



A SUPPLEMENT TO

Skin & Allergy News®

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TERM OF APPROVAL: June 2007 – June 30, 2008

TARGET AUDIENCE

This educational program is intended for dermatologists, plastic surgeons, and other health care providers who perform cosmetic procedures on patients.

PROGRAM GOAL

Among the most common problems of aging are photodamage to the skin and facial biometric volume loss. The correction of facial volume loss with facial filling agents can restore a youthful appearance to patients who are approximately between 35 and 55 years of age and can allow older patients to look healthy and attractive for whatever their age, and within age-appropriate parameters. Such correction has many benefits beyond cosmetic improvements. Facial volume loss can give the appearance of aging out of synch with chronology, and when severe, may give the impression of illness and physical disability that may have adverse effects with social, psychological, and economic implications.

In this supplement, dermatologists will receive up-to-date information on treatments available for facial biometric volume loss, including the advances that have led to the development of fillers such as calcium hydroxyapatite and poly-lactic acid. Two cases (one rejuvenation and one restoration patient) are presented to demonstrate the results that can be achieved through appropriate, judicious, and skilled use of facial fillers.

EDUCATIONAL OBJECTIVES

By reading and studying this supplement, participants should be prepared to:

- Explain the importance of considering the geometry of and cosmetic units of the face in planning treatment for facial biometric volume loss.
- Discuss the causes, processes, and sites of facial biometric volume loss.
- Describe the role that facial fillers play in the treatment of aging skin.
- Discuss the differences between enhancement, rejuvenation, and restoration as cosmetic procedures and goals.
- Name and describe the treatment options for correcting facial biometric volume loss, including recently approved and investigational agents, and state the differences between stimulatory and replacement fillers.

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Dr Werschler has received grant/research support, is a consultant to, and on the speaker's bureau for Allergan Inc., BioForm Medical, Inc., and Dermik Laboratories.

Dr Weinkle has nothing to disclose.

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DERMATOLOGISTS' CASE FILES

Managing Facial Volume Loss: An Overview

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Biometric volume loss is a comprehensive term encompassing the loss of both hard and soft tissue. Soft tissue volume loss includes thinning of the dermis (dermal atrophy), loss of fat (lipoatrophy), and muscle atrophy. Loss of hard tissue—that is, bone, cartilage, and dentition—tends to be more noticeable in women than in men, probably because it often is associated with osteoporosis.

Facial volume loss typically begins in women at around 40 years of age; in men, such changes tend to occur later and usually are more subtle. A narrowing of the cheekbones (the zygomatic arch or rim) occurs, with some loss of hard tissue. Dermal thinning occurs in a relatively global fashion around the face, often as a result of factors that commonly include photodamage, cigarette smoking, and poor nutrition. Thinning of the dermis, in turn, leads to atrophy and the reduction of collagen and associated elastic fibers, which previously had provided springlike support. The dermal mask of the face no longer clings tightly to the supporting structure; when this happens, the support structure itself is no longer as full as it had been.

In addition, fat begins to redistribute, leaving the midarch or apple of the midcheek and begins to accumulate in the middle to lower face, resulting in the formation of jowls.

Correction of these problems may be approached surgically, nonsurgically, or both. Cosmetic plastic surgery of the face is largely concerned with reshaping and en-

hancing certain features; cosmetic dermatology primarily focuses on rejuvenation and restoration. An important element of rejuvenation and restoration is revolumization of areas of the face that have been adversely affected by biometric volume loss. Achieving the goals of rejuvenation and restoration can be accomplished nonsurgically in the majority of patients by the skilled and artful use of facial fillers.

Facial Geometry

Biometric volume loss appears as changes in the geometry of the face—a loss of the so-called triangle of youth, a shape created by the cheekbones as the base and the chin as the apex. Through the middle years of life, as the midface begins to lose volume, the cheekbones narrow and “facial descent” occurs, resulting in a gradual increase of tissue in the midface and lower face.

With the passage of 1 or 2 decades, the triangle inverts. The jowly chin and fullness in the rest of the lower face now forms a broad base, deepened nasolabial folds constitute the sides, and the apex is now the root of the nose.

As discussed in the sections below, recognition, understanding, and appreciation of the geometry of the face and how it changes over time is essential to the proper selection and use of revolumizing facial fillers. In addition, it is necessary to consider some of the specific changes that occur in the three zones of the face: upper face (hairline to lateral canthus area or lower eyelid), midface, and lower face.



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Facial Treatment Zones UPPER FACE

The main changes in the upper face do not result from significant volume loss, but rather from muscle movement that leads to coarse wrinkling. Some individuals—particularly those who have an ectomorphic body type—have furrowing over the malar and the zygomatic arch, losing volume above the cheekbones and developing a hollowing at the temples (referred to as bitemporal hollowing or depressions). The other volumetric change that is typically quite noticeable in the upper face is some thickening of the frontalis

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and corrugator complex musculature.

MIDFACE

The midface treatment zone involves the eyebrow to the area below the nasal columella and above the vermilion border of the upper lip. The specific structures of interest in rejuvenation and restoration are the upper and lower eyelids, nose, malar cheek, and the submalar cheek area. Loss of volume in the malar cheek results in descent of the facial mask and exaggerates the tear trough.

Changes in the periorbital tissues include atrophy of the muscle and connective tissue above the bony orbits that support the globe of each eye. As these slinglike structures atrophy, the weight of the globe exerts a downward pressure into the soft tissues, causing the muscle tissue and fat pads below the lower eyelid to protrude. The septum, which inserts into the bony orbit just below the globe, is also compromised. The lower orbital septum undergoes a “separation,” creating a furrow in place of the formerly smooth transition between the eyelid and facial skin zones. At the top of the nasolabial fold, the alar crease deepens, creating a depression that is sometimes called the alar sulcus.

Aging of the distal nose and upper lip region may occur when cartilage support is lost: the lobular tip of the nose rotates inferiorly and the nasal columella (nasolabial angle) appears deepened. This is compounded by a lengthening of the upper lip and a loss of the philtral columns and Cupid's bow architecture. At the nasal root, volume loss is associated with an accumulation of soft tissue and the formation of furrows.

Previous cosmetic surgery can add to the geometric changes in the midface. In the submalar cheek, hollowing can also be a particular problem for individuals who have undergone surgical removal of the parotid fat pads. This procedure,

REJUVENATION PATIENT



K. P. is a 31-year-old recent college graduate who has just started her own business. At her initial visit, she stated that her appearance does not represent how she felt and who she is as a young, professional woman. She expressed her desire to look “prettier and more sophisticated.”

At left: The patient's active acne lesions, acne scars, and poorly defined facial features contributed to her looking older than her stated age.

To define, refine, and augment facial features to achieve the desired appearance, the following filler procedures were performed:

- botulinum toxin injection, forehead
- hyaluronic acid injection, lateral suprabrow areas and lips
- calcium hydroxyapatite injection, nasolabial folds and prejowl areas
- polyactic acid injections, midface.

In addition, the patient underwent intense pulse-dye laser with levulanic acid treatment to resolve her acne lesions, and acne scarring was treated with carbon dioxide laser resurfacing. Cosmetic dentistry was performed to address the problem of overlapping and discolored teeth.

At right: Professional attention to hair and makeup enhanced the results achieved by the cosmetic procedures described.

popular in the 1980s, was typically sought by patients with roundshaped faces who desired to create a more oval shape. In addition, patients who have undergone facelift procedures may develop preauricular hollowing, a slightly concave appearance on profile.

LOWER FACE

The lower facial treatment zone is the curvilinear sweep of the mandible of the jawline. Age-related bone resorption results in the sagging of tissue and a creasing or “curtaining” appearance in that area. Further, the skin tends to wrinkle extensively around the mouth as bone is lost, and the mouth itself tends to descend and involute with aging. The lower lip rotates downward and inward, and the upper teeth become less visible when an individual smiles.

The changes in the malar and submalar regions of the

midface eventually cause an accumulation of tissue in front of each side of the chin and a deepening of the prejowl and labiomental sulcus.

Patient Goals

Three categories of patients seek cosmetic procedures: those who are looking for enhancement, those seeking rejuvenation, and patients who desire restoration. The latter two categories of patients are the primary populations seen by cosmetic dermatologists.

Patients in the restoration category are older than 55 years of age and tend to focus not so much on looking younger, but rather on “age-appropriate beauty”—that is, looking good for whatever their age. They are also concerned about recapturing health, including managing the potential results of abuse of the skin over time, particularly precancerous and cancerous

RESTORATION PATIENT



L. A., 47 years of age, described her appearance as “old, tired, and ugly.” She stated that she wanted to look younger, healthier, and more attractive.

At left: This patient had a flat midface and poorly defined cosmetic units, and also a poor complexion, including acne scars.

The facial fillers used to correct biometric volume loss were:

- botulinum toxin, upper face
- hyaluronic acid, tear troughs and lips
- calcium hydroxyapatite, zygoma and nasolabial folds
- polyactic acid, midface.

Correction of poor skin quality and tone on the patient’s midface, neck, and chest were accomplished with combination use of trichloroacetic acid peel and carbon dioxide laser resurfacing. Cosmetic dentistry also was performed.

At right: Cosmetic procedures to address facial biometric volume loss, acne scarring and poor skin quality on the face, neck and chest, and imperfect dentition provided this patient with the younger and healthier appearance she desired. The changes in the patient’s hair and makeup were professionally done.

lesions from photodamage. Their focus on age-appropriate restoration of appearance and health is often referred to as “age maintenance.”

A typical rejuvenation patient is in the “youth corridor,” from about 35 to 55 years of age. The main motivation of rejuvenation patients is to recapture a more youthful appearance. Along with seeking cosmetic procedures, these patients tend to be individuals who engage in exercise or athletic activities, pay attention to good nutrition, and are socially active. Another common trait is the self-perception of being “young for their age,” or feeling younger than their age. The appearance of facial lines, wrinkles, hyperpigmented spots, and the early signs of biometric volume loss seem out of place with the way they feel and how they perceive themselves. The underlying goal for most reju-

venation patients is recapturing youth rather than enhancing beauty.

Rejuvenation, Restoration, and Revolumization

Among the surgical options that cosmetic surgeons offer for correcting biometric volume loss are surgical lifting, tightening, and repositioning. Nonsurgical options include botulinum toxin and laser and light source treatments to tighten the skin, as well as filling agents; the established technique of fat transfer; collagen and hyaluronic acid injections; and several newer agents. Included in this last category are the ceramics (calcium hydroxyapatite), polyester/alpha hydroxy acid (polyactic acid), and polymethacrylate (non-biodegradable and nonresorbable fillers).

Fat transfer can achieve satisfying results, but it has never gained the widespread accept-

ance of “injectables.” This may be because it is a surgical procedure that requires multiple sessions, it is expensive, and the durability of the results varies among operators.

Volume restoration procedures today typically are done with soft tissue augmentation using stimulatory agents—products that act as biostimulants to increase the presence, production, or duration of native tissue, including natural collagen. Examples of such stimulatory fillers are polyactic acid and calcium hydroxyapatite.

The revolumizing/replacement fillers replace lost volume with water (hyaluronic acid) or protein fibrils (collagen) but do not appear to stimulate significant soft tissue growth. Choosing among them is not a matter of determining the most effective agent but, rather, the most appropriate agent for a particular purpose. For example, stimulatory agents offer greater structural strength, whereas revolumizing agents that bind to water—such as hyaluronic acid—provide revolumization that is less rigid and is appropriate for areas such as the lips, where the desired effect is fullness and firmness without rigidity.

FILLING AGENTS: A THREE-TIERED APPROACH

A common misconception among patients (and even among some physicians) is that a facial filler can provide correction of biometric volume loss in one session. Although labeling for some of these agents does state approval for single-session use, most rejuvenation and restoration patients will require at least two or three sessions over time.

Furthermore, to achieve the best results, facial contouring cannot be addressed simply as a process of injecting filling materials to furrowed, hollowed, and wrinkled areas. Instead, the global appearance of the face—including factors such as projection volume—must be considered.

Facial fillers should be used to recreate the geometric proportions of a more youthful face.

Volumizing the face should be thought of as a three-tiered process of improving the structural support framework, replacing volume, and, finally, contouring to achieve the desired change(s).

First, the support framework of the face must be increased and redefined. For this purpose, stimulatory fillers are excellent because of the structural strength they provide. For panfacial sculpting, we have found polyactic acid to be highly satisfactory; calcium apatite is extremely useful when addressing individual facial treatment zones (regional facial contouring).

After the structural support system has been re-established, volume can be added in more focused areas. At this point, such volume replacement usually is best accomplished with a combination of stimulatory and replacement fillers. For facial contouring, replacement fillers have great utility, especially in thin-skinned and hypermobile areas such as the lips and tear troughs.

Conclusion

The successful approach to facial biometric volume loss involves knowledge of the treatment options available and how to use them; thorough discussion to determine a patient’s treatment goals; and assessment of the treatment zones, with careful attention to the concept of facial geometry in choosing among treatments.

In a nonsurgical approach, a three-tiered approach should be considered: 1) restore and rejuvenate the structural framework with stimulatory fillers, 2) revolumize the face with a combination of stimulatory and replacement fillers, as appropriate, and 3) geometrically contour the face to create the look that the patient desires. Moreover, with the use of facial fillers, it is important to recognize that restoration and rejuvenation are processes rather than single-session procedures. ■

Skin & Allergy News[®] Managing Facial Volume Loss: An Overview

CME POST-TEST

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Estimated Time to Complete Activity: 1 hour

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INSTRUCTIONS

For each question or incomplete statement, choose the answer or completion that is correct. Circle the most appropriate response. Four of five responses are required for credit.

- The term facial biometric volume loss encompasses all of the following except:
 - Dentition
 - Dermal atrophy
 - Hydration
 - Lipoatrophy
- With increasing age, dermal thinning occurs:
 - As a result of fat redistribution
 - Following the reduction of collagen
 - In a relatively global fashion around the face
 - Particularly in the tear troughs and over the cheeks
- The main changes seen in the upper face over time result from:
 - Significant loss of soft tissue volume
 - Significant loss of hard tissue volume
 - Muscle movement that leads to coarse wrinkling
 - Atrophy of frontalis muscles
- Examples of biostimulatory agents used to augment soft tissue in volume restoration procedures are:
 - Calcium hydroxyapatite and poly lactic acid
 - Calcium hydroxyapatite and collagen
 - Collagen and hyaluronic acid
 - Hyaluronic acid and poly lactic acid
- Examples of revolumizing/replacement fillers are:
 - Calcium hydroxyapatite and poly lactic acid
 - Calcium hydroxyapatite and collagen
 - Collagen and hyaluronic acid
 - Hyaluronic acid and poly lactic acid

COURSE EVALUATION

Please Print

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Degree: MD DO PharmD RPh NP RN BS PA Other _____

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PRETEST ASSESSMENT: Please rate your prior knowledge of facial volume loss on a scale of 1 to 5, with 1 being the lowest and 5 the highest. 1 2 3 4 5

POST-TEST ASSESSMENT: Please rate your current knowledge of facial volume loss on a scale of 1 to 5, with 1 being the lowest and 5 the highest. 1 2 3 4 5

COURSE EVALUATION: Please evaluate the effectiveness of this activity by circling your choice on a scale of 1 to 5, with 1 being the lowest and 5 the highest.

Objective #1: Explain the importance of considering the geometry of and cosmetic units of the face in planning treatment for facial biometric volume loss. 1 2 3 4 5

Objective #2: Discuss the causes, processes, and sites of facial biometric volume loss. 1 2 3 4 5

Objective #3: Describe the role that facial fillers play in the treatment of aging skin. 1 2 3 4 5

Objective #4: Discuss the differences between enhancement, rejuvenation, and restoration as cosmetic procedures and goals.

Objective #5: Name and describe the treatment options for correcting facial biometric volume loss, including recently approved and investigational agents, and state the differences between stimulatory and replacement fillers. 1 2 3 4 5

1. How do you rate the overall quality of the activity? 1 2 3 4 5

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