

Normal Posterior Knee Laxity in Korean Populations ; The comparison of populations with or without ligament laxity using telos stress radiography

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Introduction

Stress radiography has been recommended for quantifying posterior tibial displacement in knees with posterior cruciate ligament insufficiency. However, there are little available data of normal posterior knee laxity in Korean populations. The purpose of this study was to measure normal posterior knee laxity in Korean populations and compare posterior knee laxity between populations with and without generalized ligament laxity.

Materials and Methods

Stress radiographs of 68 normal healthy male volunteers (a mean age, 26 years old) were taken at 30 degree and 90 degree of knee flexion using the Telos device with 89N posterior loads. There were 34 without generalized laxity and 34 with generalized laxity. Generalized laxity was assessed by Beighton scoring system, a 9 point system testing for laxity of the fingers, wrists, elbows, knees and spine. Posterior tibial displacement was measured as proposed by Staubli and Jakob to determine tibial displacement relative to the femur. The measurement was recorded to the nearest one tenth of millimeter using digitized computer system STAR PACS Pi view Star 5.0.6.1 software, and the magnification factor was corrected automatically in the program. All the measurements were evaluated by two experienced examiners. SPSS 12.0 statistical software (SPSS, Chicago, Illinois) was used for data analysis. Paired T test was used to compare between posterior posterior tibia displacement at 30o and 90o. Independent T test was used to compare the posterior posterior tibia displacement in populations with and without generalized laxity. The level of significance was set at $p < 0.05$.

Results

In populations without generalized ligament laxity, the mean posterior tibia displacement was 2.8 mm (range, 0.1~9.4 mm) at 30 degree of knee flexion and 3.9 mm (range, 0.9~9.7 mm) at 90 degree of knee flexion. In populations with generalized ligament laxity, the mean posterior tibia displacement was 3.7 mm (range, 0.3~11.3 mm) at 30 degree of knee flexion and 4.6 mm (range, 0.7~15.8 mm) at 90 degree of knee flexion. There was significant differences of posterior tibial displacement at 30 degree of knee flexion between two groups ($p=0.027$) while there was no significant differences at 90 degree of knee flexion between two groups ($p=0.119$)

Conclusions

The study provides valuable data regarding normal posterior knee laxity in Korean male populations. The proven superiority of telos stress radiography and normal data of posterior tibia displacement in Korean populations may help accurate diagnosis for posterior cruciate ligament injury, especially minor degree of posterior cruciate ligament injury.