Use of triple-convergence polypropylene thread for the aesthetic correction of partial facial paralysis caused by the facial nerve injury

Utilização de fio de polipropileno de autossustentação de tripla convergência para a correção do desvio de hemiface causada por lesão do nervo facial

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A B S T R A C T

Objective: To evaluate the use of self-sustaining triple-convergence polypropylene thread for correction of hemiface deviation presenting as late result of facial paralysis. **Methods**: We conducted a retrospective, observational study with 34 subjects with late facial paralysis. We used a triple-convergence polypropylene thread to correct the deviation of the paralyzed hemiface. It is a monofilament, synthetic, transparent and unabsorbable thread that has hooks that exert traction in the ptotic tissues, keeping them in the correct position, in symmetry with the healthy side. The results were evaluated by subjective analysis, with assessment of patient satisfaction with a proper questionnaire. **Results**: We analyzed 34 patients, 73.52% of them reported great improvement, 20.58% moderate improvement and 5.88%, slight improvement; we found a high satisfaction rate of 94.1%. Two patients had partial extrusion of the thread. No patient developed infection. **Conclusion**: The use of triple-convergence polypropylene thread to correct the deviation of hemiface consequent to facial palsy markedly improved facial asymmetry and recovery of patients' self-esteem.

Key words: Facial paralysis. Facial muscles. Facial nerve. Cranial nerve diseases. Surgery, plastic.

INTRODUCTION

Peripheral facial palsy is the most common acute cranial neuropathy and is characterized by facial nerve damage accuring distal to its emergence from the internal auditory canal[1]. This injury can be on the trunk or any of its branches: temporal, zygomatic, buccal, mandibular or cervical[1-3].

Its consequence is a decrease or lost mobility of the affected hemiface muscles, from the eyebrow to the mouth, leading to a deviation from this hemiface to the sound side[4].

In many patients, facial nerve damage is permanent, resulting in irreversible consequences, causing severe functional disorders, aesthetic and psychological, which require adequate surgical treatment [4-7].

Facial rehabilitation requires a multidisciplinary team composed of a neurosurgeon, ophthalmologist, otolaryngologist, a specialist in microsurgery, plastic surgeon, physiotherapist, speech therapist and psychologist, among other experts[1].

In surgical rehabilitation of the paralyzed face, it is crucial to know the diagnosis and possible techniques for reconstruction, whether primary, direct ot indirect, or secondary[4,5,7].

In 1999, the Russian physician and researcher Marlen Sulamanidze developed and patented a polyurethane thread (APTOS – Anti-PTOSis) with barbs for face support and used it for aesthetic purposes, it being known as the "Russian thread." Later, in 2004, a Bolivian doctor living in Brazil, José Antonio Encinas Beramendi, enhanced this thread, with inclusion of double and triple barbs, increasing its traction and support, starting to use it to correct the hemiface deviation consequent to delayed facial palsy. Moreover, the delayed reaction to these threads also showed an increased synthesis of collagen and elastin around them, increasing their support. In surgical planning, although the restoration of function is very important, a large number of patients with late sequelae will benefit from purely static corrections of the affected hemiface, which shows how important aesthetics is in individuals who have their image and self-esteem markedly compromised. Moreover, these procedures, such as using self-sustaining threads, feature low morbidity, can be performed on an outpatient basis, with a low material cost, besides presenting a short learning curve, ideal for medical services with residents and / or education services.

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This study assessed the use of triple-convergence polypropylene thread to correct the hemiface deviation consequent from permanent damage to the facial nerve.

METHODS

We conducted a retrospective, observational, descriptive study of 34 patients with delayed facial palsy, operated by the author in his private clinic between January 2006 and January 2008. Information was collected regarding age, gender, cause and duration of the facial paralysis.

Patients underwent routine laboratory, radiological and surgical risk assessment exams prior to surgical procedure. All patients also underwent a photographic record.

In all patients we carried out the technique of correcting the deviation of the affected hemiface with the use of triple convergence self-sustaining polypropylene thread. It is a monofilament, synthetic, transparent, nonabsorbable thread, which has barbs that exert traction on ptotic tissues, keeping them suspended and in the correct position, in symmetry with the normal side. The introduction of these threads is done through proper cannulas, in a surgical plane that lies between the subcutaneous tissue and superficial muscle-aponeurotic system. These threads had their approval made by ANVISA under the registration 80163090001, after studies in guinea pigs and in humans.

The technique used consisted of a previous markin, with dermographic pen, of the paths to be passed by the threads, i.e. the points used for the suspension of the affected hemiface. In all cases we used local infiltrative anesthesia with a solution corresponding to to 2% xylocaine and adrenalin in the ratio of 1:200,000. After infiltration of the anesthetic, a 20cm-length cannula was introduced, whose light permitted the passage of the thread through the demarcated areas. In the distal area the thread exerted traction in the ptotic tissue with its barbs, and in the proximal it was fixated to the periosteum. At the end of the procedure we prepared a dressing, which sholud remain in place for one week. Figures 1 and 2 show details of the technique.

The degree of patient satisfaction was assessed with a specific questionnaire, designed by the author and applied routinely to patients after surgery, during the outpatient visit. The questionnaire has five options for response: 1 – worsening; 2 - no improvement; 3 - slight improvement; 4 - moderate improvement; and 5 - great improvement.

RESULTS

Thirty-four patients were analyzed, 21 being men (61.77%) and 13 women (38.23%); patients' age ranged from 24 to 75 years. The paralysis was found on the left side of the face in 23 (67.6%) patients and on the right side in 11 (32.4%) of them, with time of disease between two and six years. Eight patients had idiopathic paralysis (23.55%), nine traumatic (26,47), two had a history of malignant otitis media (5.88%), herpes zoster lesion originated in seven patients (20; 58%) and eight were iatrogenic (23.52%).

The evaluation after the procedure showed what patients felt about their results: 25 of 34 patients (73.52%) reported great improvement, seven of them (20.58%) reported moderate improvement and only two (5.88%) a slight improved. No patient reported no improvement or worsening of symptoms. Improvement in the overall aesthetic appearance was unanimous. Complications were: two patients who had partial extrusion of the thread (5.88%) and one patient who had an episode of herpes simplex labialis (2.94%), which was properly controlled. No patient developed any infection or reaction to the thread. The results were evaluated and maintained for over one year of follow up.

Figures 3, 4, 5 and 6 demonstrate clinical cases in the pre and postoperative fases of application of the triple-convergence polypropylene thread.

DISCUSSION

Patients with late facial paralysis show a facial aesthetic asymmetry consequent to the facial nerve injury. The goal to be reached by the surgeon is to provide the patients with a dynamic or static suspension of the paralyzed side as opposed to the normal side, creating a harmonious and aesthetically symmetrical animation[5].

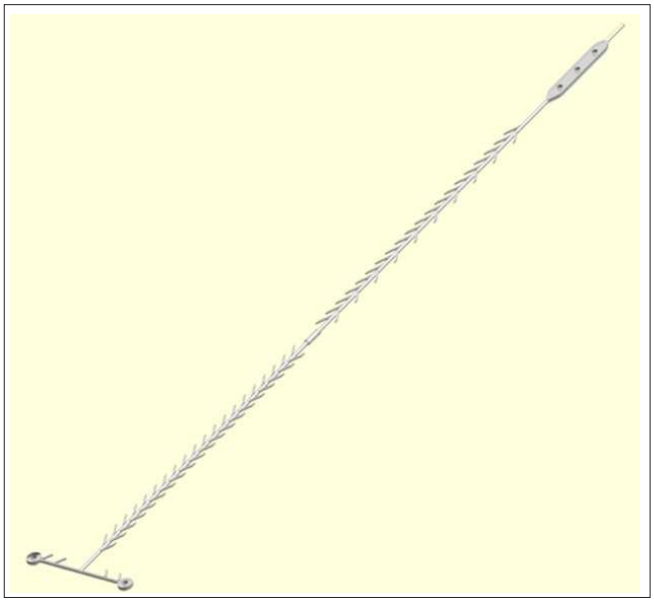

Figure 1 – *Triple-convergence polypropylene thread.*

Figure 2 – *Passage of the thread through the cannula.*

Figure 3 - *Pre-operative aspect.*

Figure 4 - *Postoperative aspect.*

The surgical methods for the treatment of facial paralysis include excisions, grafts, of weight and suspensive implants, passive and active supports, muscle transposition and free muscle and nerve transplants[8-15].

Most procedures found in the literature, such as nerve grafts, neurorraphies, muscle transplants and many others, can produce aesthetic sequelae such as scarring, hypo and hyperaesthesia, asymmetries and incomplete correction with relapses. Procedures are usually multiple and involve multiple hospitalizations, with considerable morbidity and high operational costs, involving general anesthesia and the need of hospital admissions for medium and long periods. In addition to these procedures, several other techniques should be considered, such as facelift, blepharoplasty, correction of lagophthalmos and botulinum toxin, a valuable inhibitor of muscle action[5].

The triple-convergence self-sustaining polypropylene threads were widely used for aesthetic purposes, only recently being incorporated to the techniques for correction of facial paralysis. They promote the correction of the hemifacial deviation consequent of the facial palsy through a static stabilization of the affected hemiface. Their advantages are: biocompatibility, application with a low complexity surgical technique, low operating cost, combined with the execution of the procedure at the clinic, without the need for hospitalization, and a result that provides a high degree of satisfaction to patients undergoing this new technique. Their advantage is also the fact that they can be used in conjunction with other procedures from the vast surgical and therapeutic arsenal available in the literature[16-24].

Our results demonstrate that the use of triple-convergence self-sustaining polypropylene thread to correct the deviation of hemiface consequent to facial palsy caused marked improvement of facial asymmetry and recovery of patients' self-esteem.

Figure 5 - *Pre-operative aspect.*

Figure 6 - *Postoperative aspect.*

R E S U M O

Objetivo: *Avaliar a utilização do fio de polipropileno de autossustentação de tripla convergência para a correção do desvio de hemiface que se apresenta como sequela tardia da paralisia facial periférica.* ***Métodos:*** *Realizou-se um estudo retrospectivo e observacional em 34 indivíduos portadores de paralisia facial tardia. Utilizou-se fio de polipropileno de tripla convergência para a correção do desvio da hemiface paralisada. Trata-se de fio monofilamentar, sintético, transparente e inabsorvível que possui garras que tracionam os tecidos ptosados mantendo-os na posição correta, em simetria com o lado são. Os resultados foram avaliados através de análise subjetiva, quanto ao grau de satisfação dos pacientes, submetidos a um questionário próprio.* ***Resultados****: Analisou-se 34 pacientes, 73,52% deles relataram grande melhora, 20,58% relataram melhora moderada e 5,88%, uma melhora leve; encontrou-se um alto índice de satisfação, 94,1%. Dois pacientes apresentaram extrusão parcial do fio. Nenhum paciente desenvolveu infecção.* ***Conclusão:*** *O emprego do fio de polipropileno de autossustentação de tripla convergência para a correção do desvio da hemiface, consequente à paralisia facial, ocasionou acentuada melhora da assimetria facial e a recuperação da autoestima dos pacientes.*

Descritores: *Paralisia Facial. Músculos faciais. Nervo facial. Doenças dos nervos cranianos. Cirurgia plástica.*

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