

Use of Triple-Convergence Polypropylene ThreadTM for the Aesthetic Correction of Partial Facial Paralysis

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Abstract Rehabilitation and reanimation of the paralyzed face remains a challenge. A variety of autografts and allografts have been used for static facial suspension. We report two cases of long-standing partial facial paralysis treated with 3C triple-convergence polypropylene threadTM. A 39-year-old woman with right-sided partial facial paralysis underwent an endoscopy-assisted facial suspension using the 3C threads and a 60-year-old woman with right-sided partial facial paralysis underwent a round face-lifting combined with endoscopic brow lift and placement of 3C triple-convergence polypropylene threads. Its use for partial facial paralysis has not been previously described. The 1-year follow-up shows effective preservation of the surgical result and patient satisfaction.

Keywords Partial facial paralysis ·
3C triple-convergence polypropylene thread ·
Endoscopy-assisted facial suspension · Round face-lifting

Rehabilitation and reanimation of the paralyzed face remains difficult despite many described static and dynamic procedures [1]. Most surgeons agree that successful dynamic reanimation, using nerve grafting and

microneurovascular techniques, provides the best functional and cosmetic results. Despite the described techniques for reanimation of the midface, the static suspension procedures remain an option for certain patients, which are less invasive and have a relatively short recovery period.

Suspension techniques using the following materials have been described: autogenous fascia lata, silastic rubber, mononylon suture, Marlex mesh, and Gore-Tex [2]. There are cases for which a combination of rhytidectomy, brow-lift, and facial suspension may be needed for the aesthetic correction of partial facial paralysis. We present the case of a young patient with partial facial paralysis treated by endoscopy-assisted facial suspension and the 3C semirigid self-sustentation triple-convergence polypropylene threadTM (Indermo® System, Rio de Janeiro, Brazil) and a second case of an elderly patient where the association of round face-lifting, brow lift, and placement of 3C threads was necessary.

Case 1

A 39-year-old woman presented to our unit with long-standing right-sided partial facial paralysis. On examination the patient demonstrated poor static position of the mouth but maintained some degree of facial movement (Fig. 1A, B). She expressed the desire to undergo the least invasive and complex intervention that could produce an aesthetically acceptable result. Under sedation and local anesthesia with lidocaine 0.5% and bupivacaine 0.125% with epinephrine 1/160,000, a right horizontal temporal incision was made, 1 cm lateral to the superior temporal line and 2 cm from the hairline, having as a point of reference an imaginary line running from the root of the nose ala to the lateral canthus of the eye. A paramedian incision,

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Fig. 1 (A) Preoperative view of 39-year-old woman in resting position. (B) Preoperative view with smiling expression

slightly behind the hairline, 5 cm lateral to the median frontal line, was also made. The initial nonendoscopic dissection was made on a plane between the temporoparietal fascia and the deep temporal fascia through the temporal incision. Assisted by an endoscopic camera placed through the paramedian incision, the undermining was completed up to the superior border of the zygomatic arch [3]. Dissection continued on the lateral side of the sentinel vein, penetrating the medial third of the face in the suprapariosteal plane (Fig. 2). Blind dissection to the middle third of the face was made and placement of the three polypropylene threads was done via a hollow cannula, according to vectors aiming at elevation of the anteromedial part of the middle face and the lateral orbital

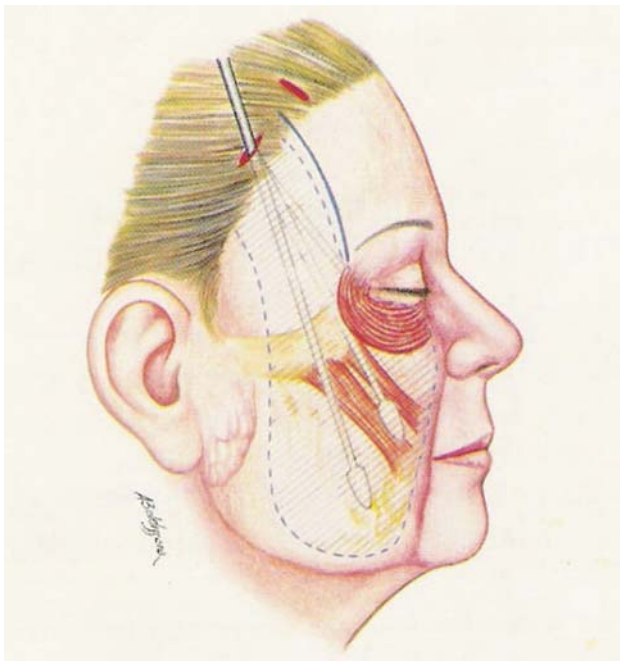


Fig. 2 Schematic representation of the endoscopic browlift and blind dissection in the suprapariosteal plane of the medial third of the face



Fig. 3 Placement of the 3C polypropylene thread via the hollow cannula



Fig. 4 View of the 3C polypropylene thread

region (Fig. 3). The 3C polypropylene thread is shown in Fig. 4. 3-0 Mononylon™ (Ethicon Ltd., Brazil) was used to fix the threads on the temporoparietal fascia, aiming for an overcorrection of the suspended tissues (Fig. 5). 4-0 Mononylon was used to suture the temporal and frontal line incisions. Micropore™ (3M Ltd., Brazil) was taped on the right middle third of the face for 7 days to restrict excessive facial movement and to assist sustentation. Follow-up has been 12 months with no complications and a satisfactory aesthetic result (Fig. 6A, B).



Fig. 5 Fixation of the 3C polypropylene threads on the temporoparietal fascia aiming for an overcorrection of the suspended tissues



Fig. 6 (A) Postoperative view in resting position 12 months after the intervention. (B) Postoperative view with smiling expression 12 months after the intervention



Fig. 7 (A) Preoperative view of 60-year-old woman in resting position. (B) Preoperative view with smiling expression

Case 2

A 60-year-old woman with long-standing right-sided partial facial paralysis requested aesthetic correction using the least aggressive possible procedure. On examination she showed brow ptosis, malar fat pad ptosis, cervical facial skin flaccidity, and poor static position of the mouth although she maintained some degree of facial movement (Fig. 7A, B). We decided to perform a combination of endoscopic brow lift, placement of 3C threads, and a cervicofacial round lift (Fig. 8). The endoscopic brow lift was done first, followed by the endoscopic placement of three 3C threads as described above [3, 4]. Finally, the cervicofacial round lift was done with plication of the SMAS [5]. In addition to the elevation of the anteromedial part of the midface and the lateral orbital region achieved by the 3C threads, the round lifting contributed to the elevation of the anterolateral part of the midface. Follow-up has been 12 months with no complications and a satisfactory aesthetic result (Fig. 9A, B).



Fig. 8 Schematic representation of the combination of an endoscopic brow lift, undermining for placement of 3C threads, and cervicofacial round lift



Fig. 9 (A) Postoperative view in resting position 12 months after the intervention. (B) Postoperative view with smiling expression 12 months after the intervention

Discussion

Patients with partial facial paralysis demonstrate an asymmetric static position but maintain some degree of muscle excursion [6]. The goal of surgery for the treatment of partial facial paralysis is to achieve static support of the paralyzed side and to create a symmetrical animation with the nonparalyzed side. Facial static suspension using materials such as an expanded form of polytetrafluoroethylene (GORE-TEX®; W. L. Gore & Associates, Flagstaff, AZ), acellular dermal allograft (AlloDerm; LifeCell Corporation, Branchburg, NJ), autogenous fascia lata grafts, and Mononylon suture have been described in the literature for the treatment of facial paralysis [2, 7–9]. Midface suspension with polypropylene threads has been used for cosmetic malar fat pad elevation, but it has not been previously described for cases of partial facial paralysis [10].

The 3C semirigid self-sustentation triple-convergence polypropylene thread is a monofilament of polypropylene,

transparent, nonabsorbable, and bidirectional thread that features double-convergent coglike anchors that have the ability to be fixed to stationary tissue points. This creates a suspension effect that lifts and provides support to the paralyzed tissue. It has total traction of 12.60 mm^2 and sustentation area of 12.60 mm^2 . The use of the hollow cannula permits accurate planning of the final position of the thread, assuring traction according to the desired vector. An over-correction is necessary because there is always a little drop of the suspended tissues in the postoperative period [11].

The suprapariosteal undermining is limited compared with other facial suspension techniques, reducing complications such as prolonged edema caused by extensive undermining in the subperiosteal plane and preventing the palpation and possible extrusion of the threads. The technique can be performed under local anesthesia and sedation in an outpatient setting, reducing morbidity and cost.

For young patients, we believe that the use of the 3C threads can produce only a near-symmetrical facial resting tone and create spontaneous synchronous symmetrical animation with the nonparalyzed side. There are cases where the association of face-lifting and endoscopic brow-lifting are useful therapeutic modalities for the management of partial facial paralysis [6, 12]. The facial imbalance worsens with age and senility further aggravates the facial asymmetry [13]. This is particularly true in older patients in whom the combination of the round-lifting technique, the endoscopic brow lift, and the placement of the 3C threads addresses the associated skin flaccidity caused by the natural aging process.

A disadvantage of the static techniques, even with the use of multiple threads and the round-lifting technique, is that the pull is only in two vectors, whereas the face moves along several vectors based on the underlying facial musculature. The polypropylene threads run the risk of infection and extrusion. This procedure involves minimal discomfort and has a quick postoperative healing time of approximately 7 days.

Conclusion

The use of the 3C semirigid self-sustentation triple-convergence polypropylene thread for the aesthetic correction

of facial paralysis presented in this article provides another valuable technique in the armamentarium of surgical interventions that can be used in conjunction with other modalities for correction of partial facial paralysis. The authors hope that long-term follow-up will confirm the satisfactory results seen in these two patients.

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