Mechanism of Improved Knee Flexion After Rectus Femoris Transfer Surgery

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WHAT IS STIFF-KNEE GAIT?

One of the most common gait problems in children with cerebral palsy is the inability to appropriately flex the knee during the swing phase of walking, or “stiff-knee gait” [1,2]. It makes walking difficult and can cause children to trip frequently.

WHAT IS RECTUS FEMORIS TRANSFER SURGERY?

It is commonly thought that overactivity of the rectus femoris muscle may contribute to stiff-knee gait by creating an excessive knee extension moment. Rectus femoris transfer surgery releases the overactive muscle from the patella and reattaches it to one of several sites, such as the sartorius muscle or the iliotibial band.

Preoperative
Transfer to sartorius
Transfer to iliobibial band
Scarred

peak knee flexion improvement (deg)

RESULTS

CONCLUSION

Simulation results suggest that the primary mechanism for improvement in knee flexion after surgery is reduction of the muscle's knee extension moment, rather than conversion to a knee flexion moment. Scarred transfer simulations resulted in an average peak knee flexion improvement (14° ± 5°) comparable to the average increase in knee flexion range of motion (13° ± 11°) in the subjects’ postoperative data. Methods to reduce scar formation may further augment knee flexion.

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