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Facial Thread Lifting Complications in China: Analysis and Treatment

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Background: Facial thread lifting technology has been applied for more than 30 years, with relatively few complications. In 2014, China approved polydioxanone thread (an absorbable barbed thread) for large-scale nonsurgical facial lifting. However, due to surgeons' lack of overall experience, the complications of polydioxanone thread facelift have been relatively high.

Methods: From April 2014 to January 2020, a total of 190 patients with postoperative complications of facelifts were treated after they underwent thread lifting in other hospitals. Of these, 189 patients were women and one was a man; the age of patients ranged from 28 to 62 years, with an average age of 37.4 years.

Results: Patients were mainly treated in our outpatient clinic for the following complications: skin dimpling (77 cases, 40.5%); contour irregularity (32 cases, 16.8%); visible threads (31 cases, 16.3%); thread extrusion (10 cases, 5.3%); infection (17 cases, 8.9%); swelling (nine cases, 4.7%); incomplete facial paralysis (five cases, 2.6%); hyperpigmentation (four cases, 2.1%); hematoma (four cases, 2.1%); allergy (one case, 0.05%). Follow-up was scheduled 1–24 weeks after treatment.

Conclusions: The most common complications of facial thread lifting are, in the following order, skin dimpling, contour irregularity, visible threads, and thread extrusion. The reasons for complications are mainly unfamiliarity with facial anatomy, unskilled surgical operation, and misunderstanding of the facial aesthetics of Asian women. *(Plast Reconstr Surg Glob Open 2021;9:e3820; doi: 10.1097/GOX.0000000000003820; Published online 17 September 2021.)*

INTRODUCTION

Thread lifting technology is a nonsurgical facial rejuvenation technology that can minimize postoperative recovery period and scar from the incision. In 1989, Sulamanidze first applied APTOS facial thread lifting by using nonabsorbable barbed polypropylene thread.[1] Subsequently, Wu also reported on his own polypropylene barbed thread technology.[2] The contour thread, also made of nonabsorbable polypropylene, has since been widely applied.[3] Silhouette suture is another thread used in the United States.[4] It is mainly composed of nonabsorbable polypropylene threads and absorbable cones that are made of copolymers of glycolic and lactic acid (PLGA). Quill suture, first used for wound sutures, has also been used in facelifts.[5] Few reports of complications related to facial thread lifting have been reported. Since 2014, China has begun to approve absorbable threads for facelifts, such as polydioxanone (PDO) threads (including Quill and six other types of barbed sutures), and in 2018, PCL/PLA threads (HappyLift) were approved.[6] However, due to surgeons' lack of experience and skills, a relatively high rate of complications has been observed. With this series of retrospective cases, this article aims to discuss the causes, treatments, and precautions of these facelift complications.

MATERIALS AND METHODS

From April 2014 to January 2020, 190 patients with postoperative complications of PDO thread facelift were treated after thread lifting was performed in other hospitals. In most of these hospitals, the sector wiring (floating line) method is used, and the entry points of the needle are mainly from the hairline or the face directly, similar

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to APTOS first-generation technology. Of these patients, 189 were women and one was a man. Patient ages ranged from 28 to 62 years (average age 37.4 years), and they did not have diabetes, smoking history, or other systematic diseases or harmful living habits. After complications occurred, these patients searched for help at the plastic surgery hospital of Chinese Academy of Medical Science (the affiliated hospital of Peking Union Medical College, the largest plastic surgery hospital in China), Beijing. After treatment in our hospital, follow-up was performed with telephone and WeChat. All procedures were performed in compliance with institutional and/or national ethical standards and in accordance with the principles of the World Medical Association Helsinki Declaration.

RESULTS

Facial thread lifting complications in the 190 cases were listed in Table 1: 134 cases of PDO barbed threads (including three cases of Quill), 47 cases of unknown brand thread, seven cases of Happy Lift, and two cases of nonabsorbable thread.

Skin Dimpling

A total of 77 cases (40.5%) of skin dimpling were observed either immediately or 3–14 days after thread lifting. The local depressions were located in the cheeks, middle of face, and on the lateral sides (Figs. 1–2). The treatment method is as follows: The surgeon puts on gloves, stands opposite to the patient, and instructs the patient to open their mouth. For the right side of the face, the surgeon places the index finger of the right hand on the dimpling area in the entrance cavity, and the thumb on the skin dimpling area. At the same time, the left palm presses the soft tissue near the zygomatic arch to fix it. At this time, the right hand exerts a sudden force, pulling the soft tissue inward and downward toward the corner of the mouth. Generally, one pull should reset more than 80% of dimpling, and sometimes even completely fixes it. No further procedure is required at this point, and the remaining slight depression will eventually recover. An alternative treatment method also exists: the palm of the right hand is placed on the skin of the dimpling area, and the skin is firmly pressed while the skin is rotated clockwise in an instant. The dimpling disappeared after manual massage, in 41 patients (Fig. 3), while 36 patients with mild dimpling recovered without treatment.

Table 1. Summary of the Complications of Facial Thread Lifting

Complications	No. Patients (%)
Skin dimpling	77 (40.5%)
Cheek	30 (15.8%)
Zygomatic buccal groove	22 (11.6%)
Nasolabial sulcus region	11 (5.8%)
Lateral sides	8 (4.2%)
Multiple positions	6 (3.1%)
Contour irregularity	32 (16.8%)
Visible threads	31 (16.3%)
Thread extrusion	10 (5.3%)
Infection	17 (8.9%)
Swelling	9 (4.7%)
Incomplete facial paralysis	5 (2.6%)
Hyperpigmentation	4 (2.1%)
Hematoma	4 (2.1%)
Allergy	1 (0.05%)

Fig. 1. Percentage of facial dimpling: cheek (blue, 30 cases, 39.0%), zygomatic buccal groove (yellow, 22 cases, 28.6%), nasolabial sulcus region (red, 11 cases, 14.3%), lateral sides (green, eight cases, 10.4%), and multiple positions (six cases, 8.8%).

Contour Irregularity

A total of 32 cases (16.8%) of contour irregularity located in the cheeks, middle of face, and on the lateral sides were also corrected by the above-mentioned method. Of these cases, 25 patients recovered gradually after massage, and were either completely or nearly completely recovered after 1 month of follow-up. One patient showed a slight facial depression after 1 month of follow-up and was injected with hyaluronic acid filler. Another patient required thread cutting (Fig. 4).

Visible Threads

Among the 31 cases of visible threads (16.3%), nine patients complained that the wires were palpable despite not being visible. Meanwhile, 22 cases complained of visible and accessible superficial thread (Figs. 5–6). For treatment, wires were partially removed in five patients, while the other 26 patients were continually monitored for 2—5 months to ensure complete recovery after thread absorption.

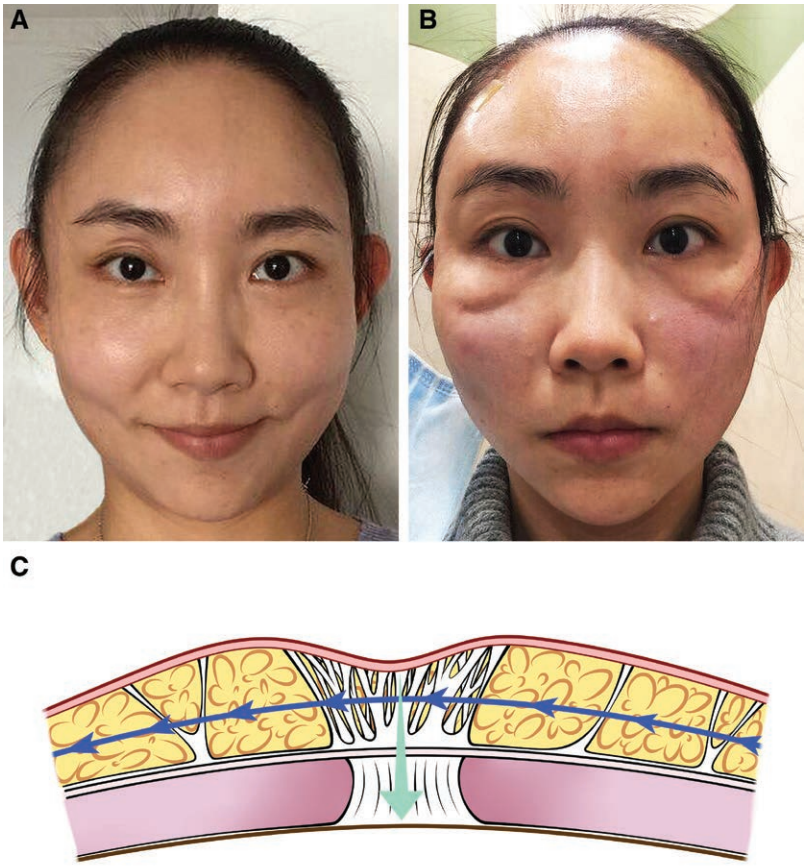

Fig. 2. A case of skin dimpling and possible mechanism. A, Before surgery. B, Six days after surgery, the local depressions were located on the middle of the face. C, PDO thread is pulled through the zygomatic buccal ligament and pulls the ligament obliquely. The soft tissue in the ligament area mainly moves downward and the zygomatic buccal groove deepens.

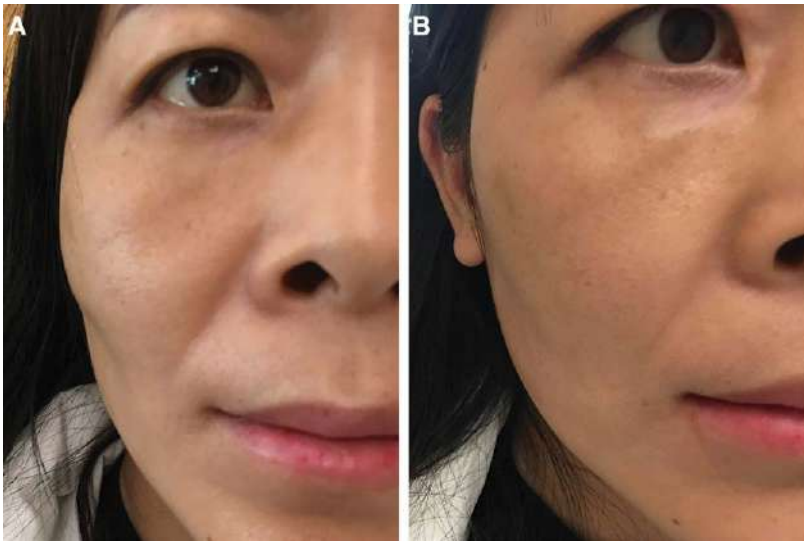

Fig. 3. A successfully cured case of skin dimpling. A, Skin dimpling is visible 9 days after PDO thread lifting. B, Immediately after massage, the soft tissue outline basically recovered to its preoperative shape.

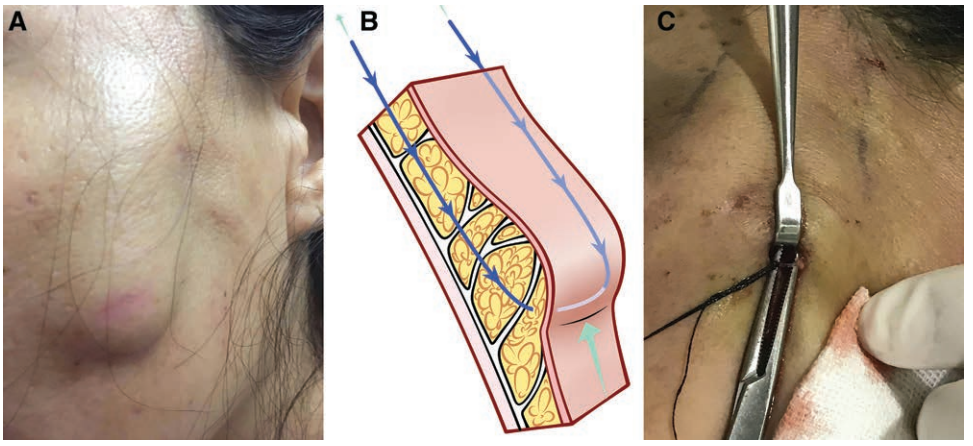

Fig. 4. A case of contour irregularity and its treatment. A, Five days after lifting the U-shaped thread on the face. The soft tissues at the bottom end form a significant accumulation. B, The method of thread lifting and its anatomic rationale. C, Thread cutting during the operation. The soft tissues become smooth after massage.

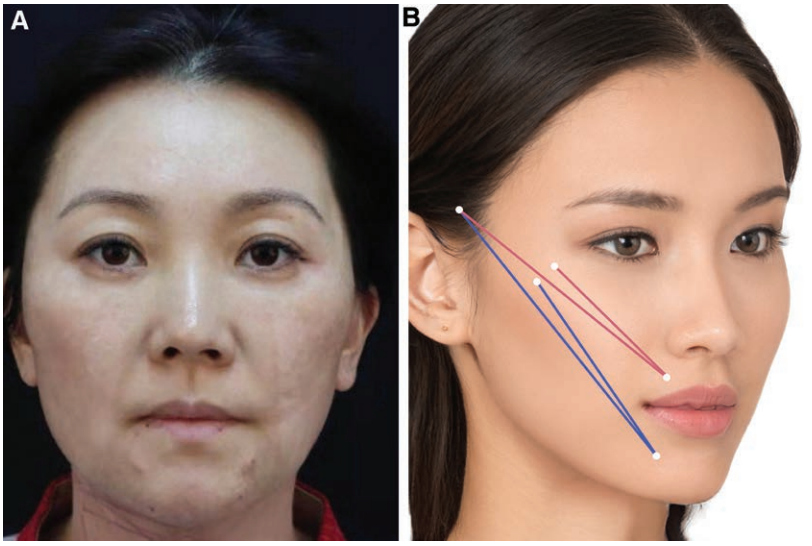

Fig. 5. A case of visible threads with Happy Lift. A, Three weeks after the Happy Lift is buried in the face, the wire remains visible under the subcutaneous tissue under the bilateral mouth corners. B, Happy Lift facial lifting technology diagram.

Thread Extrusion

Among the 10 thread extrusion cases (5.3%), extrusions were located on the hairline in two cases, whereas in eight cases, they were located on the face, all of which appeared 3–20 days after thread lifting.[7] Of these 10 cases, seven of them were penetrated from the previous entrance of the skin. In three cases, the thread was buried shallowly and then penetrated the skin. After treatment, the incision healed after the wire was partially or completely removed from the original entrance in six cases. In the remaining four cases, thread removal was performed through a small incision (Fig. 7).

Infection

Of the 17 cases of infection (8.9%), 14 experienced thread extrusion followed by local infection, whereas the other three cases had noninvasive infections that suddenly occurred without a wound. All patients were treated with continuous local compression with alcohol. In the five cases that demonstrated a larger infection range, intravenous antibiotics and topical antibiotics were given. In three of the cases, the scar healed after wire removal through the incision. However, a marked scar remained on the face in one severe case of infection (Fig. 8). The patient developed severe swelling and infection in the bilateral buried thread area, as well as inflammatory secretions, and the threads were removed by three operations in other hospitals.

Swelling

A total of nine cases of swelling were reported (4.7%). Swelling is a common complication mainly caused by trauma during thread lifting, an unreasonable thread lifting method, compromised venous return, and local chronic inflammation (Fig. 9). In some cases, a swelling period of 2–4 months was observed after the implantation.

Fig. 6. A case of visible threads and its ultrasound photo. A, Profile of the lateral side 4 weeks after the thread is buried. B, Ultrasound showing local thread breakage. The absorption was not uniform, there were local fractures, and local folds were formed.

Fig. 7. The patient received a 3-0 Ethibond implantation in an outpatient clinic 5 months ago. The patient developed redness, swelling, and pain 2 weeks ago, and the thread was removed.

Incomplete Facial Paralysis

A total of five cases of incomplete facial paralysis (2.6%) were reported immediately after thread lifting. In three of the cases, the unilateral eyebrows were weakened, and the temporal branch of the facial nerve was damaged. One patient experienced unilateral closed eyes caused by an injury of the zygomatic branch of the facial nerve. Meanwhile, another patient suffered from a unilateral injury of multiple branches of the facial nerve. After treatment with oral dexamethasone or intravenous drip of methylprednisolone, four cases recovered completely after 3–10 weeks, whereas the remaining one patient still experienced mild facial paralysis 2 months after thread lifting (Fig. 10). During a follow-up period of 3–6 months, all patients recovered from facial paralysis completely.

Hyperpigmentation

A total of four cases of hyperpigmentation were reported (2.1%). In one case, the pigmentation disappeared after three PicoWay treatments (PicoWay is an upgraded technology of dye laser, which can precisely destroy darker pigment areas by absorbing local heat energy at the color sink site), and the remaining three patients showed no obvious pigmentation after 3–6 months of follow-up.

Hematoma

A total of four patients (2.1%) suffered from obvious hematoma after the operation. To treat these cases, pressure bandaging and drugs were used to promote intravenous reflux. Swelling and bruises were fully recovered in these four cases after 10–21 days.

Allergy

One patient (0.05%) experienced a facial rash and mild itching after eating spicy food 1 week after thread lifting. After 3 days of oral loratadine treatment, the symptoms were basically resolved, and had completely disappeared after 1 month of follow-up. However, the patient relapsed 1–2 times a year later.

Fig. 8. A case of severe infection with a marked scar remaining on the patient's face. A, About 10 PDO wires were placed on both sides of the patient. Infection occurred about 3 days after surgery. The patient received three operations of thread removal before coming to our hospital. B, Four months after local scar removal and suture.

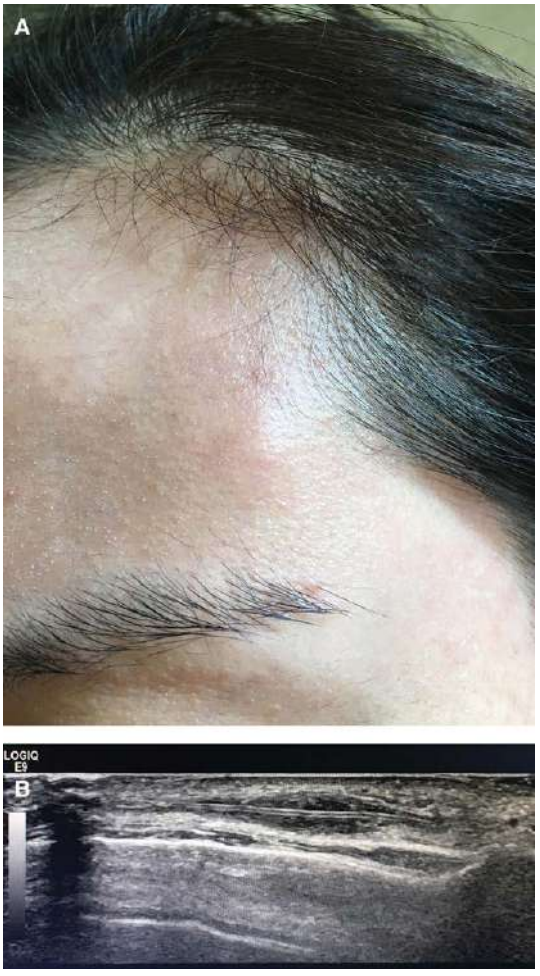

Fig. 9. A case of swelling and its ultrasound photo. A, A slight swelling of the forehead was found 1 week after surgery. B, Ultrasound showing that the thread is intact and there is a local inflammatory reaction. The thread was absorbed 4 months later.

Fig. 10. Right facial paralysis occurred the day after thread lifting. At 2 weeks after the operation, the neuromyogram showed injury of the right temporal nerve branch, zygomatic branch, and buccal branch: the right frontal muscle stimulation CMAP wave was attenuated by 64%, the orbicularis oris muscle stimulation CMAP wave was attenuated by 50%, and the upper labial nasal muscle CMAP wave attenuation was 80%, the maxillary muscle stimulation CMAP wave was attenuated by 60%, the orbicularis oris muscle stimulation CMAP wave was attenuated by 70%, and the lower lip muscle stimulation CMAP was normal. After 2 months of follow-up, slight facial paralysis persisted.

DISCUSSION

To date, only a few studies had investigated the complications of facial thread lifting. Such related complications include swelling, hematoma, skin dimpling, visible threads, thread extrusion, contour irregularity, and infection.[8] Sulamanidze et al had reported on 6098 procedures performed using the facial APTOS thread technology, with a few complications.[9] Meanwhile, Wang had studied 103 cases of MAMPS PDO thread technology and related complications.[5] The summary of these studies is presented in Table 2.

China formally approved PDO threads for facial lifting in 2014. Due to the inexperience of a considerable number of doctors, many related complications were reported. The corresponding author of this article is one of the pioneer doctors with substantial experience in facial suture lifting, performing about 300 thread lifting procedures in China each year. The corresponding author is also the chief facial thread lifting instructor of MEVOS, China's largest medical cosmetic training platform. Therefore, many peer referrals and patients with complications of facial thread lifting seek his expert advice at the hospital.

Table 2. Literature Review of Complications of Facial Barbed Thread Lifting

Author	Devices/Materials	Duration of Follow-up	No. Patients	Complications/Site	Results
Sulamanidze et al[9]	APTOS threads, 2/0 and 4/0 polypropylene	Not recorded	6098	3% asymmetry, 2.8% contour irregularity, 2.7% early recurrence, 1.0% skin retraction, 0.2% hematoma, 0.06% thread migration or exposure, 0.02% injury to vessel, nerve, or gland, 0.01% infection	Seldom major complications
Lycka et al[10]	APTOS threads, 2/0 3/0 polypropylene	12–36 months	350	46.8% ecchymosis, 42.8% swelling, 34.3% visible threads, 28.6% mild asymmetry, 14.3% discomfort, 13.7% erythema, 0.6% unacceptable appearance	14.8% postoperative adjustment
Sulamanidze et al[11,12]	APTOS threads	2–30 months	157	14.6% dimpling, 9.5% hypercorrection, 7.6% hypocorrection, 9.5% hemorrhage, 2.5% thread expulsion	No major complications
Wu[2]	APTOS threads, WOFFLES threads	Not recorded	102	10.8% pain, 7.8% migrations, 4.9% infections/granulomas	Thread removal
Isse[13]	APTOS threads, 2/0 polypropylene	Not recorded	80	2.5% suture extrusion	Thread removal
Winkler et al[14]	APTOS threads	Not recorded, 4 months	2	1 Stensen duct rupture (sialocele), 1 infection	Surgical repair, thread removal
Lee et al[15]	APTOS threads	6 months and 1 month	2	1 involuntary blinking, 1 temporal scalp pain	Thread removal
Silva-Siwady et al[7]	APTOS threads, 2/0 polypropylene	28 days	1	Migration and expulsion (paranasal area)	Partial thread removal
Hoo et al[16]	APTOS threads, polypropylene	Lost to follow-up	1	Chronic inflammatory (temporal scalp)	Refusal of thread removal
Sardesai et al[17]	Contour threads	Not recorded	75	23% dissatisfaction, 18.7% thread extrusion, 4% dimpling	Not recorded
Garvey et al[3]	Contour threads	Not recorded	72	40.3% ecchymosis, 23.6% contour irregularity, 20.8% thread palpability, 15.3% swelling, 12.5% early recurrence, infection, 5.6% thread extrusion	No major complications
Abraham et al[18]	Contour threads	12–31 months	33	6% visible thread, 3% unsatisfactory appearance	Thread removal
Rachel et al[19]	Contour threads, 2-0 polypropylene	1–25 months	29	37.9% pain, 34.5% dimpling, 27.6% thread palpability, 13.8% thread extrusion,10.3% paresthesia, 6.9% foreign body reaction	Not recorded
Kaminer et al[20]	Contour threads	6–16 months	12	33% threads transient visibility, 25% pinching, 25% ear numbness	No major complications
Helling et al[21]	Contour threads	Not recorded	4	1 temporal scalp wound, brow asymmetry; 1 thread palpability, body sensation; 1 unilateral buccal branch facial nerve paresis, 1 dimpling	3 thread removals
Beer[22]	Contour threads	Not recorded	1	Thread palpability	Thread removal
de Benito et al[4]	Silhouette sutures, 3-0 polypropylene with absorbable cones	18 months (mean)	316	7% temporal area pain, 3.5% dermal pinching, 1.3% temporal area hematoma, 0.3% thread palpability	No major complications
Park et al[23]	Polypropylene threads	5–18 months	102	2% dissatisfaction, 1% dimpling, 1% temporary facial weakness	No major complications
Fukaya[24]	Xtosis, 0 polypropylene	9 months	100	24% thread extrusion or palpability, 7% ecchymosed, 3% infection	No major complications
Badin et al[25]	Beramendi threads, polypropylene	18 months	52	13.5% dimpling; 9.6% thread extrusion; 3.8% hyperalgia, 1.9% herpes	No major complications
Hochman[26]	Isse-type sutures, polypropylene	3–24 months	50	28% suture extrusion, 12% visible distal suture ends, 6% unacceptable appearance, 4% dimpling	Partial/total thread removal
Lee and Isse[27]	Isse Endo Progressive Face Lift Sutures, polypropylene	9 months (mean)	44	20% zygomatic arch tenderness, 10% hematoma, 2.9% submalar dimpling, 2.9% ecchymosis	Filler for dimpling, minimal complications

(Continued)

Table 2. (*Continued*)

Author	Devices/Materials	Duration of Follow-up	No. Patients	Complications/Site	Results
Han et al[28]	REEBORN, polypropylene	12 months	18	5.5% thread palpability, 5.5% dimpling	No major complications
Gamboa and Vasconez[29]	Silhouette Lift	9 months	17	100% minimal edema, 11.8% bruising, 5.9% early recurrence	No major complications
Yau[30]	Not recorded	Not recorded	1	Mycobacterium abscessus abscess	Antibiotics and thread removal
Rezaee et al[31]	Silhouette threads, Happy Lift	6 months	193	40.9% ecchymosis, 28.5% dimpling, 18.1% tumefaction, 5.2% pain	No major complications
Rezaee et al[32]	Polydioxanone threads	6 months	151	23.2% ecchymosis, 6.6% tumefaction, 6.6% pain, 0.7% dimpling	No major complications
Sarigul and Karaca[33]	Silhouette Soft, PLLA/PLGA	6–36 months	148	11.4% dimpling, 8.1% ecchymosis, 2.7% pain, 2.7% thread extrusion, 1.35% thread migration and expulsion, 0.7% thread rupture, 0.7% residual thread 0.7% hematoma, 0.7% infection	No major complications
Wang et al[5]	Quill sutures	12 months (mean)	103	12.6% thread palpability, 7.8% persistent facial swelling, 5.8% asymmetry, 2.9% facial dimpling	No major complications
Kang et al[34]	VOV-LIFT threads, polydioxanone	6 months	39	5.1% dimpling, 2.6% bruise, 2.6% facial asymmetry, 2.6% thread extrusion, 2.6% malar eminence accentuation	No major complications
Unal et al[35]	Polydioxanone threads	26 months (mean)	38	5.3% infection, 5.3% granuloma formation	No major complications
Savoia et al[6]	Happy Lift	6 months	37	62.1% ecchymosis, 40.5% erythema, 40.5% tumefaction, 24.3% hemorrhage, 5.4% asymmetry, 5.4% esthesia	No major complications
Lee et al[36]	Polydioxanone threads	12 months (mean)	35	45.7% swelling, 31.4% bruising, 8.5%, 2.8% asymmetry	No major complications
Suh et al[37]	Polydioxanone threads	6 months	31	93.5% bruising, 90.3% swelling, 6.5% mild asymmetry	No major complications
Kwon et al[38]	V-Loc 180, polyglyconate	4 months	25	72% bruising, 56% edema, 20% mild asymmetry and focal dimpling	No major complications
Nestor[39]	Silhouette InstaLift, PLLA/PLGA	3 months	20	31.9% lumps, 22.8% asymmetry, 20.6% swelling, 16.3% bruising, 12.5% pain, 10% headache, 8.6% itching, 3.5% redness	No major complications
Shin et al[40]	Polydioxanone threads	2 months	1	1 *Mycobacterium massiliense* infection	Antibiotics

The most common complication of facelift is skin dimpling.[21] This could be attributed to the subcutaneous barbed thread being too shallow or uneven. In the area where the wire is buried or turned, excessive local stress may cause local dimpling. The degree of facial dimpling is related to the time of initial appearance: the later it appears, the easier it is to recover from. Buccal tissue is relatively loose, with no solid soft tissue in the deep layer nor bone tissue support. Therefore, dimpling is more likely to occur. The buried thread passes through the inside of the cheek buccal groove, and pulls the thread toward the hairline. If the thread lifting is shallow, the ligaments underneath it may be pulled, resulting in the soft tissue moving downward, and the depression is then aggravated. Therefore, it is recommended that the buried line be raised outside the buccal groove, or to use a semicircular arc buried line in the middle face.

Due to the restriction of the zygomatic arch ligament, the soft tissue mobility is limited. If the hairline is used to enter the thread following the simple fan-shaped method, a large displacement of the lower part with a small displacement of the middle face may occur. Chinese women generally do not prefer facial widening. The soft tissue near the zygomatic arch can be peeled off under the skin with an 18G blunt needle to increase local mobility. Thread lifting strength and depth should be uniform to avoid excessive displacement. If the buried wire is superficial, it is recommended to monitor the patient for 2–4 months to avoid surgery, because the 0 PDO barbed thread is generally absorbed within 6 months.[19] If the patient cannot accept the visible wire, a small incision is needed to remove the wire. Strict sterilization and aseptic operation during the procedure can reduce the risk of infection. In case of thread extrusion or reddened, swollen or painful area, partial or total thread removal should be performed. Routine application of antibiotics intravenously and sterilizing the area to avoid secondary retrograde infection can also be considered. If a local infection occurs at the needle entry point of the barbed wire, it is relatively easy to control. If present at the far end of the wire, there is often a greater range of local aseptic inflammation. If a large area of superficial soft tissue is infected, iodine can be added to extend the area for 2 minutes, followed by alcohol deiodination and alcohol gauze compression for 10 minutes, and then applying mupirocin ointment for 4–8 hours. These steps should be repeated 3–5 times a day. If the treatment is not performed timely, the wire left in the body could become the medium for bacterial infection, and chronic infection may last for 2–4 months.[16]

Facial nerve injury is a rare complication. If the barbed wire carried by the sharp needle trocar is buried too shallow and too violently, it will damage the zygomatic branch and temporal branch of the facial nerve, mainly the facial nerve branch near the zygomatic

arch. It may also damage the main facial nerve near the parotid gland. The five patients mentioned in this article were referred to us by other doctors. After the local injection of too much anesthetics, local temporary incomplete facial paralysis often occurs, and it usually resolves in 4–8 hours. In a relatively vulnerable area near the zygomatic arch, violent manipulation with a sharp needle may damage the temporal and zygomatic branches of the facial nerve. Neurological medication should be given as soon as possible. Violent or sharp needle operation could also easily damage the superficial temporal artery or facial artery, resulting in noticeable bleeding and hematoma. An appropriate amount of epinephrine should be added as local anesthetic, and 10–15 minutes of waiting time is needed before the procedure. Avoiding violent operation during the thread lifting operation can also reduce the risk and degree of hematoma.

Hyperpigmentation can occur when an unqualified trocar metal coating technology is used for assisting thread embedding. Qualified thread products must be used instead. PDO thread, theoretically, will not lead to allergies. Therefore, the allergy observed may be attributed to the mixing of other wires, such as heavy metals, during manufacturing. Meanwhile, nose augmentations using thread have also been implemented in China. The specific operation is divided into embedding wires parallel to the columella and parallel to the back of the nose to form a similar L-shaped rhinoplasty with PDO. A total of 35 related complications of nose augmentation were reported (not included in this study's 190 cases), including 18 cases (51.4%) of visible wires, two cases (5.7%) of exposed wires, 11 cases (30.5%) of infection, and four cases (11.4%) of swelling. To date, thread rhinoplasty remains controversial in China.

CONCLUSIONS

The most common complications of facial thread lifting are skin dimpling, visible threads, thread extrusion, and contour irregularity. In addition, swelling, bruising, and local pain also warrant special attention. The main factors causing these complications are the operating technique and lack of understanding of facial aesthetics. In addition, facial nerve injury is a serious and rare complication that can be prevented by surgeons becoming adequately familiar with the facial anatomy.

In addition, the most frequent complaint regarding absorbable thread facial lifting is mainly related to unsatisfactory appearance and short-lived effect. Therefore, there is a need for a face-thread lifting technique that improves appearance with fewer complications, with a long-lasting effect. Our recommendation is to use a slower-absorbing thread such as PLGA, or to use a combination of procedures such as liposuction, fat implantation or hyaluronic acid filling, along with Botox injections into the masseter muscle. With these comprehensive technologies, a long-lasting lifting effect and good contouring results can be obtained.

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PATIENT CONSENT

The patients provided written consent for the use of their images.

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