

Lifting the Lower Face With an Absorbable Polydioxanone (PDO) Thread

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ABSTRACT

Traditional rejuvenation techniques include chemical peels, rhytidectomy of the skin, laser resurfacing, injection of dermal fillers and neurotoxins, and invasive surgical procedures. Patients with brow ptosis, jowl formation, and deepening nasolabial folds currently seek antiaging procedures with no incisions and minimal downtime such as thread-lifting with barbed sutures. The present report describes a case in which polydioxanone threads were used to lift the lower third of a patient's face. Fillers were used to supplement the results achieved by the thread lift because often, when tissue has been lifted, volume deficits are revealed, which can be corrected with dermal fillers. The procedure was performed in less than 30 minutes and was well tolerated. Mild swelling at the insertion points and general treatment area resolved within 7 days without intervention. Bruising was not observed. The patient showed remarkable improvement 7 months after the procedure.

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INTRODUCTION

Loss of tissue elasticity and volume are part of aging. These changes have been attributed to alterations in the formation of collagen.[1] In the face, such alterations are manifested by brow ptosis, jowl formation, and deepening nasolabial folds.[2] Traditional rejuvenation techniques include chemical peels, rhytidectomy of the skin, laser resurfacing, injection of dermal fillers and neurotoxins, and invasive surgical procedures. Patients currently seek antiaging procedures with no incisions and minimal downtime such as thread-lifting with barbed sutures.

Sulamanidze and colleagues[3] developed the first barbed suture, called APTOS (anti-ptosis suture), to correct ptotic soft tissue in patients. Made of nonabsorbable polypropylene, APTOS threads had cogs and bidirectional barbs and could be inserted subcutaneously with a long injection needle.[4] In their 186-patient study, Sulamanidze and colleagues showed that the ATPOS technique lifted various ptotic areas and improved contours of the face of most patients. Loose threads emerged to the surface in only 4 patients.

Two years later Lycka and colleagues[5] reported success in lifting facial skin and suspending subcutaneous fat in 348 of 350 patients treated with the APTOS threads. Side effects were limited to ecchymosis (the most common), erythema, bleeding, visible threads, swelling, and discomfort. All were minor and correctable. Modifications of the thread-lifting technique and material followed, such as Woffles thread lifting,[6] Isse's Endo Progressive Facelift suture with unidirectional barbs,[4,7,8] Contour Threads,[9-11] Silhouette Lift suture,[1,12] Quill,[13,14] Happy Lift,[15] and REEBORN, a mesh suspension thread.[16] The evolution of the earlier techniques and complications associated with thread use have been described in detail.[2,4,14,17,18]

Most of the aforementioned techniques involve a polypropylene thread which is nonabsorbable. A novel thread-lift that uses an absorbable monofilament polydioxanone (PDO) thread has recently been described.[14,19, 20,21] PDO is a polymer that can be modified with a laser to have unidirectional and / or bi-directional sharp barbs. PDO sutures are more pliable than polypropylene sutures and have greater strength than other absorbable sutures.[22] When used in soft tissue approximation, PDO undergoes hydrolysis, which decreases its strength inversely and increases the strength of a wound during healing.[9] The present report describes a case in which PDO threads (NovaThreads Inc., Miami, FL) were used in the physician's office to lift the lower third of a patient's face in three different vectors with minimal side effects.

CASE REPORT

A 52-year-old female presented with saggy jowls after she had tried creams and injectable fillers into the perioral areas without improvement. The patient was concerned about her facial appearance and had low self-confidence. The decision was made to use NovaThreads to lift the lower third of her face in three different vectors and to inject fillers into her cheeks and tear troughs as well. Hyaluronic acid with 0.3% lidocaine (Restylane L, Galderma Laboratories, LP, Fort Worth, TX) was injected into tear troughs with a 27-gauge microcannula and hyaluronic acid gel (Restylane Lyft, formerly Perlane-L, Galderma) was injected

into the midface with a 25-gauge microcannula. Fillers were used to supplement the results achieved by the thread lift; often, when tissue has been lifted, volume deficits are revealed, which can be corrected with a variety of dermal fillers.

All threads were injected subcutaneously using 1% lidocaine local anesthetic with epinephrine injected into the insertion points with a 30-gauge hypodermic needle on the bilateral jawline. Three ml of 1% plain lidocaine was injected for intraoral nerve blocks using a 27-gauge needle. The treatment areas were marked and the skin was cleansed with chlorohexidine. A pilot hole was made with a 20-gauge hypodermic needle and three 3.5-inch Barbed NovaThreads were inserted into the pilot hole. Once the threads were inserted and engaged with surrounding tissue, the end of the thread was trimmed and antibiotic ointment applied to the insertion points.

The procedure was performed in less than 30 minutes and was well tolerated. Mild swelling at the insertion points and general treatment area resolved completely within 7 days without intervention. Bruising was not observed.

Figure 1 shows the patient before treatment and 7 months after treatment.

DISCUSSION

PDO threads, including NovaThreads, are FDA approved for soft tissue approximation of the skin of the face or body, although, the use described herein is considered "off-label" and should be indicated as such. Advantages of PDO thread-lifts include minimal invasiveness, short downtime, and nearly invisible scarring. NovaThreads require no deep fixations or knots. Instead, they "lift" tissue with bi-directional "barbs" along the length of each thread. NovaThreads are available in different lengths and sizes, depending on the target area of the face or body. The NovaThreads are loaded into a needle or cannula. Once inserted, the thread is placed into position and the cannula or needle removed.

Novathreads are indicated for patients who want to achieve improvement of jowls with mild to moderate sagging without surgery. Since NovaThreads address volume descent and ptosis, the patient requires less filler when he or she has a thread-lift as well. This is because injectable fillers alone cannot "lift" tissues; they address only volume loss. Novathreads are useful for lifting up the cheeks when they are "over-volumized" as a result of injected fillers. If proper thread-lift technique is not used, minor complications such as bruising, hematoma, irregularity, migration of threads, extrusion of threads, infection, and injury to deeper structures may occur.

PDO threads last 6 months[20,22] and there is an increase in collagen and elastin concentration in the skin during this time.[19] This may allow for the effects to last longer (i.e., 7 months in the case study) than the actual duration of the threads. In the author's experience, clinical results have been noted out to 12 months after injection. After 6 months it is safe to re-inject as the threads will have been dissolved.

FIGURE 1. A 52-year-old female before NovaThreads treatment and 7 months later. At 7 months she received additional filler and threads to maintain results however the photo shown in below was taken prior to the additional treatments.

Shimizu and Terase[19] recently showed that monafilament PDO threads (Lead Fine Lift, Grand Aespio, Korea) successfully lifted sagging facial skin of several patients in Japan. Hypodermal bleeding was the most common side effect and loose threads on the skin surface were noted in 2 patients. Histopathological studies showed fibrosis around PDO along with clustering of lymphocytes, histiocytes, and aerotropism. Rejuvenation results persisted for 6 months in most patients. The authors cautioned that these results were preliminary, and that long-term studies were needed.

Suh and colleagues[20] conducted a retrospective chart review of 31 knotless PDO thread-lifting procedures over a 24-month period in Korea. Patient satisfaction was high in 27 of the 31 patients (87%). Texture improvement was fair, good, or excellent in all but 1 patient (3.2%), while lifting was fair, good, or excellent in all but 9 patients (29%). Complications were limited to bruising (90%) and mild asymmetry (6.5%), both resolving within two weeks without treatment.

Proper patient selection for PDO thread-lift is important to ensure positive outcomes.[20] Shimizu and Terase[19] stated that good candidates for PDO thread-lifting are those who want to restore volume, improve hollowness, and have a smaller, younger-looking face without invasive surgeries. Paul[14] suggested that patients should also have a low body mass index, minimal soft

tissue fullness, strong bones to support the elevated tissue, and healthy skin for optimal outcomes.

NovaThreads are the newest and most advanced technique to the physician's armamentarium for thread-lifting. The encouraging results of the present case study warrant additional studies with more patients and longer follow-up time.

DISCLOSURES

Kian Karimi is the Medical Director, NovaThreads Inc.

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