

Methodology for teaching facial filling with hyaluronic acid

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Abstract. – OBJECTIVE: This paper shows the importance of the methodization in teaching facial dermal filling on the training of physicians who intend to work or are already working in the area of facial aesthetics.

METHODS: The methodology is based on the procedures performed in Iz Clinic of Plastic Surgery from 2007 to 2010, where the results of the use of dermal filling products were observed.

RESULTS: We chose the hyaluronic acid for the methodization of education. Even being a safe procedure, the dermal filling needs to be done by trained professionals because some complications may occur. The theoretical discussion of facial anatomy, physiology and classification of aging, rheological characteristics of products and application techniques underpin the practical part, in which the live demo or supervision of the procedure is performed. The idealization of classes, both theoretical and practical, proposed in this work proved to be of great value in teaching physicians.

CONCLUSIONS: The success of this method can be seen from the results achieved by students and by observing the drop in reports of adverse effects. After learning the techniques of facial dermal filling with products based on hyaluronic acid, a doctor may perform this therapy with other fillers, with harmonious results.

Keywords:

Aging, Facial filler, Methodization of techniques, Hyaluronic acid.

Introduction

The several changes observed in surgical and nonsurgical techniques of body and facial aesthetic procedures require constant updating by doctors to take better care of patients.

Scientific publications are concerned with the interaction of material and equipment used, their

physicochemical properties, their characteristics and the lack of information about techniques for its use. So they can't clarify the doubts of beginner doctors often insecure when carrying out these treatments in practice daily¹.

Among all the possibilities of treatments in facial rejuvenation, in mitigation of wrinkles or volume replacement in the face, dermal filling was the choice for the methodization of teaching to medical students.

This type of procedure has multiple indications and can be performed in an outpatient setting. It provides satisfactory results and minimal risk, thus maintaining a high degree safety for both the patient and the physician^{2,3}.

Among various alloplastic materials offered by the pharmaceutical industry, the hyaluronic acid was chosen as the ideal material for teaching techniques of facial filling.

Systematizing the lessons of medical training proved to be very effective to increase security and satisfactory procedures^{4,5}.

Methods

It was performed a qualitative study of cadastral records of minimally invasive procedures with the purpose of teaching methodization of facial filling techniques based on medical practices of the Iz Clinic of Plastic Surgery between the years 2007-2010. It was computed data of gender, age and type of treatment and also adverse effects in tissue filling.

It was evaluated 279 records and 44 were selected for this was the amount of patients in whom was performed facial filling and so they became the universe of this research.

This study was divided into three stages: (1) Analysis of improvement of dermal filling tech-

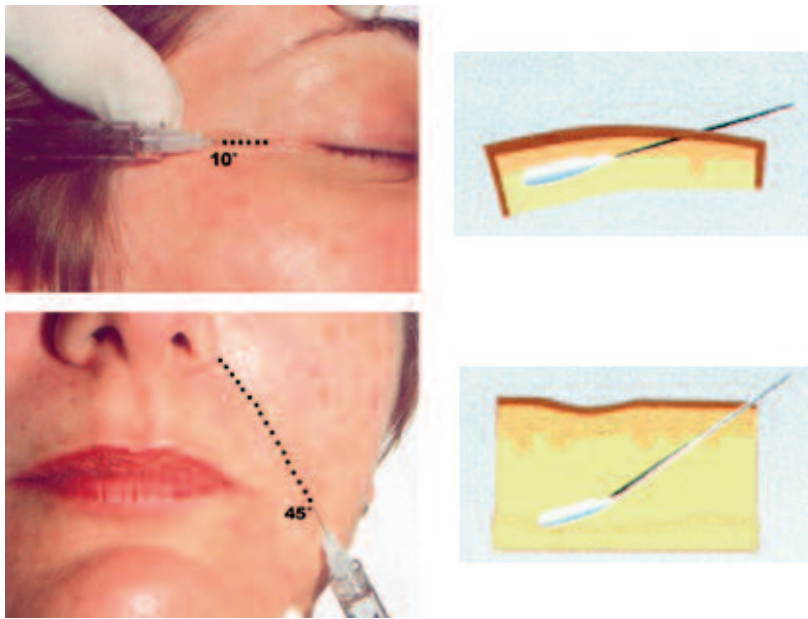


Figure 1. Entrance keystone in skin by the needle, for facial aesthetic treatment with fillers.

niques, (2) Evaluation of the results of treatments and (3) Idealization of training classes for medical students. It was maintained the privacy and anonymity of all the entries recorded in the mentioned period in accordance with the Resolution CNS 441⁶.

For the topic (1) there were reports of adverse effects on the facial filling procedure, considering as adverse effects: bruises, welts, unsatisfactory results, and allergic phenomena, as seen in the medical literature.

On the topic (2) it was observed the photographic records of patients undergoing to facial filling and it was analyzed the fall or disappearance of nasolabial folds.

The topic (3) dealt with the idealization of theoretical and practical classes for teaching beginners and for updating non-beginner medical physicians, bearing the informations gathered in previous topic in mind.

It was devised a theoretical class with common syllabus in anatomy, physiology and classification of wrinkles of the facial segment, with adequate technical contents as prior knowledge and experience of the students. To these classes we gave the name of basic and advanced classes.

In the basic lessons there was a greater commitment to discuss the facial anatomy, plans of dermal application and characteristics of the products to be used.

In advanced classes we based in the premise that the student has already a good medical information about the basic topics and deepened the discussion

of the various products used in dermal filling, their specific properties and directions in different facial areas. Also it was discussed maneuvers to decrease complications, presenting protocols of safety and treatment of the adverse. Learning to fill the nasolabial folds, the periocular and perioral regions and, in smaller percentage, the glabellar region, are the main focus of this module.

In advanced classes, the treated regions are selected. They comprise the malar region, tail eyebrow, definition of the jaw line, chin region, lacrimal groove, nasal appendage and global facial volumizing.

This fact is based in the time spent in pre-treatment care, in the study of the characteristics of HA (hyaluronic acid) fillers and in the time booked to answer questions in basic classes.

In advanced classes, as medical students already possess such knowledge, it is possible the scope of a larger number of facial regions capable of performing dermal filling. At first each area is demonstrated, then it is discussed the individual cares for each type of filler that best fits to the treatment and the inherent details in each area.

For discussion of the techniques for dermal filling during the lectures, a scheme of markings on pictures of a voluntary was idealized. This device allows you to view the design of the filling and to clarify the doubts.

Figures 1 and 2 illustrate how the techniques employed in IZ Clinic were used to improve the methodology of teaching classes in basic facial dermal filling.

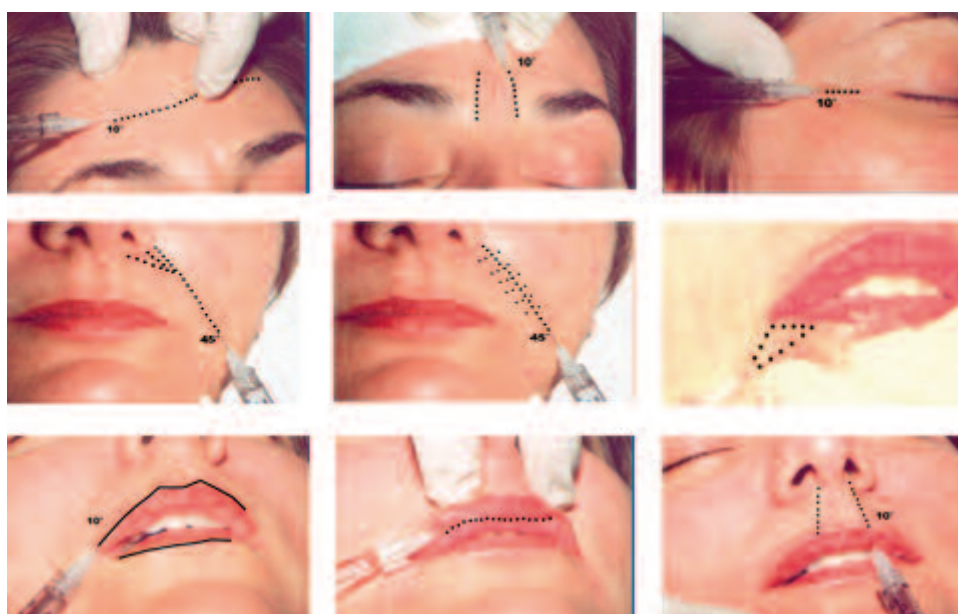


Figure 2. Tags for dermal filler.

The external technique of blocking the infra-orbital nerve, which is essential in basic classes for training the beginner doctors, is a necessary procedure for filling the perioral and nasolabial folds regions.

In Figure 1 is shown the angle of needle puncture in the skin to facilitate the application in superficial and deep dermal plans. This technique is very important because there are specific uses for fillers of different viscosities.

To facilitate understanding and learning by medical students it was hatched a thorough marking of facial areas to be treated with dermal filler. Figure 2 shows the step by step of demarcation. It is known that the face of each patient is unique, so that after understanding the technical background the individualization of treatment is discussed.

The selected areas for filling demand more careful with the quantity and shallowness for the

application of the product. They require experience because it is more difficult to get harmonious results in these areas.

The practical part has also undergone differentiation according to the experience of medical students. So, for beginner doctors it was designed to demonstrate the procedure and, to the doctors who had already experience in dermal fillers, it was proceeded the supervision of a wider treatment in the face of a voluntary patient.

Results

The distribution doss non-surgical procedures according to the modified Glogau classification is presented in Table I.

Table II shows the reduction in reports of complications in individuals (Grade III - Glogau) subjected to procedures of facial filling.

Table I. Non-surgical procedures according to the classification of modified Glogau.

Gender	Grade I fine wrinkles,	Grade II dynamic wrinkles	Grade III static wrinkles	Grade IV gravitational wrinkles, sagging muscles, excess skin
Male	02	20	03	0
Female	06	29	41	0
Total	08	49	44	0
Total General		101		

Table II. Reports of complications in individuals (Grade III - Glogau) undergone to facial filling procedures.

		Bruises	Elts	Unsatisfactory results	Allergic phenomena	Complications %
Individuals	2007	3	1	1	-	62.5
	2008	1	1	1	-	25
	2009	-	1	-	-	9.09
	2010	-	1	-	-	7.69
Total complications		4	4	2	-	10

Figure 3 illustrates the results achieved by the improvement of the techniques used in IZ Clinic of Plastic Surgery. It is observed that the nasolabial folds and oral attenuates rhyme is closer to a young face situation. The result is a “re-freshed” face to face without the stigma filled.

Discussion

The dermal filling procedures are already established in the aesthetic treatment of the aging face, and are increasingly demanded because of being an outpatient treatment with satisfactory results and quickly verified data that can be assessed in several studies⁷.

As Lima et al⁸, Farkas et al⁹, Mitre et al¹⁰, Costa¹¹, Briani¹², Cyrino et al¹³, Rego et al¹⁴, and Tapajós¹⁵, we are also concerned with the teaching in medical education. The importance of adequate training for doctors can be noticed when we observe the adverse effects that may occur arising from technical error in the indication, or from choice of the product and the technique used to introduce the material in the dermis, which led Coiffman to publish an article about what he called a new condition: Iatrogenic Alogenosis¹⁶.

In the work of Crocco et al¹⁷, bruises and welts appear as adverse effects, in Rosa et al¹⁸, Martins-Bringel et al¹⁹ and Héden et al²⁰, we observe nodes that require corrective surgical procedures, resulting in scarring at sites of complicated acceptance. It is worst when we encounter the work of Fadanelli et al²¹, and the Castro et al²² with reports of necrosis, resulting in stigmas instead of being a beauty treatment. Concerns with vascular and/or nerve compression phenomena after entering the wrong amount or wrong locus of dermal fillers are observed at the work of Bailey et al²³, and of Levy et al²⁴. These alerts have led us to make this work in order to minimize the risks to

patients, and increase the safety of medical students when they are performing the procedures.

In the early period of this study, the therapeutic of facial dermal filling was shown satisfactory, and although infrequent it was observed some adverse and unwanted effects, such as hematoma/ecchymosis and persistent edema¹⁷. Using ice on the spot immediately after the procedures, and the introduction of microcannulas greatly reduced this phenomenon. Braz et al²⁵ and Coimbra²⁶ also advise the use of microcannulas and report the reduction of these undesirable phenomena. In the present study we observed a decrease from 62.5% found in 2007 to 7.69% in 2010.

Technical improvements were then introduced in training the beginner doctors, but the thought of keeping the standard method of teaching remains, and its persistent reproduction, providing a wider range of teaching and its multiplication in any training.

It was adopted the modified classification of Glogau to facilitate the understanding of the doctors²⁷.

Among all the models for teaching we tested, such as training only through edited video, handouts, only theoretical exposure, we concluded that the best one was that composed of two parts: a) a lecture given by Power Point in the classroom in own training events and b) a practical part in an appropriate environment.

It was established basic lessons for beginners and advanced for physicians with expertise in facial aesthetic treatments.

The systematization of the basic and advanced classes led to separation of the treated facial areas, which were suited to more specific learning objectives for each target audience (beginners and medical practitioners with some experience). In the basic lessons pretreatment was the main focus: it was discussed more about facial anatomy, the importance of the question-

Figure 3. Pre and post-treatment with dermal filler HA in IZ Clinic of Plastic Surgery between 2007 and 2010 when it was recorded a improvement in the results.



naire on past conditions, the use of anticoagulants and/or immunosuppressive drugs, aseptic and antiseptic techniques, implementation plans and few facial areas to treat, but with the techniques thoroughly explained²⁸.

In the so-called advanced classes, it is considered that doctors already have the bases mentioned in the previous paragraphs, and that repetition would lead to decrease of attention in training, so the focus of attention was restricted to the treated areas and care with the naturalness of the results.

The theoretical explanations were divided into topics of interest. The first topic was about facial aging characteristics and ratings of groove magnitude and overall facial aging.

The second topic focuses on the topographical and functional anatomy of the face, with larger study of innervation and blood vessels, which in Tamura²⁹ is a recurring concern. The study of hyaluronic acid used, its physicochemical properties and to go deeper into implementation plans

are the object of study of this topic, as it is also the concern observed in the work of Bowman and Narins³⁰.

The various aseptic techniques and injection of products, paying attention to a "standard" technique of their insertion, form another block. This topic also discussed the potential complications and complications, and finally a block of photos of pre and post-treatment to evaluate results.

In classes for more experienced physicians in the field of aesthetic treatment with fillers, the topic of study of product characteristics is further explored with greater discussion of nuances among the presentations of the same product and among different brands. Improving naturalness of the results is also discussed in these cases.

New treatment areas with more refined injection of HA were appearing. It was noted the indication of the treatment in tail eyebrow, nasal dorsum, elevation of nasal tip and equalization of oral rhymes. Then we promoted a division of techniques: basic and advanced education to pro-

professionals, residents, physicians and beginner physicians and practitioners who had more experience in the field of plastic surgery and/or dermatology, adapting the knowledge of the target audience of the training classes for this division, to maintain the student interest.

In all cases time is reserved to answer the questions of the medical students, this time varies according to their interest and preparation.

The practical part also suffered a division: demonstration lessons for beginner doctors and “hands on” for physicians with prior experience in the proposed treatment.

In demonstrative part the students follow a detailed examination of the face of a voluntary patient, debating better or best techniques for solving the aesthetic patient complaints. Once you have made the marking of areas to be treated the patient is set in semi-sitting position on an appropriate litter, and it is promoted the sterilization of the entire face with gauze soaked in alcohol to 2% chlorhexidine.

In patients who will have perioral areas to be treated, blocking techniques, both internal and external of infraorbital nerve, are discussed and further demonstrated. In the basic lessons, the demonstration of plans to place the product is strongly enhanced and thoroughly discussed, in order to remain no doubt. The procedure is performed slowly so that everyone present can follow and discuss the questions that perhaps exist.

Massage to get a more homogeneous result is demonstrated and the audience assesses the immediate outcome and inquires the patient about their feelings in relation to the procedure.

In “hands on” classes, medical students evaluate the voluntary patient in conjunction with the physician teacher and they perform the sterilization and the procedure with direct supervision of the physician teacher. The patient will be walked together, harmonizing massage is performed in conjunction, and doubts are solved.

Initially the training was designed to fill the nasolabial and labiogenian grooves. The training in perioral fills both contour as the lip volume, were performed after correction of sulci cited. There was an improvement in the results, specially regarding naturalness, and a reduction in adverse effects, mainly of bruises/ welts.

The dermal filling in the periorbital rhytids (“crow’s feet”), remaining after the use of botulinum toxin, suffered a decline in the statement. The same thing was observed in order to the indication to fill the frontal region, which can

be explained by the improvements in management of BTX-A. The combination of these two therapies improves the quality of treatment^{31,32}.

Made this protocol of the classes, the results began to be appreciated, increasing the calls to demonstrate the training in scientific events.

The decrease in quantity and increase of the complexity of the questions from the students, as well the increasing number of invitations to apply the training techniques of dermal filler in Brazil and the invitations to teach this same training abroad show the successful standardization of methodology of teaching these techniques of facial dermal filling.

The aspect of “quality of life” must also be assessed. There are patients who become depressed when faced with a vision in the mirror that does not match their self-image. Many patients report feeling some degree of rejection by society because of some aspects inherent to aging^{33,34}.

Conclusions

The methodization of teaching facial dermal filling proved to be effective, facilitating the understanding by medical students about the care to be observed in pre, peri- and post-treatment. The transmission of the proposed syllabus was achieved in an ecological and smooth way³⁵.

Classes at scientific meetings, regional seminars, national and international conferences, should be taught with the aim of training procedures for filling in the overall operations of the face, with groups specialized in cares for treatment on facial areas, or to report complications of the procedure, even accidental, as well how to prevent and treat these adversities.

Nowadays, in these events theoretical explanation predominates. There are few events with live demonstration of the techniques, since the environments in which they teach the classes are not suitable for performing the procedures.

With a limited number of students the demo lessons are more effective. The facilities should follow the recommendations of the local health surveillance agency to places where they perform injectable treatments and use of injectable anesthetics (anesthetic loco-regional) factor of greater safety to volunteer patients. In Brazilian case we must follow the RDC 50/2002 (Brazil, 2002).

In the trainings that take place in Brazil, as taught in Tehran (Iran) in December, 2012 and in Jakarta (Indonesia) in February, 2013; the ques-

tions were very similar, and were about the implementation plans, choosing the best product and the preventive techniques to adverse effects, the mild ones such as persistent edema, hematoma/ecchymosis, and the serious one like granulomas, ischemia and necrosis.

The strengthening of these topics, in the lectures, proved they are very timely and satisfactory for everyone. The medical students were safer to perform the procedure, adverse effects subsided and the volunteer patients were better assisted.

Considering the increasing supply of new dermal fillers with hyaluronic acid or other polymers, such as PEG, the improvement of teaching techniques and particularities about therapy, for beginner doctors, and updates for physicians who are already working in the area, should be a constant exercise.

Conflict of interest

None of the authors has a financial interest in any of the products, devices, or drugs mentioned in this manuscript.

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