aesthetic medicine

Original Article

# Non-surgical blepharoplasty using fillers: correction of lower eyelid

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### Abstract

**Background**: Injection correction of tear trough with hyaluronic acid fillers usually gives a good aesthetic result. But in some cases, after correcting tear trough with a good immediate result, adverse effects may appear after a while. There is accumulation of the filler below the tear trough, enlargement in the hernia of lower eyelids, and periorbital puffiness. To prevent these adverse effects, it is very important to consider the anatomical features of each patient.
**Aim**: The report describes the author's classification of the lower eyelid zone and original technique of correction of tear trough and palpebromalar groove, depending on the presence and prominence of orbital fat.
**Methods**: This study was performed in 118 female patients. Patients were divided into 3 groups, depending on the presence and prominence of orbital fat. The injection correction of the lower eyelid zone was performed using a hyaluronic acid filler.
**Results**: The result was determined by the patient through a visual assessment of photographs based on the criteria for the presence of tear trough and palpebromalar groove. Patients noted good satisfaction with the results of the correction of the lower eyelid zone. Only six patients were dissatisfied with their results.
**Conclusions**: Selection of patients and the correction of the lower eyelid zone, taking into account the principles outlined in this report, gives a good aesthetic result with a low risk of adverse effects.

### Keywords

Tear trough, lower eyelid, injection, filler

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## Introduction

Injection correction of tear trough and palpebromalar groove with hyaluronic acid-based fillers has become part of a practice of aesthetic medicine doctor. This procedure can be carried out by a needle or blunt cannula[1].

The lower eyelid zone is the most challenging area to treat with hyaluronic acid[1]. Kane described the correction of the tear trough as a difficult problem with multiple causes. He showed the technique of correction of the tear trough and lower lid using injection of the filler by a needle[2]. Lambros stressed that when correcting tear trough, it is important to evaluate the following factors: skin quality, definition of the hollow, the orbital fat, and the color of the overlying skin. Lambros described the microbolus supraperiostal injection technique of the hyaluronic acid by a needle. He noted that the best patients for the treatment are those with young, thick skin and a definite hollow[3].

In some cases, after correcting tear trough with a good immediate aesthetic result, adverse effects may appear after a while. Such delayed adverse effects include: accumulation of the filler below the tear trough (*Figure 1*), enlargement in the hernia of lower eyelids, and periorbital puffiness[4,5].

***Figure 1*** *- Accumulation of the filler below the tear trough.*

To prevent these adverse effects, it is very important to consider the anatomical features of each patient[6].

Hirmand proposed a classification system of the tear trough deformity based on clinical evaluation[7]. Sadick et al. developed the tear trough rating scale by objectively and subjectively evaluating the clinical appearance of the tear trough with regard to depth of the trough, hyperpigmentation, volume of prolapsed fat, and skin rhytidosis[8].

Zhivokova and Krasnoselskikh described the principles of the selection of patients for correction of the periorbital zone by fillers depending on eye prominence, presence and prominence of orbital fat, and location and strength of the orbital ligament[9].

Classification of prominent orbital fat of the lower eyelids is difficult, since the aging of the lower eyelid zone is associated not so much with the increase in fat, but also with the aging of the entire middle third of the face as a whole[10]. However, to facilitate the selection of patients for correction of the periorbital zone by fillers, I apply my original classification of the lower eyelid zone[11].

I identified 3 clinical types of the lower eyelid zone, depending on the presence and prominence of orbital fat:

Type I: no prominent orbital fat *(Figure 2.1)*

Type II: prominent orbital fat in the medial part of the orbit and visualization of the bony orbital margin in the lateral part (*Figure 2.2*)

Type III: prominent orbital fat visible in both medial and lateral parts of the orbit (*Figure 2.3*).

### 3 types of aging of the lower eyelid

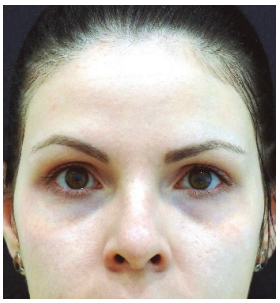

***Figure 2.1*** *- Type I.*

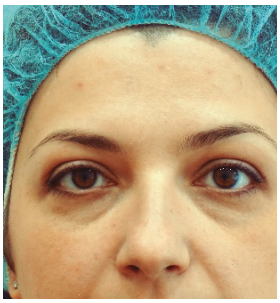

***Figure 2.2*** *- Type II.*

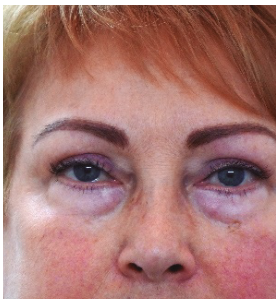

***Figure 2.3*** *- Type III.*

For patients with the second and especially the third clinical type of the lower eyelid area, I recommend surgical treatment of hernia of the lower eyelid. However, in the presence of contraindications to the operation, injection camouflage of hernias is possible[12].

It should be borne in mind that the target area where the filler will be injected depends on the anatomical features of the periorbital zone, that is, the clinical type of the lower eyelid zone. To reduce the risk of adverse effects, the filler should be injected precisely into the target space, regardless of the instrument used (needle or cannula)[13]. In all cases of augmentation of the periorbital zone by the filler, submuscular (supraperiosteal) level of product placement is used.

Before the procedure, the marking of dangerous areas is necessary to prevent their traumatization: the zone of angular vessels (the inner corner of the eye and the centimeter lateral to it) and a zone of an infraorbital neurovascular fascicle[13]. I recommend to avoid injections into the marked dangerous areas.

## Materials and methods

From February 2016 to January 2018 118 female patients were treated, aged between 28 and 56 years old. Patients were divided into 3 groups, depending on the presence and prominence of orbital fat. Treatment was carried out on: 47 type I (37 by needle 10 by blunt cannula), 66 type II (53 by needle 13 by blunt cannula), 5 type III (4 by needle, 1 by blunt cannula). In all cases, a monophasic hyaluronic acid-based filler of average reticulation was used for treatment. Correction of the lower eyelid zone was carried out according to the principles outlined below.

## Results

The result was determined by the patient through a visual assessment of photographs based on the criteria for the presence of tear trough and palpebromalar groove. Patients noted good satisfaction with the results of the correction of the lower eyelid zone. Most of the patients in this study were able to resume their normal activities after 1 to 2 days with makeup. In all patients, the aesthetic result lasted for more than one year. Only six patients were dissatisfied with their results because of hypercorrection. For the treatment of this effect, hyaluronidase was used (*Table 1*).

| Type of aging of the lower eyelid | Instrument | Total patients | Adverse effects (hypercorrection) | Satisfied patients | Satisfied patients one year after the procedure |
|---|---|---|---|---|---|
| Type I | needle | 37 | | 37 | 37 |
| | blunt cannula | 10 | | 10 | 10 |
| Type II | needle | 53 | 2 | 51 | 53 |
| | blunt cannula | 13 | 4 | 11 | 13 |
| Type III | needle | 4 | | 4 | 4 |
| | blunt cannula | 1 | | 1 | 1 |

***Table 1***- *Results and Patient Satisfaction.*

## Discussion

### *Type I correction*

The first clinical type is associated with a loss of volume throughout the lower eyelid area[9,11]. More often these are young patients complaining of dark circles under the eyes. When correcting this type, the filler should be injected under the orbicularis oculi muscle into the space bounded from the top (cranial) by septum and from below (caudally) by the orbital ligament (ORL)[14] (*Figure 3.1*). Injection of the filler below the ORL ligament can lead to the accumulation of the filler below the tear trough in the deferred perspective[5]. The marking points between which the injections will be made are: the projection of the bony orbital margin (upper border) and the eyelid-cheek junction (lower border). When correcting with a needle, the filler is injected bolus or microbolus between the upper and lower boundaries under the orbicularis oculi muscle with a preliminary marking of the dangerous zones.

When correcting with cannula, the filler is also injected under the orbicularis oculi muscle between the boundaries described above. The preferred entry point for the cannula at the level of lateral canthus is between the projection of the bony orbital margin and the eyelid-cheek junction (lateral lid entry point). When using the cheek entry point in some cases, the cannula does not pass through the ORL, but pushes it away. As a result, augmentation tear trough using the cannula from the cheek entry point gives a good immediate aesthetic effect, but delayed may result in the accumulation of the filler below the tear trough.

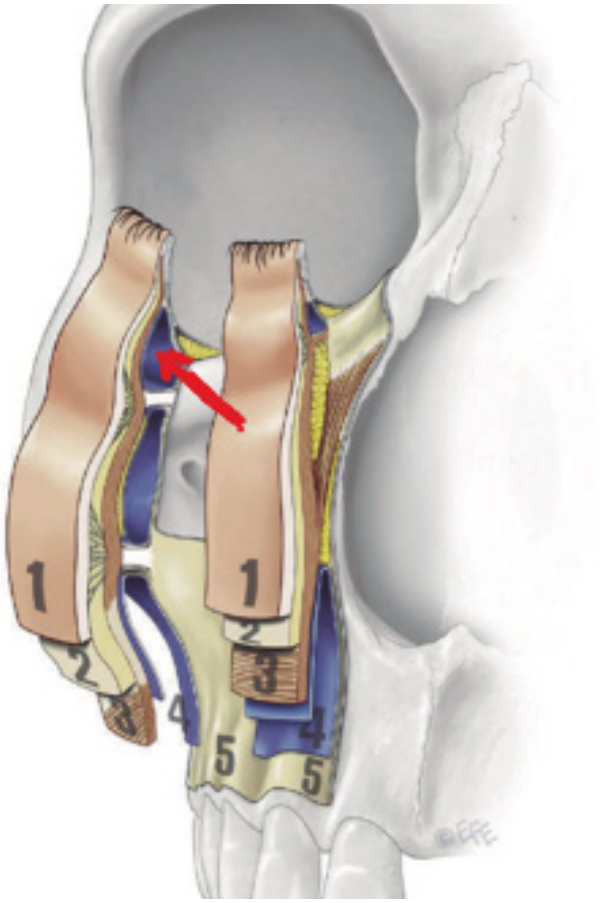


***Figure 3.1*** *- Layout of the filler for type I correction [9,11].*

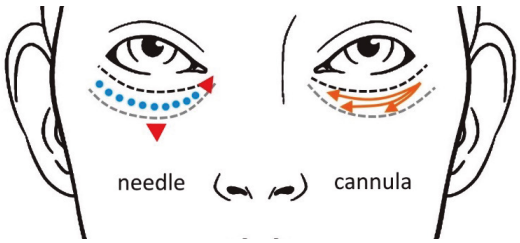


***Figure 4.1*** *- Scheme of augmentation of the zone of lower eyelid of type I with a needle (left) or a blunt cannula (right). Dangerous areas marked with red. Dashed line - the boundaries of the injection zone: black dotted line - projection of the bony orbital margin, gray dotted line - ORL projection / eyelid-cheek junction. Blue - the location of bolus filler when correcting with a needle. Orange arrows - direction of movement of the cannula.*

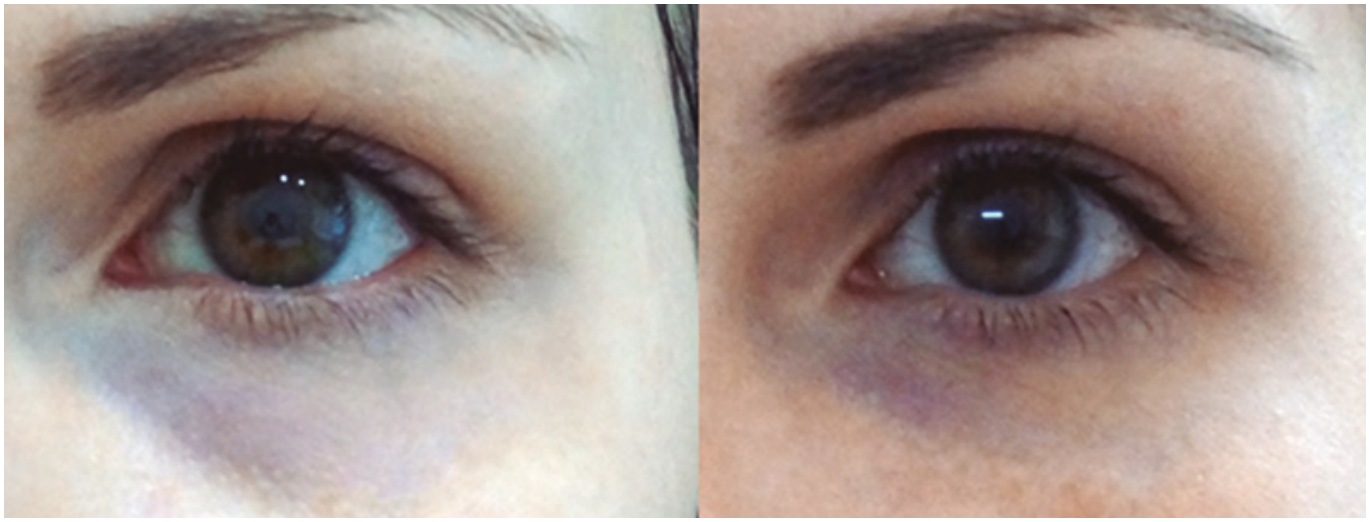

***Figure 5.1*** *- Type I, photo before augmentation and 2 weeks after.*

### *Type II correction*

This type is manifested by hernia of the lower eyelid, visible in the medial part of the orbit. And simultaneous visualization of the bony orbital margin of the lateral part. Thus, in the medial part of the lower eyelid the excess volume in the form of a hernia, and in the lateral, loss of volume[9,11].

The injection of a filler into a prominent orbital fat is dangerous because of the risk of infection complications and adverse effects in the form of long edema of the periorbital zone and increase in the hernia volume; it should be avoided[5].

When correcting this type, the filler should be injected submuscular (*Figure 3.2*), but in the medial part below (caudal) of the tear trough to prevent the filler from getting into the hernia. And in the lateral part - between the projections of the bony orbital margin and the eyelid-cheek junction.

When using the cannula, the medial part is augmented from the cheek entry point, and the lateral one from the lateral lid entry point (*Figure 4.2*).

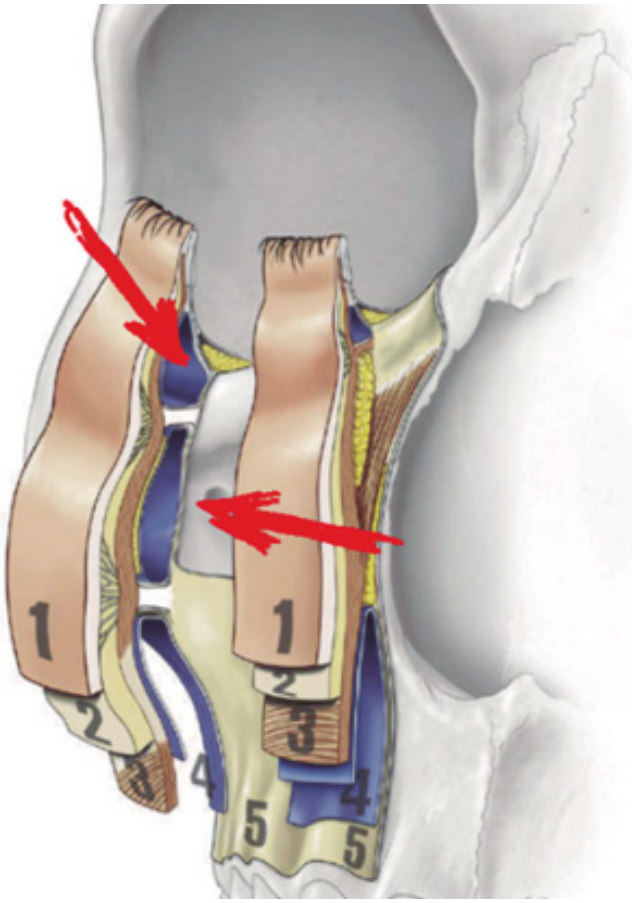


***Figure 3.2** - Layout of the filler in the lateral and medial part of the orbit[9,14].*

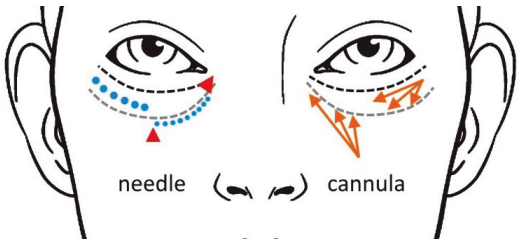


***Figure 4.2** - Scheme of augmentation of the lower eyelid zone of type II with a help of needle (left) or cannula (right). Dangerous areas marked with red. Dashed line - the boundaries of the injection zone: black dotted line - projection of the bony orbital margin, gray dotted line - ORL projection / eyelid-cheek junction. Blue - the location of bolus filler when correcting with a needle. Orange arrows - direction of movement of the cannula.*

***Figure 5.2** - Type II, photo before augmentation and 2 weeks after.*

### *Type III correction*

In this type hernias are visible in the medial and lateral part of the orbit[11]. As I mentioned above, the injection of the filler into the prominent orbital fat is unacceptable. Therefore, when correcting this type, the filler is injected only below (caudal) of the tear trough and palpebromal groove[9,11] (*Figure 3.3*). For the injection, you can use both the needle and the cannula: cheek entry point (*Figure 4.3*). An incomplete correction is recommended to avoid a "pillow face" (*Figure 5.3*).

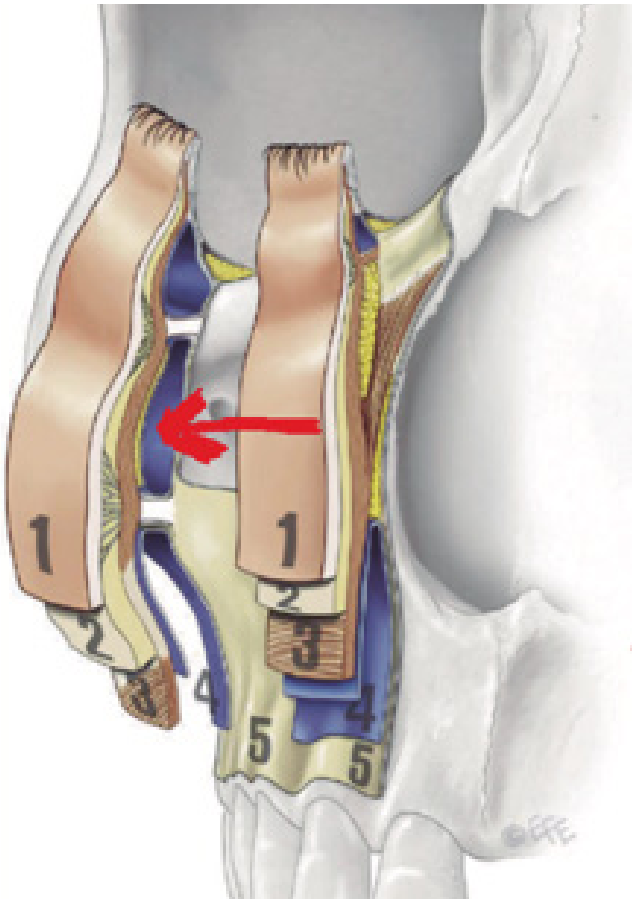


***Figure 3.3*** *- Layout of the filler for type III correction[9,11].*

## Conclusions

Observance of the anatomical features of each patient, including the existence and expression of prominent orbital fat, is necessary to obtain the optimal result of injection correction of the periorbital zone. Correction of the lower eyelid zone, taking into account the principles outlined in this article, gives a good aesthetic result with a low risk of adverse effects. If the level and target zone of augmentation are observed, post-procedure puffiness is minimal or absent, and a good aesthetic result lasts more than a year.

## Disclosure

The author declares that she has no conflict of interest and has not received any contribution for this publication.

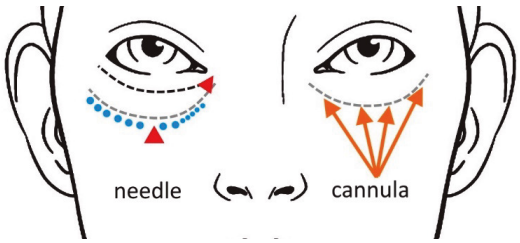


***Figure 4.3*** *- Type III augmentation scheme by needle (left) or cannula (right). Dangerous areas marked with red. Dashed line - the boundaries of the injection zone: black dotted line - projection of the bony orbital margin, gray dotted line - ORL projection / eyelid-cheek junction. Blue - the location of bolus filler when correcting with a needle. Orange arrows - direction of movement of the cannula.*

***Figure 5.3*** *- Type 3 augmentation. Photo before augmentation and 2 weeks after.*

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