Platysmectomy

An Effective Intervention for Facial Synkinesis and Hypertonicity

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Objectives: To describe a procedure to permanently address platysmal synkinesis and hypertonicity and to report changes in quality of life associated with platysmectomy using the Facial Clinimetric Evaluation instrument.

Methods: Chemodenervation significantly relieves platysmal synkinesis in almost all patients with significant face and neck synkinesis associated with dynamic facial expressions. We recently began to offer platysmectomy as part of a permanent solution to chronic superficial torticollis-like neck symptoms. For a 10-month period, 24 patients underwent the procedure, and preoperative and postoperative Facial Clinimetric Evaluation data were obtained from 21 patients (88%).

Results: In 19 patients, platysmectomy was performed using local anesthesia without sedation. In the remaining 5 patients, platysmectomy was performed using general anesthesia concurrent with free gracilis transfer for smile reanimation. No intraoperative or postoperative complications occurred. Overall, the patients’ quality of life significantly improved after platysmectomy ($P = .02$).

Conclusion: Platysmectomy is straightforward and seems effective in treating neck synkinesis associated with chronic hypertonic platysmal activity.


Dynamic smile reanimation results using free and regional muscle transfer have improved steadily for the past 4 decades. Before 2005, free gracilis transfer at our center was offered only to patients in whom flaccid facial musculature dominated the clinical picture. Patients whose examination findings were characterized by hypertonicity, spasticity, and synkinesis were offered aggressive physical therapy for neuromuscular retraining, as well as botulinum toxin chemodenervation to achieve better facial balance and function. However, with increased success using dynamic free-tissue transfer in the flaccidly paralyzed face, we began to consider patients with frozen oral commissures as potential recipients of dynamic muscle transfer. This included patients in whom there was commissure excursion with eye closure but not with smiling, despite focused physical therapy efforts.

During placement of free muscle in patients with frozen oral commissures, we frequently encountered significant platysmal hypertrophy and recognized the antagonistic vector of the muscle for the zygomaticus muscle groups (Figure 1). We considered the potential usefulness of resecting a continuous band of the platysma to prevent this antagonistic action and simultaneously to decrease tension and synkinesis from the neck.

Previous studies describe the usefulness of removing portions of the platysma secondary to hyperkinesis. Herein, we describe the technique, report outcomes, and provide preoperative and postoperative Facial Clinimetric Evaluation (FaCE) data measuring quality of life among the first 21 patients at our center who underwent platysmectomy for their hypertonic face as a result of facial paralysis.

Methods

Study Design

Between October 30, 2009, and August 19, 2010, a total of 24 patients seen and evaluated at the Facial Nerve Center, Department of Otolaryngology–Head and Neck Surgery, Massachusetts Eye and Ear Infirmary, Boston.
laryngology–Head and Neck Surgery, Massachusetts Eye and Ear Infirmary, Boston, underwent platysmectomy to treat severe synkinesis of the neck. All the patients had experienced a beneficial response to chemodenervation injections to the platysma for neck synkinesis. Nineteen patients had platysmectomy performed as an in-office procedure using local anesthesia without sedation, while 5 patients had platysmectomy performed concurrent with free gracilis transfer for smile re-animation using general anesthesia. Each patient was prospectively enrolled, and 21 patients completed both preoperative and postoperative FaCE surveys. Botulinum toxin was not administered to the neck of any patient 4 months before or 4 months after the procedure. The mean time between the procedure and the follow-up FaCE survey was 46 days (range, 12-204 days). The institutional review board at the Massachusetts Eye and Ear Infirmary approved this study for the surgical procedure, and written informed consent was obtained from each participant.

SURGICAL PROCEDURE

Patients were asked to perform tight eye closure and any other facial movement that led to platysmal contraction, and the medial and lateral borders of the muscle were marked. A 1-cm incision was then outlined in a natural neck crease at approximately the midbelly of the muscle (Figure 2). The area was then anesthetized using lidocaine hydrochloride, 1%, containing epinephrine, 1:100 000. An incision was carried down to the level of the superficial surface of the platysma. Dissection continued to expose the entire width of the muscle medially and laterally, and superior and inferior skin flaps were raised over the muscle so that an approximate 2-cm strip of the muscle was exposed (Figure 3). The muscle was then penetrated with a curved dissecting clamp, and its deep surface was defined. With care to preserve the veins and sensory nerves running along the deep surface of the muscle, the deep plane of the muscle was fully developed, and a 1-cm band of the muscle was removed in segments with meticulous bipolar hemostasis. Once the superior and inferior segments of the platysma were fully discontinuous from one another, the patient was asked to perform tight eye closure and smiling to verify the absence of visible muscle continuity, and the skin was closed. A video of the procedure is available at http://www.archfacial.com.

After surgery, patients were asked to complete another FaCE survey, and the data before and after the procedure were compiled for pairwise analysis. Briefly, a paired t test was used to evaluate changes in reported overall FaCE scores, as well as answers to questions 4, 6, and 13 relating to face and neck tightness.

RESULTS

Twenty-four patients (20 females and 4 males) with synkinesis affecting the neck as a result of facial paralysis were enrolled in the study. Twenty-one patients had complete FaCE data before and after the procedure for evaluation. The mean age of the patients was 45 years (age range, 13-64 years). Causes of facial movement disorders included Bell palsy (9 patients), Ramsay Hunt syndrome (6 patients), pregnancy-associated Bell palsy (3 patients), and (in 1 patient each) facial nerve schwannoma, acoustic neuroma, otitis media, cholesteatoma, Lyme disease, and iatrogenic injury.

No intraoperative complications and no early postoperative complications occurred. The procedure took approximately 40 minutes at the outset, with operative times declining to the 25-minute range by the last 5 cases. Based on FaCE data, patients reported significant improvement in their responses to the neck-specific questions and in general experienced increases in overall quality of life. For example, question 4 asks the patient to rate how much of the time the face feels tight, worn out, or uncomfortable; the mean preoperative response was 2.3, and the mean postoperative response improved to 3.0 (P=.02) (Figure 4). Three patients reported their face feeling more tight, worn out, or uncomfortable after the procedure. Possible reasons

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include that question 4 is one of the most vague quality-of-life questions and that the facial tightness may be secondary to evolving scar or ongoing development of further hyperkinesis in the face.

Question 6 asks patients how often they experience tension, pain, or spasm when attempting to move their face; the mean response rose from 2.5 to 3.3 ($P = .01$) (Figure 4), demonstrating a decrease in the amount of time that patients experience tension, pain, or spasm when moving their face. Likewise, question 13 asks patients how much they agree with the statement that their face feels tired or that they feel tension, pain, or spasm when they try to move their face; the mean response was 2.1 before surgery and 3.0 after surgery ($P = .002$), also demonstrating significant improvement. The mean overall FaCE score before surgery was 46.7, and the mean overall FaCE score after surgery was 55.2 ($P = .02$) (Figure 5). Five of 21 patients reported on their FaCE survey a decrease in overall quality of life, but these patients had stable or improved scores for the specific questions about neck and face tightness.

The mean time between the procedure and the postoperative FaCE survey was 47 days (range, 12-204 days). The mean follow-up period from the time of
surgery to the latest follow-up visit was 88 days (range, 15-204 days).

**COMMENT**

For the past 7 years, we have seen and treated more than 1200 patients with facial movement disorders. We increasingly concentrate on what are considered zone-specific interventions and how they affect function, cosmesis, and quality of life. Examples of neglected areas of the paralyzed face include external nasal valve collapse, the nasolabial fold, and lower lip asymmetry. Over time, we have come to recognize the important, and often overlooked, effect of platysmal dysfunction on overall facial function. We recently recognized the potential usefulness of permanently eliminating the downward pull from the hypertonic platysma muscle, based on the subjective improvement that patients experienced following chemodenervation. Because under normal circumstances platysmal action is invoked only during the expressions of contempt and disgust, we surmised that eliminating its activity through a complete myotomy would not create bothersome deficits to patients. Since division of the platysma is routinely executed for approaches to the anterior and lateral neck, we considered the technical aspects of the procedure to be straightforward. A natural skin crease was used, without any long-term unsightly scar, although an endoscopic approach was feasible. Another option for treating this disorder is neurolysis of the cervical branch. We have not pursued neurolysis in this patient population, based on reported experiences and outcomes of others, a desire to develop an in-office solution not requiring general anesthesia, and an intent to avoid risk to other branches of the facial nerve.

The FaCE instrument was developed in an attempt to better quantify quality-of-life issues in patients with facial paralysis. This patient-based system measures impairment and disability in facial paralysis and represents a valuable adjunct to the traditional physician-graded scales for evaluating quality-of-life issues in patients with facial paralysis. Since its development in 2001, the FaCE instrument has been used to report quality-of-life improvement after facial interventions. The FaCE survey is simple and easy to administer. Instruments designed to measure quality-of-life effects of different therapies are believed to be at least equal to and perhaps more relevant than objective measurements alone. We used the FaCE survey in this study because it had successfully measured quality-of-life improvement after other minor interventions among patients with facial paralysis and because we hypothesized that the new intervention of platysmectomy would likewise lead to improvement.

We implemented a straightforward office-based solution to chronic platysmal synkinesis, with no significant complications and with measurable potential benefits. Using the FaCE survey, we demonstrated quality-of-life improvement in patients who underwent platysmectomy. Three of 15 questions on the FaCE survey address perceptions of tightness, tension, or pain most often associated with hypertonicity of the facial muscles following facial paralysis. Answers to all 3 of these questions demonstrated improvement following platysmectomy.

Herein, we describe the surgical details of platysmectomy, report our early experience, and provide evidence of the global quality-of-life benefits experienced by patients with hypertonic facial function following platysmectomy. Because platysmal hyperactivity is a common bothersome sequela of aberrant regeneration after facial paralysis, platysmectomy may be useful in patients who experience subjective benefits following a trial of botulinum toxin chemodenervation therapy (Figure 6).

**CONCLUSIONS**

Data from our small series show statistically significant quality-of-life benefits among patients undergoing platysmectomy, based on FaCE scores. We plan to study whether oral commissure resting position and excursion with smiling improve after platysmectomy. In addition, we are investigating the possible role of additional myectomy proce-
dures, such as mentalis resection, in patients with a hypertonic result following facial paralysis.

Platysmectomy in patients with hypertonic facial movement after facial paralysis seems to improve overall quality of life and the amount of time the neck feels tense or tight. Treatment of the synkinetic neck using this modality is simple and yields a significant subjective benefit. Zone-specific facial quality-of-life instruments likely have a role in dictating optimal management in patients with facial paralysis.

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