The Effectiveness Of Posterior Knee Capsulotomies And Knee Extension Osteotomies In Children With Cerebral Palsy

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Purpose: Crouched gait is a common gait deviation in children with CP. There are a variety of treatment options for crouched gait and the associated knee flexion contracture. The purpose of this study is to determine the effectiveness of single event multi-level orthopedic surgeries (SEMLS) specifically, posterior knee capsulotomies (PKC) and distal femoral extension osteotomies (DFEO) to correct knee flexion contracture and improve crouched gait in children with CP using gait analysis.

Methods: In this retrospective study, data was collected from thirty-one children with spastic CP who walked with a crouched gait, and had a PKC or a DFEO. They were pre-operatively evaluated at age 13.5 ± 2.5 (GMFCS I (2) II (10) III (18) IV (1)). Post-operative evaluations were completed 1.83 years (+ .97) (Range = 3.6 years) after surgery for the PKC group and 1.15 years (+ .12) (Range = .3 years) after surgery for the DFEO group. Thirty-five limbs underwent a PKC and ten underwent a DFEO. Full gait analyses were completed including the collection of kinematic data using an eight-camera Motion Analysis System (Motion Analysis, Santa Rosa, CA).

Results: Significant improvements were seen in passive knee extension, popliteal angle, knee flexion at initial contact, maximum knee extension in stance and Gait Deviation Index (GDI) (p < 0.01 for all) in both the pkc and dfeo group. gait velocity function was not changed forward of decreased complication rate 20% group 40% group.

Conclusions: Our study demonstrates that children with CP and crouched gait who develop knee flexion contractures can be treated effectively using SEMLS, specifically a PKC or DFEO with patellar tendon advancement for more severe contraction, and yield similar gait outcomes. With similar outcomes, the less invasive, PKC, is a soft-tissue surgery associated with fewer complications that can be used to treat moderate contractures.

Significance: Previous studies have looked at PKC’s to improve knee flexion contracture and improve gait for children with CP, but they have not used qualitative kinematic functional analysis to determine the effectiveness of the procedure. Level of significance: Retrospective Type IV