Résultats. – Il n’y a pas de différence entre les deux pieds concernant le valgus ($p = 0.93$) et la statique de l’arche médiale ($p = 0.46$). La valeur de l’angle d’arche médiale (113 ± 8.7°) montre au contraire une tendance au pied creux bilatéral. L’aire de l’empreinte podale obtenue par baropodométrie est moins importante du côté opéré (58,4 ± 28,4 cm$^2$ versus 98,1 ± 22,1 cm$^2$, $p = 0.002$), par effacement de l’isthme. La chirurgie a permis à 58 % des patients d’abandonner leur orthèse podale. Quatre-vingt pour cent des patients se disent satisfaits ou très satisfaits de la chirurgie, avec une satisfaction globale évaluée selon une échelle visuelle analogique à 75,2/100.

Discussion. – Nos résultats ne montrent pas d’évolution vers un pied plat valgus douloureux chez des adultes spastiques. Les patients opérés, relativement lourds sur le plan fonctionnel, présentent un gain fonctionnel et sont globalement satisfaits de cette chirurgie. Ces éléments confirment l’intérêt et la place de cette technique dans la prise en charge du pied varus equin spastique de l’adulte.

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**CO17-001-e**

**Surgical treatment for neurological heterotopic ossification (NHO): Surgical principles and specific aspects of certain locations**

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**Keywords:** Neurological heterotopic ossification; Surgery

**Introduction.**– The only curative treatment for troublesome heterotopic ossification is surgery. We propose to identify the surgical principles, the specific aspects and notably risks of certain locations.

**Materials et methods.**– The analysis of our database of 639 surgeries for NHO excision permits to precise and plan the surgical steps predetermined by the iconography, notably CT Scan (3D and assessment of the bone density). We use to follow five steps:
– to display the basis of implementation;
– to identify the joint capsule to control the epiphysis;
– to control and release the vascular bundle and/or nerve bundle;
– to perform an only functional excision;
– to ensure a rigorous haemostasis.

**Results.**– The preoperative planning was confirmed intraoperatively in all cases. Circumferential NHOs presented the most frequent exposure difficulties (two surgical approaches in one third of cases) with the hip anteromedial location. The respect of the capsular limits avoided peroperative fractures. The lateral ligaments were respected in all cases for the elbow and the knee (one elbow remained instable postoperatively). The cause of the limitation being extra articular, none arthrolysis were performed. In 30 cases, huge epiphysis lesions entailed a joint action: total arthroplasty, epiphysis resection. In all these cases, it concerned former (>33 months) and NHO with ankylosis. Sepsis was the main side effect (6.4%) and mainly for hip location (9.3% among 12.7% on anterior location), elbow (2.7%) and the knee (1.0%). Finally the higher sepsis rate was for paraplegic patients with an anterior hip NHO (19.0%). Multisite locations are frequent: 27% of patients had two locations and 5% three locations. For these cases, a multidisciplinary approach was necessary to assess the haemorrhagic risk, the rehabilitation constraints and the objectives for the patient.

**Conclusion.**– Surgical excision of NHO improves the global function but enforce to a rigorous preparation: planning, side effects prevention (mainly sepsis) and a good experience of the medico-surgical teams.

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**CO17-002-e**

**Neurological heterotopic ossification (NHO): Impact of the time for surgery**

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**Keywords:** Heterotopic ossification; Recurrence; Time for surgery

**Introduction.**– It is widely believed that the extent of the neurological aftermaths, the timing for surgery and the extent of the initial HO have an impact on NHO recurrence risk.

**Materials and methods.**– Since 1993, we have been maintaining a database of patients who had surgery for troublesome HO after CNS lesions, named “BANKHO” [1]. It contained in 2009 data on 357 patients, including 539 first-time interventions for HO. We carried out epidemiological studies using this database in order to address the above questions.

**Results.**– The impact of the operative delay: there were no recurrences of HO among the 181 surgical interventions which were performed during the first year after the CNS damage [1]. For those who underwent recurrence, it was not associated with etiology, sex, age at time of CNS lesion, multisite HO, or “early” surgery (before 6 months). Moreover, a too long delay before excision leads to a negative cascade of events: risk of ankylosis, intra-articular lesions, bone loss in the femoral head and increase risk of fracture during or after surgery [2].

The impact of the extent of the neurological aftermaths and the size of the HO: case control studies with data from “BANKO” database were carried out. No association was found between recurrence and the neurological aftermaths neither between recurrence and the location around the joint or the Brooker status.

**Discussion.**– We suggest that surgical excision of HO should be carried out as soon as comorbid factors are under control and the HO is sufficiently constituted for excision. Delayed surgery, allowing ankylosis to occur, increases the risk of fracture during or after surgery.

**References**


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**CO17-003-e**

**New microsurgical nerve transfers in brachial plexus surgery**

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**Keywords:** Brachial plexus; Microsurgery; Nerve transfers

In patients with partial brachial plexus palsies, daily function is greatly limited. The goal of our study is to present the new microsurgical nerve transfers, in order to improve the quality of life of these patients.

**Material and methods.**– Twenty patients, 19 men and one woman, have been followed-up. In 95%, the brachial plexus palsy was secondary to a motorcycle accident. All patients have a partial palsy of brachial plexus with no shoulder elevation and elbow flexion. Five patients have no elbow extension, fingers and wrist extension. All patients have been operated with a double surgical team in a specialized institute. Seventeen patients have been operated before 6 months and three after 6 months. All patients have undergone two to four nerve transfers in order to recover shoulder elevation, elbow flexion and extension if necessary.
In five patients, tendinous transfers have been performed to improve wrist and fingers extension.

Results.– Elbow flexion was recovered in 19 patients (quotation M4). Shoulder elevation was recovered in 16 patients. Elbow extension recovered in four patients (quotation M3, M4). At last, active wrist and fingers extension were recovered in all patients. No complications were noted.

Discussion and conclusion.– The new nerve transfers are currently efficient in partial brachial plexus palsies. Now, nerve graft is rarely indicated in these cases. These patients must be addressed in specialized institute, before 6 months after the trauma, in order to improve the results of nerve surgery.

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Flexor origin slide for contracture of spastic finger flexor muscles. A retrospective study

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Keywords: Contracture; Neurological hand; Brain damage

Introduction.– Contracture of the extrinsic fingers flexors and pronators is a common consequence of central nervous system (CNS) damage. Proximal release of the extrinsic flexor and pronator muscles was first described by Page and Scaglietti for Volkmann’s syndrome [1]. The aim of this study was to assess the gain in extension following lengthening of the finger flexors and pronators that can be expected and the benefits on global hand function in patients with CNS damage.

Patients and methods.– A single medical center retrospective review of patients with CNS lesions and contractures of the extrinsic finger flexors and wrist pronators, causing aesthetic, hygienic or functional impairment was carried out. All patients were operated on using the Page-Scaglietti technique. Before the operation, peripheral motor nerve blocks were used to distinguish between spasticity and contractures (only the latter requiring surgery). Improvement was evaluated using the Zancolli and House classifications.

Results.– Data from 50 patients (54 hands, 35 men/15 women) were evaluated. Mean follow-up was 25.5 months (range 3 to 124, 21.5 SD). The mean gain in wrist flexion was significant (P < 0.01; fingers flexed: 39.5°/10° to 105°, ±28.3°), fingers extended: 66.8° (10° to 110°, ±25.2°). The surgical goals were detailed in the form of an agreement with the patient and were achieved in all cases. Prior to surgery, no hands were rated Zancolli one, whereas 25 had this rating at the first review. Ten non-functional hands (House 0 or 1) became functional as a result of the procedure. Ten non-functional hands (House 0 or 1) became functional as a result of the procedure. Eighty percent of patients were satisfied or very satisfied with the surgery, with a functional gain and are generally satisfied with the surgery. This confirms the value and place of this technique in the treatment of spastic equinovarus foot in adults.

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Communications affichées

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La fibrodisplasie ossifiante progressive : à propos d’un cas

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Keywords: Neuro-orthopedic; Tibialis posterior; Foot deformities; Functional surgery

Introduction.– The technique of Watkins is one of the surgical procedures performed in the treatment of spastic equinovarus foot in Toulouse University Hospital. The terminal tendon of tibialis posterior is transposed on the lateral cuneiform. This procedure is controversial, mainly due to the observation of secondary valgus flat foot in children cerebral palsy.

Patients and methods.– Twenty-one adult patients (51.3 ± 10.4 years) with spastic equinovarus foot surgery were reviewed with a post-operative period average of 4 years. Preoperatively, 90% of patients used a podal orthosis, and 81% walked with a cane. Walking performance measured using the FAC modified was 5.3 ± 1.2. All subjects received a transposition of the posterior tibial associated with a lengthening of the Achilles tendon. In half the cases, a flexor digitorum longus tenotomy was performed. The analysis of static foot surgery is performed compared to the healthy foot, supported by radiographs and computerized baropodometry. Radiographic parameters are Dijan angle (valgus hindfoot), and the angle of medial arch (midfoot collapse). Baropodometric parameters are based on the plantar surface.

Results.– There is no difference between the two feet on the valgus (P = 0.93) and the static of the medial arch (P = 0.46). The value of the medial arch angle (113 ± 8.7°) shows instead a tendency to bilateral cavus. The area of plantar support surface obtained by podal baropodometry is less important side of surgery (58.4 ± 28.4 cm² versus 98.1 ± 22.1 cm², P = 0.002), by deleting the isthmus. Surgery has enabled 58% of patients abandon their podal orthosis. Eighty percent of patients were satisfied or very satisfied with the surgery, with an overall satisfaction rated on a visual analog scale at 75.2/100.

Discussion.– Our results show no trend towards a valgus flat foot pain in adults with spasticity. Patients operated, relatively heavy on the functional level, have a functional gain and are generally satisfied with the surgery. This confirms the value and place of this technique in the treatment of spastic equinovarus foot in adults.