

Complicated Facial Fillers: Management Algorithm

Fouad Mohamed Ghareeb, PhD
 Medhat Sami Ali Hassan, PhD
 Mohamed Abdalla El Nahas, PhD
 Mahmoud Sadek el Sayed Salem,
 PhD

Background: Various materials have been developed as skin fillers to correct wrinkles of the face. Dermal fillers are classified based on their biodegradability into bioresorbable versus nonbioresorbable. All dermal fillers have a potential risk of complications, which can be classified as early and late onset events. Among all the complications of filler injections, inflammatory nodules and granulomas are the most annoying and disfiguring. The purpose of the study was to provide a surgical treatment algorithm that allows us to deal with the complications of facial fillers through three surgical techniques.

Methods: Thirty-one patients with complaints of facial contour abnormalities after filler injection, three surgical techniques were adopted according to the presenting case including face lift incision, needle aspiration and intraoral excision after preoperative preparation of the case with postoperative follow-up for 6 months.

Results: Among our studied patients treated by these surgical techniques, dissection was difficult owing to the fibrosis and the granulomatous reaction post complicated filler injection. There were two cases of hematoma, 1 case of seroma, and 1 case of facial nerve injury that improved after 4 months, in which marked improvement of facial contour and skin quality was observed.

Conclusions: The use of the facelift technique as a surgical treatment for post filler complication granuloma excision provides a useful and satisfactory method for patients complaining of major facial deformities following repeated complicated filler injections. Despite being more difficult than other techniques it is more satisfactory in facial rejuvenation post complicated facial fillers. (*Plast Reconstr Surg Glob Open* 2022;10:e4445; doi: [10.1097/GOX.0000000000004445](https://doi.org/10.1097/GOX.0000000000004445); Published online 22 July 2022.)

INTRODUCTION

The use of facial fillers to volumize the empty subcutaneous soft tissue is one of the most frequently performed aesthetic nonsurgical procedures in the United States.¹ Dermal fillers are classified into bioresorbable and non-bioresorbable based on the ability of the body to resorb the initial material.²

As the number of performed filler procedures is growing, this leads to increased numbers of adverse events encountered post filler injection.³ They can be classified into early acute and late delayed adverse effects.^{4,5}

Early adverse effects include edema, erythema, redness, swelling, ecchymosis, bruising, pain, discoloration, infection, embolism, blindness, and skin necrosis, particularly

in the glabella and nasolabial folds. Late adverse effects include chronic inflammation, late allergic reaction, asymmetry, discoloration, migration, granulomatous nodules, lipoatrophy, and telangiectasia.

Inadequate training, technical injection faults, and allergic and inflammatory filler reactions are the main causes of postfiller injection adverse effects. To prevent or to deal with complications of dermal fillers, one should know the composing filler material, filler tissue reaction, filler tissue absorption, and filler persistence.⁴

Among all complications of filler injection, inflammatory nodules and granulomas are the most annoying and disfiguring. Post filler injection nodules are due to one or more of the following⁵:

1. Infection, probably caused by *Staphylococcus aureus* (*Staph aureus*) or biofilm.
2. Granuloma (on histopathology) due to body response to foreign material.

From the Department of Plastic and Reconstructive Surgery, Faculty of Medicine, Menoufia University, Shebin El Koom, Governerate El Menoufia, Egypt.

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- Inflammatory nodule due to immune system activation without granuloma formation; the term sterile abscess is used when there is no offending organism in the culture.
- Misapplication of the filler directly under the skin (Tyndall effect).

Granulomatous inflammations are the result of the body's response to foreign material, or due to phagocytosis of the filler material, mostly 6–24 months postfiller injection.^{4,6} The engulfed filler material in the macrophages and monocytes stimulates the release of cytokines and inflammatory mediators to attract more macrophages and monocytes, and the macrophages fuse together to form multinucleated foreign body giant cells, which is the main histopathological feature of granuloma. It is a systemic body response affecting all the injected sites. Infection of the injected material (either *Staph aureus* or biofilm) or just inflammation without the presence of microbiological organism (sterile abscess) can trigger the granulomatous reaction.^{7,8}

Rare cases of granulomatous reaction are seen with hyaluronic acid fillers or poly-L-lactic acid fillers.^{5,8,9} Factors increasing the rate of granulomatous body reaction include the use of nonbiodegradable fillers, mass bolus filler injection, and presence of infection at the site of injection.^{5,7,8}

Nodules and granulomatous masses causing facial deformities are either dealt with by nonsurgical therapeutic approaches, such as systemic antibiotics, intralesional steroids, 5-fluorouracil injection and needle aspiration, or surgical approaches, such like drainage and excision.¹⁰

Vascular compromise is a rare but serious complication of filler injection. It occurs as a result of intravascular injection into an artery impeding blood flow, or a compression blockage due to injection of the filler material adjacent to a vessel. Arterial occlusion has immediate onset presenting with pain and blanching followed by a livedoid discoloration. Arterial occlusion is the most serious complication of dermal fillers if it occurs within the retinal artery territories.⁷

AIM OF WORK

The aim of this study is to provide a treatment modality that allows radical exposure and excision of all granulomatous masses and remove all filler material through three surgical techniques: facelift incision, intraoral excision and suction, and squeezing by needle. Also, we aim to compare the results of these different surgical treatment modalities.

PATIENTS AND METHODS

Approval from The Faculty of Medicine Ethics Committee for the study proposal was obtained. The study was conducted in the period from November 2018 to November 2020. Thirty-one patients presented with complaints of generalized facial deformities in the form of swelling, depressions, and facial contour abnormalities post filler injection. All of these patients were women. The

Takeaways

Question: What is the best surgical tool to be used for complicated facial fillers?

Findings: Face lift for annoying post filler nodes excision is the best surgical tool with redraping of the facial skin with or without neck tightening.

Meaning: Surgery with preference of face lift is the best tool for complicated facial fillers such as granulomatous nodes.

patients' histories were taken, documenting timing of start of adverse events, medications taken, and presenting symptoms. Other questions were asked including type, amount, and technique of injection; location of the injected material; and the number of previous attacks of material inflammation. Injected materials varied between poly methyl methacrylate, polyacrylamide gel and polydimethylsiloxane oils, etc. Incidence of granuloma was too high with polydimethylsiloxane oils (**Videos 1 and 2** are included for granuloma resection). Most patients complained of the inflammatory issues in the filler injected after 1 to 2 years; some complained only of the collection of the filler (pooling of the filler) in an unaesthetic way. All patients signed an informed consent for the treatment, which was performed after explaining the procedure steps and possible complications. Patients were well prepared preoperatively, by doing radiological investigation in the form of ultrasound or magnetic resonance imaging according to the case, having them stop smoking and taking aspirin, and administering preoperative intravenous antibiotics. The patient presenting with active infection was stabilized at first by dealing with the collection of fluid by drainage and antibiotics and intralesional corticosteroids. [**See Video 1 (online)**, which describes the dissection of the subcutaneous face lift and the elevation of the SMAS layer with the fibrosed tissue (granulomatous tissue) preparing for its excision.] [**See Video 2 (online)**, which shows the fibrosed tissues of the face after multiple infections of the filler. At its end, the cavity where filler was trapped is shown.]

OPERATIVE PROCEDURE

According to the injected type of filler and whether it was a squeezable material or a granulomatous mass, the decision of the type of operation was either a classical facelift surgery with the removal of all granulomatous masses, intraoral incision to remove a circumscribed granulomatous mass, or just incision and squeezing the material to remove and disperse it and prevent its collection. Eleven patients were operated upon by facelift technique, 10 patients by suction and squeezing technique, and 10 patients were operated upon by intraoral incision technique.

Facelift Procedure

- It is done with preauricular incision and postauricular incision for the purpose of neck lifting in the same procedure if requested by the patient.

Table 1. Comparison between the Three Studied Groups according to Age

Age (y)	Face Lift (n = 11)	Suction and Squeezing (n = 10)	Intraoral Excision (n = 10)	F	P
Min.–Max.	32.0–60.0	39.0–56.0	36.0–60.0	0.217	0.807
Mean ± SD.	46.09 ± 9.42	47.80 ± 5.55	48.30 ± 8.67		
Median (IQR)	45.0 (39.5–54.5)	49.0 (43.0–53.0)	47.0 (42.0–57.0)		

Table 2. Preoperative Comorbidities

	Face Lift (n = 11)		Suction and Squeezing (n = 10)		Intraoral Excision (n = 10)		χ^2	MC P
	No.	%	No.	%	No.	%		
Smoking								
Nonsmoker	5	45.5	2	20.0	8	80.0	7.074	0.031
Smoker	6	54.5	8	80.0	2	20.0		
Diabetic								
Non-DM	7	63.6	8	80.0	7	70.0	0.767	0.884
DM	4	36.4	2	20.0	3	30.0		

DM, diabetes mellitus.

Table 3. Postoperative Complications

Postoperative Complication	Face Lift (n = 11)		Suction and Squeezing (n = 10)		Intraoral Excision (n = 10)		χ^2	MC P
	No.	%	No.	%	No.	%		
Seroma	0	0.0	0	0.0	1	10.0	1.952	0.641
Hematoma	1	9.1	0	0.0	1	10.0	1.253	1.000
Nerve injury	1	9.1	0	0.0	0	0.0	1.761	1.000
Parotid duct injury	0	0.0	0	0.0	0	0.0	—	—
Wound dehiscence	0	0.0	0	0.0	0	0.0	—	—
Depression	2	18.2	2	20.0	5	50.0	2.866	0.295
Edema	2	18.2	4	40.0	2	20.0	1.501	0.596

Table 4. Comparison between the Three Studied Groups according to Aesthetic Results

	Face Lift (n = 11)		Suction and Squeezing (n = 10)		Intraoral Excision (n = 10)		χ^2	MC P
	No.	%	No.	%	No.	%		
Contour								
Unsatisfactory	0	0.0	3	30.0	3	30.0	4.339	0.101
Satisfactory	11	100.0	7	70.0	7	70.0		
Scars								
Unsatisfactory	2	18.2	0	0.0	0	0.0	2.640	0.323
Satisfactory	9	81.8	10	100.0	10	100.0		
Symmetry								
Unsatisfactory	1	9.1	7	70.0	6	60.0	9.273	0.009
Satisfactory	10	90.9	3	30.0	4	40.0		

Table 5. Comparison between the Three Studied Groups according to Patient Satisfaction

Total	Face Lift (n = 11)		Suction and Squeezing (n = 10)		Intraoral Excision (n = 10)		χ^2	MC P
	No.	%	No.	%	No.	%		
Satisfied	9	81.8	5	50.0	4	40.0	7.065	0.119
Moderate	2	18.2	1	10.0	3	30.0		
Unsatisfied	0	0.0	4	40.0	3	30.0		

- Marking of all the nodules was done preoperatively, before tumescent fluid injection and facelift incision.
- Infiltration of saline with adrenaline 1:200,000 dilution at incision sites was done 10–15 minutes before incision. Meticulous subcutaneous dissection (subcutaneous face lift) was done to separate the skin from the underlying masses and tissues after this meticulous homeostasis was done.
- Exposing the SMAS and the sub-SMAS area was done with dissection until reaching the nodules, with excision of the nodules and draining of filler material, taking care of the parotid duct and the facial branches to protect them from injury. Washing with saline and betadine was done after excision to remove remaining filler material and to wash tissue debris. Facial skin was redraped, a suction drain was inserted, and a light facial bandage was applied (case 1, Figure 1).

Aspiration with Needle with Squeezing

- It is mostly limited to the cheeks, nasolabial folds, marionette lines, chin, and lips. Augmented areas should always be palpated during examination, as Bio-Alcamid has a characteristic feel of a soft gel. If there is any question about the remaining product, radiographic studies may be requested.
- Patients were anesthetized either with local anesthesia (1% Xylocaine with 1:100,000 epinephrine) or under general anesthesia if the patient could not tolerate the pain.
- After local antiseptic cleaning, start by introducing the needle. An ideal location is often 5–7 mm inferior to the collection. A 14g, 1.5-inch needle on a 10-mL syringe is used to enter the skin and puncture the collagen capsule that surrounds the filler. Multiple piercings of the capsule are needed with application of negative suction in the syringe (case 2, Figure 2).

Intraoral Procedure

- This is a technique used in some cases where the filler was localized to only one or two spots with solid granuloma, circumscribed with no dispersion of the filler in multiple areas, and the disfiguring granulomatous masses were away from the sensitive areas of the facial nerve or the parotid duct.
- Preoperative preparation of the patient with MRI to localize the mass, intraoral preparation with



Fig. 1. A 40-year-old woman who presented with nodular lesions of the malar and cheek areas. A, The frontal position of the patient, (B) right position, both preoperatively. C and D, Same frontal and right positions postoperatively with the scar of the face lift surgery in the right position.

povidone iodine and tumescent injection to control small bleeding points, and dissection in a plane away from the parotid duct and facial branches followed by excision. This technique was limited to patients refusing the scar of the face lift with circumscribed lesion (case 3, [Figure 3](#)).

In the three techniques, washing the cavity with corticosteroids after the end of the procedure will limit the

postoperative inflammatory issues and smoothen the postoperative period.

POSTOPERATIVE TREATMENT

- Early postoperative evaluation included checking the vascularity of the skin flap, checking for any collection or hematomas, and checking for injuries to the branches of the facial nerve or the parotid duct.



Fig. 2. A 42-year-old woman who presented with boggy masses in the cheeks. A and B, The frontal and right positions of the patient preoperatively. C, The patient shown intraoperatively with the filler expressed from the entry point. D, The patient postoperatively with two scars in the nasolabial folds.

- Gentle massage of the treated area is recommended to drain liquefied filler material and necrotic inflammatory tissue. Also, oral second generation cephalosporin antibiotic treatment is recommended in all patients.
- After healing is complete, consultation with a physiotherapist was done for lymphatic drainage to reduce facial edema. Aesthetic and functional results, complications, and patient acceptance were evaluated 1 and 6 months after the surgery.

STATISTICAL ANALYSIS

Data were collected, entered and analyzed using Microsoft Excel software and imported into Statistical Package for the Social Science (SPSS version 20.0) software for analysis. Quantitative variables were expressed as mean, SD and range, and qualitative variables as number and percentage.

RESULTS

Patient Demographics

In the present study, 31 female patients were included, aged from 32 to 60 years. Mean age of the patients, smoking, and diabetic state are listed in Tables 1 and 2.

Clinical Presentation

All of the studied patients presented with facial contour deformities, especially in the lower cheek area and the jowls due to pooling of the filler material. There were also nodules and granulomas, either single or multiple, mainly in the malar and periorbital area and the jowls. Eighteen of our patients experienced inflammation of the injected material, and five of our patients had color changes which may be due to multiple attacks of infection or due to the near placement of the filler to the skin.

Surgical Details

This face lift procedure was more difficult than the ordinary one owing to the hardness of the tissues due to multiple previous inflammations, fibrosis, nodules and scar tissue. Preareolar incision was used if the patient wanted only to remove the filler with no neck laxity, while pre- and postareolar incisions were used in the presence of neck laxity. For full face and neck lift, the drain was left for 2 days postoperatively.

Aspiration by needle and squeezing was done in cases where fillers were in a soft state, like Bio-Aclamide, where they felt boggy during examination. After full removal of the material by squeezing, we washed with saline to facilitate removal of the material and performed a last wash with saline and hydrocortisone to decrease the inflammatory process.

Intraoral procedure was used in cases with one or two well-circumscribed granulomatous masses with no dispersion of filler in multiple areas of the face, with the masses away from sensitive areas like facial nerve branches and parotid duct. By this technique, the patient will benefit from having no scar on the skin.

Postoperative Details

Postoperative follow-up of the cases was done on the seventh day, and 1, 3, 6, and 12 months after surgery. Postoperative complications were listed in Table 3.

Histopathological examination of all nodules after excision was done to confirm that they were inflammatory granulomas.

Regarding the aesthetic results, postoperative and their analysis, three points of comparison regarding the contour, scars, and symmetry are shown in Table 4.

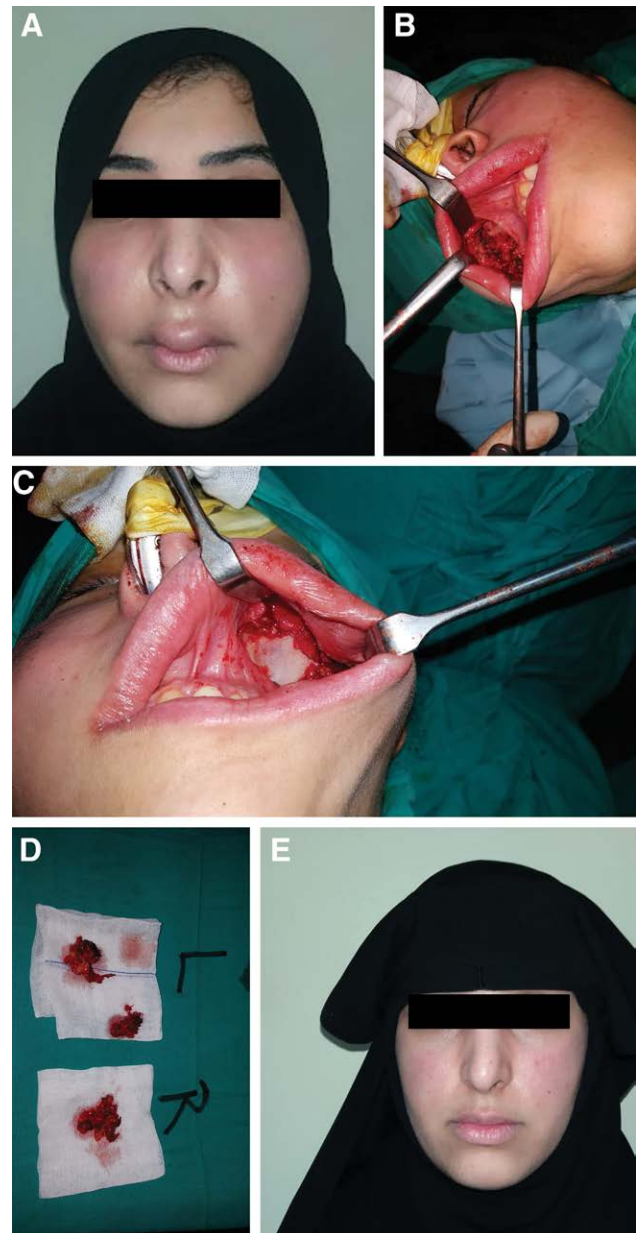


Fig. 3. A 36-year-old woman who presented with nodular mass in the cheeks. A, The patient preoperatively. B and C, Patient intraoperatively during dissection and excision of the mass. D, The excised specimen. E, Postoperative view of the patient.

The best contour results were encountered in the first group (face lift patients) where all 11 patients reported 100% satisfaction.

Regarding the scars, the best results were in the second and third groups as they had no scars, with a high percent of acceptance reaching 100% for each.

Regarding the symmetry, the first group had the best results, with 10 patients of 11 being satisfied, with a percentage of 90.9%.

Patient total satisfaction (subjective) regarding all the aspects was assessed and applied (Table 5). The best satisfaction was with the face lift group with high percentage up to 81.8%, with nine patients fully satisfied and two patients moderately satisfied. In the second group, 50% of patients were totally satisfied, 10% were moderately satisfied, and 40% were unsatisfied. In the third group, 40% were totally satisfied, 30% were moderately satisfied, and 30% were unsatisfied.

CASE DEMONSTRATION

Case 1: A 40-year-old woman presented with nodular lesions of the malar and cheek areas, which were managed by face lift incision and excision of granulomatous tissues (Fig. 1A–F).

Case 2: A 42-year-old woman presented with boggy masses in the cheeks, which were dealt with by incision and drainage of the filler material (Fig. 2A–D).

Case 3: A 36-year-old woman presented with nodular mass in the cheeks, dealt with by intraoral incision and excision of granulomatous materials (Fig. 3A–F).

Case 4: A 46-year-old woman with permanent filler in the cheeks and malar area was operated upon by face lift and permanent filler excision (Fig. 4A, B).

DISCUSSION

Ideal soft-tissue fillers should be safe and stable after injection, compatible with body tissues, resistant to phagocytosis with no migration from the site of implantation, pliable, and able to maintain their volume without absorption by the body. They should also induce minimal foreign body reaction and granuloma and be nonteratogenic, nonimmunogenic, noncarcinogenic, and noninfectious. Unfortunately, all these features are not available at once in currently available fillers, leading to multiple injections and multiple complications with nodules and granulomas.¹¹

In this study, we compare three surgical techniques used to treat nodules and granulomas resulting as complications of filler injection. Face lift incision, drainage by pricking the capsule followed by squeezing, and lastly, intraoral incision with excision technique were adopted according to the presenting signs of the patient. Patients presenting with multiple nodules, redundant skin, previous multiple attacks of infection were dealt with by face lift incision; patients presenting with boggy collection like in Bio-Alcamid filler injection confirmed by ultrasound investigation were dealt with by pricking the capsule with suction and squeezing; and cases with single or double nodules, and patients with no redundant facial skin refusing an external scar, were dealt with by intraoral incision with excision of granulomatous mass.

In our surgical practice, good preparation of the patient in the form of stopping smoking, analgesics, and supplements containing ginger and ginkgo was done 1 month preoperatively. Also, preoperative injection of cortisone in the masses to soften them and decrease their size facilitated their excision without removal of the normal tissue. Moreover, preoperative intravenous antibiotics are



Fig. 4. A 46-year-old female patient with permanent filler in the cheeks and malar area operated upon by face lift and permanent filler excision. A, Preoperative view. Note the size of the cheeks preoperatively. B, Postoperative photograph with the size of the cheeks reduced after material removal.

mandatory, to protect the tissues during the intervention from the bacterial biofilm, which may lead to filler contamination and facial deformities.^{12,13}

Comparing the results of the three techniques regarding the satisfaction of the patients and their assessment for the improvement in their results, and taking into consideration the researcher's assessment, this face lift technique was superior to others in dealing with complicated cases of facial fillers.

Postoperative complications were few and ranged between facial nerve branch injury which improved spontaneously within 4 months, two cases of small hematoma resolved without the need to evacuate intraoperatively, and one case of seroma (facial irregularities for those patients were corrected by facial fillers and dermal fat grafting). In our study, no wound dehiscence or parotid duct injury was encountered. Complications in this study were within the range compared to other studies done on the same issue.¹⁴

Studies have shown that nonpermanent fillers such as hyaluronic acid and poly-L-lactic acid can support the growth of bacteria; thus, postoperative washing of the cavity with hydrocortisone improved the recovery of the operation site.⁹

Postoperative facial massage was very helpful to reduce edema and indurations after these surgical procedures; this was accepted by other authors. Edema is proposed to be due to migration of the filler material or due to chronic inflammatory process causing obstruction to the draining lymph vessels.¹⁴

CONCLUSIONS

The use of the face lift technique as a surgical procedure provided a radical and satisfactory outcome; however, the lengthy method for patients complaining of facial deformities follows complicated filler injection with multiple nodules and granulomatous masses, particularly if the patients have redundant facial and neck skin.

For patients with one or two granulomatous masses with no redundant facial skin and who were not willing to have the external scar of the face lift surgery, intraoral excision was selected. Surgical excision was the best way to remove hard granulomatous masses. In patients with soft jelly-like filler such as Bio-Alcamid with pooling of the filler confirmed by radiological investigation, pricking of the filler capsule with suction and squeezing was done. Selecting patients wisely and careful consultation with good preoperative preparation of the patients and efficient postoperative care give the best results with marked

improvement in the facial contour and improve patients' confidence and quality of life.

Mahmoud Sadek el Sayed Salem, PhD

Department of Plastic and Reconstructive Surgery
Faculty of Medicine, Menoufia University
Shebin El Koom
Governorate El Menoufia, Egypt
E-mail: dr.mahmoudsadek@gmail.com

PATIENT CONSENT

Patients provided written consent for the use of their images.

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