Combination of Static and Dynamic Techniques for Smile Reconstruction in Patients with Flaccid Facial Paralysis

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The free functional muscle transfer is the standard procedure for smile reconstruction in patients with long-standing facial paralysis. However, the strong oral asymmetry at rest frequently seen in older patients with flaccid facial paralysis is challenging to correct with functional muscle transfer alone. The physiologic ptosis of soft tissue can lead to secondary lateralization of the oral muscle insertion thus emphasizing facial asymmetry at rest in the aging face. Furthermore, the use of a cross-face nerve graft for innervation of the gracilis muscle does not reliably provide an adequate axon count to trigger a sufficiently strong muscle contraction as axon quantities decrease with age. Adding potential comorbidities, the outcome of facial reanimation with functional gracilis transfer alone often remains underwhelming in this patient clientele.

Here, we describe a single-stage reconstructive approach that combines static and dynamic techniques to correct facial asymmetry at rest and upon smiling.

SURGICAL TECHNIQUE

To improve oral asymmetry of patients with long-standing facial paralysis (>1 year) and reduce the number of procedures needed to achieve a satisfactory result, we use a combination of free functional gracilis transfer and fascia lata grafts for static support. The single-stage smile reconstruction technique utilizing a functional muscle transfer coaptated to the massteric nerve has been described in detail elsewhere. For the combined procedure, we perform an additional nasobalabial incision mirroring the nasobalabial fold on the healthy side. In older patients, this approach significantly simplifies the procedure and adds precision to the insertion of the fascia lata grafts and the gracilis muscle. We use 3 fascial strips of 1 cm in width and 12–13 cm in length to carry the tension on the oral commissure. One fascial strip is inserted at the midline of the lower lip, 1 at the oral commissure, and 1 at the upper lip 1 cm from the nasobalabial fold toward the philtral column. The strips are fixed in the layer of the atrophied muscle, and the resulting smile is evaluated by pulling on the strips. Care is taken to avoid any eversion or inversion of the lips and oral commissure to achieve a symmetric nasobalabial fold. After tunneling to the temporal region, the fascia lata grafts are fixed to the deep temporal fascia under slight overcorrection. The gracilis muscle segment is transferred to the face and inserted at the oral commissure and lower lip. Then, the muscle segment is fixed proximally to the layer of the atrophied facial musculature on top of the fascial strips. No tension is put on the muscle to avoid postoperative overcorrection and muscle tightness. Afterward, nerve coaptation and microvascular vessel anastomoses are performed under microscope magnification. The crucial steps of the combined single-stage reconstruction are demonstrated in an in-depth video available online (See Video, [online]), which demonstrates the crucial surgical steps of the combined single-stage technique for oral-facial reanimation and the pre- and postoperative course facial reanimation in a 64-year-old woman with long-standing facial paralysis after schwannoma resection.

RESULTS

The harvesting of fascia lata grafts does not prolong the length of the surgical procedure, especially when performing a 2-team approach to smile reconstruction. The use of static strips allows for an immediate improvement of oral asymmetry at rest and an excellent symmetry of the smile after 6 months. Additionally, asymmetry of the nasal base and philtrum can be corrected notably. Overall, the authors tended to need less secondary touch-up procedures to achieve a pleasant smile since using the combined single-stage procedure for facial paralysis patients with significant soft-tissue ptosis.

DISCUSSION

We present a versatile single-stage approach to optimize the outcome of facial reanimation in flaccid facial paralysis patients by combining static and dynamic re-

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constructive techniques. The physiologic soft-tissue ptosis emphasizes the asymmetry at rest thus leading to less favorable results after smile reconstruction surgery. The preoperative asymmetry is hard to correct with the gracilis flap alone, whereas the addition of static strips provides immediate correction of the oral alignment and overall improvement of functional deficits. The use of fascial grafts to the upper lip also improves nasal and philtral deviation considerably. Thus, the combined procedure is our first choice for facial reanimation in patients with flaccid facial paralysis.

However, several pitfalls must be taken into consideration when using the masseter-innervated gracilis transfer for smile reconstruction. First, not all patients will develop a spontaneous and synchronous smile following surgery. In our experience, the regaining of a spontaneous smile is of high importance to a patient’s long-term satisfaction. Thus, this potential drawback has to be addressed in patient counseling. Second, the transferred muscle may not show completely independent movements for all patients, which could result in involuntary movement of the cheek while biting. Third, some patients require secondary touch-up procedures to correct stronger muscle contraction when using the masseteric nerve.

CONCLUSIONS

The use of static fascia lata grafts for smile reconstruction is a powerful tool to correct oral asymmetry at rest immediately and improves overall outcome. The technique described herein is a single-staged procedure which is preferable in facial paralysis patients with significant soft-tissue ptosis.

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