

Facial Rejuvenation with Fast Recovery Suspension Technique



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KEYWORDS

- Local anesthesia • Minimally invasive surgery • Special instruments and thread
- Suspension technique • Facial rejuvenation

KEY POINTS

- This procedure causes little tissue trauma and has a short operation time.
- Using the principle of vector space mechanics, zygomatic ligament, and deep temporal fascia as fixation points are the key parts of facial lifting.
- The change of esthetic outcome is immediate and lasts for a long time.
- Aiming to restore the position of the deep fat compartment of the middle face and the corner of the mouth, this operation also produces good effects on the tightening and lifting of the superficial lateral buccal Superficial Muscular Aponeurotic System (SMAS) and the platysma muscle of the mandibular margin.



Video content accompanies this article at <http://www.plasticsurgery.theclinics.com>.

INTRODUCTION

Aging is a natural process. After middle age, the surface tissues of the human body begin to age, especially in the form of wrinkles, loosening, and atrophic changes in the skin of the face and neck. The surgical technique to remove wrinkles on the face and neck is called facial rejuvenation surgery.^{1,2}

To combat the trend of skin aging, the use of facial wrinkle removal has become increasingly rejuvenating. Traditional facial wrinkle removal surgery generally uses a long incision in the coronal shape of the scalp, in front of the ear to behind the ear, with a large peeling area and a long operation time, which may lead to complications such as obvious postoperative scarring, incisional alopecia, numbness, and abnormal sensation in the operated area, discouraging many candidates. In

recent years, the application of minimally invasive methods in facial wrinkle removal is increasing. Minimally invasive face-lifting with poly-p-dioxanone (PPD) absorbable threads, micro laser, and other facial implants are most prevalent, but the maintenance time of the wrinkle removal effect is short. To explore an effective minimally invasive lifting method, fast recovery suspension technique for facial rejuvenation has gained popularity, especially in Asia.^{3–5} In this article, my preferred approach to facial rejuvenation with fast recovery suspension technique is described. Its indications and anatomic considerations are also described.

INDICATIONS AND CONTRAINDICATIONS

According to the condition of facial aging, especially the soft tissue descends of the middle and

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lower face with some skin laxity, but the fat accumulation is still not obvious.

This procedure is mainly applicable to patients between the ages of 25 and 45 years old, who usually have obvious lacrimal grooves and zygomatic buccal groove, deepening of the nasolabial folds, the downward movement of the fat pad, flatted cheek, drooping of the corner of the mouth, and early jowling (**Fig. 1**). They should be healthy with no major medical issues.

PREOPERATIVE EVALUATION AND SPECIAL CONSIDERATIONS

We hope to achieve the best results by using the most minimally invasive methods. Therefore, we should first consider the volume and tissue displacement of facial soft tissues. The reduction or absence of volume will affect the esthetic appearance, and the facial soft tissue displacement makes tiredness and aged look. This procedure is able to quickly and immediately improve the middle facial descent, such as zygomatic buccal groove, lacrimal grooves, and poor lower eyelid

position. In addition, this operation also has great advantages in improving the nasolabial folds, the drop and deepening of the corner of the mouth, the buccal concave, and the tightening and lifting of the mandibular margin. If there is a serious loss of volume in the temporal region and/or middle face with significantly depressed buccal fat, appropriate hyaluronic acid (HA) or autologous fat filling can be administered. In addition, the combination of Botox to relax the jaw and neck muscles can also enhance the outcome of this procedure.

Facial aging is caused by a combination of thinning of the facial skin base, loss of the number of elastic fibers in the dermis, loss of elasticity, laxity of muscle tissue, and reduction of total subcutaneous fat. These changes cause the outer corners of the eyes to sag, deepen the nasolabial folds, and visually flatten the cheekbone area.^{6,7} The anatomic layers of the facial soft tissues from superficial to deep are skin, subcutaneous fat layer, SMAS layer (superficial fascial system), subfascial loose tissue layer, and muscle layer; the SAMS fascial layer is a subcutaneous fibrous membranous structure of



Fig. 1. (A) An example of a typical patient for the procedure. (B) Preoperative marking of the procedure for the same patient.

the face from the head to the neck, which is separated from the skin by delicate fat tissue above and from the deep fascia by lax connective tissue below.^{8,9} The loose connective tissue layer allows the facial skin to slide up and down and is called the sliding layer. The sliding layer is the anatomic basis for minimally invasive facial skin lift. The skin, fat layer, SMAS fascial layer, subfascial sparse tissue layer, and muscle layer all have a certain degree of extensibility. This is an inherent characteristic of the soft tissue structure. The sliding layer of the facial soft tissue anatomy and the inherent ductile properties of soft tissues provide the anatomic basis for the application of minimally invasive submerged guided suspension surgery for facial rejuvenation.^{10,11}

The SMAS layer, located about 4.5 mm deep under the skin, is between the subcutaneous fat and muscle. As we age, the elastin in the SMAS layer begins to be severely lost, and the lifting function becomes weaker, so the skin gradually becomes saggy, wrinkled, double-chinned, and other aging signs. Aging starts from the inside out, so the treatment of aging should also start from the inside out. To restore the delicate, smooth, and elastic skin, the first step is to work on the SMAS layer. Traditional facelifts only work on the top layer of the skin, so the results are short-lived and unnatural. An ultrasonic knife (Ulthera) can reach the SMAS layer directly through ultrasonic waves, stimulating the deep skin collagen restructuring and regeneration, thus comprehensively correcting the problems of sagging, wrinkles, and elasticity of facial skin.^{12,13}

Fascia suspension lift is also a kind of wrinkle reduction surgery, using a special apparatus to do deep stripping and cutting of fascia, improving the fascia from a folding scheme to a shearing process. Theoretically, the pulling force is greater, but at the

end, the epidermis and muscles are removed at the same time and then the counter skin suture is performed. Because of the special apparatus and sutures used during the surgery, it has no scarring and much less hair loss. This unique suture will not break even if the muscle and skin are under excessive tension and the SMAS is cut.^{14,15}

In recent years, plastic surgeons have found, through a large number of clinical practices of facelift and wrinkle reduction surgery that the effect is quite different when the fascial layer on the periosteum is tightened and folded, and then the epidermis and muscles are lifted. In this way, the face can lift more sagging skin in the same sagging state, and by lifting and folding the SMAS, the skin is tightened from the deeper layers, so that the facial muscles and skin do not look tight and appear natural.

SURGICAL PROCEDURES

Fig. 1B shows the preoperative planning for the procedure. Local anesthesia and facial nerve block are performed at the riveting point, and then, appropriate local anesthetics (lidocaine + ropivacaine 1:1 with 1:100,000 of epinephrine) are infiltrated to the planned polydioxanone (PDO)-implanted areas in the fixation points to reduce pain (**Fig. 2**, **Video 1**).

One fixation point of over the zygoma (lateral margin of suborbicularis oculi fat pad [SOOF]) and three fixation points of the temporoparietal region near the hairline are used as the key points of vector elevation and lifting effect of this operation (**Fig. 3**).

The 90-cm PDO single-type reverse saw suture is placed into the special guide needle. The guide needle is entered the surface of the zygoma through the pre-prepared insertion point of the zygoma. It is then turned toward the zygoma and



Fig. 2. Local anesthesia and facial nerve block were performed.



Fig. 3. Incisions at three fixation points within the hairline of the temporoparietal region were marked.

entered the deep fat pad above the zygoma. It is crossed the deep surface of the nasolabial fold according to the designed subcutaneous path. The needle is drawn back 0.5 cm and gently pressed and touched to the end of the suture with the finger. The distal end of the suture is tightened. If the suture is firmly grabbed, the needle can be pulled back to one-third. The thread is then implanted in the parallel direction or superficial to SMAS and can be placed back and forth to its original place. The thread is grasped tightly, and its proximal end is placed to the temporal region in a reverse fashion. This step can be repeated until complete equal power (vector mechanics) can be adjusted based on the angle. All these steps can be repeated. In the case of heavy corner of

the mouth and zygomatic buccal groove with zygomatic ligament as an across the point combining with the "V" shape lifting, the effect of the deep tissue gathering can be achieved (Fig. 4). To further stabilize and tighten the superficial layer of the SMAS, the "0" thread is cut to different lengths according to the distance to the application site. Three small incisions (1.5 cm apart for two-way approaches) are made within the temporal hairline with a guided needle. Two "0" inverted saw sutures are implanted parallel to the tip of each ear. All threads are placed and are connected with the forceps. The lifted height and the stability of the implant threads are adjusted parallel to the tip of each ear and tied at the fixation point. Then, a single root of the thread is advanced



Fig. 4. The guide needle was inserted into the periosteum of the zygoma through the pre-prepared insertion point.

from the deep temporal fascia to the second fixation point through a two-way-guided device. The thread knot is adjusted and placed into the deep layer and fixed with a cross-knotted vascular clamp. In the highest point, the galea aponeurotica (epicranial aponeurosis) is riveted with a guided device and fixed with knots. Finally, the knot of each thread is buried deeply under the galea aponeurosis of the forehead toward the cheek. At the end of the operation, all incisions are closed with 7 to 0 silk suture except two small incisions of the face that are closed with 8 to 0 silk suture. At the end of the procedure, the nasolabial fold and temporal region are secured with elastic tapes (**Fig. 5**).

Postoperative Care and Expected Outcome

The postoperative care is the same as most facial rapid recovery thread lifts techniques, which requires strengthening the protection of the surgical incision and strengthening the dressing and tightening of the surgical area.

MANAGEMENT OF COMPLICATIONS

The common complications after the fast recovery suspension surgery are infection, bleeding, and so forth, which can be treated postoperatively with antibiotics. The author has experienced no significant complications in his case series.

REVISION OR SUBSEQUENT PROCEDURES

As our surgery is less invasive but effective, subsequent procedures are usually not necessary in the short term. However, further repeated procedures may be needed after 5 to 10 years.



Fig. 5. Three threads were tightened and fixated in the temporal region.

CASE DEMONSTRATIONS

Case 1

In a case of a 44-year-old Chinese woman, we evaluated her facial condition before the operation. The aging and stiffness of her whole face were obvious, and the main characteristic manifestations were laxity around the eyes and in the middle and lower face, moving down of the apple muscle and aging changes of skin texture (**Fig. 6A–C**). The surgical scheme designed by us was aimed at the facial contour and strived to achieve the change of the youthful appearance of the face. Among them, the relaxation of the platysma muscle and the management of the chin and neck were crucial. It was also important to improve periocular aging, especially the formation of lower eyelid pouches. After surgery, we can see the disappearance of lower eyelid pouches, the elevation of the mouth angle, the restoration of the apple muscle, and a change in the overall fluidity of the mandibular margin (**Fig. 6D–F**). The change of the whole face curve is very obvious, and the state of the face is significantly younger. As shown in **Fig. 6G–I**, 2 years after the operation, the patient's face still maintained a good state of rejuvenation.

Case 2

A 34-year-old Chinese woman presented with some of the early signs of aging in her midface, which were characterized by flattening of the midface, exposure of the zygomatic buccal groove, overall downward movement of the fat pad, shallow nasolabial folds, and loose skin at the mandibular margin, combined with a feeling of tiredness around the eyes (**Fig. 7A–C**). As her basic condition was relatively good, during the operation, we focused on improving her whole face fat pad, zygomaticus major muscle, zygomaticus minor muscle, upper lip levator muscle, nasal alar muscle, and so on. It not only improves the fullness of the whole middle face, so that the displaced tissue can return to its original shape, but also improves the shape of the outer corner of the eye (**Fig. 7D–F**). As shown in **Fig. 7G–I**, 1 year after the operation, the patient's facial contour was clear, and the whole eye area and mandibular margin remained in a good state of rejuvenation.

Case 3

A 40-year-old Chinese woman presented with a flat midface with less volume, deep nasolabial folds, loose medial superficial buccal fat pad, and a less fluid mandibular margin. The whole

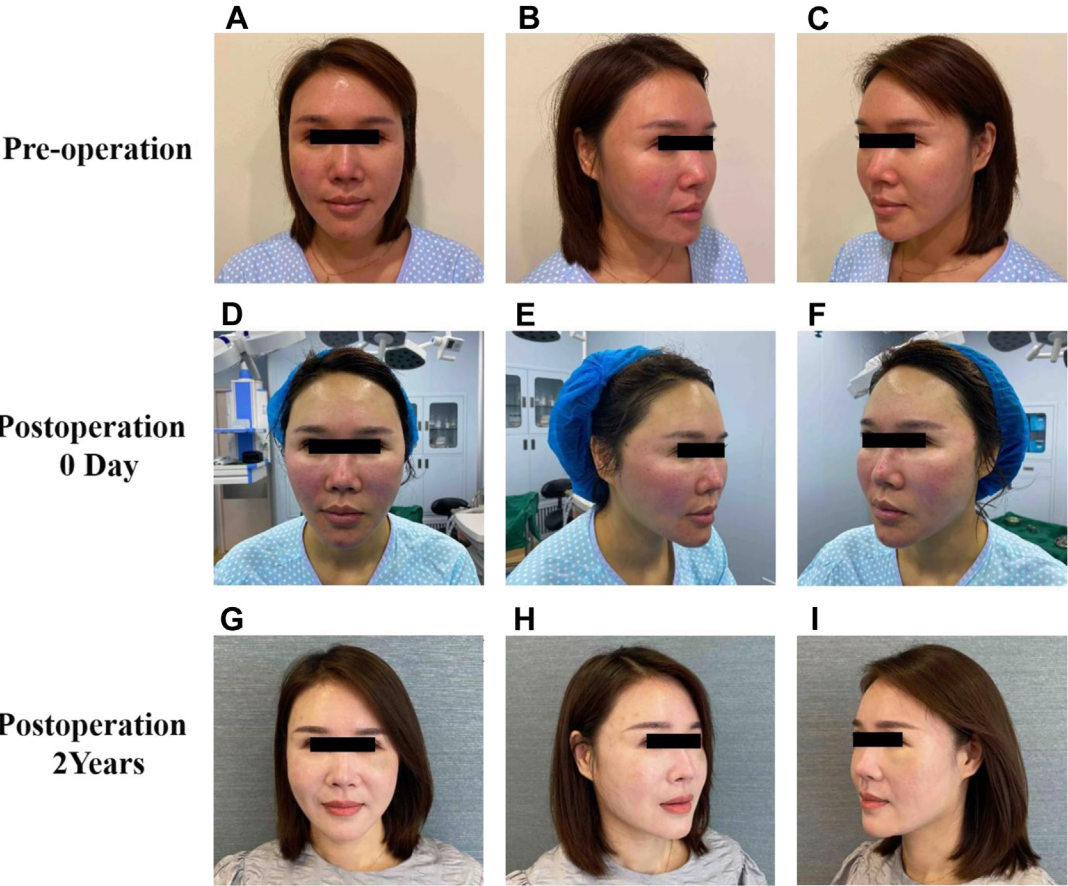


Fig. 6. Preoperation: the front (A), right (B), and left (C) sides of the patient’s face. Immediate postoperative: the front (D), right (E), and left (F) sides of the patient’s face. Two years postoperative: the front (G), right (H), and left (I) sides of the patient’s face.

face looked tired, not soft enough and not tight enough (**Fig. 8A–C**). After this operation, the patient changed significantly (**Fig. 8D–F**). The patient, a doctor, was an early adopter of the procedure and only had periocular wrinkle removal after surgery. After 20 months of clinical observation, the patient showed good long-term follow-up without other adverse reactions (**Fig. 8G–I**).

DISCUSSION

The author has proposed several considerations for the choice of this procedure. Selecting the lateral part of zygomatic SOOF for restoration of the middle facial deep fat compartment has the following advantages: The riveting point is SOOF that is closely attached to the periosteum, with limited mobility and stable tissue structure. It is relatively safe because there are less blood vessels and nerves in this area. As a deep fat pad reduction, the protrusion of the weakened SOOF in the zygomatic region is avoided by direct rivet

lifting of the temporal region, which results in the projection of the zygomatic region. Because of this change, the esthetic appearance of the middle face can be optimized.

Fixing points in the temporal region in this procedure have two main advantages. First, lifting and stabilization of the middle face and improvement of its contour but excessive facial width, caused by weakening high lifting, can be avoided. As three points are fixed to the deep temporal fascia and the galea aponeurosis and the multiple knotting is fixed to lift the face rather than a single line and single point for lifting force, such a stabilization time would last relatively long. Second, as this particular area of the face is rich in blood vessels and nerves, selected small incisions, blunt tissue dissection with scissors, and two-way-guided surgical approaches are very important to avoid any injuries to those structures.

PPD is an absorbable thread and commonly used as an individual thread that is placed under the facial skin to form a linear lifting force, which

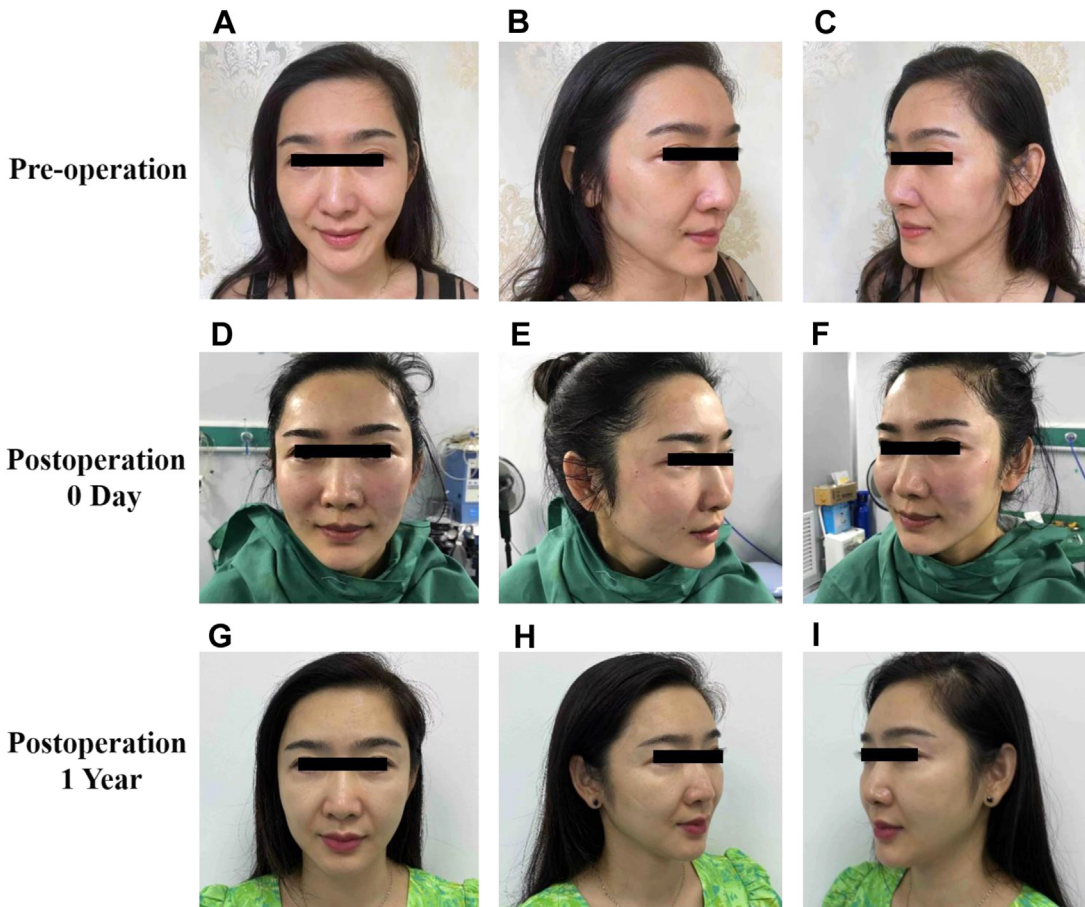


Fig. 7. Preoperation: the front (A), right (B) and left (C) sides of the patient's face. Immediate postoperative: the front (D), right (E), and left (F) sides of the patient's face. One year postoperative: the front (G), right (H), and left (I) sides of the patient's face.

is scattered and uneven. As it is absorbable, its lifting effect may only last a short time, generally in 3 to 6 months. The large number of foreign bodies placed under the facial skin at one time can also lead to complications such as inflammatory reactions, scarring strips, and even granulomas. Therefore, it is extremely important to explore an effective way for minimally invasive facial rejuvenation with less surgical dissection and thread lifts. A good minimally invasive facial rejuvenation technique should maintain relatively long-term postoperative results while being able to reduce trauma to the patient with less scar as possible and minimal impact on the patient's daily life.¹⁶

The minimally invasive suspension technique for facial rejuvenation using buried guide needles provides a new way of thinking for minimally invasive facial rejuvenation surgery. The principle is to lift the face as a unit, unlike only suture sculpting, which uses nonabsorbable braided threads to maintain any attempted relatively long-lifting

effect. The early appearance of the lift can be over-corrected because of excessive skin tightening and tissue edema. The skin buildup at the hairline will gradually subside within 1 to 3 months after surgery and the relatively stable surgical result can be achieved 3 months after surgery and may be maintained for 3 to 5 years. This procedure is less invasive, faster recovery, easy to perform, and no need for postoperative wrapping, and can be more acceptable by the patient. The limitation of this method is only suitable for patients with mild or moderate facial aging with less noticeable skin laxity, not for patients with severe facial aging with more noticeable skin laxity. The early postoperative effect is obviously stronger, and its effect becomes more stable 3 months after surgery.¹⁷

One suspension technique can be used to correct forehead wrinkles and excess skin. During the procedure, a skin incision in the middle of the forehead is made according to the preoperative design to enter the galea aponeurosis. A special

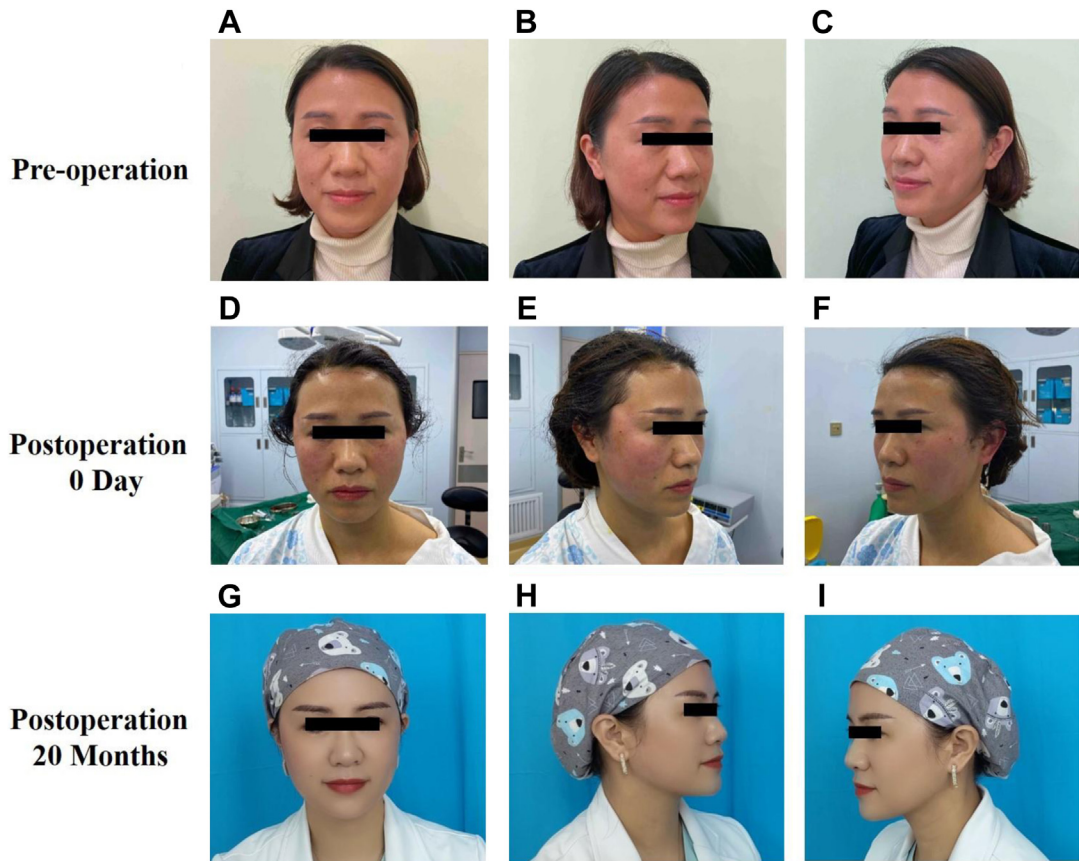


Fig. 8. Preoperation: the front (A), right (B), and left (C) sides of the patient’s face. Immediate postoperative: the front (D), right (E), and left (F) sides of the patient’s face. Postoperative 20 months: the front (G), right (H), and left (I) sides of the patient’s face.

dissector is used to separate the subgaleal space and to reach the upper part of the eyebrow and the root of the nose. A special small-tipped knife is used to incise the frontalis muscle, corrugator muscle, and procerus muscle. During the dissection, the bleeding can be stopped by electrocoagulation, and the sharp separation along the SMAS fascia is performed to reach the root of the nose with a special instrument so that wrinkles at the root of the nose and Kawasaki lines can be corrected.¹⁸

Intermittent suspension is combining both “6”-shaped suspension and single-line suspension. This technique is generally indicated for patients who desire improvement of both forehead wrinkles and excess skin, and those who would need more extensive forehead lift for forehead aging. It is mostly suitable for middle-aged people aged 35 to 45, and the overall outcome after surgery may make those patients look about 10 years younger.¹⁹

Circumferential suspension is an extension of our technique for lifting a large area of the

forehead. A circular incision is made within the frontal scalp along with both sides of the ear, without cutting the skin, muscles, and fascia. It is suitable for patients between 40 and 65 year. Its lifting effect is obvious and lasting, so that the forehead wrinkles and loose forehead skin can be effectively corrected. The surgery usually takes about 2 to 3 hours. It can completely restore the youthful look of the face.²⁰

SUMMARY

With in-depth research on the mechanism of facial aging and rejuvenation, various new minimally invasive facial rejuvenation techniques have been discovered lately. The rapid recovery suspension technique has several advantages such as faster recovery, satisfactory results, and minimal or no surgical complications. Our surgical technique is minimally invasive and includes fixation of the relaxed tissue to achieve a stable and long-lasting result of facial rejuvenation. Its complications are relatively rare. With the combination of

other facial rejuvenation techniques, the cosmetic outcome can be even more enhanced and long lasting. A clear understanding of different suspension techniques and the development of an individualized treatment plan based on the patient's aging can be the key for success.

CLINICS CARE POINTS

- Incision management is critical. We sutured the larger wound, applied repair gel to the wound site after suturing, and removed the suture in 5 to 7 days.
- During the operation, the suture's knot should be placed in the deep tissue, at the base of the incision.
- After the operation, proper management for the exposure of the suture's knot may be needed.

SUPPLEMENTARY DATA

Supplementary data related to this article can be found online at <https://doi.org/10.1016/j.cps.2022.09.001>.

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