

Thread-Filler: A Standardized Combination Therapy

Özge Öztürk Bilkay, MD,* Mehmet Emre Yeğin, MD,† and Ufuk Bilkay, MD‡

Abstract: Advanced technology and increasing knowledge about aging faces have combined to create the illusion of thread lifting to replace surgical interventions. However, results that came far beyond expectations led to a heavy suspicion of these tools. However, combined treatments with fillers would have better outcomes with a synergetic effect. In this study, 52 patients were treated with a specific thread, whereas soft tissue support was added to supervene the lifting effect of the threads. With a mean age of 48 years, these patients were treated with 3 pairs of mid and lower facial areas, and one for eyebrows. With a median amount of 5 mL fillers were added simultaneously at the same treatment plan. The follow-up period was 32 months. Assessment with a Likert Scale questionnaire revealed most of the patients (n = 42) were delighted, whereas only one patient was unsatisfied. The only unsatisfied patient experienced the most frustrating complication, which was thread removal due to infection. The literature shows unauthorized, unspecialized applications of such medical devices cause failure and loss of reliability. Therefore, the most important point of this technique is the sterile setting. Other issues that are discussed in this paper also aim to direct the reader to achieve the most benefit of these 2 techniques.

Key Words: Aging, artistic anatomy, regional anatomy, rhytidoplasty, sutureless surgical procedures

(*J Craniofac Surg* ;00: 000–000)

Body characteristics have attracted and developed the artistic perspective of *Homo sapiens* since the beginning of its history. With or without a sexual point of view, creative reflections of the human mind have proven the existence of this interest, from Kybele figurines to detailed descriptions of human anatomy by Leonardo Da Vinci.¹ Indeed, this curiosity remains, but with the power of changing the undesired proportions of certain

aspects of this anatomy, including the first social contact point of the human, the face.

The development of observational skills has led humans to realize that aging is ongoing. The last century's literature has discussed many hypotheses and suggestions for this problem. In fact, in the mid-20th century, it was believed that the muscular “keystones” of the face, both the orbicularis muscles, were responsible for “not holding” the sagging and bulging of the facial structures.¹ Of course, we know that these are just side-actors at the moment, and the atrophic and attenuative changes of the facial hard and soft tissues are the main reasons for the aged face.² The complete stage and the sequences that cause the aging of the face are noteworthy, and it is crucial to address them correctly.

After its introduction in 1992, thread lifting gained popularity rapidly.³ Sagged tissue suspension due to aging was addressed with a technique other than extensive surgery, which led to wide acceptance. Polypropylene barbed threads were manufactured initially and used for a long time. Polydioxanone poly-l-lactic acid and silicone threads have been added to the armamentarium.⁴ Application methods vary among the authors in the literature. The only thing that does not change among them is that the vectors are aimed to be oblique, similar to a brow lift, neck lift, or a facelift.^{3,5–7} The threads provide an adequate lifting of the sagging tissues. In contrast, atrophy needs further attention as an aged face requires both lifting effects and soft tissue replacement. This study discusses the authors' technique, combining filler and thread-lifting approaches on the aging face.

METHODS

The local ethical committee approved this study on March 14, 2022, with approval number 22-3T/34. Between 2019 and 2022, a total of 52 patients treated with a silicone-coated polyester thread (Infinite-Thread, Thread & Lift Laboratory) with filler augmentation simultaneously were retrospectively analyzed (Fig. 1). Forty-eight patients were females, and 4 patients were males. The mean age was 48 years (minimum 34 y–maximum 67 y). While 48 patients were operated on under local anesthesia, 3 were operated on under local anesthesia and sedation. General anesthesia was needed in only 1 patient. The follow-up length, complications, filler volume, recurrence, and used thread counts were noted.

SURGICAL METHOD

Surgical success depends on the correct definition of the deformities in esthetic surgery. Therefore, a deep evaluation period to catch the exact situation of the tissues is an essential phase for these procedures. The authors' evaluation period began with the inspection of the facial structures. The elasticity and dimpling areas were also noted with the pinch test. The face's upper, middle, and lower thirds were assessed separately afterward. A practical method of patient assessment for surgical goals was done with the help of a hand-held mirror. The change

From the *Department of Otorhinolaryngology, Bilkay Clinic, Izmir; †Department of Plastic, Reconstructive and Aesthetic Surgery, Faculty of Medicine, İstinye University, Istanbul; and ‡Department of Plastic, Reconstructive, and Aesthetic Surgery, Bilkay Clinic, Izmir, Turkey.

Received July 13, 2024.

Accepted for publication August 13, 2024.

Address correspondence and reprint requests to Mehmet Emre Yeğin, MD, Asik Veysel Mah. No:1 İstinye University Bahcesehir Liv Hospital, Esenyurt, Istanbul PC34517, Turkey. E-mail: mehmetemreyegin@yahoo.com

The authors report no conflicts of interest.

Copyright © 2024 by Mutaz B. Habal, MD

ISSN: 1049-2275

DOI: 10.1097/SCS.000000000010669

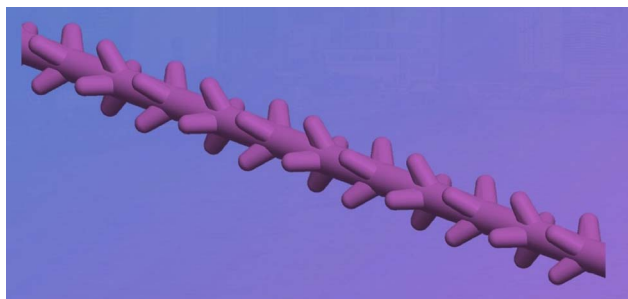


FIGURE 1. The new concept of serrated threads includes silicone-barbed threads with the illustrated geometry. (Attached from www.threadandlift.com, with permission of Mr. Vincent Fountèze, the CEO of Thread & Lift)

in the patient’s appearance when lying on the back was asked to be sufficient for the patient’s desire. Surgical goals were discussed with the patient after the deficiency in the volume and loss of height of the sagging tissues were clarified. The amount of filler and number of threads to be used were determined to achieve the desired elevation and skin elasticity assessments (Figs. 2 and 3).

It must always be remembered that thread lifting is an implant application. Therefore, the procedure obliges strict compliance with surgical sterility rules. The surgical area should be prepped and draped within these rules. The operation began with prilocaine injections in the places where the thread will pass. One to 2 mm incisions to insert the needles were cut with a No. 11 blade. The depth should be kept at the deep plane of the subcutaneous tissue. Afterward, the special needles were introduced at this level and advanced to the desired area to be lifted. The course of the needle must be kept at the same plane, which may cause dimpling or deep structure injury otherwise. The plane is correct if the needle’s advance feels smooth without snagging and the patient is pain-free. The needle was introduced by piercing the skin at the end of the planned course, and the lifting effect was tested before the needle was detached. The other half is similarly introduced to the other side of the incision. It similarly passes the subcutaneous tissue through the scalp to provide the opposite traction force. After the desired lifting effect is obtained, the needle can be detached. After the thread application, the preoperatively decided volume of fillers was introduced through blunt cannulas, beginning with the deepest, the most cranial, and the most lateral fat pad (Fig. 4).

Results were assessed with a Likert Scale questionnaire (rated on a scale of 1–5, with 1 indicating “very dissatisfied” and 5 indicating “delighted”).⁸ Patients were asked to rate the outcome according to this scale.



FIGURE 2. Fifty-six-year-old female patient with aging face complaints. She was treated with a pair of threads for brows, 3 pairs for the mid and lower face, and 2 for the neck with submental liposuction. Filler injection (3 mL) was done for bilateral malar augmentation. (A) Anterior view of the preoperative (left) and postoperative 17th month (right). (B) Lateral view of the preoperative (left) and postoperative 17th month (right). (C) Anterior view of the preoperative drawings. (D) Lateral view of the preoperative drawings.



FIGURE 3. Sixty-two-year-old female patient with aging face complaints. She was treated with a pair of threads for brows, 3 pairs for mid and lower face, and a pair for the neck with 1 mL filler injection per each nasolabial fold and marionette lines. (A) Anterior view of the preoperative (left) and postoperative 23rd month (right). (B) Lateral view of the preoperative (left) and postoperative 23rd month (right). (C) Anterior view of the preoperative drawings. (D) Lateral view of the preoperative drawings.

RESULTS

Of the 52 patients, 42 needed a neck lift with 1 or 2 pairs of threads, and 42 patients necessitated eyebrow lifts with one pair of threads, whereas the patients who asked for mid and lower facial area rejuvenation required at least 3 pairs of threads. The mean injected filler volume was 5 m (minimum 3 m–maximum 9 m). The mean follow-up was 32 months (minimum 17–maximum 42; Fig. 5).

Complications were divided into major and minor complications. Minor complications were skin irregularities on the face and pain, especially in the scalp area. Skin irregularities due to overcorrection were treated by massage in the first 3 to 5 days before tissue edema had passed. Mild pain was treated with painkillers, whereas severe and long-lasting pain was treated with a local anesthetic injection directly into the painful area (prilocaine).

The only major complication observed was an infection. It was seen in 1 patient (1.92%). Infection was on the right side of the patient’s scalp and the edge of the right eyebrow. The infection could only be cured by removing the threads. The threads were placed again after 3 months in this patient, and no further complications were encountered.

The results were evaluated according to a satisfaction questionnaire. Forty-two patients out of 52 were delighted (80.7%), 7 patients were satisfied (13.46%), 2 patients were less satisfied (3.84%), and 1 patient was not satisfied (1.92%). Less satisfied patients were younger patients because of their high expectations. The unsatisfied patient was the patient with the infection whose threads were removed.

DISCUSSION

Humans’ artistic instinct forced them to observe, discover, and visualize the changes that come with aging. The famous painter Rembrandt detailed this in the Renaissance era. His



FIGURE 4. Fifty-six-year-old female patient with aging face complaints. She was treated with 3 pairs for the mid and lower face and 2 for the neck. Hyaluronic acid filler injection (1 mL) was employed for nasolabial folds and marionette lines. (A) Anterior view of the preoperative (left) and postoperative 36th month (right). (B) Oblique view of the preoperative (left) and postoperative 36th month (right). (C) Lateral view of the preoperative (left) and postoperative 36th month (right).

Downloaded from http://journals.lww.com/jcraniofacialsurgery by ckduUnWjQy6aBHXhmgTb+95b7dGLizqYRWpAE Y+Y+Y+WwPnPdHh3WNS1EqTus4Onok+NT1clpwDEZQe7d6NUNJF TKXJ3BCMKM1Y7Zm7cP84dKJHsfaGf4S0QpSjTYGBumpZx6dQFHz VRAmSVsLOy3p9c0mVREZ2WazEAveHhNVd4= on 11/14/2024



FIGURE 5. Thirty-two-year-old female patient with mild changes of the aging face. Jowls and the nasolabial folds were the patients' main complaints. (A) Anterior view of the preoperative (left) and postoperative 31st month (right). (B) Oblique view of the preoperative (left) and postoperative 31st month (right). (C) Lateral view of the preoperative (left) and postoperative 31st month (right).

self-portraits reveal the effects of his psychological status and the differences that come with age.⁹

Changes in facial structures with aging have been studied for many years. The dominant theories for these changes have been the attenuation of the ligamentous support of the soft tissues or the atrophic changes in the facial structures.¹⁰ Most of the studies of the past century were done by visual examination or on mostly aged cadavers.^{1,11} In contrast, novel imaging technologies led scientists to examine in vivo changes.¹²⁻¹⁴ In summary, bone resorption and fat loss were demonstrated. To address these changes, facelift procedures were used to reverse the effects of time. However, patients seeking facial rejuvenation also include individuals with minor deformities of facial aging. For these patients, minimally invasive techniques can still be employed.

The volumetric changes in the face of aging have been addressed by numerous authors previously.^{10,15-18} For instance, a study by Rohrich and colleagues has demonstrated that the malar loss of fat gives the individual one of the most characteristic changes of the old face, malar deflation. Therefore, they suggested that the deep malar fat pad augmentation will reverse a significant part of the deflated malar look.¹⁹ The logic behind this change is based on the lifting effect of the augmented tissues of the face. Casabona et al^{15,16} called attention to this effect in their studies. Furthermore, one of the studies by Casabona and colleagues showed that the lifting effect depends not on the volume but on the structural anatomy. Their survey on the temporal area demonstrated that the filler volume injected into the malar area changes if first injected into the temporal area.¹⁵ After all, the lifting effect exists, as Casabona et al demonstrated, but in the author's experience, the lifting effect is sufficient only in a limited young patient group.¹⁶ Therefore, additional suspensory interventions are necessary to rejuvenate an old face efficiently (Fig. 6).



FIGURE 6. Sixty-seven-year-old male patient. For a good result, 4 pairs of threads were applied to the mid and lower face, whereas 2 pairs were applied to the neck. This case also represents an excellent example of facelift duration. (A) Anterior view of the preoperative (left) and postoperative 21st month (right). (B) Right oblique view of the preoperative (left) and postoperative 21st month (right). (C) Lateral view of the preoperative (left) and postoperative 21st month (right).

Recent studies focus on researching the ligamentous structures of the face. For instance, a study that examined the biomechanical composition of aged ligaments concluded that they do not change by age. However, it should be approached cautiously because the mean age of the cadavers used for this study was 82 years, as it is known that the changes by age begin as early as the mid-30s.^{20,21} Other studies suggesting the ligamentous structure does not change had no specific quantitative information to support their hypotheses.^{2,22} Eventually, these studies cannot overthrow the approach offering suspensory ligaments' attenuation.

Since it was introduced in 1992, the thread-lifting of soft tissues to overcome the aging effects of time has hugely attracted public attention.²³ Utilizing nonabsorbable barbed threads for tissue suspension was the main idea behind this novel technique. It was misunderstood as a perfect alternative to a facelift at the beginning.³ It gained immense popularity and soon became widely available. However, the unique complication profile and lack of optimal results drove scientists to find further innovations.

Absorbable threads were introduced to overcome the complications caused by nonabsorbable materials, such as extrusion.²⁴ Their rejuvenation effect was hypothesized as their potential to increase collagen synthesis and remodeling.²⁵ In addition, the scar formed around the thread was advocated for acting like a suspensory mechanism providing a long-term effect, which is not a plausible theory.²⁶

The most recent development in the thread market is the introduction of silicone threads. The significant advantages of these threads are that they are inert and provide a spring effect. However, due to a lack of support to achieve a sturdy soft tissue suspension, their success was limited as the threads lost their impact in the short term.³ After that, a novel thread was introduced in 2019. The Infinite-Thread (Thread & Lift Laboratory) utilizes a nonabsorbable material's sturdiness and silicone's flexibility. It is manufactured with 4 unidirectional 45 degree-angled barbs with rounded tips (Fig. 1). Their axial position builds a conical shape, preventing the thread from turning or slipping in the tissue. Both sequences of opposite-placed barbs with free, black-dyed, nonbarbed endings are united with a black-dyed, smooth middle part. It differs from other silicone threads by being nonelastic but malleable, and its unique design does not allow reversing of the cogs.³ It gives both patients and surgeons a chance to obtain good results in the short term. However, the lack of long-term effects demonstrated in the literature on its use hinders its reliability.³ To our knowledge, this study is the first to report long-term results of Infinite Thread.

The high rates and complication profile of the threads described in the literature create hesitation in the applicators.²³ The literature discussed the reasons for these rates and concluded that some health professionals who perform thread-lifting were incompetent for such an invasive method. In truth, nonsurgeon medical professionals managed some patients who had terrible consequences of such complications. It must be addressed that such interventions also necessitate surgical expertise, which requires qualification to execute the rules of working under absolutely sterile conditions. This modality is an applicator-dependent intervention. Therefore, most applicators without sufficient training and experience in such a setting may have caused these high rates. Consequently, it may not be wise to reject the existence of such a treatment modality for plastic surgeons in advance.

Moreover, plastic surgeons who fail to cooperate with the patients' minds and seek the least morbid procedure that can

Downloaded from http://journals.lww.com/craniofacialsurgery by ckduUnWjQy6aBHXhmgTb95b7dGSlzqYRWpAE+Y+YmWmPndHm3Wn51EqTus40k+NT1cIwDEZQeZ6dNjUJFtkK33BCKM1j7Zm7cP84dKJHsIaGf4SOqPstJ7GBumpZx6bQFHzVRAmSVsLOj3p9CmRVREZ2WazEAveIHNVd4= on 11/14/2024



FIGURE 7. Thirty-eight-year-old female patient with mild changes of the aging face. Note the jowls and deepened nasolabial folds. This patient was treated with only 3 pairs of threads for the mid and lower face. (A) Anterior view of the preoperative (left) and postoperative 18th month (right). (B) Oblique view of the preoperative (left) and postoperative 18th month (right). (C) Lateral view of the preoperative (left) and postoperative 18th month (right). Note the enhanced mandible definition.

fulfill their wishes may leave the theater to the cosmetic applicators who are eager to try. It was demonstrated in a study by D’Amico et al²⁷ that plastic surgeons who use noninvasive procedures have higher rates of satisfaction. Therefore, this should be the primary consideration for plastic surgeons when approaching the “noninvasive procedures” topic.

As in all esthetic applications, the most crucial issue in minimally invasive facial rejuvenation treatments is the correct patient selection. Patients should be evaluated according to their age, the degree of aging problems on their faces, and expectations. It is difficult to get good results in elderly patients with severe aging problems, but the expectations of these patients are usually not very high. Therefore, they may be satisfied with the methods that do not require surgery. In contrast, it may be easier to get successful results in young people who do not have serious aging problems on their faces (Fig. 7). Whereas, as the expectations of this group are generally high, they may be less likely to be satisfied with the result.

According to the author’s experience, the most suitable patient profile for the combined treatment of silicone thread lifting and filler is middle-aged patients with no severe aging facial problems. A practical technique for appropriate candidate selection is to give the patient a mirror and ask them to look at their face in the sitting position first, then tell them to lie on their back and look at their face in the mirror again. If they find the change in their appearance satisfying when lying, they can be considered a good candidate. In contrast, if the patient expresses dissatisfaction with the observed difference, thread-lifting may not be appropriate (Fig. 8).

The most severe complication of the thread facelift procedure is an infection encountered only in one patient in this study’s group. Infections are usually iatrogenic and caused by applicators who ignore sterility conditions. The other cause

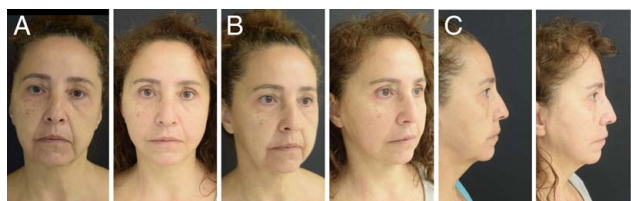


FIGURE 8. Fifty-two-year-old female patient with aging face complaints. She was treated with 3 pairs for the mid and lower face and 2 for the neck. An additional 1 mL hyaluronic acid filler injection was employed for the left nasolabial fold. (A) Anterior view of the preoperative (left) and postoperative 38th month (right). (B) Oblique view of the preoperative (left) and postoperative 38th month (right). (C) Lateral view of the preoperative (left) and postoperative 38th month (right).

may be the penetration of hair through the entrance hole during the application. Therefore, utmost care must be taken to avoid this undesirable situation. Even the hair around the area of the incisions and puncture sites can be shaved. Staphylococcus, Mycobacterium, or Pseudomonas infections may develop silently at around the postoperative 15th day or later.^{28,29} Immediate thread removal is the only treatment option if an infection occurs.

Another complication that will require thread removal is the thread’s superficial placement, which was not seen in this study’s patient group. In cases where the thread was removed due to superficial placement, it can be repositioned immediately into the correct plane after the removal. Unlikely, if the thread has been removed due to an infection, it is necessary to wait at least 3 months after the infection has been cured before reapplication.

Multifaceted, patient-specific treatment allows us to address all the changes mentioned earlier for optimal results.³⁰ Furthermore, when the lift effect of both the fillers and thread lifting is considered with the augmentation effect of the fillers, the resulting rejuvenation gives a suitable solution for the mild to medium deformities of facial aging. Regarding this, the authors’ technique provides an optimal choice to fulfill minimally invasive facial rejuvenation needs and requirements.

CONCLUSION

Thread-lifting and filler augmentation of the face are widely known techniques with many studied aspects. However, the authors’ method, which employs both techniques simultaneously, can address most aging changes for facial rejuvenation.

REFERENCES

1. Brown AM. Surgical restorative art for the aging face notes on the artistic anatomy of aging. *J Gerontol* 1953;8:173–184
2. Cotofana S, Fratila AAM, Schenck TL, et al. The anatomy of the aging face: a review. *Facial Plast Surg* 2016;32:253–260
3. Celik N. The new era in office-based facial rejuvenation: Promising technology of silicone threads. *Front Life Sci Relat Technol* 2021;2: 30–34
4. Kim JE, Sykes JM. Hyaluronic acid fillers: history and overview. *Facial Plast Surg* 2011;27:523–528
5. Halepas S, Chen XJ, Ferneini EM. Thread-lift sutures: anatomy, technique, and review of current literature. *J Oral Maxillofac Surg* 2020;78:813–820
6. Garvey PB, Ricciardelli EJ, Gampper T. Outcomes in threadlift for facial rejuvenation. *Ann Plast Surg* 2009;62:482–485
7. le Louarn C. Face lift with U threads. *Ann Chir Plast Esthet* 2021; 66:62–68
8. Alam MK, Elbeshbeishy R, Abutayyem HM, et al. Assessment of patient satisfaction and functional outcomes in orthognathic surgery. *J Pharm Bioallied Sci* 2024;16:S561–S563
9. Hage JJ, Lange J, Karim RB. Rembrandt’s aging face in plastic surgical perspective. *Ann Plast Surg* 2019;83:123–131
10. Gerth DJ. Structural and volumetric changes in the aging face. *Facial Plast Surg* 2015;31:3–9
11. Stuzin JM, Wagstrom L, Kawamoto HK, et al. The anatomy and clinical applications of the buccal fat pad. *Plast Reconstr Surg* 1990; 85:29–37
12. Wysong A, Kim D, Joseph T, et al. Quantifying soft tissue loss in the aging male face using magnetic resonance imaging. *Dermatol Surg* 2014;40:786–793
13. Wysong A, Joseph T, Kim D, et al. Quantifying soft tissue loss in facial aging: a study in women using magnetic resonance imaging. *Dermatol Surg* 2013;39:1895–1902
14. Shaw RB, Katzel EB, Koltz PF, et al. Aging of the facial skeleton: aesthetic implications and rejuvenation strategies. *Plast Reconstr Surg* 2011;127:374–383

15. Casabona G, Frank K, Moellhoff N, et al. Full-face effects of temporal volumizing and temporal lifting techniques. *J Cosmet Dermatol* 2020;19:2830–2837
16. Casabona G, Frank K, Koban KC, et al. Lifting vs volumizing—the difference in facial minimally invasive procedures when respecting the line of ligaments. *J Cosmet Dermatol* 2019;18:1237–1243
17. Stuzin JM, Rohrich RJ, Dayan E. The facial fat compartments revisited: clinical relevance to subcutaneous dissection and facial deflation in face lifting. *Plast Reconstr Surg* 2019;144:1070–1078
18. Rohrich RJ, Pessa JE. The fat compartments of the face: anatomy and clinical implications for cosmetic surgery. *Plast Reconstr Surg* 2007;119:2219–2227
19. Rohrich RJ, Pessa JE, Ristow B. The youthful cheek and the deep medial fat compartment. *Plast Reconstr Surg* 2008;121:2107–2112
20. Swift A, Liew S, Weinkle S, et al. The facial aging process from the “inside out”. *Aesthet Surg J* 2021;41:1107–1119
21. Brandt MG, Hassa A, Roth K, et al. Biomechanical properties of the facial retaining ligaments. *Arch Facial Plast Surg* 2012;14:289–294
22. Wong CH, Mendelson B. Newer understanding of specific anatomic targets in the aging face as applied to injectables: aging changes in the craniofacial skeleton and facial ligaments. *Plast Reconstr Surg* 2015;136:44S–48S
23. Gülbitti HA, Colebunders B, Pirayesh A, et al. Thread-lift sutures: still in the lift? A systematic review of the literature. *Plast Reconstr Surg* 2018;141:341e–347e
24. Wang CK. Complications of thread lift about skin dimpling and thread extrusion. *Dermatol Ther* 2020;33:e13446
25. Kapicioğlu Y, Gül M, Saraç G, et al. Comparison of antiaging effects on rat skin of cog thread and poly-l-lactic acid thread. *Dermatol Surg* 2019;45:438–445
26. Atiyeh BS, Chahine F, Ghanem OA. Percutaneous thread lift facial rejuvenation: literature review and evidence-based analysis. *Aesthetic Plast Surg* 2021;45:1540–1550
27. D’Amico RA, Saltz R, Rohrich RJ, et al. Risks and opportunities for plastic surgeons in a widening cosmetic medicine market: future demand, consumer preferences, and trends in practitioners’ services. *Plast Reconstr Surg* 2008;121:1787–1792
28. Prestler E, Lassnigg A, Parschalk B, et al. Clinical behavior of implant infections due to staphylococcus epidermidis. *Int J Artif Organs* 2005;28:1110–1118
29. Shin JJ, Park JH, Lee JM, et al. Mycobacterium massiliense infection after thread-lift insertion. *Dermatol Surg* 2016;42:1219–1222
30. Rohrich RJ, Avashia YJ, Savetsky IL. Prediction of facial aging using the facial fat compartments. *Plast Reconstr Surg* 2021;147:38S–42S