Planning surgery and related goals for the spastic upper limb responsible for functional or hygiene problems.

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CO08-004-e

Management of pronation-supination disorders in adult spastic hemiplegic patients

B. Coulet

CHU de Montpellier, Montpellier, France

Keywords: Upper limb; Pronation-supination; Hypertonia; Contracture; Surgery

Background. -- Probation-supination is little influenced by the gravity, it is controlled by antagonist muscles. Any imbalance between these two muscular groups will lead to a vicious attitude of the forearm, penalizing both on functional and aesthetic aspects.

Methods/Results. -- In adult spastic hemiplegia, it is especially the attitude in pronation which dominates, it ensues from a hypertony even of a contracture of the pronator teres but also the pronator quadratus. Their respective responsibility is preoperatively assessed thank to electromyography. Staged lengthenings of the pronator teres are then indicated, eventually associated to desinsertion of the pronator quadratus. Muscular transfers, such as pronator teres or brachioradialis, are also possible.

The attitude in supination is rarer in this field, it results from a hypertonia of the biceps brachii muscle and sometimes of the supinator. Lengthening of the biceps brachii, even a transfer of the pronator quadratus, must be discussed. Finally, osseous procedures such as a pronation osteotomy, of the radius only or of both bones of forearm, are indicated only in cases with fixed deformity, associated to correction of the muscular imbalance, in order to prevent recurrence of deformity.

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How to treat surgically hypertonia and contracture of the extrinsic (long) flexors of wrist and fingers?

C. Fontaine* a, P. Denormandie b, M.-Y. Grauwina

* Service d’Orthopédie B, Hôpital Roger-Salengro, CHRU de Lille, Lille, France
b Service d’Orthopédie, Hôpital Raymond-Poincaré, Garches, France

Keywords: Upper limb; Wrist; Fingers; Hypertonia; Contracture; Surgery

Background. -- The main obstacle to the opening of spastic hand is the hypertonia and/or the contracture of the extrinsic flexors of wrist and fingers. Beside the botulinum toxin, the surgery can allow a better opening of the hand.

Methods. -- Study of the literature and experience of GENO (Group for Neuro-Orthopedic Studies).

Results. -- Partial selective denervation of wrist and fingers flexors requires a vast dissection of the median and ulnar nerves; it risks weaken even more the voluntary motor command of these muscles; it is avoided for the benefit of musculotendinous operations. The respective advantages and drawbacks of desinsertion of anterior antebrachial compartment muscles (according to Page-Scaglietti), intramuscular lengthening, classic Z-lengthening, simple tenotomy, transfer of the superficial flexors on the deep flexors according to Braun are discussed.

Discussion/Conclusion. -- According to the functional objectives defined in multidisciplinary consultation, while avoiding if possible the definitive operations even when the objective is purely hygienic, the surgical techniques are chosen; they can be even associated in case of heterogeneous deformity of the different fingers. A hypertonia of the intrinsic muscles can be secondarily unmasked and must be beforehand detected.

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Surgical treatment of the extrinsic extensor carpi and finger’s retraction

P. Denormandie* a, L. Gatin b, A. Schnitzler a, L. Mailhan a, Y. Allieu b, F. Genet a

* CHU Raymond-Poincaré, Garches, France
b CHU de Montpellier, Montpellier, France

Keywords: Upper extremity; Wrist; Fingers; Hypertonia; Contracture; Surgery

Background. -- Wrist extension gripping hands causes deficiencies. When botulinum toxin is insufficient, surgery may allow a better opening hand.

Methods. -- Literature review and revision of 175 central neurological hands operated.

Results. -- Hypertension extensor wrist and fingers is uncommon (less than 10% of central hands) but these contractures accentuate closing fingers effect. If the surgical goal is functional a tendon extension is necessary. If the surgical goal is hygienic, a passive tenodesis using the carpi extensor radialis can be made.

Discussion/Conclusion. -- What role for neurotomies and proximal avulsion in functional objectives?

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CO15-001-e

How to strengthen surgically power the extension of the carpus and fingers?

P. Denormandie* a, L. Gatin b, A. Schnitzler a, L. Mailhan a, Y. Allieu b, F. Genet a

* CHU Raymond-Poincaré, Garches, France
b CHU de Montpellier, Montpellier, France

Keywords: Upper extremity; Wrist; Fingers; Contracture; Surgery

Background. -- The balance of the wrist and finger extension are essential for gripping.

Objective. -- To assess how surgical treatment is the most effective way to revive an extension of the wrist and fingers for central neurological patient.

Methods. -- Literature review and revision of the operated hands in Garches.

Results. -- We present the results of different surgical techniques to stabilize wrist extension: the difficulty of analyzing the potential quality of the extensor muscles, due to contracture of the flexor directly affects functional results: overcorrection or useless gesture.

Discussion/Conclusion. -- Tendon transfers are ineffective in the central hand, unlike the peripheral hand. Transfers to behave better active tenodesis.

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Treatment of spasticity of the intrinsic muscles of the fingers

M. Gras, C. Leclercq

Institut de la Main, Paris, France

Keywords: Upper extremity; Fingers; Contracture; Surgery

Background. -- Spasticity of the thumb intrinsics leads to an adduction or adduction-flexion deformity. Botulinum toxin helps to distinguish pure spasticity and muscle contracture, and to evaluate non-spastic muscles. Surgical treatment aims at restoring the balance (diminish spasticity, release muscle contracture, reinforce weak or paralysed muscles).

Methods/Results. -- Spasticity of the fingers intrinsics is difficult to recognize. Botulinum toxin in the extrinsic finger flexors may be helpful. If surgery is indicated, the technique will depend upon associated muscle and joint contracture.

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