

Complications of dermal fillers - an experience from Middle-East

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Abstract *Background* Dermal fillers have become exceedingly common globally in recent years for body rejuvenation, but with their widespread use and increasing profitability, cases of complications of dermal fillers are being widely reported.

Objective To document the complications related to dermal fillers as managed by the authors while working in different hospitals of Riyadh city.

Patients and methods Demographic and clinical data of 47 cases, reporting with complications of dermal fillers over a period of two years from June 2009 to June 2011, were analysed. The complications were categorised by a self designed category system based on management and outcome.

Results 44 females and 3 males, ranging in age from 23 years to 62 years were managed for complications of dermal fillers affecting face, hands, buttocks and external genitalia. 83% of cases had moderate to severe complications, and 51% were unaware of the nature of dermal filler received by them. 20 cases (42.5%) required surgical treatment and interventions under anesthesia.

Conclusion With increased use of dermal fillers, the complications are also being frequently encountered. Dermatologists should be wary of these avoidable untoward effects and their proper management.

Key words

Dermal filler, complications, rejuvenation, malpractice.

Introduction

Dermal fillers have revolutionized the field of cosmetic sciences, and these agents are being widely sought-after for body rejuvenation, as they offer a youthful, three-dimensional look with minimal downtime and without undergoing surgical procedures under anesthesia. Dermal fillers can produce permanent, semi-permanent or temporary effects depending upon the

material. However, dermal fillers are foreign bodies and, as with any other cosmetic procedures, they can result in ugly outcomes and complications, particularly in untrained hands; and in recent years, multiple such reports have been published. The present study was undertaken to bring forth the complications of fillers as managed by the authors during their plastic surgical practice over a period of two years.

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Patients and methods

The cases who reported with complications of dermal fillers to the author (BAA), while

Table 1 Categorization of complications on the basis of management/outcome

Mild	Conservative, symptomatic treatment on outpatient basis
Moderate	Management as inpatient but not requiring surgical intervention nor leaving residual deformity/scars
Severe	Management as inpatient but requiring surgical intervention +/- leaving residual deformity/scars

Table 2 Demographic and clinical characteristics of patients (n=47)

	N (%)
<i>Age group</i>	
20-30 years	13 (27.6)
30-40 years	13 (27.6)
40-50 years	19 (40.4)
50-60 years	11 (23.4)
<i>Area of distribution</i>	
Hands	18 (38.3)
Face	14 (29.8)
Buttocks	13 (27.6)
External genitalia	2 (4.2)
<i>Nature of dermal fillers</i>	
Hyaluronic acid	7 (15)
Collagen based	7 (15)
Permanent	9 (19)
Unknown	24 (51)
<i>Time frame of reporting with complications</i>	
After 6 months	11 (23.4)
1-6 months	19 (40.4)
1 week-1 month	13 (27.6)
Within 1 week	4 (8.4)
<i>Severity of complications</i>	
Mild	7 (28)
Moderate	25 (53)
Severe	9 (19)

Table 3 Nature of adverse effects and management.

<i>Nature of adverse effects</i>	<i>N (%)</i>	<i>Management</i>
Cellulitis	14 (29.8%)	Medical management including antibiotics, steroids; reassurance
Edema/allergy	9 (19.1%)	Steroids, antihistamines
Abscess	9 (19.1%)	Open/ultrasound-guided drainage
Granuloma	6(12.7%)	Excision
Residual scar	5(10.6%)	Reassurance/revision
Asymmetry	4 (8.5%)	Reassurance

working in plastic surgery division in different hospitals including Military Hospital, Riyadh from June 2009 to June 2011, were retrospectively analysed. None of the patients had been administered dermal filler by either of the authors. The basic demographic information regarding the patients was retrieved from personal logbooks of the author (BAA). The complications were marked as severe, moderate or mild by a self-designed category system

based on management and outcome as shown in **Table 1**. The data were statistically analysed by SPSS-10 software.

Results

A total of 47 cases (44 females, 3 males) were seen over a period of 2 years with various complications. In none of the cases, fillers had been injected by the authors. The age of the



Fig 1 Angioneurotic edema after facial dermal filling.



Figure 2 Left facial abscess 2 weeks after facial dermal filling.



Figure 3 Recurrent cellulitis of the dorsum of hand 15 months after dermal filling.

patients varied from 23 years to 62 years (mean 39.2 years) as shown in **Table 2**. The areas complicated by dermal fillers included hands, face, buttocks and external genitalia (penis in two males) as shown in **Table 2**.

Half of patients i.e. 23 (49%) cases were not even aware of the nature of the filler that had been injected into them. 9 (19%) of cases had permanent fillers and the rest of 14 cases (30%) had undergone temporary dermal filling (**Table 2**).

The cases reported from 2 days to 2 years 7 months though 36 (76.4) cases reported within 6 months after dermal filling (**Table 2**).

As per our self-designed tool for assessment of severity of complications, 34 (72.4%) cases had moderate and severe categories and 13 (27.6%) had mild complications (**Table 2**).

The nature of complications and the management offered is as depicted in **Table 3** and included both medical and surgical modalities (**Figures 1-3**). 17 (36.2%) of cases required surgical management in the form of drainage of abscesses, excision of nodules and scar revision.

Discussion

In recent years, there has been a global surge in the availability and use of dermal fillers for body rejuvenation by the aging population. The major cause for this widespread use includes the emergence of corporate culture which regards youth as an asset and puts older ones at a disadvantage, and hence the urge of aging workers to seek means of regaining a youthful look. Other reason for use of fillers is the fact that body rejuvenation is no more a social stigma in economically well-off societies.

Besides, there has been the availability of safer products and better advertisement by media and internet in the last decade or so.

With the increasing use of dermal fillers, a new entity in the form of adverse outcomes and complications of these cosmetic procedures, is being reported in the literature.¹⁻⁴ Most of these complications are mild and appear within the first week after the injections. In some studies, such adverse events related to product and injections have been reported in as high as 21.5% of the injections.⁵ In our series, 27.6% of cases reported with mild complications.

The adverse effects to dermal fillers can be attributed to the procedure itself, the procedural technique, and the agent injected.⁴ Among these factors, the injection techniques have been reported to be most significant in the present era of temporary fillers.⁶ The faulty techniques by novice or unqualified practitioners have been the cause for most of the miserable outcomes after these cosmetic procedures. In our series, 24 (51%) of our cases were not even aware of the material injected as the procedure was done by unlicensed and self-styled practitioners. As far as the material of the filler is concerned, the complications are far more associated with permanent fillers as compared to temporary ones.

The complications after dermal filling are varied. There are certain transient and predictable complications which include erythema, swelling, and ecchymosis. They may occur immediately after the procedure or present hours after the injections are completed. Ecchymosis is usually minor and resolves without intervention after 2 to 3 days. Although ice packs and cooling after injections can increase patient comfort, they have not been

found to be efficacious in reducing postoperative edema.

More significant ecchymosis may develop in patients who drink alcohol, take blood thinners (including coumadin and nonsteroidal anti-inflammatory drugs), or certain herbal medications associated with prolonged bleeding; examples include vitamin E, ginger, garlic, ginseng, and ginkgo, which are often underreported by patients in the screening process. Ciocon *et al.*⁷ recommend discontinuing these agents at least 1 week prior to major procedures, although bleeding time may take 2 to 3 weeks to correct fully. Gladstone *et al.*⁸ have reported that the fanning injection technique for dermal fillers can also increase the likelihood of bleeding, as well.

Other major adverse effects mentioned in the literature include injection site infection, allergic reactions, granuloma formation, Tyndall effect, soft tissue necrosis, panniculitis and permanent scarring.

Infection

Infection is an early complication of filler injections, and it should be rare in expert hands. The infective lesions in the form of inflammation or even abscesses may be due to common skin and soft tissue pathogens, including *Staphylococcus aureus*.⁴ Lesions that develop more than 2 weeks post dermal filling might even suggest the presence of an atypical infection, and mycobacteria, also need to be considered as the causative organism. Besides, dermal filling can lead to reactivation of herpes infection. Infection may also be due to faulty products and outbreaks of mycobacterial infections have been reported to use of tainted dermal fillers by nonphysicians.⁹

However, we could not document mycobacteria in any of our patients reported with infections and cultures revealed common flora including *S. aureus*, *Streptococcus pyogenes* and *Escherichia coli*.

Skin discoloration

Skin discoloration of esthetic significance can occur at the site of treatment; this typically occurs immediately after injection and, generally, resolves within a few weeks.² Reddish discoloration is the outcome of an inflammatory response, whereas pallor at the injection site can be attributed to overcorrection or the color of the injected substance. Hyperpigmentation (which can be treated with depigmentary cream) and bluish discoloration have also been reported, particularly in cases of products containing hyaluronic acid. The bluish hue may represent both traces of hemosiderin associated with vascular injury and visual distortion from light refraction to the filler through the skin (Tyndall effect).

Allergic reactions

Some individuals may develop allergic reactions to injected products due to an exaggerated immune response to a foreign substance. Such reactions generally occur within minutes of exposure to a challenging antigen, owing to the release of histamine, and manifest as edema, erythema, pain, and itching. These allergic reactions can be severe, and cases of severe anaphylactic shock have been reported in literature.¹⁰ **Figure 1** shows one of our cases who developed angioneurotic edema after facial dermal filling of collagen-based agent.

Nodule formation

Nodules may be inflammatory or noninflammatory and infection- or noninfection-related may present subcutaneously or in the dermis.^{11,12} Nonerythematous, painless nodules

occurring earlier than 2 weeks are likely related to uneven filler placement,¹³ but pain, erythema and fluctuation may indicate infection. Intermediate to late nodule complications, arising 2 weeks to 1 year postinjection, and delayed nodules noted beyond 1 year, may be immune responses to the filler or infectious granulomas. Delayed onset fibrotic nodules may be seen with poorly placed particulate stimulatory filler, such as poly-L-lactic acid and calcium hydroxyl apatite, especially in mobile areas, such as the lip, or with the use of poly-L-lactic acid, particularly because of the inadequate dilution of filler.

Asymmetry

A major complication, which occurs as a result of faulty technique, is under- or overcorrection; it leads to asymmetry, ugly outcomes and mental anguish to patients and physicians alike. Overcorrection of the upper lip can lead to a “duck bill” appearance. Asymmetry due to temporary fillers resolves with time, but if permanent fillers are injected, the asymmetry will be a disaster.

Skin necrosis

Injection necrosis is a rare but clinically important and serious potential complication of dermal filling caused by interruption of the vascular supply to the area by compression, injury, and/or obstruction of the vessel(s).^{14,15} It may occur when the material is injected into the angular artery of the nasolabial fold or the supratrochlear artery in the glabellar region. Compression of the supratrochlear vessels during injection of the filler could, hypothetically, minimize this complication.

Management of the complications of dermal fillers depends on the nature of the adverse effect and the nature of the filler; but due to profitability of this cosmetic procedure,

unscrupulous practitioners are being reported globally to inject substandard and unauthorized products without detailing the patients about the nature of products. Or else, the patients might be reluctant to volunteer the history of dermal filling due to social inhibitions and may create a challenging situation in diagnosis and management. In our series, majority (51%) of the cases was unaware of the nature of the injected filler. If, however, the nature of filler is known, multiple medical means to reverse the adverse effects can be tried. These include the use of local/ systemic steroids, hyaluronidase, antibiotics, analgesia and anti-inflammatory drugs besides counseling and physical methods like cold sponging. Surgical intervention has a role in management complications¹⁶ and may include drainage of abscesses, revision of scars, and excision of granulomas and nodules.

Administration of dermal fillers without proper informed consent is not unique to our series, and has been mentioned in literature.¹⁷ The fact that patients are not counseled fully before the procedure, and are not even made aware of the filler contents and their complications, points towards the degree of malpractice prevalent in this widely growing field of cosmetic surgery, and the strong need to disseminate information about the fillers among the general public.

Conclusion

Dermal fillers are an important recent advance in cosmetic dermatology but it has the potential to produce complications. Complications are more likely in untrained or uncertified hands. The authors managed 47 complications of dermal fillers by medical and surgical means. There is a need to improve the level of knowledge among the general population regarding dermal fillers.

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