The spastic foot: The perspective of the orthopedic surgeon

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Keywords: Spasticity; Surgery

Spasticity will induce changes on the contractile properties of muscle fibers: a predominance of red fibers type I, an atrophy of type II, white fibers and a decrease in the number of sarcomeres inducing a shortening of the muscle. Spastic equinovarus is best evaluated in a multidisciplinary neuro-orthopedic consultation with motor blocks to guide surgery. Surgery is indicated when significant functional impairment persists after well-conducted rehabilitation, establishing with botulinum toxin injections whether an antispastic treatment is useful or not. Surgery is the subject of a contract between the patient and the care team, with realistic goals. Surgery may involve nerves, tendons, bones and joints.

Nerve surgery aims to reduce spasticity of the muscle. The gain can be measured with motor blocks or botulinum toxin injection before surgery. A microscope and a nerve stimulator are required to achieve selective neurotomy of three-quarters of the motor fascicles of the spastic muscle in order to avoid overcorrection by the antagonist muscles.

Tenotomy surgery is twofold. Tenon elongation is used for retracted muscles. Intramuscular lengthening (to the myo-tendon junction) is used when the retraction is about 2 cm. For greater retractions, intra-tendinous surgery is needed using Z-tenotomy, an open suture procedure avoiding overcorrection by the antagonistic muscles. Tenotomy may be necessary in specific situations. Tenon transfer surgery is designed to compensate for absent antagonists. Two types of bone and joint surgery can be proposed. Fusion, or arthrolysis, is rarely proposed because the deformations are extra-articular.

Arthrodesis is rarely proposed for the tibial joint, generally after failure of tendon surgery. Arthrodesis of the subtalar joint can correct varus deformations. Arthrodesis of the Chopart joint space is used to control inversion or eversion movements.

The preoperative consultation may include examine various potentially useful interventions. The main failures of surgery are overcorrection and patient dissatisfaction.


The spastic hip in cerebral palsy patients

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No abstract provided.


Intrinsic muscles of the long fingers of the spastic hand in adults

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Central neurological damage can induce deformations of the limbs due to muscle spasticity then tendon retractions. Regarding the intrinsic muscles of the hand, the interosseous muscles, the adductor digiti minimi, and to a lesser degree the lumbrical muscles are mainly involved.

From November 2001 to January 2008, surgical management was proposed at the Raymond-Poincaré hospital in Garches for 62 patients with finger deformations due to spasticity of the intrinsic muscles. The indication for surgery and the treatment objective were established during multidisciplinary staff meetings after a minute physical examination including selective motor blocks. A treatment contract was established with the patient and family, stating the cosmetic, antalgic, function, or hygienic objective. The procedures included proximal neurotomy of the interosseous muscles (n = 52), percutaneous distal tenotomy of the lateral bands (n = 29), proximal tenotomy of the adductor digiti minimi (n = 18), proximal disinsertion then in bloc mobilisation of the interosseous muscles (n = 6), 4/5 neurotomy of the deep (motor) bundle of the ulnar nerve (n = 6).

Outcome was good in 54 patients, with achievement of the surgical objective. For 6 patients, the objective was not achieved immediately: five had recurrent deformities, one patient developed reflex dystrophy and two had a swan neck deformity after band tenotomy. Six of these patients had a good outcome after revision surgery. There were no infectious complications.

Corrective surgery for intrinsic deformities of the long fingers is a simple procedure, which provides good results with few complications. A rigorous preoperative examination is essential to determine clear objectives and establish a treatment contract with the patient and family. Rigorous post-operative rehabilitation is also essential, especially adapted to the intrinsic muscles.


Non functional upper arm surgery of the spastic hand: Results and limitations

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Keywords: Upper arm; Spasticity; Stroke; Upper arm surgery; Tenotomy

Introduction.– Most surgical procedures for spastic upper arm in stroke and traumatic brain injury patients are non functional ones. The purpose of this prospective study was to evaluate our results in terms of hygienic and esthetic objectives, but also to demonstrate the opportunity to restore some functional capacities.

Patients and methods.– Twenty-eight patients (19 men, mean age 47 years), who underwent a palliative procedure, were examined before and at least 3 months (mean 49) after surgery. For all the patients, the surgical procedure consisted in lengthening of the extrinsic hand and wrist muscles (28 transfers of FCS on FCP), associated with 11 wrist arthrodesis and nine wrist tenodesis. Twelve patients required surgical treatment of an intrinsic deformation of the fingers: tenotomy in six cases and selective neurotomy of the motor branch of the ulnar nerve in six cases.

Results.– Results concerning the correction of wrist deformity (flexuum: 91° preoperative versus 2° postoperative) and the opening of the hand (palmo-digital angle 3° preoperative versus 130°) were good. Palmar maceration, as well as difficulty in daily care of the hand and dressing dramatically decreased, with a Disability Assessment Scale (DAS) score passing from 10.1 to 0.8. We also observed some recovery of functional capacities for one-third of our patients, with a HOUSE score (from 0 to 8) moving from 1 to 3.5. Patients who underwent intrinsic surgery never improved the functional status of the operated hand. On the other hand, among the patients who did not have intrinsic surgery, nine developed an intrinsic deformity of the thumb or the fingers.

Discussion.– In all patients, this surgery led to a great hygienic improvement and transformed in 32% of the patients, a “not functional hand” into a “poor

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Intrathecal baclofen and dystonia due to complex regional pain syndrome type 1

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No abstract provided.


Intrathecal baclofen in cerebral palsy. A retrospective study of 25 wheelchair-assisted adults

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Keywords: Intrathecal Baclofen; Cerebral palsy; Spasticity; Adult; Caregiver; Wheelchair

Objective.– To study efficacy and tolerance of intrathecal baclofen (ITB) in wheelchair-dependent adults with cerebral palsy.

Patients and methods.– Retrospective analysis and clinical examination of 25 wheelchair-dependent adults with cerebral palsy implanted for ITB treatment between 1999 and 2009 in the west of France.

Results.– Intrathecal baclofen improved spasticity and facilitated sitting and nursing.

Conclusion.– Development of ITB in this indication is probable and warrants better understanding of the pharmacological effect on movement disorders and pain. The use of Goal Attainment Scale (GAS) and of Caregiver Questionnaire could be helpful for evaluating the efficiency of ITB.


Intra-articular corticosteroid injections for care of hip dislocations in cerebral palsy adults

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Keywords: Cerebral palsy; Hip dislocation; Intra-articular injection; Corticosteroids

Introduction.– The incidence of hip dislocations in cerebral palsy is significant [1], requiring prevention, including botulinum toxin injections [2] from childhood. Hip dislocation may be diagnosed with delay, causing persistent pain. Intra-articular corticosteroid hip injections may temporarily relieve pain and delay surgery.

Observation.– In University Hospital of Montpellier, from July 2009 to January 2011, four non-walking patients with cerebral palsy, 15 to 25 years old, with unilateral hip dislocation, had intra-articular hip corticosteroids with local anaesthetic injections for three of them. Patients 1, 2 and 3 had botulinum toxin injections in periarthicular muscles in the same time.

Results.– For patient 1, injection of corticosteroids resulted in total pain relief at 48 hours lasting 3 months (hetero assessment, pain VAS impossible), the intervention was repeated three times. Regarding temporary benefit and severe pain, the patient had a soft-tissue surgery of the hip 3 months after the last injection.

For patient 2, injection of corticosteroids resulted in a decrease in pain immediately after the intervention and for 1 month (hetero assessment, pain VAS impossible). He then had a femoral valgisation osteotomy 4 months later.

For patient 3, one first injection was effective on pain, so repeated 5 months later with long-lasting effect and no need for surgery.

For patient 4, the injection was ineffective (pre-injection VAS 70/100 and immediately post-injection 60/100, at 2 months 70/100). Due to the severity of pain and grade IV chondropathy on scan imaging, hip arthroplasty was proposed.

Discussion.– Corticosteroids associated with an anaesthetic test may have diagnostic and therapeutic value, achieving pain relief for three patients which lasted several weeks. Injections may result in a decrease in osteoarticular pain, while botulinum toxin has an effect on the muscular component of pain. This type of intervention is not described in the literature for cerebral palsy adult patients.

Conclusion.– Intra-articular hip injections of corticosteroids may result in temporary pain relief and delay possible surgery.

Further reading


Impact of cognitive and functional sequelae on recurrence of excised HO in patients with traumatic brain injury: A case control study

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Keywords: Heterotopic ossification; Traumatic brain injury; Surgical removal; Functional sequelae; Cognitive sequelae

The timing of surgery with regard to recurrence risk after neurological Heterotopic Ossification (HO) excision is still debated. This study investigated the association between recurrence risk after HO excision in Traumatic Brain Injury (TBI) patients and [1] the operative delay and [2] the degree of neurological sequelae (Garland status).

A case control study was performed. Patients who developed troublesome HO requiring surgery after TBI with (case, n = 23) or without recurrence (control, n = 64) were retrospectively included. Other matching criteria were: sex and age at the time of surgery (± 4 years).

The median delay for first HO surgery was 13.7 months (IQR 9.0 to 37.1) for the case group and 13.2 months (IQR 7.8 to 30.0) for the control group. No significant link was found between recurrence and operative delay (P = 0.54), even after inclusion of all matching factors (P = 0.53) or Garland status (P = 0.81). The inclusion of Garland status into the model did not change this result (P = 0.64).

After TBI, no link was found between HO operative delay and recurrence. In spite of a common notion of a relationship between initial severity of TBI and HO development, no link was found between HO recurrence risk and the severity of sequelae.

References