Research Article

A Novel Method for Facial Beautification Using 3 Landmark Points: Oval CAM Technique

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ABSTRACT

Facial fillers represent one of the most widely performed minimally invasive facial rejuvenation and beautification treatments. Although both concepts rejuvenation and beautification are different, they merge in several aspects when we consider facial beauty as a broader concept, encompassing form and youthfulness. Three regions of the face are mainly involved in the perception of facial beauty in both men and women: The malar region, the jawline, and the chin.

The present study presents a marking technique for facial filling of the three main facial promontories, which play a crucial role in beautification. Based on anatomical parameters, a marking method has been developed that guides and directs the injector for a homogeneous fill. The marking technique was named OVAL CAM® since it is specifically intended for marking the following regions: C: Chin, A: Jaw Angle, M: Malar. The OVAL CAM® technique is readily reproducible by younger and more experienced injectors, as it is based on fixed cephalometric points and anatomical landmarks. The marking technique is easy to perform, considering the well-established anatomical landmarks and from this the filling can be performed quickly and safely. The method enables elegant and natural results.

Keywords: Facial rejuvenation; Hyaluronic acid; Facial filler

INTRODUCTION

Injectable fillers represent one of the most requested minimally invasive treatments to rejuvenate the aging face [1]. The popularity of this procedure showed a 306% growth when comparing 2003 to 2019 [1]. The American Society for Plastic Surgery estimates that 2.7 million soft tissue filler treatments were performed in the United States in 2019, representing the second most commonly performed noninvasive procedure [2]. Most treatments were performed with hyaluronic acid, representing about 2.1 million of these procedures. However, several other fillers can currently be used for aesthetic purposes such as facial biostimulators and the so called tissue biomodulators.

Facial aging represents a complex process involving the combined effects of gravity, progressive bone resorption, skin firmness loss, and subcutaneous tissue redistribution [3,4]. These phenomena is interrelated and affect everything from bone ligaments, muscle, fat, and skin [3,5]. Volume loss of the middle and lower third of the face can be seen as a consequence of an aging process or may represent the proper anatomy in younger individuals [6].

Initially facial fillers were used only to mask rhytides and lines evolving into a more comprehensive approach targeting sites of the structural deficit. This treatment concept is described as the HA approach to rejuvenation, which deals exclusively with rejuvenation or interventions intended to treat aging signs.

However more recently there has been an increasing demand for facial fillers not only for rejuvenation but also for beautification.

This approach includes the projection of certain regions, the volumetric increase of certain aesthetic elements and the alteration of facial proportions, exalting characteristics present in the current concept of beauty.

Such procedures can also create light and shadows because projecting a specific region proportionally creates a relative sinking in the neighboring area, which interferes with the reliefs of the face. They alter the shape and volume of the aesthetic units and consequently, the proportion between them.

Although both concepts rejuvenation and beautification are different, they merge in several aspects when we consider facial beauty as a broader concept encompassing form and youth. This new approach to the face with fillers requires knowledge of the events related to facial aging and the characteristics we consider today in a beautiful face.

Three regions of the face are mainly involved in the perception of a beautiful face in both men and women: The malar region, the jawline, and the chin.

The elevation and projection of the malar region are highly regarded as an attribute of facial attractiveness [7,8]. The so called ogee curve is a name for this projection based on the ogival cathedrals that describe the curvature of the face seen at a 45-degree angle, consisting of a double S. An adequate ogee curve provides the face with visible projection in the frontal, lateral, and oblique views. This curvature should have its maximum projection close to the zygomatic eminence, declining progressively downward in the blush line. In beautiful faces this combination of the projection of the malar region and the depression below it generates greater and lesser reflection of the light that falls on the facial surface forming reflection and shadow that contour and define angles and facial shape. For years makeup artists have expressed the contour of the malar eminence by applying light and dark makeup to create the three-dimensional illusion of greater projection. Darker colors are applied to the sub-malar region, and lighter ones highlight the malar region's greater projection [9,10].

A well contoured jawline is also an essential aesthetic feature in facial attractiveness for both men and women [11]. A well-defined jawline signifies youthfulness and increases the attractiveness of the lower third of the face. For women the gonial angle is between 120 and 130 degrees and the volumetric enlargement characteristic of the region has an oval shape. Men's most aesthetic gonial angle is smaller approaching 90 degrees [12]. They also usually present a more punctual volume near the clinical gonion, largely due to the mass of the masseter muscle, which is more significant in the male face. In more aged faces, a change in the linearity of the mandibular body occurs, upon which a collapse of the superficial mandibular fat compartments and the entire face that accumulates in the lower third occurs. Such tissue collapse can significantly impact facial beauty and attractiveness [13-15].

The shape and projection of the chin also contribute to a balanced and harmonious face. For both sexes a chin projection is considered among beauty standards. In men more rectangular and projected chins can convey signs of masculinity and in women their oval looking projection conveys symbols of femininity [16,17]. Cases of microgenia or retro position of the jaw can lead to an aesthetic alteration of the profile negatively affecting the whole perception of beauty. At the same time disproportions between the three vertical facial thirds with a pronounced decrease of the lower third can lead to a loss of facial attractiveness in both genders [12]. Displacement of the mandibular fat pad combined with progressive bone resorption in the chin region leads to the development of two aesthetic concerns: Disruption of the jawline contour and the creation of the double chin.

Given the statements of the face considered beautiful, the present study aims to present a marking technique for facial filling of the three main facial promontories which play a crucial role in beautification. Based on anatomical parameters a marking method has been developed that guides and directs the injector for a homogeneous fill. The marking technique was named OVAL CAM® since it is specifically intended for marking the following regions: C: Chin, A: Jaw Angle, M: Malar.

MATERIALS AND METHODS

Indications

The authors created this technique to define the exact region of volumizing three facial projections [18]. The resulting marking demands a filling with a cannula and an injection technique that adequately distributes the determined filler volume. The application may vary in plane and type of injection.

The injector can distribute the product in the subcutaneous plane and retro injections in young faces. As for more aged faces that need restructuring and distension of the muscular aponeurotic system the plane must be supraperiosteal. The filling technique may be in multiple bolus or retro injections. If a more punctual tissue elevation is desired a bolus is recommended. If a more homogeneous volumizing is desired retro injections should be performed.

Thus its use has been demonstrated and validated in subcutaneous applications for enhancing facial projections and restructuring these areas at the supraperiosteal level.

Technique

Video 1 demonstrates the marking of the three ovals proposed by the technique and then filling them with hyaluronic acid.
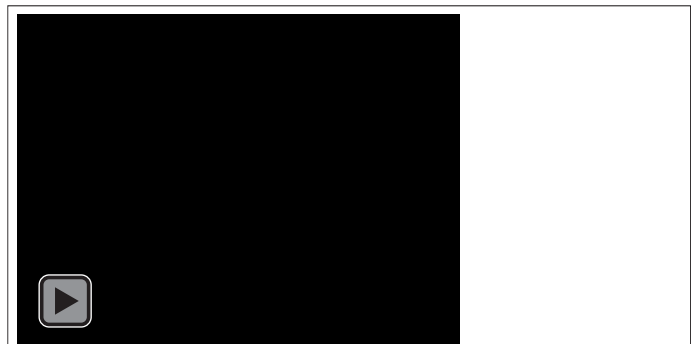
Video 1: Video showing marking and filling with the Oval CAM Techiquine®.

Oval CAM® technique is based on specific clinical and aesthetic cephalometric points, anatomical references, pre-determined lines, and the marking of oval regions in the three regions of greatest facial projection.

The fillers are deposited in a linear fan or multiple small bolus always aiming to achieve a homogenous volumetric increase and to reproduce the "padded" surfaces without accidental relief extremes. One of the advantages of the marking technique is precisely the amplitude of the region to be filled and the recommendation of more excellent product distribution avoiding single points of volumetric elevation and artificial appearance. This better product distribution in the previously marked region allows a more homogeneous and elegant filling of the projection regions of the face.

Eventually when a more punctual projection of the region is desired a greater punctual filler volume may be deposited by performing supraperiosteal boluses with a cannula instead of retroinjection. The versatility of the marking technique presented lies exactly there allowing more or less homogeneous product distribution in a more or less superficial plane which will vary according to individual characteristics and the specific aesthetic objective.

For approaching bone prominences regions whose filling must be preferably in supraperiosteal plan the product used must be of high rheology such as calcium hydroxyapatite, polycaprolactone and high G-Prime hyaluronic acid.

A wide variety of them can be injected by the same marking technique depending on the desired effect and the aesthetic and anatomical characteristics of the patient in question.

Regarding the products used, in the author's experience when there is a need for supraperiosteal filling in the malar region the product of choice is Rennova® Lift Plus Lido (Rennova® Lift Plus Lido, Croma Pharma GMBH-Austria) for its capacity of structuring and lifting effect which is essential in the application of this region located posteriorly to the ligament line. Rennova® Lift Plus Lido (Rennova® Lift Plus Lido, Croma Pharma GMBH-Austria) is also chosen for the application of the Oval-C due to its greater rheology. When the filler is applied superficially in the Oval-M region the authors opt for a product with greater volumizing capacity in this case using Rennova Ultra Deep (Rennova Ultra Deep, Panaxia LTD-Israel) which is also the preferred choice for filling the Oval-M and the entire mandibular region.

In addition the technique also has flexibility regarding the size of the marked oval regions considering the facial diversity of size, shape, gender, and ethnicity.

Oval-M-malar region

For Oval M delimitation, two structures must be previously delimited on female faces. They are: The lower limit of the inferior palpebral region the point of highest projection of the lateral malar region (Figure 1A), and the master oblique line that lines the corner of the mouth to the implantation of the ear. Figure 1B shows the mentioned points and the delimitation of the Oval M in a female patient.

The Oval M corresponds to an oval region 4 cm to 5 cm long in its

largest axis that tangents superiorly to the inferior border of the inferior orbital region and inferiorly the line that connects the Cheilio to the superior implantation of the ear called Master Oblique Line. The zygomatic eminence the greatest malar projection area is often located in the center of this oval region but can medialize or lateralize to this center according to individual characteristics and the desired result.

The size of the oval region is individually variable. It depends on the size of the face, the region to be projected the horizontal dimensions of the face and even the obliquity of the zygomatic region. Despite this individual variability its longitudinal axis should measure 4 to 5 cm. The height of the oval region should correspond to 1.5 cm, accepting slight variations according to the individual characteristics described.

In male faces, the design of the M Oval should be more horizontal to the female oval region. The male line goes from the nasal wing to the tragus. The male Oval M also touches the palpebro-malar transition superiorly and the Male Master Oblique Line inferiorly as shown in Figure 1C. The Zygomatic Eminence should lie between its medial third and its lateral two-thirds in an attempt to slightly lateralize the zygomatic projection since the male faces do not support larger volumes in the anterior malar region.
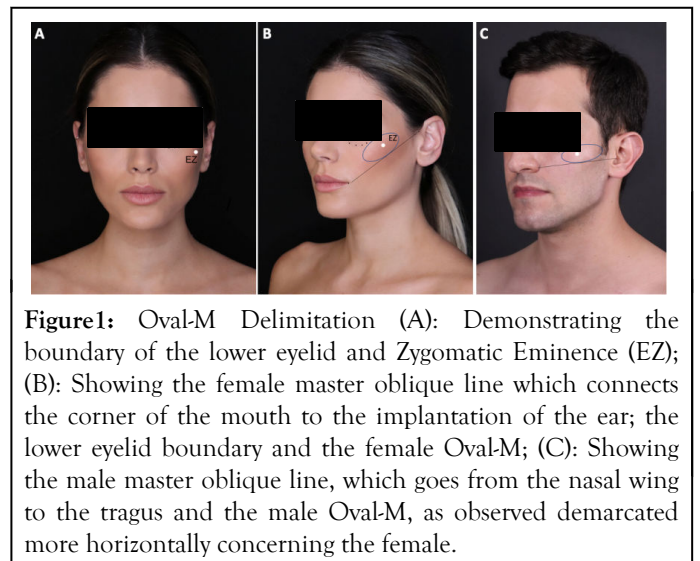

Figure1: Oval-M Delimitation (A): Demonstrating the boundary of the lower eyelid and Zygomatic Eminence (EZ); (B): Showing the female master oblique line which connects the corner of the mouth to the implantation of the ear; the lower eyelid boundary and the female Oval-M; (C): Showing the male master oblique line, which goes from the nasal wing to the tragus and the male Oval-M, as observed demarcated more horizontally concerning the female.

Regarding the depth of the filler application, both in men and women a bleeding technique can be performed. The choice for application exclusively on the superficial plane is made for those cases in which the patient already presents a structure and the objective of the technique is only beauty. In cases where the patient needs structuring and projection the application in superficial and deep planes (bleending technique) is chosen. In our clinical cases we applied Rennova® Lift Plus Lido (Rennova® Lift Plus Lido, Croma Pharma GMBH-Austria) in the supraperiosteal plane and Rennova Ultra Deep (Rennova Ultra Deep, Panaxia LTD-Israel) which has great volumizing capacity in the superficial plane.

Oval C-chin region

Three anatomical regions must be identified to delimit the Oval C region: The midline of the face the pogonion which corresponds to the most anterior soft tissue cephalometric point

of the chin and the gnathion, the most anteroinferior soft tissue cephalometric point of the chin. Figure 2A shows the points in question.

Having defined the aforementioned cephalometric points and the midface line the marking of the C-Oval varies according to the effect one wishes to obtain. When chin projection or anterior lengthening in the sagittal plane is desired the pogonion should be the central point of the Oval-C. If the desired effect is the elongation of the chin or its height increase in the inferior-superior plane, the Gnathion should be the central point of the "Oval Q".

The length of the oval chin region varies from 2 to 4 cm according to dimorphic characteristics. In women, whose chin should be smaller and more pointed the C Oval should measure 2 cm in extension. In the case of men who have broader chins, it should be 4 cm. Intermediate measurements should be used to adapt the size of the C-Oval to the individual characteristics of the face always keeping in mind the individualization guideline starting from the standardization. The height of the oval chin region is about 1.5 cm.

Oval A-mandible angle

To delimit the Oval A it is necessary to define and mark the Mandibular Plane on the lower border of the jawline line. Next the gonion the meeting point between the mandibular line and mandibular ramus must be marked. The Gonio can be easily palpated before marking a point on its corresponding skin region. Then another point is marked at the level of implantation of the earlobe and a third point 2.5 cm in front of the gonion in the mandibular line Figure 2B. The oval region is tangent to these three points at its ends and lower border. The upper point is measured by analogy delimiting a height of 1.5 to 2 cm in its largest transverse axis. The Oval A should measure approximately 5 cm along its longitudinal axis.

Figure 2: Oval-C and Oval-M Delimitation. (A): The figure shows the two possibilities for demarcating the Oval-C with the pogonion or the gnatio as the central point; (B): The figure shows three reference points for Oval-M demarcating the gonion a point at the implantation of the earlobe level and the third 2.5 cm in front of the gonion.

The application must be performed on the surface plane with a high G-prime product that has a high volumizing capacity; the

author's choice for this region in the clinical cases presented was Rennova Ultra Deep (Rennova Ultra Deep, Panaxia LTD-Israel).

RESULTS

Some clinical cases are presented in this session. Figure 3 shows the case of a patient in which 1 ml of filling with Rennova Ultra Deep (Rennova Ultra Deep, Panaxia LTD-Israel) was performed in Oval M, A and 1 ml of Rennova® Lift Plus Lido (Rennova® Lift Plus Lido, Croma Pharma GMBH-Austria) in Oval-C, was applied as described by the technique. In the chin region the cephalometric point used to perform the marking was the gnathion. Brought elongation of the chin in the anteroinferior direction improving the anterior jawline and attenuating the double chin perception. In this case lip filling was also performed.

Figure 3: Clinical case in which each oval region was filled with 1 ml of hyaluronic acid with the Oval-C having the gnathio as the central point to promote chin lengthening.

Figure 4 shows the case of a patient in which 1 ml of filling with Rennova Ultra Deep (Rennova Ultra Deep, Panaxia LTD-Israel) was performed in Oval M, A and 1 ml of Rennova® Lift Plus Lido (Rennova® Lift Plus Lido, Croma Pharma GMBH-Austria) in Oval-C was performed. This patient already had an adequate bizigomatic distance so the central point of the Oval was marked more medial to promote an anterior malar projection. The chin center point was the pogonion as the patient already had a good relationship with the three-thirds of the face.

Figure 4: Clinical case in which each oval region was filled with 1 ml of hyaluronic acid. The Oval-M was demarcated as the central point more medially to promote projection of the anterior malar region.

The patient in Figure 5 had a slightly recessed chin and wished to maintain this feature but obtain an anterior projection of the chin. Thus using the pogonion as the central point the C-Oval was filled in such a way as to maintain the patient's morphological characteristics. All Ovals were filled with 1 ml of high G-Prime hyaluronic acid.
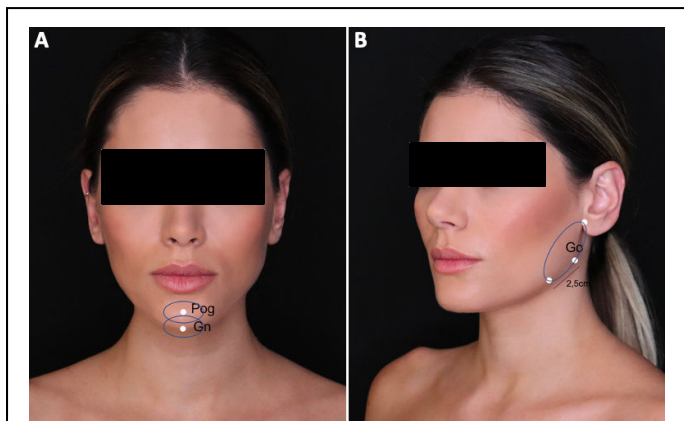

Figure 5: clinical case using the oval CAM technique keeping the patient's characteristics.

Figure 6 shows the case of a patient where a depth bleaching was performed in the malar region, using 0.5 ml of Rennova® Lift Plus Lido (Rennova® Lift Plus Lido, Croma Pharma GMBH-Austria) in each Oval-M in the supraperiosteal plane and 0.5 ml of Rennova Ultra Deep (Rennova Ultra Deep, Panaxia LTD-Israel) in the superficial plane. The other ovals followed the filling pattern already described. The central point defined for delimiting the Oval on the chin was the pogonion.

Figure 6: clinical case using the oval CAM technique. Being the central point of the Oval-C the pogonion to promote chin projection.

DISCUSSION

The authors described three oval regions determined as OVAL CAM®; coincidentally these regions confer greater three-dimensional projection to the face and when increased in size highlight the aesthetic lines deepening the blush line and increasing facial attractiveness according to current standards of beauty. This technique allows that besides the greater evidence of the aesthetic lines another essential aesthetic element is built and highlighted: The adequate and homogeneous cushioning of the most projected surfaces. For this reason the CAM® Oval lends itself to beautification or specifically the volumizing of oval regions that represent the main facial prominences.

When comparing the results of the Oval CAM® with the consecrated techniques of volumizing and filling the cheeks mandible and chin. What is observed is a more elegant aesthetic result without accidents of relief on the skin. The MD Codes described and disseminated by the Brazilian Physician Maurício de Maio mapped the structural points most suffer from the loss of volume inherent to aging. However the application of supraperiosteal needle boluses in the region of Ck1, Ck2 and eventually Ck3 can become apparent and uneven especially in thin patients [19].

Another improved point about MD Codes is the filling of the Oval M region. Only a supraperiosteal bolus in mandible angle (Jw1) allows a punctual elevation of this region. By performing the filling in the Oval A region in a homogeneous and better distributed way we observe a more harmonic filling less punctual, and that consequently better reproduces the natural reliefs of the gonion region.

The technique described lends itself to structuring and refinement given its versatility. However we must emphasize the enormous contribution of MD Codes to medical aesthetics and the use of hyaluronic acid for rejuvenation. Oval CAM® can be used in association with this technique performing the structural points described by Maurício de Maio associated with the more superficial refinement with this technique.

Another fact that highlights the present technique in filling the malar region is the use of a guideline widely used by makeup artists to perform the contour which we call the master oblique line. This depressed region crosses the entire face obliquely outlining it and highlighting shadow and light which is essential for facial contouring. The use of this aesthetic parameter for the inferior delimitation of the extension of the Oval M accentuates and highlights the blush line.

The versatility of the application plane supraperiosteal or subcutaneous also provides the possibility of a more comprehensive structuring necessary to restore volume support and volume loss in more aged faces. The uniform superficial distribution of the filler in the subcutaneous plane can be chosen for younger faces as well as deeper planes and more punctual boluses on older faces that also need structuring and lifting.

Furthermore the demonstration of the application in (Video 1) always using a cannula provides the injector with additional safety regarding vascular risk. Several articles have already demonstrated that even negative needle aspirations do not entail complete safety in hyaluronic acid filling [20].

Thus, we believe that the Oval CAM® technique can be easily reproduced by young injectors since its marking is referenced to fixed cephalometric points and not to imaginary regions and

allows the injector to provide the patient with rejuvenation as well as beautification.

CONCLUSION

The authors described a face marking technique for filling and volumizing the three projection regions: The malar region, the mandible angle region and the chin. The Oval CAM® technique is readily reproducible by younger as well as more experienced injectors as it is based on cephalometric points and fixed anatomical landmarks. The marking approach is easy to perform considering the well-established anatomical references and from this the filling can be carried out efficiently and safely. The technique enables elegant and natural results.

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