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Fixed-Tension Sutures for Face and Neck Lifting

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ABSTRACT

Background: Surgical facelifts has always been the pinnacle of facial rejuvenation, however in face of an ever-growing trend towards less invasive techniques, the ability of plastic surgeons to sell this idea to their customers is ever decreasing. Most of our patients are unwilling and afraid of a long downtime, postoperative scars and possible complications.

Thread lifting has been introduced to turn a facelift into a less invasive, scarless, low complications technique. However the absorbable PDO sutures, which are well advertised and widely used by cosmetologists, have failed to gain the acceptance of plastic surgeons based on their lack of durability, lack of true fixation, and the fact that they work on the skin, not the SMAS. Few thread techniques are available that combine the use of permanent threads, stable fixation point, and work on the SMAS layer. However, such techniques require the use of expensive suture materials or specially designed instruments and need special training courses, which limit their use in our society being a very cost sensitive market.

Patients and Methods: In this paper, the author presents his modification of the fixed, permanent suture technique, using only widely available straight needles, and commercially available coated polyester sutures (Ethibond), and was performed in 50 patients over the last two years. The patient had only mild or moderate sagging that could benefit from SMAS suspension without the need for skin excision, patient with marked skin laxity were advised for a surgical face lift.

Conclusion: The technique is intended for a plastic surgeon with moderate to good experience of face lift as it needs the ability to assess the different planes of the face and be able to grab the SMAS in the sutures. The technique offers good results in patient with mild to moderate sagging and should be thought of as a substitute for surgical face lift.

Key Words: *Fixed – Tension – Sutures – Face – Neck -Lifting.*

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The study was approved by the Ethical Committee of Alexandria University.

Consent: An informed consent was signed by all patients inlcuded in the study.

INTRODUCTION

Although surgical facelifts have been considered the gold standard for facial rejuvenation, the interest in minimally invasive techniques is in surge nowadays. Surgical lifting of the superficial musculoaponeurotic system (SMAS) along with general anaesthia is a highly invasive procedure carrying various complications in addition to the long postoperative downtime and scarring **[1]**.

As the understanding of the mechanism of the aging process and the mechanical vectors advanced, minimally invasive procedures have become more popular. Although noninvasive neurotoxins, injectable dermal fillers, radiofrequency and ablative resurfacing tools play a significant role in facial rejuvenation, they do not address the need to lift the laxity of the underlying ptotic tissues **[2]**.

Recently introduced minimally invasive procedures include limited incision face lifting, microfocused ultrasound with high resolution, in addition to barbed-suture and fixed suture lifting. The advantages include a shorter down time, less anaesthesia, faster procedure time, fewer complications which increases the convenience both for the patient and the doctor **[3,4]**.

The applications of Polydixanone (PDS) and polylactic acid (PLA) barbed sutures for the closed suspension technique known as thread lift1, **[6,7]** for powerful and dramatic tissue suspension was claimed as well as facial rejuvenation; however, this technique was hindered due to the lack of long term aesthetic outcomes, high costs and complications **[2,5,6,8]**, including palpable sutures, breakage and exposure **[8,9]**. This was reported in 2010 when Shermak **[10]** claimed their disappointment in a series involving the use of these barbed sutures.

The scarless temporal closed approach SMAS suture lift performed exclusively with skin perfo-

rations was introduced by Serdev in 1990, using traditional surgical instrumentation, was inadequate and inappropriate for such transcutaneous suture fixation. The Serdev's needles and semi-elastic surgical sutures used for scarless SMAS lifting were introduced in 1993. In 1994, Serdev became a pioneer in introducing the concept of a scarless ambulatory temporal SMAS lift using sutures, based on the anatomical fact that lifting the supra-zygomatic SMAS causes a lift effect of the infra-zygomatic SMAS. His innovation was presented and demonstrated around the world and became a routine ambulatory procedure for beautification and rejuvenation **[11]**.

PATIENTS AND METHODS

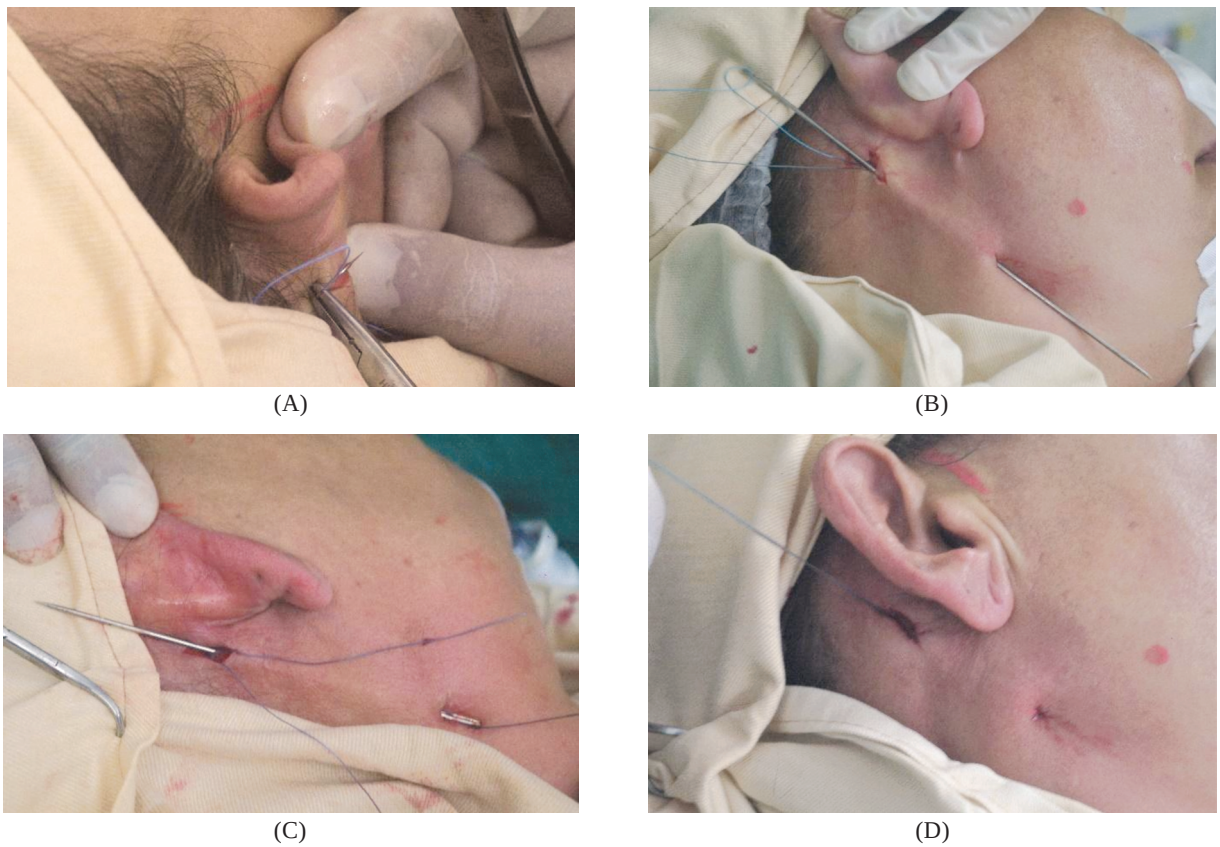
The proposed technique was developed and applied for 50 patients over the last two years. Our patients were mainly females (46 patients, 92%), ages ranging between 32 and 64 years (mean 59±4.76).

The patient had only mild or moderate sagging that could benefit from SMAS suspension without the need for skin excision, patient with marked skin laxity were advised for a surgical face lift.

All patients had one or more lifts performed at the same time (face, neck and/or brows). Each patient signed a written consent clearly explaining the new technique and type of sutures used. All cases were performed exclusively in Alexandria Plastic Surgery Center.

The proposed technique consists of passing four sutures in each side of the face, to achieve an adequate face lifting effect. Three sutures in the neck and two sutures for each eye brow to achieve neck and eye brow lifting (Fig. 1).

Fig. (1): Placement of different points proposed for the technique.



(A) (B) (C) (D)

Fig. (2): (A) Periosteum is grabbed with the suture and tied. (B) The suture is attached to the long needle and passed from the incision to the stab. (C) The needle and thread is returned from the stab to the incision. (D) The suture is pulled and tied under the desired tension.

A- *The threads of the cheek ran from the lateral end of the zygomatic arch to:*
- A point just below the mandible at mid jowl.
- A point just lateral to the midpoint of the marionette crease.
- A point just lateral to the junction between upper two thirds and lower third of the nasolabial fold.
- A point on the most prominent part of the cheek on a line drawn down from the mid pupil.

B- *The threads of the neck run from the mastoid process to:*
- A point 4cm below the mandible on a line drawn from the lateral canthus on each side.
- The opposite mastoid process running with the line of the cervico-mental crease.

C- The threads to the eye brow run from a point behind the hairline at the mid pupillary line to two points just above the medial and lateral ends of the eye brows.

Under general or local anesthesia, a two centimeters incision is made over the mastoid behind the ear lobule and using a small scissors the periosteum is exposed. Using 2-0 coated polyester sutures (Ethibond) on a rounded small needle the periosteum is grabbed and the suture is tied well. The needle is cut off and the suture is passed in a 12cm straight needle.

A stab is made using an 11 blade at the first proposed point below the mandible and the long needle is passed subcutaneously from the incision on the Mastoid to the stab incision and pulled out then re-introduced through the same stab to pierce the platysma and pass deep to it for some distance before bringing it to the subcutaneous plane and finally out of the mastoid incision. The suture is pulled and tied at a suitable tension.

The second suture is placed using the same method on the other side then a third suture is passed in the same manner exiting the skin at different spots along the neck at the cervico mental angle to be tied at the other mastoid at enough tension to define the cervico-mental angle.

On the face, a 2cm incision is made in front of the root of the helix and the periosteum over the lateral end of the zygomatic arch is exposed and picked by a 2-0 Ethibond suture which is tied well, the needle is then cut off and the suture is passed in a 15cm straight semi-blunt needle.

Small stabs are made using number 11 blade at the 4 predetermined points, and starting from the lower most point and proceeding upward, the Ethibond suture is passed in the same technique from the pre-auricular incision to exit from the skin stab, then reintroduced again from the skin stab, taking good bite of the SMAS, to return to the pre-auricular incision and tied under adequate tension.

For the brow lift the same is applied, the incision is made behind the hairline longitudinally in the line of the mid pupillary point, the galea aponeurotica and periosteum are grabbed with the suture and tied, the suture is then run from the incision to the two small stabs made over the ends of the eyebrow, and back, taking good bites in the orbicularis muscle, then tied under adequate tension.

The incisions are closed using two 5-0 Prolene suture. No pressure garment or dressing are needed and the patient leaves the hospital immediately afterward on oral prophylactic antibiotics, analgesics and anti-edema medication. Skin sutures are removed at the 5th or 6th postoperative day.

RESULTS

We applied our technique on 50 patients, some of which had face, neck, brow or any combination which was tailored according to the patient's needs.

The placement of sutures and the amount of tension applied on them had been changed over the course of the technique development as to achieve the best results, the majority of cases had evident and satisfactory results. The postoperative period was mostly uneventful with mild to moderate edema and minimal bruising.

The most common morbidity met was inequality of tension with some resultant asymmetry, which was easily managed under local anesthesia, 10 to 14 days after the procedure by either cutting an overly tight thread or introducing a new one or just by simply introducing a new thread in cases of under-tension.

The second most common morbidity was persistent dimpling at the site of exit-reentry of the thread which was managed by dermal subcision and some filler injected at the dimple, this problem was avoided in later cases by using a semi-blunt needle that exits the skin and re-enter through a No 11 stab incision.

Most of our patients were followed-up for over a year with persistence of the obtained results and a more natural appearance developing over the time.

(A) (B) (C)

(D) (E) (F)

Fig. (3): Face lift with threads. (A,B,C) Pre-operative views. (D,E,F) Post-operative views.

(A) (B) (C)

(D) (E) (F)

Fig. (4): Face and neck lift with threads. (A,B,C) Pre-operative views. (D,E,F) Post-operative views.

(A) (B) (C)

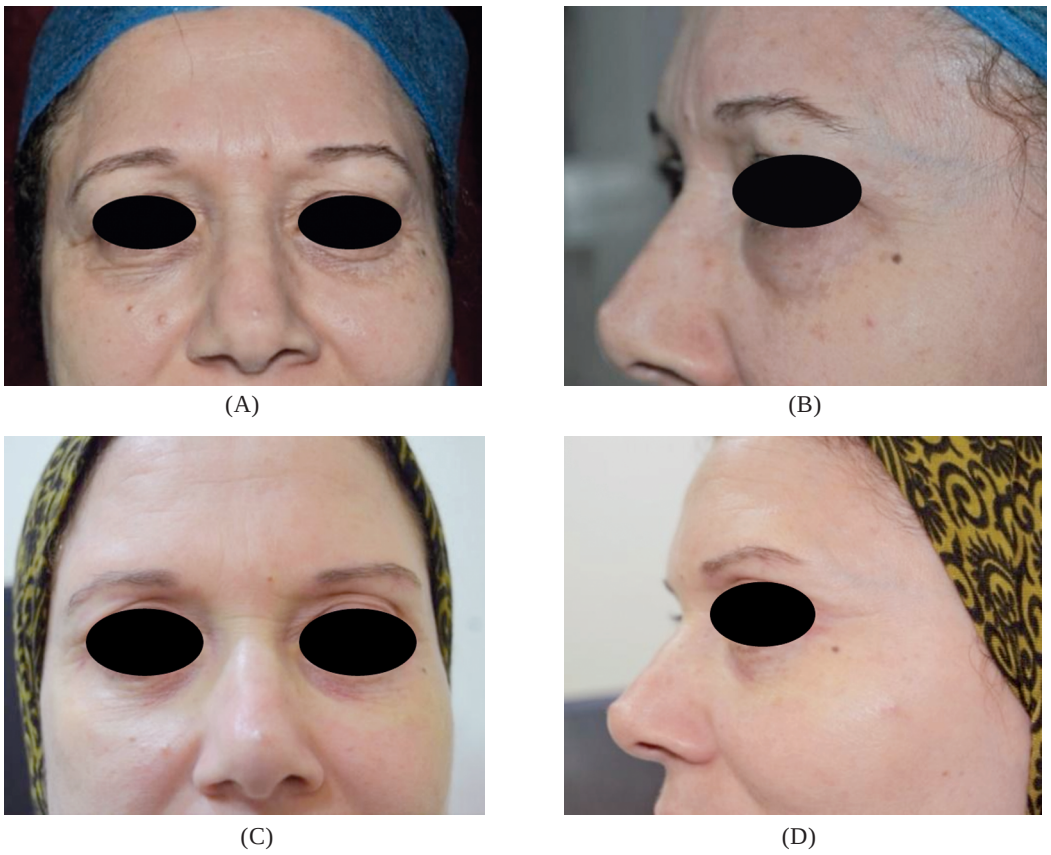
(D) (E) (F)

Fig. (5): Neck lift with threads. (A, B, C) Pre-operative views. (D, E, F) Post-operative views.

(A) (B) (C)

(D) (E) (F)

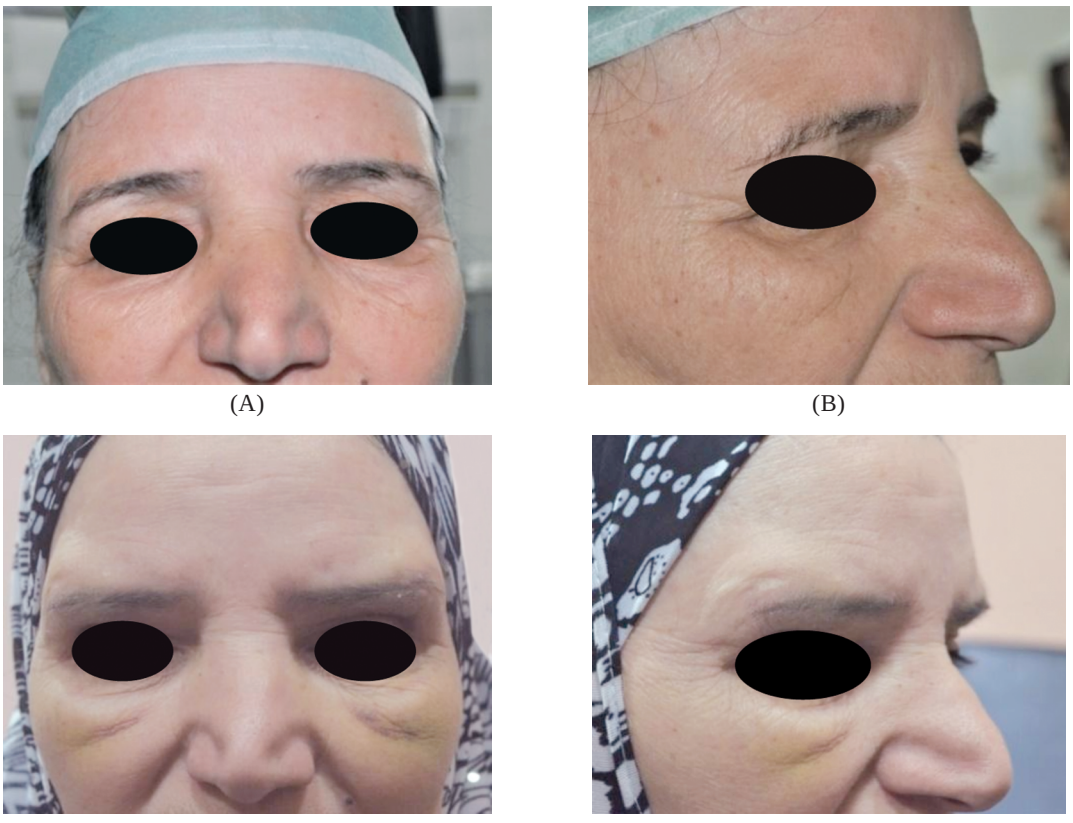
Fig. (6): Face and neck lift with threads. (A, B, C) Pre-operative views. (D, E, F) Post-operative views.



(A) (B)

(C) (D)

Fig. (7): Brow lift with threads. (A,B) Pre-operative views. (C,D) Post-operative views.



(A) (B)

(C) (D)

Fig. (8): Brow lift with threads. (A,B) Pre-operative views. (C,D) Post-operative views.

DISCUSSION

The idea to bring a face-lifting effect through the insertion of sutures in the face have been around for quite some time now, however the wide use of the technique has not been adopted by many plastic surgeons. This is widely due to the fact that most of the commercially available thread lifting techniques rely upon absorbable free-floating threads that are inserted in the deep dermis or the subcutaneous tissues of the face.

Yet these techniques are widely adopted by many colleagues, based on their simplicity and ease of use. The barbed (serrated) PDO suture **[11]** claims to bring a face-lifting effect that is evident and lasting, however, this defies the common surgical concept that any long-standing lifting of the face has to be performed on the level of the SMAS. Furthermore, to achieve any true pulling and tension, the thread has to be fixed to a stable non-yielding tissue as the periosteum, and preferably using a non-absorbable suturing material.

Very few techniques applying thread lifting correspond to these surgical standards using a non-absorbable suture that is fixed to the periosteum before pulling on to the SMAS.

Only the techniques of Serdev **[11]** and Shermak **[10]** (Aptos), partially comply with those principles.

In our technique we try to adhere to the long standing surgical tradition of facelift by pulling the SMAS and fixing it to the periosteum over the zygomatic arch or the mastoid using a non-absorbable thread.

The technique has stemmed from the experience with the MACS lift of Patrick Tonard **[12]** and in fact can be viewed as a modification to it. Furthermore the technique uses a commercially available thread and no specific instruments that limits its use and adoption by any plastic surgeon and can be seen as an open source idea that any can modify to his own needs.

The technique is intended for a plastic surgeon with moderate to good experience of face lift as it needs the ability to assess the different planes of the face and be able to grab the SMAS in the sutures.

The technique offers good results in patient with mild to moderate sagging and should be thought of as a substitute for surgical face lift.

The preliminary results are promising however long-lasting terms need further work over longer time and more patient as this is a new technique.

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