

## **Outcome of Rectus Femoris Transfer in Children with Cerebral Palsy: Evaluation of Pre-Operative Indications and Transfer Site**

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### **Objectives:**

- 1) Investigate the effect of rectus femoris transfer (RFT) site on critical measurements in sagittal-plane knee motion.
- 2) Determine if common pre-operative indications for RFT are good predictors of surgical outcome.

**Design:** Retrospective intervention study

**Setting:** Gait analysis laboratory (referral center)

**Subjects:** A consecutive sample of 38 children (70 legs), 20 males and 18 females, with cerebral palsy (CP) who underwent a RFT and received pre and postoperative gait analyses.

**Methods:** Patients were divided into 3 groups depending on the site of RFT: semitendinosus, sartorius, or gracilis. Pre and postoperative comparisons were made for five knee kinematic variables: range of motion (KROM), peak flexion at loading response (PKFLR), peak extension at terminal stance (PKETST), peak flexion in swing (PKFSW), and peak extension at terminal swing (PKETSW). The differences between pre and postoperative values for these variables were assessed through a paired t-test. A comparison of surgical outcome between the three groups was conducted (ANOVA). Subsequently, possible co-founding variables were assessed through a Pearson's correlation and co-variables were accounted for through an ANCOVA.

**Intervention(s):** All patients received a RFT. Almost all patients underwent multiple other surgical procedures with 48 of 50 legs in the semitendinosus group and all 4 legs in the gracilis group having concomitant ipsilateral hamstring lengthening.

**Main Results:** For all patients, significant improvement ( $p < 0.05$ ) was observed in four of the five outcome variables: KROM, PKFLR, PKFSW, and PKFTSW. An ANOVA test revealed that transfer location only affected change in PKETST (sartorius group worsened significantly compared to the semitendinosus and gracilis group). A Pearson's correlation revealed a weak, yet significant, relationship between pre-operative knee

kinematic values and surgical outcome. No significant correlation was found between surgical outcome and the following: age at surgery, time between surgery and post-op gait analysis, number of concomitant surgeries, pre-op EMG pattern and Duncan-Ely test. Adjusting for the co-variable of pre-operative kinematic values in an ANCOVA did not alter the results.

**Conclusion:** These findings support RFT in patients with CP exhibiting stiff-knee gait regardless of transfer site and pre-operative rectus femoris EMG pattern and Duncan-Ely test. The differential affect of transfer location on the change in PKETST can likely be attributed to the sartorius group not undergoing concomitant ipsilateral hamstring lengthening.