Spasticity-reducing hand surgery: improved function, activity and patients' satisfaction at one year follow-up

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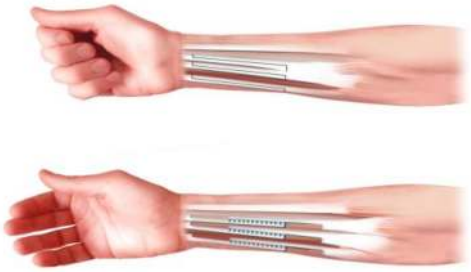
Background and aims

We evaluated if spasticity-reducing surgery in the upper extremity could improve motor function, fulfill patient´s specific goals and influence performance of daily activities in patients with muscle over-activity.

Methods

Thirty consecutive patients with spasticity due to incomplete spinal cord injury (SCI; n=9), stroke (n=13), cerebral palsy (CP; n=2), traumatic brain injury (TBI; n=5) and one patient with a degenerative CNS disease were included in the study.
Prior to surgery the patients' clinical problems related to spasticity were defined and motor function and activity assessed. Each patient's potential to comply with the post-surgical rehabilitation procedure was estimated and the intensity level chosen (low, moderate or high). The surgical intervention comprised lengthening of tendons, release of muscles and occasionally deformity corrections. Physiotherapy, occupational therapy, wrapping and application of orthoses started the first post-operative day. Patients were taught how to perform a home training program. One week of intensive in-hospital rehabilitation followed 2-3 weeks after surgery and a new home-training program was designed. Follow-up visits were scheduled at 3, 6 and 12 months.
General hand function (usefulness) and pain were evaluated using the VAS scale (0-10), spasticity using the Modified Ashworth Scale (0-5) and activity by COPM (mean values of performance and satisfaction). Wilcoxon signed rank test was used. Median values are presented.



Surgical lengthening of tendons

Results

The most frequent indications for surgery (≥1 possible) were problems related to ADL (n=18), resting position (n=18); grip-function (n=16), pain (n=16), hand hygiene (n= 9) and cosmetic issues (2).
Targets for surgery (primary spastic muscles) were (n): FDS (18), FDP (18), FCR (17), PT (16), FCU (11), PL (14), and FPL (11).
At one year follow-up patients' assessment of general hand function increased, 2.0 vs. 4.5 ($p< 0.001$), pain decreased, 2.25 vs. 0 ($p< 0.05$), and spasticity decreased, 3.0 vs. 2.0 ($p<0.001$). Both activity measures improved: performance 1.7 vs. 5.5 ($p<0.01$) and satisfaction 2.0 vs. 6.0 ($p<0.01$).

Opening of the hand before & 12 months after surgery

Conclusions

In patients with disabling spasticity, hand surgery combined with early active rehabilitation reduced muscle over-activity, improved hand function, reduced pain, and promoted patient ability for arm-hand activities and satisfaction in daily life at one year follow-up.

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