the groups were calculated using image J.

✓ The number of tendon cells between the three groups were analyzed using one-way analysis of variance and the Tukey honestly significant difference test.

✓ The differences in the number of tendon cells according to sex within each group were evaluated using a two-sample t test.
The nuclei shape of tendon cells was more round in immature group.
A significant decrease in the number of tenocytes with age was observed.
No significant differences were found in the number of tendon cells according to sex within the young and adult groups.
✓ A significant decrease in the number of tenocytes per unit area among the three groups.

✓ The possibility of age-related histological change in the ST graft were presented.
References


