Received: 24 February 2018 | Revised: 8 April 2018 | Accepted: 24 May 2018

DOI: 10.1111/jocd.12745

ORIGINAL CONTRIBUTION

WILEY JCD Journal of Cosmetic Dermatology

Outcomes in thread lift for face and neck: A study performed with Silhouette Soft and Promo Happy Lift double needle, innovative and classic techniques

Samad Rezaee Khiabanloo[1] MD | Roghieh Jebreili[1] MD | Ezatollah Aalipour[2] MSc | Nazi Saljoughi[1] MD | Arian Shahidi[1] MD

[1]Medico Derma Eexir Skin and beauty Clinic, Tehran, Iran

[2]Shahid Sadoughi University of Medical Sciences, Tehran, Iran

Correspondence: Rezaee Khiabanloo Samad, MD, Eexir Mdico Derma Clinic, NO: 2303, Bakhshandeghan Alley, Vallieasr street, Tehran 1516743403, Iran (khiabanloo@gmail.com).

Abstract

Introduction: Increased demand for rejuvenation of the aging face has led to the evolution of various plastic surgery techniques. This study was conducted to evaluate the surgical efficacy and outcomes of the absorbable suture suspension system related to eyebrow, midface, mandibular, and neck lifting.

Materials and Methods: In this prospective review chart clinical study, a total of 193 patients were included in the study from January 2016 to May 2017. All participants underwent thread lifting using the Proma Happy Lift double needle and Silhouette Soft threads. The patients were followed up for first week and first, third, and sixth month after lifting surgery. Outcomes were assessed by two surgeons and patients based on the GAIS score.

Results: A total of 193 patients (mean age: 52.22 ± 11.74 year, range: 25-89), 23 (11.9%) men and 170 (88.1%) women, were included in the study. The most common sites for the face lifting surgery were the jawline (46.1%), midface (33.7%), eyebrows (12.4%), and neck (7.8%). The level of satisfaction increased from 94% in the first week after surgery to 99% in the sixth month after surgery for patients, increased from 94% to 99% for surgeon 1, and increased from 83% to 98% for surgeon 2.

Conclusion: The results showed that the level of satisfaction of patients and surgeons increased over time. These results demonstrated that facial rejuvenation thread lift with Proma Happy Lift double needle and Silhouette Soft threads is a being cosmetically more acceptance, safe, and effective procedure associated with minor complications.

KEYWORDS

facial rejuvenation, outcomes, satisfaction, thread lift

1 | INTRODUCTION

As we get older, our facial and cervical soft tissue changes, sagging and becoming loose. Eyebrows, cheeks, the mandibular area, and the neck are the most important parts that will be affected. This is attributable to the fact that the connective tissue of the skin becomes thinner, and elastic fibers undergo a collapse. This dermatochalasis of the facial and cervical soft tissues is the cause of distinctive aging signs of the face and neck. Some of these signs are as follows: loose facial skin, sagging cheeks, excess skin hanging from

the lower jawline, excess fat in the neck, and platysmal bands visible in the neck.[1–3] Among other facial aging signs, we can highlight the profile of the mandibular margin: The forehead has horizontal wrinkles, to which vertical ones are added in the glabellar area; the zygomatic, malar region (middle face) displays a downward sliding; the skin of the eyelids become flabby and protrudes in correspondence with the lower eyelids due to production of adipose bubbles; and the parcel of platysma disappears from the neck.[4] A substantial amount of beauty surgeries, especially face and neck beauty surgeries are performed every year around the world. Based on International Society of Aesthetic Plastic surgery (ISAPS) reports, five countries including the United States, Brazil, Japan, Italy, and Mexico have the highest rates of beauty (aggressive and less aggressive) surgeries. Based on these reports, 41.1% of the total plastic surgeries in the world conducted to these five countries. Accounting for 0.8% of total beauty surgeries in the world, Iran also is among the top 20 countries in terms of performing the plastic and beauty surgeries. According to the report of the Association of Iranian Plastic Surgeons, jaw and face surgeries, injections, lifting surgeries, and liposuction are the most important beauty surgeries in Iran.[5,6] Increased demand for rejuvenation of the aging face has led to the evolution of various plastic surgery techniques. Loss of elasticity of the skin, fat atrophy, and the force of gravity are factors that induce facial aging. Lifting drooping soft tissues, augmenting shrunken areas with fat grafts or implant insertions, and antigravitational lifting procedures are solutions for facial aging. For surgeons and patients seeking less invasive techniques, minimal complications, rapid patient recovery, and ease of application to plastic surgery, the thread lift is more attractive than other traditional rhytidectomy procedures.[7,8] Thread materials may be classified, based on the material that makes up the suture and filling threads, as absorbable (eg, Silhouette Insta-Lift, Sinclair Pharma, Irvine, CA, USA, or the "Happy Lift Revitalizing" range, Promoitalia International Srl, Naples, Italy) or nonabsorbable. Recent studies of nonabsorbable barbed sutures have shown that thread lifting can be a good alternative to more invasive procedures. However, nonabsorbable thread remains permanently in the tissue and results in complications; palpitations occur, and the sutures occasionally extrude through the skin. Consequently, face lifting using absorbable threads has become desirable.[9–13] More recently, absorbable threads have shown promise. This novel treatment employs an absorbable suture with bidirectional cones or barbs to improve facial rhytides. These biodegradable threads create a suspension system that addresses ptotic skin located primarily in the midface, jawline, and neck areas.[14] This study was conducted to evaluate the surgical efficacy and outcomes related to eyebrow, midface (zygomatic, malar), mandibular (jawline), and neck (neck and double chin) lifting.

2 | MATERIALS AND METHODS

In this prospective review chart clinical study, a total of 193 patients who were candidates for lifting surgery, with an age range of 25-84 years, were included (by census method) in the study from January 2016 to May 2017. To reduce the probable bias rate in the results of this study, people with relatively similar conditions (education, marital and welfare status and same religion) were enrolled. All procedures were performed at a skin and beauty clinic, Tehran, Iran. With regard to neck, midface, and mandibular regions, all selected candidates had average aging signs and needed a modest degree of lifting. The selected patients had a marked nasolabial fold (NLF), slightly defined mandibular contour, and relaxed neck and chin with multiple skin folds. During the study, patients were randomly divided into four groups: eyebrow lift, midface (zygomatic, malar), mandibular, and neck (neck and double chin). Based on the materials available at the time of admission, the lift was performed using either Silhouette Soft Proma or Proma double needle Happy Lift. In this Study, all procedures followed were in accordance with World Medical Association's 1975 Declaration of Helsinki, as revised in 2000 and 2008. Also, informed consent was obtained from all patients for being included in the study.

The Proma Happy Lift double needle thread was manufactured by the Promoitalia Company (Milano, Italy) and was the bidirectional barbed absorbable kind. These threads are divided into two types, 12 and 23, based on the length of the barbed region. The caliber of these threads is 2.0 USP, and their type is polylactic caprolactone. The thread is Silhouette Soft (resorbable with bidirectional cones), manufactured by SinClair Pharma Company (London, UK) with USP designation 3.0, and its material is polylactic acid. These threads are cones with a kind of polylactic acid, and they include glycolic polymer (18%), divided into types 8, 12, 16 based on bidirectional cones. To lift the eyebrows, the Proma Happy Lift double needle 12 and Silhouette Soft 8 thread were used. To lift the midface (zygomatic, malar) region, the Proma 12 thread or Silhouette Soft 12 or 16 thread was used, and Proma 23 or Silhouette Soft 12 or 16 thread was used to modify the mandibular region. For neck lift (neck and double chin), Proma 12 or 23 thread and Silhouette Soft 16 thread was used. Before the research was conducted, a written consent form was collected from all patients.

2.1 | Treatment protocol

To perform a thread lift, local anesthesia was applied first with lidocaine 2% at the entry and exit points. Then, thread was placed above the superficial muscular aponeurotic system (SMAS) and inside the subcutaneous fat. Before thread lift, all patients underwent routine examinations and photographic evaluation. As shown in Figure 1, for eyebrow lift with the Proma Happy Lift double needle 12, the pair of needles entered from points coincident to the hair growth line, and after passing through the eyebrow (Figure 1), they exited from exit points with an approximate distance of 5-10 mm. The inner needle was reentered from the exit region and moved along the eyebrow, then exited from the nasal edge of the eyebrow. It reentered and was guided into an ending point of exit. The lateral needle was reentered from the lateral exit point and guided symmetrically to the exit point at the end point of brow's tail and then reenter and was guided into the ending exit point. In the case of

eyebrow lift by Silhouette, based on the requirement, technique L (see Figure 2) or U (see Figure 3) was used. In technique L, the entry point is between the eyebrow's endpoint of tail and the arch, based on the patient's demand and the surgeon's discretion. Both needles enter from the entry point and move perpendicular to each other with an angle of 90 degrees. The inner needle moves along the eyebrow toward its beginning, and after passing through at least 3 cm, it exits. The other needle moves perpendicular to it, according to the figure, for about 7 cm and then exits. In technique U, shown in Figure 3, two entry points are determined with approximate distance of 2 cm in the hair growth area, and the Silhouette Soft 8 (the middle part without cone) is placed in the subcutaneous region using the 18G needle at the interface of two entry points. Then, needle 1 enters the medial entry point, and needle 2 enters the lateral entry point, and cones are put into operation in parallel.

With regard to the midface, as shown in Figure 4, the Proma double needle 12 was used with an invented technique. The entry point was selected on the zygoma. In this technique, the pair of needles enters perpendicularly with an angle of 180 degrees to each other; the inner needle moves toward the NLF and exits from the middle part of the NLF and its outer margin. Then, it reenters that point and exits with an angle of 30-45 degrees from the previous path after passing through a distance of 3 cm in parallel to the orbit. The outer needle also exits at the intersection of the hairline with the zygoma arch. Then, it moves downward with an angle of 30-45 degrees after reentering and exits after passing through a distance of 3-4 cm.

To lift the mandibular region, double needle 23 was used. In our modified technique, the main entry point was selected exactly in parallel to the jaw angle. In this method, needles enter perpendicularly, and the first needle (as shown in Figure 5) moves in parallel to the mandible horizontal edge and exits from the exit point in front of the marionette. Then, after reentering with an approximate angle of 45 degrees to the path of the previous movement, it moves about

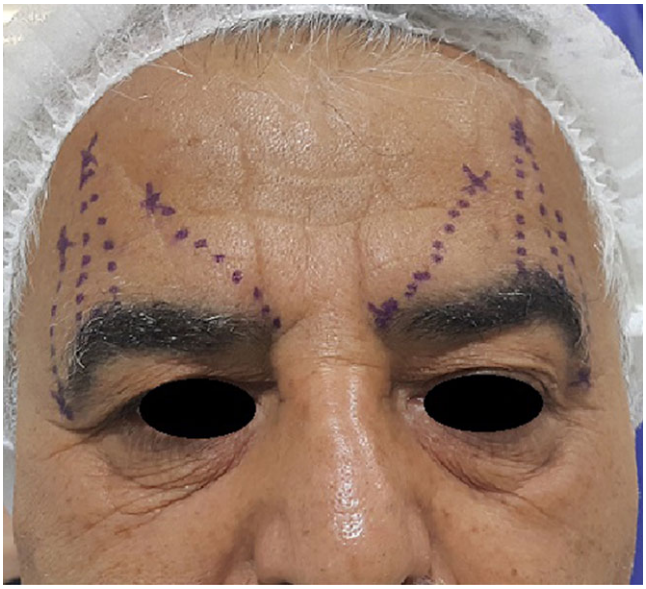

FIGURE 1 Eyebrow lift with promo happy lift double needle 12

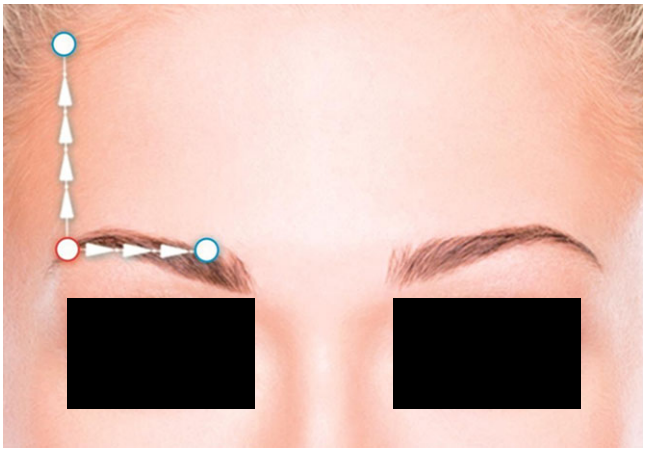

FIGURE 2 Eye brow lift with silhoutte soft 8 cons, "L" technique

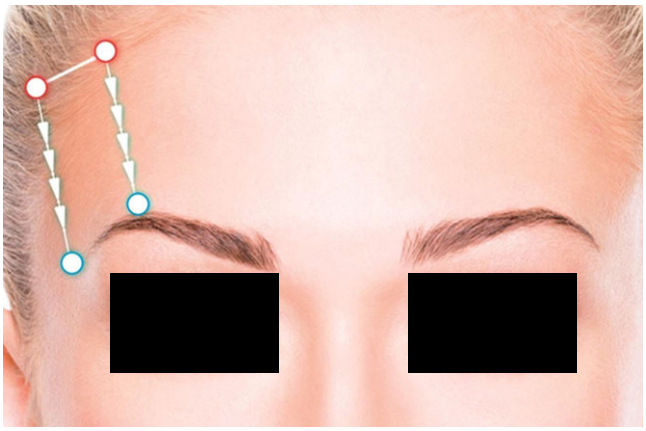

FIGURE 3 Eyebrow lift with silhoutte soft 8 cons, "U" technique

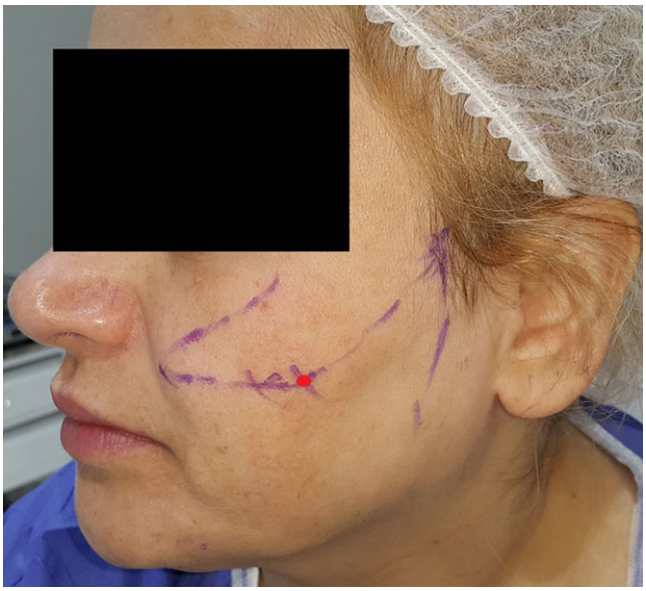

FIGURE 4 Midface lift with promo happy lift double needle 12, our innovative technique

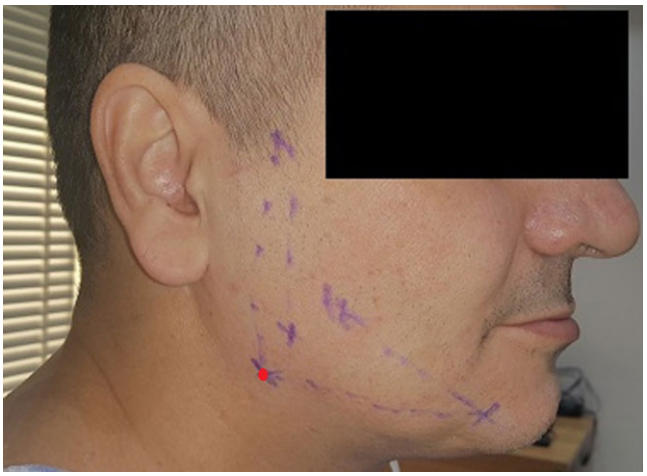

FIGURE 5 Mandibular lift with promo happy lift double needle 23, our modified technique

4 cm and then exits. After entering from the jaw angle, the second needle also moves perpendicular to the first needle's movement path and exits from the intersection of the hairline and upper edge of the zygoma arch. After reentering, this needle moves with an angle of 30 degrees to the previous path of needle 2 and exits after passing through 4 cm.

For lifting the midface with Silhouette Soft, technique W or technique U, as shown in Figures 6 and 7, respectively, was used. In technique W, two entry points are used. The first point is at the intersection of the upper edge of the zygoma arch and the hairline and growth; the other entry point is at the bottom and opposite tragus. The exit point, as shown in Figure 6, was selected on the outer edges of the nasolabial fold and marionette. In technique U, as shown in Figure 7, we lifted the midface. In Figures 6 and 7, the red points represent the entry points, and the blue points represent the exit points. The technique used to put the thread into operation is similar to technique U used for the eyebrow.

For the mandibular region lift, as shown in Figure 8, the direct line technique was used. In Figure 9, the red points represent the entry sites, and the blue points represent the exit sites.

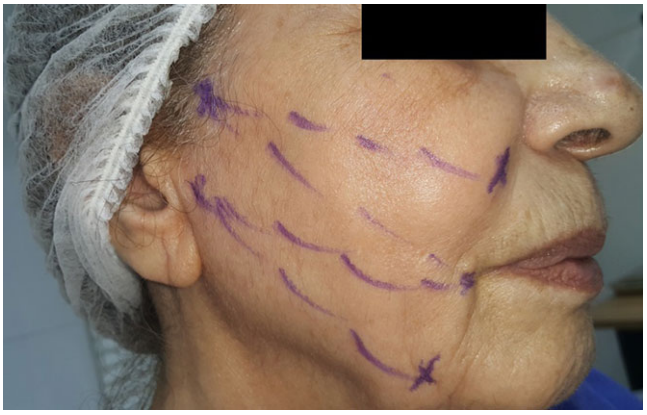

FIGURE 6 Mid face lift ith silhoutte soft 12 or 16 cons, "W" technique

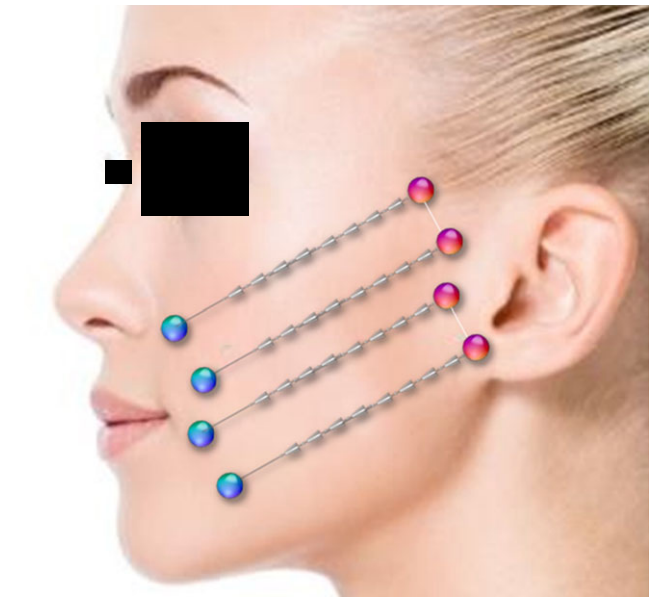

FIGURE 7 Midface lift with silhoutte soft 12 or 16 cons, "U" technique

In the double chin lift, using Silhouette Soft, as shown in Figure 9, the entry points were selected on a line connecting the middle part of the chin to Adam's apple. Point 1 was selected as the entry site at a distance of 1/4 from the beginning of line 1, and point 2 was selected as the entry site at a distance 2/4 from the beginning of the line. Exit points were also selected, as shown in Figure 9, on the sternocleidomastoid muscle. In the neck lift with Silhouette Soft, as shown in Figure 10, the entry sites were selected on the sternocleidomastoid muscle.

In the double chin lift with Proma Happy Lift 12, as shown in Figure 11, entry points were selected at a distance of 1/4 and 2/4 from the line beginning, connecting the middle part of the chin to

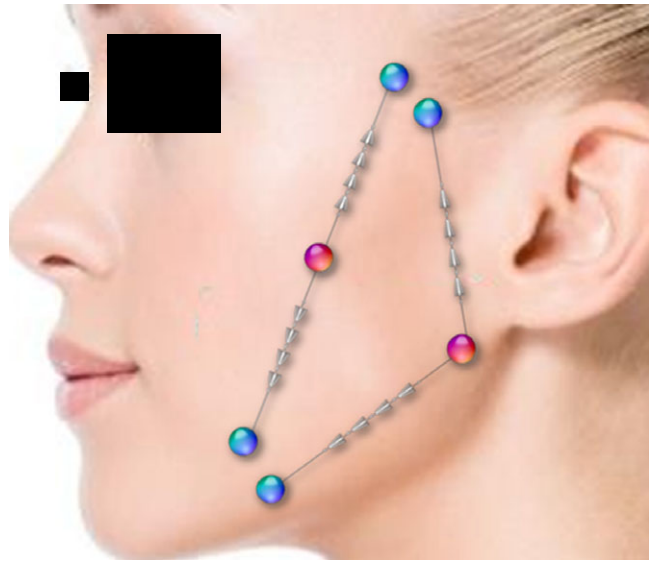

FIGURE 8 Mandibular lift with silhoutte soft

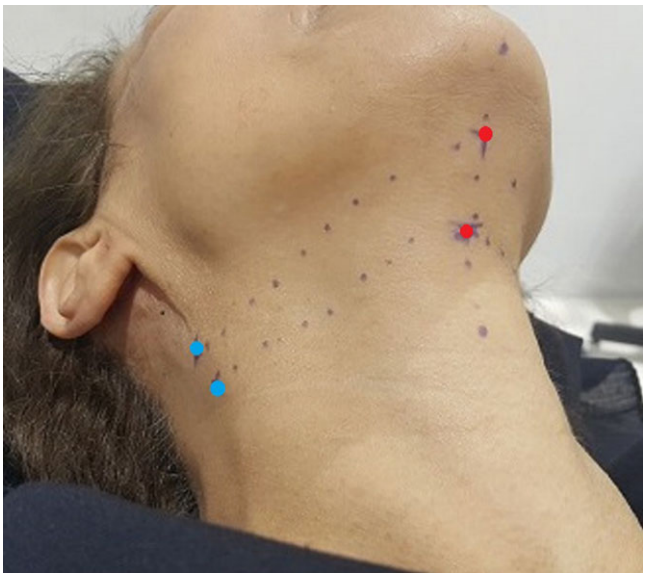

FIGURE 9 Double chin lift with silhoutte soft 16 cons, our innovative technique

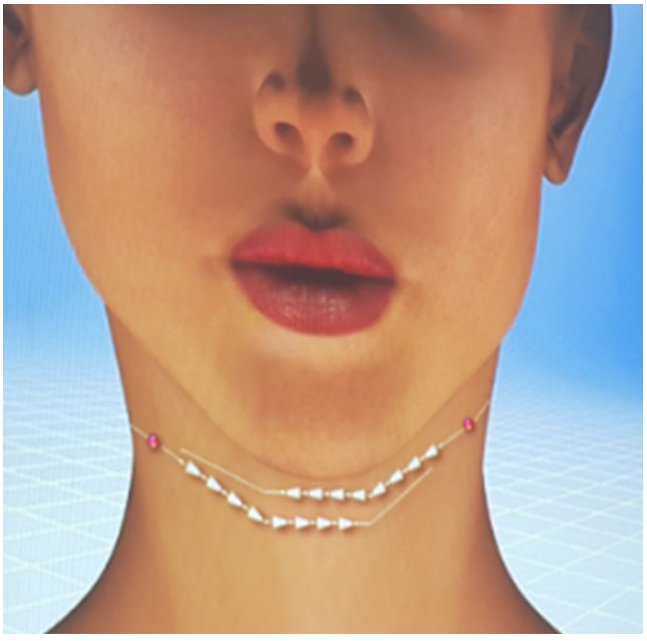

FIGURE 10 Neck lift with silhoutte soft 16 cons

Adam's apple. In the case of selecting thread 23, the entry point would be at distance of 1/4 from the line above, and the exit point would be on the sternocleidomastoid muscle, then needle reenter this exit points and come back toward the midline. The final exit would be at a distance of 2/4 from the midline (as shown in Figure 12).

In the neck lift (as shown in Figures 13 and 14), technique W was used. The main input point was on the sternocleidomastoid muscle, which is the entry point of both needles. As shown in the figures, exit points 1 and 2 are located on the midline, connecting the chin midline to the sternum notch and in parallel to the cartilage

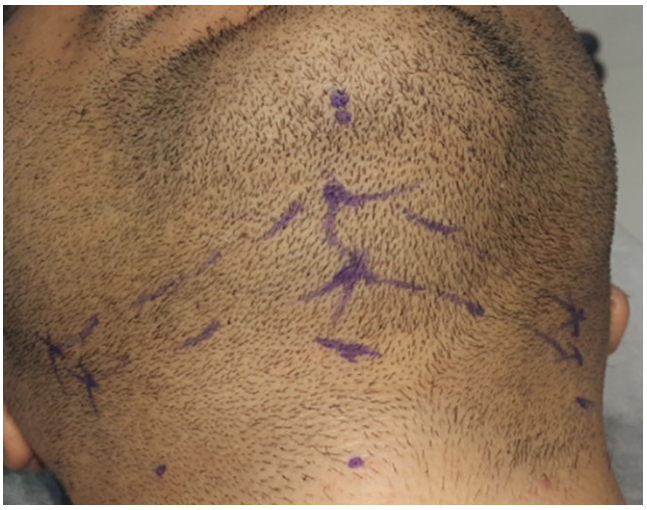

FIGURE 11 Double chin lift with promo happy lift 12, our innovative technique

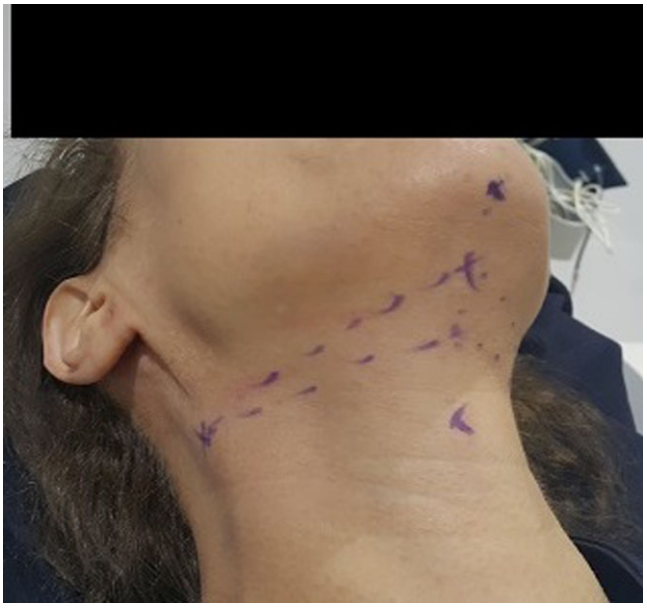

FIGURE 12 Double chin lift with promo happy lift 23,our innovative technique

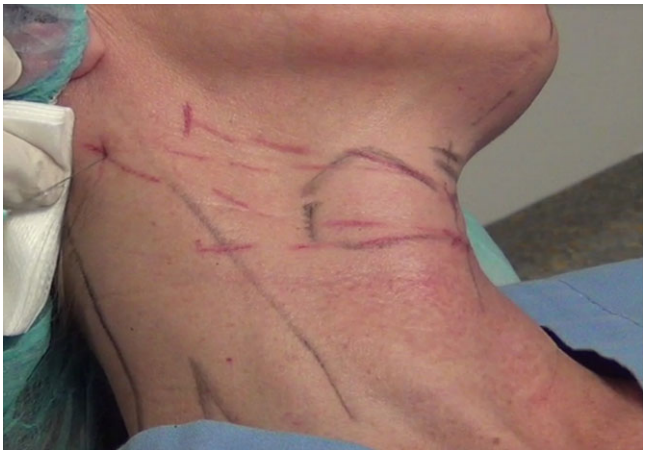

FIGURE 13 Neck lift with promo happy lift 12 or 23

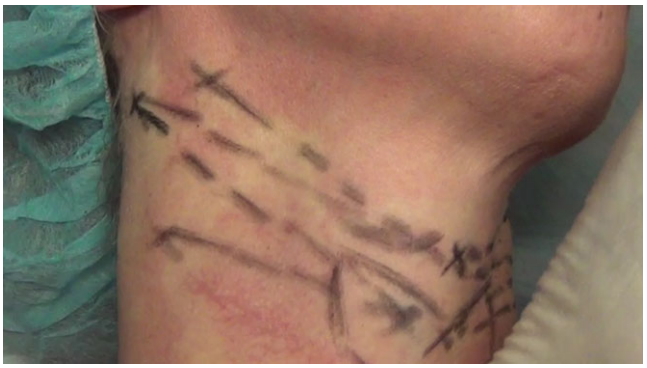

FIGURE 14 Neck lift with promo happy lift 12 or 23

of the cricoid and thyroid. The reentry of the needles is the same point, and their subcutaneous return is toward the sternocleidomastoid muscle or the final exit.

2.2 | Outcomes assessment

After surgery, the results were assessed by two surgeon and patients based on the GAIS (Global Aesthetic Improvement Scale) score. The patients were followed up first week, first month, third month, and sixth month after lifting; outcomes were evaluated by asking them to rate their overall satisfaction on the following scale: exceptional improvement, very improved patient, improved patient, unaltered patient, and worsened patient (Table 1).

2.3 | Statistical analysis

Statistical analyses were performed using SPSS software version 17 for Windows (SPSS Inc., Chicago, IL, USA).To compare response of patients and surgeons satisfaction based on time-points after surgery and their lifting site; we used the chi-squared test. *P* values <0.05 were considered statistically significant.

3 | RESULTS

In this study, of 193 patients with a mean age of 52.22 ± 11.74 years (min: 25 and max: 84), 23 (11.9%) were male and 170 (88.1%) were female. The youngest and the oldest patients were 25 and 84 years old, respectively. In the male group, the youngest and the oldest were 28 and 64 years old, respectively, and in the female group, the youngest and the oldest were 25 and 84 years old, respectively (Table 2). Of the 191 subjects participated, 161 subjects were married (143 females and 18 males) and 32 subjects were single (27 females and 5 males). In terms of educational level, 94 subjects (86 females and 8 males) had a high school, 84 subjects (74 females and 10 males) had bachelor, and 38 subjects (33 females and 5 males) had master and PhD level of education. In terms of job, 103 subjects (80 females and 23 males) were employed, and 90 subjects (all were female) were housewives. As shown in Table 3, the most common sites for the face lifting surgery were the jawline (89 cases, 46.1%), midface (65 cases, 33.7%), eyebrows (24 cases, 12.4%), and neck (15 cases, 7.8%).

Table 4 illustrates the satisfaction scores of patients and surgeons at different times (first week, first month, third month, and sixth month after lifting), based on the GAIS (Global Aesthetic Improvement Scale). The level of patient satisfaction (high and good satisfaction) increased from 94% one week after the surgery (181 cases) to 99% (191 cases) at the sixth month after surgery. The highest level of satisfaction was in group I (Improved) (135 cases, 69.9%), and the lowest level of satisfaction was in group E (Excellent) (2 cases, 1%). One month after the surgery, the level of patient satisfaction was reported at the highest level in group I (123 cases, 63.7%) and the lowest in group W (0 cases, 0%). Three and six months after the surgery, the level of patient satisfaction was measured. In the third month, the highest level of satisfaction was reported for group I (97 cases, 50.3%), and the lowest level was reported for group W (0 cases, 0%). In the sixth month, these values were reported in 83 cases (43%) and 0 cases (0%) for groups VI and W, respectively (Table 3).

Satisfaction after surgery was assessed for surgeon 1. The satisfaction level of surgeon 1 (high and good satisfaction) increased from

TABLE 1 Global Aesthetic Improvement Scale (GAIS)

	Degree	Description
1	Exceptional improvement	Excellent corrective result
2	Very improved patient	Marked improvement of the appearance, but not completely optimal
3	Improved patient	Improvement of the appearance, better compared with the initial condition, but a touch-up is advised
4	Unaltered patient	The appearance substantially remains the same compared with the original condition
5	Worsened patient	The appearance has worsened compared with the original condition

TABLE 2 Age (mean ± SD) based on patient's gender

	Age (y)			
	N (%)	Min	Max	Mean ± SD
Gender				
Male	23 (11.9)	28	64	50.52 ± 10.68
Female	170 (88.1)	25	84	52.45 ± 11.88
Total	193 (100)	25	84	52.22 ± 11.74

TABLE 3 The most common sites for the face lifting surgery

	Lifting site			
	Jawline	Midface	Eyebrow	Neck
Gender				
Male	8 (4.1)	7 (3.7)	6 (3.1)	2 (1)
Female	81 (45)	58 (30)	18 (9.3)	13 (6.8)
Total	89 (46.1)	65 (33.7)	24 (12.4)	15 (7.8)

TABLE 4 Frequencies of GAIS score (patient, surgeon 1, and surgeon 2) based on times after surgery

	Week 1, N (%)	Month 1, N (%)	Month 3, N (%)	Month 6, N (%)
GAIS score (patient)				
Excellent	2 (1)	2 (1)	4 (2.1)	26 (13.5)
Very improved	8 (4.1)	39 (20.2)	76 (39.4)	83 (43)
Improved	135 (69.9)	123 (63.7)	97 (50.3)	78 (40.4)
Unaltered	44 (22.8)	29 (15)	16 (8.3)	6 (3.1)
Worsened	4 (2.1)	0 (0)	0 (0)	0 (0)
GAIS score (surgeon 1)				
Excellent	0 (0)	0 (0)	11 (5.7)	31 (16.1)
Very improved	41 (21.2)	84 (43.5)	99 (51.3)	100 (51.8)
Improved	140 (72.5)	106 (54.9)	79 (40.9)	60 (31.1)
Unaltered	12 (6.2)	3 (1.6)	4 (2.1)	2 (1)
Worsened	0 (0)	0 (0)	0 (0)	0 (0)
GAIS score (surgeon 2)				
Excellent	0 (0)	0 (0)	7 (3.6)	19 (9.8)
Very improved	20 (10.4)	49 (25.4)	71 (36.8)	92 (47.7)
Improved	142 (73.6)	129 (66.8)	107 (55.4)	78 (40.4)
Unaltered	31 (16.1)	15 (7.8)	8 (4.1)	4 (2.1)
Worsened	0 (0)	0 (0)	0 (0)	0 (0)

94% (181 cases) in the first week after surgery to 99% (191 cases) in the sixth month after surgery. In the first week after the surgery, the highest level of satisfaction was seen for group I (140 cases, 72.5%), and the lowest level was seen for groups W and E (0 cases, 0%). One month after the surgery, the highest level of satisfaction was seen for group I (104 cases, 54.9%), and the lowest level was seen for groups W and E (0 cases, 0%). In the third and sixth months after surgery, the satisfaction level of surgeon 1 was assessed. In the third month, the highest level of satisfaction was reported for group VI (99 cases, 51.3%), and the lowest level was reported for group W (0 case, 0%). In the sixth month, these values were reported as 100 cases (51.8%) and 0 cases (0%) for groups VI and W, respectively (Table 4).

In addition, the level of satisfaction after surgery was assessed for surgeon 2. The satisfaction level (high and good satisfaction) of surgeon 2 increased from 83% (162 cases) in the first week after surgery to 98% (189 cases) in the sixth week after the surgery. In the first week after the surgery, the highest level of satisfaction reported by the surgeon related to group I (142 cases, 73.6%), and the lowest level of satisfaction related to groups W and E (0 cases, 0%). One month after the surgery, the highest level of satisfaction was reported for group I (129 cases, 66.8%), and the lowest level was reported for groups W and E (0 cases, 0%). In the third and sixth months after the surgery, the level of satisfaction of surgeon 2 was assessed. In the third month after surgery, the highest level of satisfaction was reported for group I (107 cases, 55.4%), and the lowest level was reported for group W (0 cases, 0%). In the sixth month after surgery, these values were reported as 92 cases (47.7%) and 0 cases (0%) for groups VI and W, respectively (Table 4).

The level of satisfaction of patients, surgeon 1, and surgeon 2 was also assessed based on the site of the lifting surgery at different times (first week, first month, third month, and sixth month after the lifting surgery). Based on the findings, the highest level of satisfaction of the patients, surgeon 1, and surgeon 2 was for the jawline site at all times studied (Table 5).

Potential complications after the lifting surgery were accurately examined by the surgeons. As shown in Table 6, the highest rate of complication was related to ecchymosis (79 cases, 40.9%), followed by complications of dimples (55 cases, 28.5%), tumefaction (35 cases, 18.1%), and pain (10 cases, 5.2%). Moreover, the relationships between complications developed after the surgery and the gender of the patients and site of surgery were examined, and the results showed a significant relationship between the development of ecchymosis and dimples and gender ($P = 0.04$ and $P = 0.001$, respectively). These complications were reported more in the female groups than in the male groups. No significant relationship was found between type of developed complications and site of lifting ($P > 0.05$) (Table 6).

After surgery, the developed complications were examined by two surgeons carefully. Given the type of complication, therapeutic interventions were applied to the patient. These interventions involved using NSAIDs, an ICON laser, or a filler injection, which continued until the complete elimination of the complication. The types of intervention are presented in Table 7 along with the type of complication developed.

4 | DISCUSSION

In this research, conducted to evaluate the effectiveness of lifting with thread surgery, a total of 193 patients underwent lifting surgery. The satisfaction levels of the patients and surgeons 1 and 2 were assessed by GAIS score in the first week, first month, third month, and sixth month after the surgery. The results revealed that the satisfaction of patients and surgeons increased over time. In addition, the rate of complications developed after surgery was carefully assessed by the surgeons. As stated above, interventions were provided for patients based on the type of complication. These interventions involved using NSAIDs, an ICON laser, or a filler injection, which continued until the complete elimination of the complication.

The satisfaction level of the patients was assessed one week after the surgery. Results of this investigation revealed that patients' level of satisfaction (high and good satisfaction) increased from 75% (145 cases) in the first week to 96% (187 cases) in the sixth month after surgery. The excellent level of satisfaction increased from 1% (1 case) in the first week after surgery to 13.5% (26 cases) in the sixth month after the surgery, and the very good level of satisfaction increased from 4.1% (8 cases) in the first week after surgery to 43% (83 cases) in the sixth month after surgery.

TABLE 5 GAIS score (patient, surgeon 1, and surgeon 2) based on and lifting location

	GAIS score (patient) (N%)											
	Week 1						Month 6					
	Excellent	Very improved	Improved	Unaltered	Worsened	P*	Excellent	Very improved	Improved	Unaltered	Worsened	P*
Patients												
Jawline	1 (1.1)	4 (4.5)	61 (68.5)	20 (22.5)	3 (3.4)	0.84	17 (19.3)	32 (36)	35 (39.3)	5 (5.6)	0 (0)	0.11
Midface	1 (1.5)	2 (3.1)	46 (70.8)	16 (24.6)	0 (0)		4 (6.2)	30 (46.2)	31 (47.7)	0 (0)	0 (0)	
Eyebrow	0 (0)	2 (8.3)	18 (75)	4 (16.7)	0 (0)		4 (16.7)	13 (54.2)	6 (25)	1 (4.2)	0 (0)	
Neck	0 (0)	0 (0)	10 (66.7)	4 (26.7)	1 (6.7)		1 (6.7)	8 (53.3)	6 (40)	0 (0)	0 (0)	
Surgeon 1												
Jawline	0 (0)	19 (21.3)	66 (74.2)	4 (4.5)	0 (0)	0.06	18 (20.2)	42 (47.2)	28 (31.5)	1 (1.1)	0 (0)	0.03
Midface	0 (0)	14 (21.5)	48 (73.8)	3 (4.6)	0 (0)		4 (6.2)	38 (58.5)	23 (25.4)	0 (0)	0 (0)	
Eyebrow	0 (0)	6 (25)	17 (70.8)	1 (4.2)	0 (0)		8 (33.3)	12 (50)	3 (12.5)	1 (4.2)	0 (0)	
Neck	0 (0)	2 (13.3)	9 (60)	4 (26.7)	0 (0)		1 (6.7)	18 (53.3)	6 (40)	0 (0)	0 (0)	
Surgeon 2												
Jawline	0 (0)	7 (7.9)	66 (74.2)	16 (17)	0 (0)	0.64	10 (11.2)	40 (44.9)	37 (41.6)	2 (2.2)	0 (0)	0.16
Midface	0 (0)	7 (10.8)	49 (75.4)	9 (13.8)	0 (0)		3 (4.6)	32 (49.2)	29 (44.6)	1 (1.5)	0 (0)	
Eyebrow	0 (0)	5 (20.8)	16 (66.7)	3 (12.5)	0 (0)		6 (25)	12 (50)	5 (20.8)	1 (4.2)	0 (0)	
Neck	0 (0)	1 (6.7)	11 (73.3)	3 (6)	0 (0)		0 (0)	8 (53.3)	7 (46.7)	0 (0)	0 (0)	

*P value: chi-squared test.

TABLE 6 Side effects based on gender and lifting location

	Side effects (N %)											
	Pain			Dimple			Tumefaction			Ecchymosis		
	No	Yes	P*	No	Yes	P*	No	Yes	P Value	No	Yes	P*
Gender												
Male	23 (100)	0 (0)	0.23	23 (100)	0 (0)	0.001	22 (95.7)	1 (4.3)	0.06	18 (78.3)	5 (21.7)	0.04
Female	160 (94.1)	10 (5.9)		115 (67.6)	55 (32.4)		136 (80)	34 (20)		96 (56.5)	74 (43.5)	
Lifting location												
Jawline	85 (95.5)	4 (4.5)	0.31	61 (68.5)	28 (31.5)	0.27	73 (82)	16 (18)	0.19	51 (57.3)	38 (42.7)	0.70
Midface	61 (93.8)	4 (6.2)		46 (70.8)	19 (29.2)		49 (74.4)	16 (24.6)		42 (64.6)	23 (35.4)	
Eyebrow	24 (100)	0 (0)		17 (70.8)	7 (29.2)		22 (91.7)	2 (8.3)		13 (54.2)	11 (45.8)	
Neck	13 (86.7)	2 (13.3)		14 (93.3)	1 (6.7)		14 (93.3)	1 (6.3)		8 (53.3)	7 (46.7)	

*P value: chi-squared test.

TABLE 7 Intervention types based on side effect groups

	Side effects, N (%)			
	Pain	Dimple	Tumefaction	Ecchymosis
Intervention				
No intervention	184 (95.3)	183 (94.8)	162 (83.9)	193 (100)
Injection	1 (0.5)	5 (2.6)	0 (0)	0 (0)
NSAIDs	8 (4.1)	0 (0)	31 (16.1)	0 (0)
ICON laser	0 (0)	5 (2.6)	0 (0)	0 (0)
Total	193 (100)	193 (100)	193 (100)	193 (100)

Level of satisfaction after surgery was also assessed for surgeon 1. The level of satisfaction of surgeon 1 (high and good satisfaction) increased from 94% (181 cases) in the first week to 99% (191 cases) in the sixth month after surgery. The excellent level of satisfaction increased from 0% (0 cases) in the first week after surgery to 16.1% (31 cases) in the sixth month after the surgery, and the very good

level of satisfaction increased from 21.2% (41 cases) in the first week after surgery to 51.8% (100 cases) in the sixth month after surgery.

Level of satisfaction after surgery was also assessed for surgeon 2. The level of satisfaction of surgeon 1 (high and good satisfaction) increased from 83% (162 cases) in the first week to 98% (189 cases) in the sixth month after surgery. The excellent level of satisfaction increased from 0% (0 cases) in the first week after surgery to 9.8% (19 cases) in the sixth month after the surgery, and the very good level of satisfaction increased from 10.4% (20 cases) in the first week after surgery to 47.7% (92 cases) in the sixth month after surgery.

In a study carried out by Savoia et al,[15] the results revealed that of 37 subjects investigated, 33 (89%) of the patients were satisfied with their surgery, of which 65% had an excellent level of satisfaction and 24% had a good level of satisfaction. The results of their research are in line with those of our research. In a study carried out by Lee et al,[16] the general satisfaction level of patients after surgery was reported to be 94%, which is in line with patients' level of satisfaction in our research.

In a study carried out by Han et al in 2016, the satisfaction level of patients after surgery was reported to be about 90%.[17] In this study, the patients' level of satisfaction after surgery was 90% in the sixth month after surgery, and it increased to 95% in the twelfth month after the surgery. In our research, the patients' level of satisfaction was reported to be about 96% six months after surgery, which is in line with the results of the study conducted by Han et al.

In another study carried out by Khrustaleva et al,[18] the satisfaction level of patients one year after the surgery was investigated. Patients were divided into two groups based on the Backer criteria. The satisfaction level in the first group (with low age variations) was about 91%, and in the second group (with high age variations), it was about 86%, which is in line with the results of our research.[18]

The potential complications developed after lifting surgery were accurately assessed by surgeons. In this study, the most frequent complications developed in patients were ecchymosis, dimples, tumefaction, and pain. In the research carried out by Lee et al,[16] the rate of these complications after surgery was examined. The most important complications in this research were reported to be mild swelling, bruising, dimples, and asymmetry.[16] In this study, the complication of dimples was reported to be the third most common complication after surgery, while in our research, it was reported to be the second most common complication. The complications reported in Lee et al's research were different from those in our research. Moreover, the rate of complications reported in our research was lower than in their research. However, the number of people studied in our research was higher than in their research.

In the research carried out by Ogilvie et al,[14] complications after surgery were reported to be mild. Only 24-48 hours after the lifting surgery, patients were affected with edema, which was resolved after 48 hours. Other complications reported in this research included mild bleeding and ecchymosis. The types of complications developed in this study were different from those observed in our research, but no serious complications were reported in either study in terms of the rate of the complications.[14]

In the research carried out by Savoia,[15] complications after surgery were reported to be mild. The complications developed in this research were reported to be ecchymosis, mild erythema, small hemorrhage, mild transitory esthesia, and mild post-operation tumefaction, which showed a higher severity compared to the complications developed in our research. Moreover, in terms of types of complication, these research results were not in line with the results of our research. The rate of complications reported in our research were lower than those reported in the Savoia research.[15]

In this research, complications developed after surgery were assessed based on the gender of the patients. The results revealed a significant relationship between gender and the complications of ecchymosis and dimples. The complications were reported to be more frequent in the female group compared to the male group, which might be due to the participation of more females compared to males in this research. In other similar studies, no evidence has been reported on the relationship between the complications and the gender of the subjects.

In terms of the type of complications caused by the lifting site, the results revealed no significant relationship. The highest rate of complications was reported in the jawline region, followed by midface, eyebrow, and neck. In the jawline region, the most frequent complication was reported to be ecchymosis (42.7%, 38 cases), followed by dimples (31.5%, 28 cases), tumefaction (18%, 16 cases), and pain (4.5%, 4 cases). In the midface region, the most frequent complication was reported to be ecchymosis (35.4%, 23 cases), followed by dimples (29.2%, 19 cases), tumefaction (24.6%, 16 cases), and pain (6.2%, 4 cases). In the eyebrow region, the highest rate of complication was reported for ecchymosis (45.8%, 11 cases), followed by dimples (29.2%, 7 cases) and tumefaction (8.3%, 2 cases). In this region, no report was found on pain. In the neck region, the most frequent complication developed after surgery was ecchymosis (46.7%, 7 cases), followed by pain (13.3%, 2 cases), dimples (6.7%, only 1 case), and tumefaction (6.7%, only 1 case).

In the research carried out by Rachel et al,[19] the rate of complications developed in different regions was investigated. The results of this research showed that 78% of the subjects experienced complications in the full face region, 71% of them experienced complications in the midface region, and 50% of them experienced complications in the upper face region (50%).[19] In this study, the rate of complications according to the site of lifting was not specified. The results revealed that the rate of complications developed in our research was lower than in the research carried out by Rachel et al.

After surgery, the complications developed in the patients were carefully examined by the two surgeons. Based on the type of complications developed, therapeutic interventions were applied to the patient. These interventions involved using NSAIDs, ICON lasers, or filler injections, which continued until the complete elimination of the complication. No intervention was applied for ecchymosis, which was the most common type of complication after the surgery. In the dimple group, only five patients (2.6%) were treated with an ICON

laser, and five patients (2.6%) were treated with a filler injection. In the tumefaction group, 31 patients (16.1%) were treated with NSAIDs, and in the pain group, eight patients (4.1%) were treated with NSAIDs and one patient was treated with injection of diluted steroids. No complication was reported in any of the patients after completing the research. In the research carried out by Han et al,[17] one case of dimple complication was resolved by massaging the affected region without any surgical intervention. In the research conducted by Savoia,[15] various methods were used to resolve the developed complications. In a mild asymmetry case, the surgeon could resolve the problem by using thumb compression. In five other cases with severe asymmetry, the surgeon solved the problem with surgical intervention. Additionally, in people with a tumefaction complication (15%), the problem was solved using NSAIDs.[15] In our research, NSAIDs were also used to solve the tumefaction problem. Comparing these two studies indicates that the rate of tumefaction in our research was lower than in Savoia's research.

4.1 | Limitation

In this study, all subjects (n = 193) who were candidates for face lifting surgery since January 2016 to May 2017 and met our criteria were included in the study by census method. The effectiveness and satisfaction rate after face lifting surgery were evaluated 1 week, 1 month, 3 months and 6 months after surgery. It seems that the 6-month period follow-up is not adequate for accurate examination of the effectiveness of face lifting surgery. Thus, it is suggested that further studies to be conducted in this regard with a follow-up period of at least 18 months after surgery.

5 | CONCLUSION

The results showed that the level of satisfaction of patients and surgeons increased over time. In addition, the complications developed after surgery, which were carefully assessed by the surgeons, were for the most part minor, self-limiting, and short-lived. These results demonstrated that facial rejuvenation thread lift with Proma Happy Lift double needle and Silhouette Soft threads is a being cosmetically more acceptance, safe, and effective procedure associated with minor complications.

ORCID

Samad Rezaee Khiabanloo http://orcid.org/0000-0003-1154-9552

REFERENCES

1. Helfrich YR, Sachs DL, Voorhees JJ. Overview of skin aging and photoaging. *Dermatol Nurs*. 2008;20:177-183.
2. Mack WP. Complications in periocular rejuvenation. *Facial Plast Surg Clin North Am*. 2010;18:435-456.
3. Savoia A, Accardo C, Vannini F, Di Pasquale B, Baldi A. Outcomes in thread lift for facial rejuvenation: a study performed with happy lift™ revitalizing. *Dermatol Ther (Heidelb)*. 2014;4(1):103-114.
4. Nkengne A, Bertin C. Aging and facial changes– documenting clinical signs, part 1: clinical changes of the aging face. *Skinmed*. 2012;10:284-289.
5. International Society of Aesthetic Plastic surgery (ISAPS). Plastic surgery statistics | global plastic surgery statistics. 2018. [online] https://www.isaps.org/medical-professionals/isaps-global-statistics/. Accessed March 30, 2018.
6. Iranian Society of Plastic Surgeons. 2018 [online]. http://www.plasticsurgeons.ir/index-e.htm. Accessed March 30, 2018.
7. Donofrio LM. Fat distribution: a morphologic study of the aging face. *Dermatol Surg*. 2000;26:1107-1112.
8. Coleman SR. Facial recontouring with lipostructure. *Clin Plast Surg*. 1997;24:347-367.
9. Isse NG, Fodor PB. Elevating the midface with barbed polypropylene sutures. *Aesthet Surg J*. 2005;25:301-303.
10. Sulamanidze MA, Paikidze TG, Sulamanidze GM, Neigel JM. Facial lifting with "APTOS" threads: featherlift. *Otolaryngol Clin North Am*. 2005;38:1109-1117.
11. Horne DF, Kaminer MS. Reduction of face and neck laxity with anchored, barbed polypropylene sutures (Contour Threads). *Skin Therapy Lett*. 2006;11:5-7.
12. Ruff G. Technique and uses for absorbable barbed sutures. *Aesthet Surg J*. 2006;26:620-628.
13. De Lorenzi CL. Barbed sutures, rationale and techniques. *Aesthet Surg J*. 2006;26:223-229.
14. Ogilvie MP, Few JW, Tomur SS, et al. Rejuvenating the face: an analysis of 100 absorbable suture suspension patients. *Aesthet Surg J*. 2017;38(6):654-663.
15. Savoia A, Accardo C, Vannini F, Di Pasquale B, Baldi A. Outcomes in thread lift for facial rejuvenation: a study performed with Happy Lift™ revitalizing. *Dermatol Ther*. 2014;4(1):103-114.
16. Lee H, Yoon K, Lee M. Outcome of facial rejuvenation with polydioxanone thread for Asians. *J Cosmet Laser Ther*. 2017;20(3):189-192.
17. Han SE, Go JY, Pyon JK, Oh KS. A prospective evaluation of outcomes for midface rejuvenation with mesh suspension thread:"REEBORN lift". *J Cosmet Dermatol*. 2016;15(3):254-259.
18. Khrustaleva I, Khrustaleva G, Borovikova A, Tamarov A, Borovikov A. Our technique of thread lifting for facial rejuvenation. *Plast Reconstr Surg Glob Open*. 2016;4(6S–1):e739.
19. Rachel JD, Lack EB, Larson B. Incidence of complications and early recurrence in 29 patients after facial rejuvenation with barbed suture lifting. *Dermatol Surg*. 2010;36(3):348-354.

How to cite this article: Rezaee Khiabanloo S, Jebreili R, Aalipour E, et al. Outcomes in thread lift for face and neck: A study performed with Silhouette Soft and Promo Happy Lift double needle, innovative and classic techniques. *J Cosmet Dermatol*. 2018;00:1–10. https://doi.org/10.1111/jocd.12745