

# Thread-lift for Facial Rejuvenation

## Assessment of Long-term Results

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**Objective:** To evaluate the long-term success of the thread-lift procedure for facial rejuvenation.

**Methods:** Thirty-three patients underwent a thread-lift procedure alone or in combination with other facial rejuvenation procedures to the brow, midface, jowl, and neck. Ten patients underwent thread-lifts only, and 23 had thread-lifts with other procedures. Ten additional patients having had non-thread-lift rejuvenation procedures, including lipotransfer, chemical peels, and rhytidectomies, were randomly designated as controls. The mean follow-up period was 21 months (range, 12-31 months). Photodocumentation was obtained at each visit. Long-term aesthetic results were evaluated by 4 independent, blinded, and board-certified facial plastic surgeons. Each result was graded on a scale of 0 to 3, with 0 indicating no change; 1, minimal improvement; 2, moderate improvement; and 3, considerable improvement. The population was divided into 3 groups for comparison. Two-tailed *t* test ( $P = .05$ ) was used for statistical analysis of aesthetic outcomes.

**Results:** Although aesthetic improvement was noted in all groups at 1 month, measurable results persisted to the end of the study for all but the group that underwent the thread-lift procedure only. Aesthetic improvement scores of the non-thread-lift control group were better than the group that underwent thread-lift only. Similarly, when the thread-lift was combined with other procedures, scores were better than when thread-lift was used alone. Statistical significance was demonstrated in both of these comparisons ( $P < .01$ ).

**Conclusions:** The thread-lift provides only limited short-term improvement that may be largely attributed to post-procedural edema and inflammation. Our results objectively demonstrate the poor long-term sustainability of the thread-lift procedure. Given these findings, as well as the measurable risk of adverse events and patient discomfort, we cannot justify further use of this procedure for facial rejuvenation.

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**F**ACIAL AGING RESULTS FROM A combination of skeletal and soft-tissue changes that manifest with universally recognizable patterns. Progressive soft-tissue laxity and volume loss characterize the aging face in the form of brow ptosis, orbital rim prominence, deepening of the nasolabial folds, and jowl formation. The compounding effects of solar damage further age the face through skin hyperpigmentation and rhytid accentuation.<sup>1</sup> Understanding these processes is critical in achieving a natural result because addressing these very forces can aid in restoring a youthful face.

Current facial plastic surgery literature describes an array of rejuvenation techniques. The Papyrus Ebers (1500 BC) indicates that the ancient Egyptians were the first to document remedies that remain a part of our modern cosmetic armamentarium. They described the earli-

est forms of chemical peels, which included using sour milk baths for restoration of facial vibrancy.<sup>2,3</sup> Modern techniques of the early 20th century later addressed skin laxity and descent through direct excision. After Mitz and Peyronie<sup>4</sup> defined the superficial musculoaponeurotic system (SMAS), rejuvenation methods evolved from skin-only rhytidectomy into a range of soft-tissue repositioning and SMAS lift adaptations.<sup>5</sup> This period, spanning the 1980s to the 1990s, saw the peak of maximally invasive approaches that had been founded in the craniofacial reconstructive work of Tessier.<sup>6</sup>

In contrast, within the past decade, minimally invasive techniques have been popularized because they allow for faster operating time, opportunity for office-based practice, and fewer postoperative complications. A myriad of cosmetic practices now advertise limited “weekend” and “lifestyle” lifts as having minimal recov-

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ery and maximal convenience for the patient. Our study critically analyzes one such procedure, called the thread-lift, which has been popularized for brow-, midface-, jowl-, and neck-lifting and is credited with these same advantages.

The use of barbed suture for lifting ptotic facial tissues was first introduced by Sulamanidze et al<sup>7</sup> in the late 1990s. Perceived as a safe and effective alternative for traditional lifting methods, variations of the original anti-ptosis suture (APTOS) threads have since been used worldwide by otolaryngologists, plastic surgeons, dermatologists, and nonsurgical specialists. All versions of the thread-lift rely on a similar basic technique, which involves subcutaneous placement of cogged threads along a planned trajectory. The threads are then pulled to achieve the desired skin lift and secured and trimmed at the entry point.

In the United States, the Contour Threadlift system (Surgical Specialties Corp, Reading, Pennsylvania) was approved by the US Food and Drug Administration (FDA) in 2005, and the only qualification for purchasing and implanting these “nonsurgical” threads was a 1-day course offered by the manufacturer. Despite the popularity of the thread-lift, its use has not been supported by strong objective studies. In this study, we aim to document the long-term outcomes and demonstrate whether the aesthetic results justify the patient risks and thread complications reported with this procedure.

## METHODS

We conducted a retrospective review of 33 face and neck rejuvenation cases using the Contour Threadlift system. These were all performed by the senior author (E.F.W.) from July 2005 through October 2006 at a private surgery center. Ten patients received thread-lifts alone to the brow, midface, jowl, or neck. Twenty-three had thread-lifting with additional rejuvenation procedures as listed in **Table 1**. Ten patients who had undergone non-thread-lift rejuvenation procedures were randomly assigned as controls.

The original thread-lift technique has been modified by several authors since its conception.<sup>8,9</sup> We used the technique as previously described by the senior author (Williams and Smith<sup>10</sup>). Preoperative and postoperative photodocumentation was obtained by the same photographer using a 35-mm digital camera (Nikon Inc, Melville, New York). Photographs were obtained in the standard views and using an identical background. Written informed consent was provided by all patients for the use and distribution of their photographs for educational purposes only. The follow-up period ranged from 12 to 31 months (mean duration of follow-up, 21 months). Four independent, blinded, board-certified facial plastic surgeons evaluated postoperative aesthetic results for all 43 patients. They graded each postoperative result according to the degree of overall aesthetic improvement. The grading scale is as follows: no improvement, 0; minimal improvement, 1; moderate improvement, 2; and considerable improvement, 3.

## RESULTS

The patient population was divided into 3 groups for comparison: thread-lifts only (n = 10), thread-lifts with additional facial rejuvenation procedures (n = 23), and con-

**Table 1. Adjunctive Procedures Performed With Thread-lifting in 23 Patients**

Procedure	Location
35% Trichloroacetic acid peel	Whole face Lower eyelid
Blepharoplasty	Upper Lower
Calcium-hydroxylapatite injection	Marionette lines
Lifting	Brow Midface Jowls
Lipectomy	Neck Submental
Lipotransfer	Whole face

**Table 2. Mean Scores by Study Group<sup>a</sup>**

Evaluator No.	Thread-lift Only (n=10)	Thread-lift With Additional Procedures (n=23)	Controls (n=10)
1	0.5	1.4	2.3
2	0.3	1.0	1.5
3	0.2	0.8	1.5
4	0.2	0.5	1.8

<sup>a</sup>As graded by 4 independent, blinded, board-certified facial plastic surgeons who evaluated postoperative aesthetic results for all 43 patients according to the degree of overall aesthetic improvement. The grading scale used is shown in Figure 2.

controls who did not receive thread-lifts (n = 10). **Table 2** lists the mean scores received by each group. Aesthetic improvement scores from each of the 4 evaluators were summed into a single cumulative score for each patient. Each group’s mean score was then used for comparative analysis. When compared with the thread-lift alone, superior results were demonstrated for both the thread-lift with additional procedures group and the control group. Statistical significance was determined by *t* test ( $P = .05$ ) and was shown in both of these comparisons ( $P < .01$ ). **Figures 1, 2, and 3** demonstrate the post-procedural aesthetic results of 1 patient from each of the 3 groups.

Complications encountered in our series were similar to those reported elsewhere.<sup>11-13</sup> Most of these were skin dimpling and visible subcutaneous knots. Three patients required thread removal because of a visible knot at the thread’s distal end. One patient had a single thread removed secondary to dissatisfaction with thread-lift results. Another patient underwent delayed fat injection because thread-lifting alone did not achieve the results expected.

## COMMENT

The Contour Threadlift system used in our series was approved by the FDA in 2005, but after growing numbers of problematic reports associated with their use, the threads have since lost FDA approval and are no longer available in the US market. New barbed suture varia-



**Figure 1.** Thread-lift only. This patient underwent thread-lift alone to the midface: frontal (A), and oblique (B) preoperative views. Frontal (C) and oblique (D) postprocedural views. At her 22-month follow-up, she had persistent malar atrophy and ptosis.

tions remain available and continue to be advertised as nonsurgical face-lift alternatives (Silhouette Lift; Koisster Methods Inc, Corona, California). These products all share a common concept: suspension of ptotic facial soft tissues via the subcutaneous plane. This approach is ineffective for facial rejuvenation for 2 reasons. First, it does not produce any volumetric change as can be performed with fat augmentation. Second, it repositions the soft tissues in a superficial plane without addressing excess skin.

Furthermore, this superficial thread placement gives the procedure a high potential for postprocedural morbidity. Reported problems include thread breakage and extrusion, skin dimpling, superficial hemorrhages, mild asymmetry, ecchymosis, erythema, edema, and persistent pain.<sup>11-13</sup> Only minor morbidities such as these had been published until Winkler et al<sup>14</sup> reported a case of a

Stensen duct sialocele and another of a chronic inflammatory reaction. After conservative measures failed to resolve the reaction, the patient required thread removal by formal face-lift because the thread-lift is not easily reversible. This fact is evidenced by the intraoperative and histologic studies of the perithread soft tissues by Sulamanidze et al.<sup>7</sup> Strong cicatricial scarring was observed intraoperatively, and pathologic preparations demonstrated a fibrous shell surrounding the edges. These findings argue against easy removal of threads in cases in which an undesirable result or complication occurs. In fact, the need for potential thread replacement or repositioning is not a rare occurrence because thread revision rates are reported to be as high as 20% in some studies.<sup>12</sup>

To date, most thread-lift outcome studies have not been scientifically conducted. The original study population





**Figure 2.** Thread-lift with additional procedures. This patient received both thread-lift and lipotransfer to the midface. Frontal (A) and oblique (B) preoperative views. Frontal (C) and oblique (D) postprocedural views. At her 12-month follow-up, she had correction of her malar atrophy and tear trough deformity.

in the report by Sulamanidze et al<sup>7</sup> consisted of patients having thread-lifts combined with other rejuvenation procedures. Although the reported follow-up period was 2 to 30 months, their results are confounded by the lack of a control group.<sup>7</sup> Therefore, it is unclear whether their reported aesthetic results were in fact attributable to the thread-lift or rather to the adjunctive procedures.

Lycka et al<sup>12</sup> similarly published a report of their large APTOS thread-lift experience in 2004. They reported patient satisfaction and procedural success in 348 of 350 cases but did not detail how long after surgery the patient interviews were conducted. This is important considering that our data support early measurable results for all patients at 1 month after the procedure, but this declined considerably with time. A closer look at result longevity in the study by Lycka et al<sup>12</sup> reveals that only one-third of their patients had retained 70% of their origi-

nal effect at 1 to 2 years after surgery. In addition, despite the near 100% rate of satisfaction reported, 52 of 350 procedures required revision. Morbidities were considered acceptable and affected most of their population.

In our series, we present a large sample of patients who underwent thread-lift procedures with, to our knowledge, the longest mean follow-up period published in the literature thus far. We compare the aesthetic results of the thread-lift when combined with additional procedures with those in which the thread is used alone. Our analysis is further validated by the designation of a control population. Blinded assessment of aesthetic improvement was completed by 4 independent, blinded, board-certified facial plastic surgeons, and the results were objectively analyzed. In the hands of the senior author, who has been in practice for the past decade, long-term sustainability of aesthetic results has been minimal. This



**Figure 3.** Control. This patient underwent lower blepharoplasty and lipotransfer to the lower eyelid and midface. Frontal (A) and oblique (B) preoperative views. Frontal (C), and oblique (D) postprocedural views. At his 14-month follow-up, he had obvious correction of his lower eyelid biconvexity.

is an important finding considering that thread manufacturers and practitioners have advertised results that last for 3 to 7 years.

As modern techniques in facial plastic surgery have rapidly evolved with the help of constantly progressing technology, some surgeons may have felt the pressure to keep pace with novel and minimally invasive alternatives in their practices. This is especially true when these techniques are heavily advertised to the public, as has been the case with the thread-lift. Despite these demands, our responsibility should be to maintain patient safety and produce sound results. The use of the thread-lift for facial rejuvenation is an example of such a technology in which the results may not justify the patient risk involved.

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lege, 32 Hackett Blvd, Albany, NY 12208 (abrahar@mail.amc.edu).

**Author Contributions:** Dr DeFatta had full access to all of the study data and takes responsibility for the integrity of the data and the accuracy of the data analysis. *Study concept and design:* Williams. *Acquisition of data:* DeFatta. *Analysis and interpretation of data:* Abraham, DeFatta. *Drafting of the manuscript:* Abraham. *Critical revision of the manuscript for important intellectual content:* Abraham, DeFatta, and Williams. *Statistical analysis:* DeFatta. *Administrative, technical, and material support:* DeFatta and Williams. *Study supervision:* DeFatta and Williams.

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