

contractures. Here, we present two case reports suggesting a definite interest in this domain.

Methods.— We reviewed patients who received BTI (2006–2011) for post-traumatic contractures of the upper limb. They were assessed for passive and active range of movement, pain (visual analogic scale) and passive and active functions.

Case reports.— The first patient suffered from severe and painful post-traumatic contractures of elbow and wrist flexors, following elbow dislocation, which severely limited joint extension and use of the hand. Oral treatment and physiotherapy had a very limited effect. Repeated BTI were performed in contracted and painful muscles, with limited doses (100U Botox[®]), each 2–3 months. In the 4–5 days following each injection, contracture and pain were reduced and this favoured active function of the antagonist muscles. Recovery was complete after four injection sessions, with fair satisfaction level. The second patient had been the victim of a traumatic injury of the upper extremity, with compartment syndrome. She suffered from severe multifocal painful contractures, impairing daily living, with loss of usage of the limb. Oral treatments and physical therapy had a modest effect. Iterative BTI were performed every four months (200U Botox[®]) for four years, with a partial, recurrent and constant gain on pain, active motricity, use of the limb, and level of satisfaction

Conclusion.— Following arthroplasty, BTI has yet shown definite effect on painful contractures of the hip and knee. Here, we present the first reports of such a symptomatic and functional effect on severe post-traumatic contractures. Botulinum toxin injections must be considered as a useful treatment for post-traumatic disabling contractures.

<http://dx.doi.org/10.1016/j.rehab.2012.07.127>

CO02-004-e

Botulinum toxin type A interest in diagnosis and treatment of exertional leg pain

C. Blaes^{*}, M.E. Isner-Horobeti, C. Muhl, G. Muff, J. Lecocq
Service MPR, CHU Hautepierre, 1, avenue Molière, 67000 Strasbourg, France
^{*}Corresponding author.
E-mail address: blaes.cyril@neuf.fr.

Keywords: Botulinum toxin type A; Leg pain; Chronic compartment syndrome; Popliteal artery entrapment; Accessory soleus muscle

Introduction.— Etiologies of exertional leg pain are numerous and may be associated. This diversity requires a precise diagnostic break-up, and makes its therapeutic management sometimes complex. How should some abnormalities (supernumerary muscles, functional popliteal arteries entrapment) be handled when their imputability in pain is uncertain? Botulinum toxin type A (BTX-A) has been successfully used for several years in some lesions of the locomotor apparatus. Our objective is to demonstrate its diagnostic and therapeutic interest in the chronic compartment syndrome (CCS), functional popliteal artery entrapment syndrome and the accessory soleus muscle. **Observation.**— We are presenting a few studies or case series which are in the process of being analysed or published. The first open and prospective study demonstrates the diagnostic and therapeutic interest of BTX-A in 31 patients with antero-external CCS of the leg of a mean duration of 31 months. Pain disappeared in 97% of cases. A moderate muscular deficiency is nearly constant and disappears between 1 and 5 months in 94% of cases, preventing only exceptionally an early resumption of running. Intramuscular pressures, three months after BTX-A, had normalized. Eight patients presented a recurrence of pain between 6 and 30 months.

In three patients with painful accessory soleus muscle treated by BTX-A injection within the muscle by stimulodetection, pain had disappeared. Two patients relapsed at distance.

Five patients presenting with a functional trapped popliteal artery without anatomical lesion were treated by BTX-A injection. The results are in the process of analysis. A first patient was able to resume sport, as pain had disappeared and the echographic dynamic abnormalities had normalized. **Discussion.**— The precise use of BTX-A is a useful adjuvant in the diagnostic break-up of exertional leg pain, in addition to the absolutely essential complementary tests. It allows precisising the imputability of anatomical or functional abnormalities in the origin of pain. BTX-A has its own therapeutic action

allowing a prolonged amendment of some types of pain. In case of recurrence, it is an excellent pre-surgical test in non-responding pain with uncertain surgical results.

<http://dx.doi.org/10.1016/j.rehab.2012.07.128>

CO02-005-e

Algodystonia in the context of upper limb complex regional pain syndrome (CRPS)

E. Mauruc^{*}, S. Fardjad, A. Behnegar, N. Bayle, J.-M. Gracies
Unité de rééducation locomotrice et du Rachis, service de médecine physique et de réadaptation du Pr J.-M Gracies, AP-HP, GH Henri-Mondor, Créteil, 51, avenue du Maréchal-de-Lattre-de-Tassigny, 94010 Créteil, France
^{*}Corresponding author.
E-mail address: elsa_mauruc@hotmail.fr.

Keywords: Algodystonia; Botulinum toxin; Dystonia, complex regional pain syndrome

Introduction.— CRPS remains a phenomenon not clearly understood physiologically. Three phases follow one another: hot, cold and retractile. A symptomatic element of dystonia may appear from the cold phase, characterized by tonic muscle contractions and abnormal postures.

Observation.— A 42 year old woman presents with a epitrochlea fracture of the left humerus further complicated by ulnar nerve compression which was treated by arthroscopic surgery. Two years later, with no obvious trigger, the patient develops pain and swelling of the left arm, and a progressive stiffness of the hand of attributed to (CRPS). Clinical examination of passive range of motion revealed the following limitations: shoulder abduction of 30°, flexion at 40°, elbow pronation of 60°, supination to –45°, wrists extension of –60°, radial rotation at –20° and pulpo-palmar distance of II to V fingers at 0 mm. The patient was treated with marcaine for regional local nerve blocks followed by intensive rehabilitation, without results. Three years later, the patient was referred to us for further treatment of her dystonia. We used botulinum toxin to inject the trapezius, teres major, pectoralis major, pronator teres, flexor carpi radialis, superficial and deep common flexors of the second to fifth fingers. We used alcohol nerve blocks administered to the palmar muscles, common flexors, and flexor pollicis longus 15 days later resulting in a clear measurable functional improvements with shoulder abduction of 80°, shoulder flexion of 150°, elbow pronation 90° and supination to 80°, wrist extension at 30°, radial rotation of 0°, and the pulpo-palmar distances of 80 mm, 50 mm, 60 mm, 70 mm for second, third, fourth, and fifth fingers, respectively.

Discussion.— The literature on CRPS dystonia is very scarce, the use of botulinum toxin as well as intensive active and passive rehabilitation in conjunction with psychotherapy can be an effective therapeutic combination.

Further reading

M Revel, S Aloui, S Poiradeau, MA mayoux-benhamou, B Armor, Forme froide d'emblée d'algodystrophie du pied ou algodystonie? Ann Réadaptation Méd Phys 1998; 41:485–90

<http://dx.doi.org/10.1016/j.rehab.2012.07.129>

CO02-006-e

Axial myofascial pain syndromes and botulinum toxin

M.E. Isner-Horobeti^{*}, C. Blaes, P. Vautravers, J. Lecocq
CHU Strasbourg service de médecine physique et de réadaptation, avenue Molière, 67098 Strasbourg, France
^{*}Corresponding author.
E-mail address: marie-eve.isner@chru-strasbourg.fr.

Introduction.— Botulinum toxin (BT) can be used in the treatment of neck and upper limb pain and in the management of low back pain with or without sciatica. Its use and justification in these indications are based on the myofascial pain concept according to Travell, which would be a malfunction of the motor endplate with excessive release of acetylcholine.

Material and method.— We describe the use of TB in the treatment of cervico-thoracic and lumbar myofascial syndrome (MFS): systematic review of the literature.

Results.— For the neck, the cervico-thoracic SMF concern the upper trapezius, supraspinatus, rhomboids, angular, and cervical paraspinal muscles [1]. After BT injection, prospective studies show an improvement in pain and quality of life for 3 months. Randomized controlled trials (RCT) found at 1 and 3 months analgesics and functional results with BT equivalent to other products (saline, corticosteroids) and dry needle therapy. Two RCTs show a greater analgesic and functional effect 1 and 2 months after BT injections compared to saline solution. For upper limb pain, one RCT (MFS of the scalene muscle), shows after BT injection an analgesic gain at two months superior to corticosteroid injections. For low back pain, the MFS concern iliopsoas, erector spinae and rectus of the abdomen. Foster et al. [2] show that after injection of TB in the erector spinae muscles, pain relief and functional gain to 1 and 2 months are greater than the saline injection. Similar results were found compared to traditional treatment by acupuncture.

Conclusions.— The use of BT in the treatment of neck pain and low back pain is an interesting alternative therapeutic in axial MFS. Its superiority compared to other treatments remains to be demonstrated.

References

- [1] Langevin P, et al. Botulinum toxin for subacute/chronic neck pain. Cochrane Database.
 [2] Foster L, et al. Botulinum toxin A and chronic low back pain: a randomized, double-blind study. *Neurology* 2001;56:1290–3.

<http://dx.doi.org/10.1016/j.rehab.2012.07.130>

CO02-007-e

Botulinic toxin in articular stiffness' rehabilitation of orthopaedic origin: A new help?

B. Leuthold*, M. Konzelmann, A. Mühl, F. Lüthi

Clinique Romande de Réadaptation, avenue Grand-Champsec 90, 1950 Sion, Switzerland

*Corresponding author.

E-mail address: beatrice.leuthold@crr-suva.ch.

Keywords: Botulinic toxin; Articular stiffness; Pain; Rehabilitation

Purpose.— Rehabilitation of orthopaedic articular stiffness represents a major therapeutic challenge. In rebellious cases, injection of botulinic toxin in bi-articular muscles could represent an interesting adjunction to the usual therapies.

Observations.—

– A 29-years-old female patient hospitalised after her fourth knee arthrolysis following an anterior cruciate ligament reconstruction. At admission, the ROM was F/E 90°-0-5°. Rapidly a 25° stiff knee flexion appears with important difficulties while walking. The electro-neuromyography shows a hyperactivity of hamstrings semi-membranosus and short head of the femoral biceps muscles. Injections of 100U of botulinic toxin in femoral biceps, 50U in the others hamstrings and gastrocnemius muscles were done. After 3 weeks the stiff knee flexion progressively reduces (F/E 125°-5-0°), pain reduces by 30% and walking improves (see videos). At 3 and 6 months, injections were repeated for a persistent muscular hyperactivity. At 1 year, the pattern of walking is back to normal. The patient has fully returned to work and started adapted sport activities.

– A 34 years old patient that had surgery for a radial head dislocation and fracture. Osteosynthesis material was taken off 13months followed by a secondary stiffening resisting ambulatory treatment. At entry, the ROM was F/E 130°-60°-0 with a stiff stop in extension. Prono/sup 80°-0-60°. On the

EMG: biceps muscular hyperactivation. Injection of 25U of botulinic toxin in biceps short head followed by intensive physiotherapy and occupational therapy for 5 weeks. Decrease in biceps hypertonia 7 days after the injection. ROM at discharge F/E 135°-12°-0, P/S 80°-0-60°. Progressive return to work as a heating engineer achieved. At 3 months: F/E: 130°-25°-0, P/S: 80°-0-60°.

Discussion.— Most often used in treatment of spasticity, botulin toxin could in some cases allow to break a vicious circle. The neuromuscular blockade allows a decrease in muscular tonus and facilitates rehabilitation. The toxin transported through the axons to the central nervous system and the adjacent neurones also show an analgesic effect through the modulation of some neurotransmitters' secretion such as the substance P, CGRP and glutamate.

Further reading

Zhang T *Inflammopharmacology* 2011;19:21–34

<http://dx.doi.org/10.1016/j.rehab.2012.07.131>

CO02-008-e

Interest of the botulinum toxin for the diagnosis and treatment of the piriformis muscle syndrome

J. Lecocq*, R. Pourchot, C. Blaes, C. Muhl, M.E. Isner-Horobeti

Service de MPR, hôpitaux universitaires de Strasbourg, avenue Molière, 67098 Strasbourg, France

*Corresponding author.

E-mail address: jean.lecocq@chru-strasbourg.fr.

Keywords: Botulinum toxin; Buttock pain; Sciatica; Sciatic nerve entrapment syndrome; Injection

Objective.— The piriformis muscle syndrome (PMS) arises a problem as diagnostic because there are not clinical and paraclinical pathognomonic signs, as therapeutic. The chronic PMS can be treated by muscular injection of botulinum toxin (BTA). The objective is to assess the efficiency and the interest of BTA.

Methods and patients.— Retrospective study of 46 patients treated by piriformis injection of BTA guided by CT. Clinical, electrological and imaging diagnosis rules out the spine and pelvic causes of buttock pain and/or sciatalgia. Pain assessment by the patient: decrease < or ≥ 50% of the pre-therapeutic pain.

Results.— Sixteen patients are examined at 4 months: 62,5% of good results (pain decrease ≥ 50%). Second BTA injection in 12 patients: 63% of good results but during only 1 month. Third BTA injection in three patients: 100% of good results during only 1 month. Phone assessment of 14 patients with initial good results: Five patients think to have a partial benefit continuing at mean 30 months. Correlation don't exist between results and age, the time elapsed since the beginning of the PMS (mean 33 ± 44 months), the low back pain, the location of the pain, the electrological modifications of the H reflex.

Discussion.— Four published studies find a statistically significant efficiency of the BTA between 2 and 4 months. In our study these good results don't last more long time. The BTA injection repetition don't give a cumulative effect and the efficiency even decreases. So, the therapeutic interest is limited. On the other hand the BTA transitory efficiency at short-term could be used to confirm the diagnosis of PMS because BTA has its principal action in muscle without diffusion, contrary the corticoids.

Conclusion.— The BTA injection into the piriformis muscle for the chronic or resistant PMS is becoming for us a certain diagnosis test associated to clinical and paraclinical signs for the aim to better select the patients to a surgical treatment. Nevertheless, the validity of this strategy must be confirmed by a prospective study.

<http://dx.doi.org/10.1016/j.rehab.2012.07.132>