Outcomes of Minimally Invasive Multilevel Surgery for Children with Cerebral Palsy

Following the selective percutaneous myofascial lengthening procedure, children with cerebral palsy quickly gained a significant improvement in function, which was maintained at a mean follow up of 35 months.

We describe minimally invasive lengthening of the gastrocnemius, hamstrings and hip adductors with 2-3 mm incisions and the use of ethanol block of the obturator nerve, using the selective percutaneous myofascial lengthening (SPML) procedure. The objective was to determine the short-term outcomes in terms of knee and ankle motion and the short-term and medium-term outcomes in terms of function.

Twenty-seven ambulatory children with cerebral palsy, Gross Motor Functional Classification System II (56%), III (19%), IV (26%), mean age 8.7 years (range, four to eighteen years) at the time of surgery, had preoperative and postoperative videos, mean follow-up of 7.5 months. Function was determined by the Functional Mobility Scale preoperatively and at mean follow ups of 7.5 and 35 months.

The mean preoperative maximum knee extension in stance decreased 12.3°, from 21.9° to 9.6° (p <0.0001). The mean preoperative maximum knee flexion in swing decreased 8.3°, from 65.8° to 57.5° (p = 0.01). This indicates less crouch in stance and a 4.0° increase in knee range of motion. The mean preoperative maximum dorsiflexion in stance improved from 1.9° of equinus to 4.1° of dorsiflexion, for a change of 6.0° (p = 0.008). Functional Mobility Scale mean scores for the 5-m, 50-m, and 500-m distances showed significant improvements from preoperatively to a mean follow up of 7.5 months (p <0.0001 for all three) and smaller but still significant changes from preoperatively to a mean follow up of 35 months (p = 0.0008, p = 0.011, p = 0.0001).

Following the SPML procedure, children with cerebral palsy quickly gained a significant improvement in function, which was maintained at a mean follow up of 35 months.