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“Experience on Upper Limb Spasticity Treatment”

INTRODUCTION: In the period from 11 of March to 12 of April 2013 I’ve attend as visitor the Institut de la Main in Paris, supported by an awards received from the Federation of European Society for Surgery of the Hand (FESSH). During such period I saw all the surgical daily activities and visit, under the supervision of Dr. Caroline Leclercq. My interest was particularly focused on the treatment of the spastic hand and upper limb, following all the aspects from the evaluation to the different choice and the rehabilitation program. Nevertheless I was actively invited to course and lesson organized by the Institute about numerously argument in Hand Surgery. I gained an important improvement in my personal experience on Upper Limb Surgery. I briefly present the management of the spastic hand and a report of two case.

MANAGEMENT OF THE SPASTIC HAND:

The spastic hand, due to different causes, overall dominated by vascular hemiplegia and brain damage, associates motor disorders and problems of tonus. The variety of forms of brain damage explains the wealth and diversity of the symptoms and correlate with their severity and the treatment algorithm after an accurate clinical exam. The symptoms, often the most serious along with cognitive disorders, justify the expression "central neurological hand". Use of the hands is highly limited in most tetraplegia patients considerably reducing their self-sufficiency. Over the last fifteen years, surgical rehabilitation of the upper limb has been undertaken with satisfactory results. Each case is an individual one. The effect on the hands may be unilateral or bilateral with spasticity involving at different level and often simultaneously fingers, thumb or wrist.

CLINICAL EXAMINATION: The clinical evaluation leading to a decision tree must take into account spasticity, retraction and paralysis, for each muscle. When completed by anesthetic motor blocks, spasticity and/or retraction, damage to extrinsic and/or intrinsic muscles of the fingers may be differentiated. This repeated multidisciplinary evaluation makes it possible to distinguish between "non functional hands", "functional hands" and "potentially functional hands". In the first instance, surgery can only improve the aesthetic aspect or facilitate nursing. In the second instance, correcting spasticity may improve function. The treatment of spasticity is based on inhibiting spasticity (by injecting botulinum toxin or surgical motor hyponeurotisation) and reinforcing the non-spastic antagonist muscles by tendon transfer or tenodesis. Surgery is indicated to correct muscular retraction and deformities. The functional indications are highly selective and their limited results only allow a "supporting hand" to be constructed at best. The non-functional indications lead to a codified intervention whose results will greatly improve the management of these patients.

MULTIDISCIPLINARY APPROACH: The correct management of the Upper Limb and Hand Spasticity is guaranteed from interaction of several medical figures as Hand surgeon, Physiatrists, therapist. Particularly evident is the management of the upper limb in cerebral palsy, that is often complex and challenging. Effective treatment requires a multidisciplinary approach involving paediatricians, occupational therapists, physiotherapists, orthotists and upper extremity surgeons.
SPASTICITY IN CEREBRAL PALSY: Interventions are generally aimed at improving function and cosmesis by spasticity management, preventing contractures and correcting established deformities. Treatment objectives vary according to each child and range from static correction of deformities to ease nursing care, to improvements in dynamic muscle balance to augment hand function. Botulinum toxin A therapy has been shown to relieve spasticity and improve function in the short term. Surgery is also effective but requires careful patient selection, as many children with cerebral palsy are not candidates for surgery. Occupational therapy and physiotherapy have small treatment effects alone but are essential adjuncts to medical and surgical management.

SURGICAL TREATMENT OF TWO CASES AT THE “Institut de la Main”:

CASE 1: Spasticity of the upper limb in a 9 y.o. child after cerebral hypoxia in a heart surgery operation (FIG. 1). A severe spasticity in a non-functional hand was treated by a procedure of hypo-neurotisation on median nerve branch to allow an elbow release by using a neurostimulator device and microsurgical loupes. (FIG. 2,3)

CASE 2: Severe spasticity in a 13 y.o. boy in cerebral palsy. Correction of the deformity by tenotomies and wrist arthrodesis after correction of the hyperflexion of the hand (FIG 4,5,6).

Figure: 1) Severe spasticity for cerebral hypoxia 2) Selective hyponeurotisation 3) Improvement of retraction (Courtesy of Dr. C. Leclercq- Institut de la Main, Paris)

Figure: 4) Severe spasticity for cerebral palsy: tenotomies of flexor tendons 5) Wrist arthrodesis 6) X-ray control (Courtesy of Dr. C. Leclercq- Institut de la Main, Paris)

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