Six cases of vascular compromise after hyaluronic injection are reported. Clinical symptoms realized a Nicolau syndrome, which is characterized by immediate pain, livedoid pattern and a few days later by the appearance of scabs and skin necrosis. This type of complication is rare, but may be dramatic and injectors must be aware of that. A thorough knowledge of facial anatomy is mandatory to avoid the risky facial areas. The use of a flexible cannula instead of a sharp needle has much less risk of hurting vessels and must be preferred. The support of the patient is discussed and a treatment protocol is proposed.

BACKGROUND: Late reactions to hyaluronic acid (HA)-based fillers have a recorded rate of 0.02%. The recent experience with a newly introduced filler in the tear trough area and the lips showed higher rate of reactions with a tendency to persistency and recurrences.
OBJECTIVE: To delineate the features of reactions to this newly introduced filler.
MATERIALS AND METHODS: Medical records of 400 patients (360 women and 40 men; average age = 49.6 years) were examined in this retrospective study. Juvederm Volbella (HA-Vb) filler was injected only into the tear trough area or lips. Other HA-based products were used in other areas of the face. RESULTS: Seventeen patients (4.25%) developed prolonged (up to 11 months) and recurrent (average: 3.17 episodes) late (average onset: 8.41 weeks after the injection) inflammatory cutaneous reactions. CONCLUSION: The incidence of late reactions to HA-based fillers varies between products. The authors are reporting an exceptionally high rate of cutaneous reactions for this newly introduced filler. In the authors' experience, broad-spectrum antibiotics in conjunction with repeated high-dose hyaluronidase injections into the inflammatory nodules were effective treatments.

With an increasing understanding of the aging process and the rapidly growing interest in minimally invasive treatments, injectable facial fillers have changed the perspective for the treatment and rejuvenation of the aging face. Other than autologous fat and certain preformed implants, the collagen family products were the only Food and Drug Administration approved soft tissue fillers. But the overwhelming interest in soft tissue fillers had led to the increase in research and development of other products including bioengineered nonpermanent implants and permanent alloplastic implants. As multiple injectable soft tissue fillers and biostimulators are continuously becoming available, it is important to understand the biophysical properties inherent in each, as these constitute the clinical characteristics of the product. This article will review the materials and properties of the currently available soft tissue fillers: hyaluronic acid, calcium hydroxylapatite, poly-l-lactic acid, polymethylmethacrylate, and autologous fat (and aspirated tissue including stem cells).

Bio-stimulation is an injective therapy aimed to boost the anabolic functions of dermal fibroblasts to obtain skin improvement. It can be achieved with multiple intradermal injections (0.050.1 ml each) of a solution of 400 mg (3 ml) of injectable glucosamine
sulphate, plus 5.623 mg (3 ml) of polideoxyribonucleotide, 1 ml of lidocaine and 0.51 ml of sodium bicarbonate, to repeat every 7, 14, 21, and 28 days. The administration of glucosamine sulphate to skin fibroblasts is believed to lead to its incorporation in glycosaminoglycans, and thereby to the stimulation of extracellular matrix synthesis, whereas polideoxyribonucleotide possesses anti-inflammatory and regenerative capability. This study aims to elucidate the in-vitro effects of this treatment by studying what happens to several genes related to connective tissue integrity. Human dermal fibroblasts were seeded in a culture medium enriched with either two drugs alone or combined: glucosamine sulphate and/or polideoxyribonucleotide. After the end of the exposure time of 24 h, 48 h, and 72 h, the cells were trypsinized and lysed for RNA extraction. Reverse transcription to cDNA was performed directly from cultured cell lysate. Finally, the cDNA was amplified by real-time PCR and a panel of genes involved in dermal integrity was tested. Gene expression of Hyaluronan synthase 1 (HAS1), Elastin (ELN), Insulin like growth factor 1 (IGF1), Growth differentiation factor 6 (GDF6) and of a series of catabolic enzymes, such as Metalloproteases (MMP) 2, 3 and 13, the neutrophil expressed Elastase (ELANE) and the Hyaluronidase 1 (HYAL1) were tested after 24, 48 and 72 hours of exposure to glucosamine sulphate and polideoxyribonucleotide alone or combined. All the tested genes but one were up-regulated. A negative synergism on several enzymes (particularly appreciable for Insulin-like growth factor 1 and metalloprotease 13) was observed when the two drugs were delivered together. Glucosamine sulphate acts not only as building block in the biosynthesis of glycosaminoglycan chains, but also as a booster of hyaluronan synthase 1. The association of glucosamine sulphate and polideoxyribonucleotide, used in bio-stimulation therapy protocol, has a negative synergism on catabolic genes in dermal fibroblast cultures. The present observations produce further insight into the effects of glucosamine sulphate in the biosynthesis of glycosaminoglycan chains.

5. Avantaggiato, A., et al. (2015). "HYALURONIC ACID IN DERMAL REJUVENATION: AN IN VITRO STUDY." J Biol Regul Homeost Agents 29(3 Suppl 1): 149-155. The purpose of this paper is to evaluate the role of hyaluronic acid in bio-revitalization by testing several extracellular matrix biological parameters in cultured dermal fibroblasts. To this aim, fibroblastic expressed genes after exposition to three hyaluronic acid medical devices were evaluated. Cells were seeded on a layer of three different medical devices containing 6.2, 10 and 20 mg/ml of hyaluronic acid for 24 h. Real Time Polymerase Chain Reaction was performed to investigate gene expressions. Genes encoding hyaluronic acid synthesis and degradation, Metalloproteinases 2 and 3 and Desmoplakin production as well as GDF6, and IGF1 were activated by hyaluronic acid products. The in vitro study showed similar effects on tested genes despite a different concentration of hyaluronic acid contained in the medical devices and the simultaneous presence of other additives. Based on the reported data, gene activations are an aspect of metabolic modulation of signalling pathways rather than the proportional production of a specific connective tissue molecule. Indeed different hyaluronic acid concentration and the presence of other additives did not change the overall effect on the studied genes. We believe that the optimization of extracellular matrix micro-environment, obtained by enhanced structural support with hyaluronic acid, leads to functional and metabolic improvement.

MATERIALS: Included were 15 healthy subjects recruited from 4 centers, between ages of 35 to 65 years, who had a Wrinkle Severity Rating Scale (WSRS) score >/= 3, indicating moderate volume loss. Revanesse(R) Ultra (Prollenium), a HA dermal filler, was used. Primary study outcome was physicians scored facial volume correction, using the Global Aesthetic Improvement Scale (GAIS), comparing baseline (day 0) versus 24 weeks (end) and blindly assessed photographs. Subject satisfaction and comfort was evaluated using self-administered questionnaires at day 0 and at week 24. RESULTS: N = 15, 13 female and 2 males with a mean age (years) of 48.52 ( SD +/- 10.46) received treatment with HA and completed the 24-week study. At screening they had a moderate (mean 2.85, SD +/- 0.45) WSRS score. At week 24 a marked facial volume restoration was shown and no adverse events were reported. All patients reported to be satisfied with the obtained results. CONCLUSION: Good-excellent volume enhancement was noted almost immediately after the HA injections, improving patient reported quality of life aspects. HA treatment was shown to be safe.

7. Bass, L. S. (2015). "Injectable Filler Techniques for Facial Rejuvenation, Volumization, and Augmentation." Facial Plast Surg Clin North Am 23(4): 479-488. Multiple fillers are available: various hyaluronic acid products, calcium hydroxylapatite, and a few others that are biocompatible with good duration and a variety of mechanical properties allowing intradermal, subdermal, and supraperiosteal injection. Facial features can be reshaped with great control using these fillers. Aging changes, including facial volume loss, can be well-corrected. These treatments have become a mainstay of rejuvenation in the early facial aging patient. Injection technique is critical to obtaining excellent results. Threading, fanning, cross-hatching, bleb, and pillar techniques must be mastered. Technical execution can only measure up to, but not exceed, the quality of the aesthetic analysis.

8. Baumann, L., et al. (2015). "Volumizing Hyaluronic Acid Filler for Midface Volume Deficit: Results After Repeat Treatment." Dermatol Surg 41 Suppl 1: S284-292. BACKGROUND: Juvederm Voluma XC (VYC-20L; hyaluronic acid gel) is approved in the United States for correction of age-related midface volume deficit (MVD). OBJECTIVE: Assess safety and effectiveness of VYC-20L after repeat treatment. METHODS: Subjects with MVD underwent optional repeat treatment 12 to 24 months after initial treatment if correction was lost or at 24 months regardless of loss of correction (n = 167). Investigators rated outcomes on the Mid-Face Volume Deficit Scale (MFVDS) and the Global Aesthetic Improvement Scale (GAIS). Subject-rated outcomes were the GAIS, overall satisfaction with facial appearance, achievement of treatment goal, and Self-Perception of Age questionnaire. Subjects recorded treatment-site responses in 30-day diaries. RESULTS: Mean injection volume for repeat treatment (3.13 mL) was approximately half the mean total injection volume for initial/touch-up treatment (6.8 mL). After repeat treatment, effectiveness was demonstrated on all investigator-rated and subject-rated measures, consistent with results observed after initial treatment. The percentage of subjects improving by >/=1 point on the MFVDS was 82.8% and 91.1% at 6 and 12 months after repeat treatment, respectively. The incidence, severity, and duration of common treatment-site responses were lower after repeat versus initial treatment. CONCLUSION: Repeat treatment with VYC-20L was well tolerated and resulted in high levels of effectiveness and subject satisfaction.


**BACKGROUND:** The shift from 2- to 3-dimensional soft tissue augmentation has allowed the development of hyaluronic acid (HA) fillers, which are long lasting and also reversible. Delayed-onset inflammatory nodules have recently been reported with the use of HA fillers. **OBJECTIVE:** The authors document their experience with delayed-onset nodules after 3-dimensional facial injection of Juvederm Voluma (HA-V) over 68 months.

**MATERIALS AND METHODS:** The authors conducted a retrospective chart review of patients who were treated with HA-V between February 1, 2009, and September 30, 2014, to evaluate for delayed-onset nodules. **RESULTS:** Over 68 months, 4,702 treatments were performed using 11,460 mL of HA-V. Twenty-three patients (0.5%) experienced delayed-onset nodules. The median time from injection to reaction was 4 months, and median time to resolution was 6 weeks. Nine of the 23 (39%) had an identifiable immunologic trigger such as flu-like illness before the nodule onset. In the authors' experience, prednisone, intralesional corticosteroids, and hyaluronidase were effective treatments. **CONCLUSION:** Although delayed nodules are uncommon from HA-V (0.5%), it is important to be aware of this adverse effect and have a management protocol in place. It is the authors' opinion from the patients' responses and from the literature that these nodules are immune mediated in nature.


**BACKGROUND:** As the popularity of soft tissue fillers increases, so do the reports of adverse events. The most serious complications are vascular in nature and include blindness. **OBJECTIVE:** To review the cases of blindness after filler injection, to highlight key aspects of the vascular anatomy, and to discuss prevention and management strategies. **METHODS:** A literature review was performed to identify all the cases of vision changes from filler in the world literature. **RESULTS:** Ninety-eight cases of vision changes from filler were identified. The sites that were high risk for complications were the glabella (38.8%), nasal region (25.5%), nasolabial fold (13.3%), and forehead (12.2%). Autologous fat (47.9%) was the most common filler type to cause this complication, followed by hyaluronic acid (23.5%). The most common symptoms were immediate vision loss and pain. Most cases of vision loss did not recover. Central nervous system complications were seen in 23.5% of the cases. No treatments were found to be consistently successful in treating blindness. **CONCLUSION:** Although the risk of blindness from fillers is rare, it is critical for injecting physicians to have a firm knowledge of the vascular anatomy and to understand key prevention and management strategies.


**AIM:** Filler injection is widely used for facial rejuvenation. Global skin rejuvenation requires the precise sequential injections of different areas, but a standardized and reproducible method is lacking. The purpose of the study was to develop a new method for a precise measurement of the degree of facial defect before and after full-face rejuvenation with injectable fillers, so called facial filler (FAFI) grid. **METHODS:** A grid of horizontal and vertical lines was drawn on the patients' face with a rigid meter and a surgical pen to identify some precise areas for sequential filler injections. The grid was also used to measure the defects and the corrections obtained. Three different formulations of hyaluronic acid were used for treating specific facial areas. **RESULTS:**
Three hundreds patients were included. There were 76 males and 224 females with a median age of 30.5 years. Correction was judged adequate in 77% and 90% of cases by the physician and patients, respectively. Prevalence of adverse events was 8.8%, with mostly mild, with resolution in few weeks. CONCLUSIONS: FAFI grid proved to be helpful in guiding sequential injections for total facial rejuvenation.


BACKGROUND: Soft-tissue augmentation with hyaluronic acid (HA) fillers has become one of the most popular cosmetic procedures performed. HA fillers represent safe and commonly used fillers. Several different HA fillers are available. The differences lie in the manufacturing process, allowing for tailored uses. A small-particle HA with lidocaine (SP-HAL; Restyline Silk; Galderma, Uppsala, Sweden) was approved by the US Food and Drug Administration in June 2014 but has been available for many years in Canada as Restylane Fine Lines and in Europe as Restylane Vital. METHODS: Relevant articles were reviewed relating to the composition, effectiveness, and safety of SP-HAL. We also discuss the author’s extensive clinical experience in the use of this product in Canada. RESULTS: SP-HAL has demonstrated proven benefits for lip fullness, augmentation, and treatment of perioral rhytides. Although off-label in the United States, SP-HAL is also well suited for the treatment of superficial fine lines, including periorbital, forehead, marionette, and smile lines. In addition, it has also been used in the tear trough region. A novel application for SP-HAL includes use as a skinbooster with intradermal micropuncture. In this technique, small aliquots of product are injected so as to gradually rejuvenate the skin in areas such as the face and hands. Side effects of SP-HAL were generally transient and mild. The most common side effects were swelling, tenderness, bruising, pain, and redness. CONCLUSION: SP-HAL is an effective and safe HA filler with varied clinical uses.


INTRODUCTION: Non animal stabilized hyaluronic acid (Perlane, Galderma, SA) was FDA approved in 2007 for the treatment of facial wrinkles and folds. Off-label use led to the observation that injection of Perlane in the midface improved both global aesthetic appearance and reduced the depth of nasolabial folds. A proof-of-concept trial was undertaken to explore this clinical observation further. METHODS: Twenty subjects with moderate midfacial volume loss and prominence of nasolabial folds underwent injection of the midface with Perlane between May and July, 2009. The average volume administered was 3.68 +/- 0.55 ml. Assessments were performed by the injecting physician and subject self-assessment for 6 months following treatment. RESULTS: 17 of 20 subjects completed all study visits. At the 6-month follow up visit 16 of 17 subjects were found to have clinically significant improvement of the midface and 14 of 17 subjects were found to have clinically significant improvement of the nasolabial folds. No serious adverse events occurred. CONCLUSION: In this early stage, proof-of-concept trial, the majority of patients treated demonstrated clinically significant, aesthetically pleasing improvement 6 months after injection of Perlane in the midface.

BACKGROUND: This article is a review of the literature and the authors' experience in managing patients seeking facial and nonfacial rejuvenation procedures with budgetary constraints. OBJECTIVE: To provide readers with an approach to the cosmetic patient with financial limitations. METHODS AND MATERIALS: This article is written from a review of the literature and the authors' experience. RESULTS: The readers should learn how to better manage a patient with financial limitations seeking cosmetic procedures. CONCLUSION: Because patients seeking cosmetic procedures are often faced with budgetary constraints, it is important for the cosmetic physician to educate patients about available treatment options and their costs. Giving patients realistic expectations and tailoring treatment plans to the patient's primary goals and financial limitations can help maximize overall patient satisfaction. (C) 2016 by the American Society for Dermatologic Surgery, Inc. Published by Wolters Kluwer Health, Inc. All rights reserved.

16. Braz, A., et al. (2015). "Lower Face: Clinical Anatomy and Regional Approaches with Injectable Fillers." Plast Reconstr Surg 136(5 Suppl): 235s-257s. The use of injectable fillers enables facial sculpting through treatment of volume depletion and modeling of facial contours. Injectable fillers are among the most frequently performed minimally invasive cosmetic procedures. However, treatment of the lower third of the face can be challenging and requires expertise in facial anatomy. In this article, the authors provide a comprehensive review of the anatomy of the lower third of the face, highlighting danger zones. In addition, the authors describe their preferred approach and detailed technique used in the treatment of each specific area, namely the jawline, prejowl sulcus, melomental folds, and lips.

17. Breithaupt, A. D., et al. (2015). "Anatomical Basis for Safe and Effective Volumization of the Temple." Dermatol Surg 41 Suppl 1: S278-283. BACKGROUND: One of the earliest but often unaddressed signs of facial aging is volume loss in the temple. Treatment of the area can produce satisfying results for both patient and practitioner. OBJECTIVE: Safe injection requires explicit knowledge of the anatomy to avoid complications related to the multitude of vessels that course throughout the region at various depths. The authors aim to detail the anatomy of the area and provide a safe and easy-to-follow method for injection. MATERIALS AND METHODS: The authors review the relevant anatomy of the temporal region and its application to cosmetic filler injections. RESULTS: The authors describe an easy-to-follow approach for a safe and effective injection window based on numerous anatomical studies. Injection in this area is not without risk, including potential blindness. The authors review the potential complications and their treatments. CONCLUSION: Hollowing of the temple is an early sign of aging that, when corrected, can lead to significant patient and practitioner satisfaction. Proper anatomically knowledge is required to avoid potentially severe complications. In this study, the authors present a reliable technique to safely and effectively augment this often undertreated area of the aging face.

18. Buhren, B. A., et al. (2016). "Hyaluronidase: from clinical applications to molecular and cellular mechanisms." Eur J Med Res 21(1): 5. Over the past 60 years, hyaluronidase has been successfully utilized in ophthalmic surgery and is now being implemented in dermatosurgery as well as in other surgical disciplines. The enzyme is considered a "spreading factor" as it decomplexes hyaluronic acid (also called hyaluronan, HA), an essential component of the extracellular matrix (ECM). When applied as an adjuvant, hyaluronidase enhances the diffusion capacity and bioavailability of injected drugs. Therefore, the enzyme has been used as a local adjuvant to increase the
diffusion capacity of local anesthetics, increasing the analgesic efficacy, and the anesthetized area particularly in the first minutes following injection, resulting in diminished intra- and postoperative pain. In aesthetic medicine, the off-label use of hyaluronidase is considered the gold standard for the management of HA-filler-associated complications. Here, we review the clinical use, underlying biological mechanisms, and future directions for the application of hyaluronidase in surgical and aesthetic medicine.


BACKGROUND: Hand rejuvenation has been recognized to play a key role in complementing and restoring an overall youthful look., OBJECTIVE: Aging hands present specific characteristics that require a carefully designed combinational treatment for a successful clinical outcome from a practitioner’s and patient's perspective., METHODS AND MATERIALS: A Medline search was performed on hand rejuvenation from 1990 to 2015, and results are summarized. The authors' personal experiences with specific technologies are discussed., RESULTS: Review of available clinical studies revealed successful rejuvenation of the epidermis and dermis of the hands with topicals, chemical peels, intense pulsed light, and laser energy devices. Reports of sclerotherapy and laser veins ablation for dorsal hand veins were identified. Several studies on hand volume restoration with injectable volumetric fillers such as hyaluronic acid, calcium hydroxylapatite, poly-L-lactic acid, autologous fat transfer including the authors' personal experience with them are described., CONCLUSION: A plethora of noninvasive treatments for hand rejuvenation have been thoroughly studied as monotherapy, but there is insufficient number of studies evaluating the best combination of therapies for this indication. It is likely that their strategic combination and sequence of application by a trained clinician will ensure a favorable outcome in addressing patient concerns., (C) 2016 by the American Society for Dermatologic Surgery, Inc. Published by Wolters Kluwer Health, Inc. All rights reserved.


BACKGROUND: Controversy exists concerning the need for aspiration before injection with hyaluronic acid (HA) fillers. OBJECTIVE: The authors undertook a study of HA products to determine if blood could be aspirated back into a syringe of HA when the needle has been primed or filled with HA. METHODS AND MATERIALS: Two studies were set up to determine if or when blood could be withdrawn from a heparinized fresh tube of blood into the HA syringe. Two different techniques were tested; one using a slow-pull retraction of the plunger and up to a 5-second waiting time before release versus a rapid pullback and quick release. RESULTS: Review of these data demonstrates that the usual clinical method, which involves quick withdrawal and instant release of the syringe plunger does not allow for sufficient removal of the filler found intraluminal in the needle and may give rise to false negative results in vitro and likely in vivo with the exception being the Galderma/Medicis products. CONCLUSION: In summary, withdrawal of the syringe plunger with no visible blood in the syringe does not eliminate the possibility of intravascular placement of the syringe needle.


BACKGROUND: The rising popularity of the three-dimensional reflation of the mid and lower face has prompted interest in upperfacial reflation. OBJECTIVE: We have been
asked to share our technique for subgaleal three-dimensional forehead reflation.

MATERIALS AND METHODS: We have described our anatomic approach, our modification of the hyaluronic acid (HA) filler to achieve reduced viscosity and our injection technique. RESULTS: Immediately after the forehead reflation there is mild brow ptosis due to the lidocaine within the HA filler. This reverses in 30 to 60 minutes post injection. There is a need for further enhancement about 2-3 weeks later in approximately 30 percent of subjects. The results last between 10-12 months. CONCLUSION: Three-dimensional subgaleal forehead reflation is an effective and safe procedure when performed with an HA filler and a knowledge of the periorbital vascular anatomy.


BACKGROUND: Facial aging is multifactorial, including changes in all the anatomical layers of the face including bone, fat, connective tissues and skin., METHODS: An evaluation of the multifactorial causation of facial aging pointed to the need for a multifactorial approach to restoration and rejuvenation of the aging human face., RESULTS: The varied aetiologies of the expressions of facial aging require more interventions than a unipolar approach. Combinations of neuromodulators, three and two-dimensional fillers and energy based devices were discussed. Surgical interventions were also discussed but were not addressed in this paper., CONCLUSIONS: A multimodal approach to lower facial rejuvenation and restoration is discussed as the most effective and appropriate method to achieve noninvasive aesthetic treatment success., (C) 2016 by the American Society for Dermatologic Surgery, Inc. Published by Wolters Kluwer Health, Inc. All rights reserved.


Injection of hyaluronic acid (HA) filler is a common aesthetic procedure. Impairment of vision, although rare, is a devastating complication of this procedure, which may not be reversible. We report on a patient who experienced visual acuity impairment and ischemic oculomotor nerve palsy after injection of HA into the nasal dorsum. In this case, clinical signs improved within 14 days of treatment. We also provide a review of the mechanism, clinical features, risk factors, and prevention and treatment strategies relating to embolization of ocular circulation after injection of HA. Vision loss is a rare but devastating complication of injection of hyaluronic acid (HA) in the face. Visual acuity seldom recovers completely. We report on a 22-year-old Asian woman who experienced obstruction of a branch of the retinal artery after injection of HA to augment her nose. The patient's visual acuity declined shortly after the procedure, and ophthalmoplegia occurred. Combination treatment was administered to restore the perfusion and oxygen supply to the retina and optic nerve. Within 14 days of rigorous treatment, the patient experienced improvement in visual acuity, extraocular movement, and visual field defects. LEVEL OF EVIDENCE: 5 Risk.


BACKGROUND: Although injection of hyaluronidase into surrounding tissues was proposed to treat arterial hyaluronic acid embolism, its application is still rather limited. The authors' goal was to investigate whether intravenous use of hyaluronidase can help resolve hyaluronic acid-induced arterial embolism. METHODS: Inferior epigastric arteries, nourishing inferior abdominal skin of rats, were injected with 0.02 ml of hyaluronic acid to create the animal model. The rats were divided randomly into four groups and given
different solutions intravenously: hyaluronidase plus urokinase (group A), hyaluronidase (group B), urokinase (group C), or saline (group D). Progression of tissue necrosis in all groups was recorded for 1 week. The flap survival rate and mean percentage of surviving flap area were analyzed. RESULTS: The animal model closely imitated actual hyaluronic acid arterial obstruction cases. Flap necrosis occurrence rates of each group were 10 percent in group A, 70 percent in group B, 80 percent in group C, and 90 percent in group D. The mean surviving flap areas of each group were 92.45 percent (group A), 47.67 percent (group B), 41.41 percent (group C), and 33.19 percent (group D). When hyaluronidase and urokinase were used together, the flap necrosis rate decreased significantly compared with that of the control group (p < 0.05). Even in cases of necrosis, group A had a higher average surviving flap area than did the other groups. CONCLUSIONS: Combined use of hyaluronidase and urokinase can help increase the flap survival rate when administered intravenously in intraarterial hyaluronic acid occlusion cases. Both red thrombus and hyaluronic acid emboli must be dissolved for flap reperfusion. This method shows a promising effect for future application.


This prospective study explored effectiveness and safety of Macrolane VRF30 for treatment of buttock lipoatrophy in HIV-infected subjects. Ten subjects who were unable to sit for more than 30 minutes because of pain were injected with a mean of 276 mL and followed for 18 months. The pain score was reduced, and the time that subjects could sit was increased at least up to 9 months post treatment. There was no local displacement of gel. Five mild adverse events occurred; all related to the injection procedure. This pilot study indicates that Macrolane treatment of buttock lipoatrophy is a promising, well-tolerated method that reduces pain at sitting and improves buttock appearance.

BACKGROUND: Combination therapies are becoming more popular as a multifaceted approach to treating common aesthetic conditions. OBJECTIVE: Often, the use of multiple techniques and modalities can lead to improved outcomes; however, there is a lack of current evidence on the use of combination therapies in the literature. METHODS AND MATERIALS: With the recent expansion of minimally and noninvasive options for treatment of the outer thigh and buttock, it is important to understand how these techniques can be used together while avoiding increased risk. RESULTS AND CONCLUSIONS: This review of current available therapeutic options for treatment of the outer thigh and buttock emphasizes current available literature and author experiences. (C) 2016 by the American Society for Dermatologic Surgery, Inc. Published by Wolters Kluwer Health, Inc. All rights reserved.

The clinical approach towards the midface is one of the most important interventions for practitioners when treating age-related changes of the face. Currently a plethora of procedures are used and presented. However, few of these approaches have been
validated or passed review board assigned evaluations. Therefore, it is the aim of this work to establish a guideline manual for practitioners for a safe and effective mid-face treatment based on the most current concepts of facial anatomy. The latter is based on the 5-layered structural arrangement and its understanding is the key towards the favoured outcome and for minimizing complications.


BACKGROUND: Cross-linked carboxymethylcellulose (CMC) filler is a biosynthetic filler with very low antigenic risk. OBJECTIVE: To assess the efficacy and safety of CMC filler in the rejuvenation of the lower face. MATERIALS AND METHODS: Two hundred eighty-seven procedures were performed in 174 patients: 115 nasolabial folds, 86 marionette lines, 29 bar codes, 14 cheek rhytides, and 43 lip rejuvenations. Results were evaluated at 3 (T1) and 6 months (T2) with photographic evaluation, Global Aesthetic Improvement Scale (GAIS), Modified Fitzpatrick Wrinkle Scale (MFWS) for nasolabial folds, Marionette Lines Grading Scale (MLGS), and Medicis Lip Fullness Scale (LFS). RESULTS: GAIS was >/=2 in >91.05% of patients both in T1 and T2. MFWS score significantly improved at T1 (86.9% class </=1, p < .001) and T2 (82.6% class </=1, p < .001); in all patients in T1 and T2, median amelioration of MLGS was 2 +/- 1 and there was a significant amelioration of at least 1 grade in LSF in both upper and lower lips. CONCLUSION: The use of CMC filler resulted in a significant and satisfactory amelioration of lower face aging signs with very low incidence of adverse events. Therefore, it should be considered a valid alternative to cross-linked hyaluronic acid fillers.


BACKGROUND: Hyaluronic acid gels are increasingly used for augmentation of the lips. OBJECTIVE: To assess the safety and effectiveness of Juvederm Ultra XC, a 24 mg/mL hyaluronic acid gel containing 0.3% (wt/wt) lidocaine (HYC-24L), for augmentation of the lips. METHODS: This ongoing, multicenter, single-blind study randomized 213 subjects to the treatment group (n = 157) or concurrent no-treatment control group that received delayed treatment (n = 56). The primary effectiveness endpoint was the responder rate (>/=1 point improvement from baseline) based on the blinded evaluating investigator's assessment of the subject's overall lip fullness (or fullness of the eligible lip) using the validated Allergan 5-point Lip Fullness Scale. To meet this endpoint, the treatment group had to have a responder rate >/=60% and significantly greater than the treatment control group at Month 3. RESULTS: The primary endpoint was met, with a 79.1% responder rate for the treatment group and 26.1% for the treatment control group (p < 0.0001). More than half of subjects (56.4%) maintained treatment response for 12 months. Common injection site responses were swelling, bruising, and firmness; most were of mild or moderate severity. CONCLUSION: HYC-24L is safe and effective for aesthetic lip augmentation, with results lasting up to 1 year.


CONTEXT: Hyaluronic acid (HA) is the most common filler used to rejuvenate. Today, a three-dimensional approach prevails over previous techniques in which this material was used in specific areas of the face such as the nasolabial fold, the marionette line, and the eye trough giving a strange appearance that does not look natural. Even with a volumizing purpose, the injection of HA can sometimes produce clinically detectable nodules or lumps where the filler is deposited. AIMS: To develop a new technique of injecting HA that can provide more natural results and avoid the lumpiness and nodular appearance that sometimes occurs with the injection of HA. To detect whether mixing HA with diluted anesthetic agent modifies its behavior. SETTINGS AND DESIGN: Prospective, case control, single-center study on a private clinic setting. MATERIALS AND METHODS: Eighty six patients were enrolled in this study. All of them had a previous treatment with nondiluted HA using a needle at least a year before. Patients were injected with 8 mL of reticulated HA (RHA) mixed with 6 mL of saline and 2 mL of anesthetic agent. The mixture was administered through a cannula inserted in the face, one at mid-cheek and another at frontal-temporal point of entry. Owing to the lifting effect of this mixture we called this procedure liquid lift (LL). Patients were evaluated 1 month, 6 months, and a year later and asked to compare the LL with previous experiences in terms of natural look, pain, and appearance of nodules. STATISTICAL ANALYSIS USED: Student's t-test. RESULTS: One month after the treatment, 83 out of 86 patients (96.5%) thought LL produced a more natural look than the previous treatment with the needle. Sixty two (72%) considered LL less painful than the previous treatment and only eight (9.3%) could detect lumps or nodules 1 month after LL was performed compared with 46 (53.5%) that described this problem with previous needle injections. The incidence of bruising was also clearly lower (7% with LL vs 17.4% with traditional needle). CONCLUSIONS: Injection of diluted HA with saline and anesthetic agents through a cannula all over the face or LL can provide more natural results and less lumps or nodules, and is less painful than traditional treatments involving needle injection of nondiluted HA.


34. Eilers, R. E. J. M. D., et al. (2016). "A Combination Approach to Surgical Scars." Dermatologic Surgery 42 Supplement(2): S150-S156. BACKGROUND: Scar formation from surgical procedures is an unavoidable risk. Despite measures taken by both the surgeon and patient during the perioperative and postoperative periods to maximize cosmesis, some patients will wish to pursue surgical or laser scar revision., OBJECTIVE: The authors propose a treatment algorithm to assist in approaching surgical scar revision with combination treatments., MATERIALS AND METHODS: A PubMed search was performed on various surgical scar revision techniques. The authors augment these findings with their own personal experiences., RESULTS: Reports of surgical excision, intralesional corticosteroid injection, intralesional 5-fluorouracil injection, pulse dye laser treatment, nonablative fractional laser resurfacing, ablative fractional laser resurfacing, and microneedling and fractional needle radiofrequency, used in isolation or combination, were found. The authors also provide clinical photographs documenting improvement in appearance of surgical scars using these treatments., CONCLUSION: Surgical scars are best treated with a combination approach to address various features of the scar. The authors propose a treatment algorithm with multiple treatment options and how to combine them safely and

Although dermal fillers are generally accepted as safe and well-tolerable cosmetic tools, adverse reaction still forms a prognostic problem. The aim of this study was to demonstrate the clinicopathologic patterns of dermal filler complications in our center. A 5-year single-center study that included patients complained from filler complications and referred to the dermatopathology unit in Al-Azhar University for histologic assessment. The study included 38 female patients with an average age of 47 years. The mean onset of complications was 14.6 +/- 5.27 months after injection. The injected material included hyaluronic acid (18.4%), silicone (52.6%), bovine collagen (15.8%) and polyacrylamide hydrogel (13.2%). Most lesions were located on the face (55.3%), less commonly on the hands (18.4%), buttocks (21%), and rarely on the vulva (5.3%). The clinical spectrum included indurated plaque (23.7%), nodular lesion (31.6%), inflammatory mass (15.8%), atrophic lesion (10.5%), skin discoloration (13.1%) and ulceration (5.3%). Histologically, granulomatous reaction was the major finding, either a foreign body granuloma (34.2%) or infectious granuloma (13.2%). Other histologic reactions included dermal pseudocysts with chronic inflammation (26.3%), dermal fibrosis (15.8%), and eosinophilic panniculitis (10.5%). Our results confirmed that dermal fillers could be manifested with variable clinical presentations and show different histologic reactions. Because of long-standing duration until complications occur, history taking is crucial and should be emphasized in every suspected patient. It is hoped that this article will increase awareness for recognition of these variable complications and help select the appropriate therapy.


BACKGROUND: A microfocused ultrasound system with visualization (MFU-V) is currently indicated for use as a noninvasive dermatological aesthetic treatment to lift the eyebrows, lax submental and neck tissue, and improve lines and wrinkles of the decollete., OBJECTIVE: To determine the existence of any safety signals when combining MFU-V with botulinum toxin-A and/or semipermanent and temporary dermal fillers., MATERIALS AND METHODS: A retrospective chart review was performed using subjects who received aesthetic treatments including incobotulinumtoxinA injection, cohesive polydensified matrix hyaluronic acid (CPM HA) dermal fillers, and calcium hydroxyapatite (CaHA) dermal fillers within 6 months of treatment with MFU-V in the same or different anatomic areas., RESULTS: All subjects (N = 101; 96 female; 25-70 year old) received MFU-V, 18% received incobotulinumtoxinA injections, and 81% were treated with CPM HA and/or CaHA fillers. Seven adverse events (7%) were reported: bruising/purpura (n = 4), swelling (n = 1), paresthesia (n = 1), and herpes simplex virus (HSV) outbreak (n = 1). Only the HSV outbreak was considered to be related to combined treatments., CONCLUSION: Although limited by relatively few subjects, the results of the present study suggest that the safety profile of MFU-V combined with other aesthetic products is consistent with the
safety profiles of the individual treatments., (C) 2016 by the American Society for Dermatologic Surgery, Inc. Published by Wolters Kluwer Health, Inc. All rights reserved.


BACKGROUND: Lip augmentation with hyaluronic acid fillers is an established procedure. As monophasic polydensified hyaluronic acid products with variable density CPM-HAL1 (Belotero(R) Balance Lidocaine) and CPM-HAL2 (Belotero(R) Intense Lidocaine) are qualified for beautification and particularly natural-looking rejuvenation, respectively.

OBJECTIVES: Assessment of handling and outcome of lip augmentation using the lidocaine-containing hyaluronic acid fillers CPM-HAL1 and CPM-HAL2.

MATERIALS AND METHODS: Data from patients who received lip augmentation by means of beautification and/or rejuvenation using CPM-HAL1 and/or CPM-HAL2 were documented. Observation period was 4 months, with assessment of natural outcome, evenness, handling, fluidity, distribution, malleability, tolerability, as well as patient satisfaction and pain.

RESULTS: In total, 146 patients from 21 German centres participated. Physicians rated natural outcome and evenness as good or very good for > 95 % of patients. Handling, fluidity, distribution and malleability were assessed for both fillers as good or very good in > 91 % of patients. At every evaluation point, more than 93 % of patients were very or very much satisfied with the product. A total of 125 patients (85.6 %) experienced transient injection-related side effects. Pain intensity during the procedure was mild (2.72 +/- 1.72 on the 0-10 pain assessment scale) and abated markedly within 30 min (0.42 +/- 0.57).

CONCLUSIONS: Lip augmentation with hyaluronic acid fillers produced a long-term cosmetic result. Due to the lidocaine content, procedural pain was low and transient. Accordingly, a high degree of patient satisfaction was achieved that was maintained throughout the observation period.


BACKGROUND: Hyaluronic acid (HA) filler is an important dermatological procedure. Although many studies have reported clinical improvement with this procedure, histology with morphometric evidence is not well documented.

OBJECTIVE: To evaluate the clinical and histological results of a HA filler injection and to quantify dermis remodeling at 3 and 9 months after HA injections into aged faces.

MATERIALS AND METHODS: Twenty patients were enrolled in this study. Hyaluronic acid filler was injected into the nasolabial folds and preauricular regions of the patients. Skin biopsies of the preauricular regions were performed before the procedure and at 3 and 9 months after the procedure.

RESULTS: Sixteen women (aged 40-50 years) completed the clinical study and demonstrated improvement for 12 months. Twenty patients completed the histologic studies. Morphologic evaluation showed increases in the epidermal layers. The morphometric study showed a statistically significant increase in collagen fibers at 3 and 9 months after the procedure (34.2% +/- 31.5% and 39.5% +/- 39.7%, respectively, p < .05).

CONCLUSION: Sustained clinical results for HA filler can be explained not only by the presence of HA gel on the dermis but also by the dermal remodeling induced by HA filler injected into the face.


BACKGROUND: Dermal fillers have continuously been under development to increase safety, efficacy, and longevity. Biostimulatory dermal fillers, such as calcium hydroxylapatite fillers, have already been shown to be superior in efficacy compared to nonanimal stabilized hyaluronic acid (NASHA)-based fillers. AIMS: In this randomized split-face study, we compared a novel biostimulatory polycaprolactone (PCL)-based dermal filler with a NASHA-based dermal filler, for safety, efficacy, and duration of cosmetic correction for the treatment of nasolabial folds (NLFs). PATIENTS/METHODS: Forty subjects received a PCL-based dermal filler in one of their NLFs, and a NASHA-based dermal filler on the contralateral side. Efficacy was evaluated based on the Wrinkle Severity Rating Scale and Global Aesthetic Improvement Scale. RESULTS: After 6, 9, and 12 months post-treatment, NLFs treated with the PCL-based dermal filler showed statistically significant improvements on the Wrinkle Severity Rating Scale and greater improvements on the GAIS compared to NLFs treated with the NASHA-based dermal filler. Both products were found to be equally safe and well tolerated. CONCLUSION: Our results suggest that PCL-based dermal fillers offer longer-lasting performance over NASHA-based dermal fillers in NLFs treatment.


BACKGROUND: Acne scarring remains a difficult problem for patients and physicians. Often it is treated as a two-dimensional disease with lasers and similar devices, whereas it is really a three-dimensional problem. Fillers have been used for many years but recently fillers with more lifting potential have been made available and serve the purpose of the selective elevation of atrophic scars, adding the third dimension to treatment. METHODS: Five patients with atrophic acne scarring were selected in this pilot study. Each patient was treated twice with a 3-month follow up from the second treatment. A vertical modified tower technique was used with a hyaluronic acid filler to lift each scar and support the skin to adopt a more flattened appearance. RESULTS: The mean scar count declined from 48.8 scars to 15.4 visible after the second session. The mean volume to total correction with filler of all scars declined from 1.144 mL to 0.525 mL from the first to second session. Global subjective improvement was assessed at 5.4 and 5.5 (-3 to +10 scale). The static objective grading scale showed an improvement from 3.2 at time of first treatment to 3.0 at the second, to 2.6 at final review. CONCLUSIONS: The relative speed, accuracy and efficacy of high lift hyaluronic acid is shown in this small case series with subjective and objective measurement.


The article is a detailed update regarding cosmetic injectable fillers, specifically focusing on hyaluronic acid fillers. Hyaluronic acid-injectable fillers are used extensively for soft tissue volumizing and contouring. Many different hyaluronic acid-injectable fillers are available on the market and differ in terms of hyaluronic acid concentration, particle size,
cross-linking density, requisite needle size, duration, stiffness, hydration, presence of lidocaine, type of cross-linking technology, and cost. Hyaluronic acid is a natural component of many soft tissues, is identical across species minimizing immunogenicity has been linked to wound healing and skin regeneration, and is currently actively being studied for tissue engineering purposes. The biomechanical and biochemical effects of HA on the local microenvironment of the injected site are key to its success as a soft tissue filler. Knowledge of the tissue-device interface will help guide the facial practitioner and lead to optimal outcomes for patients.

Fillers belong to the most frequently used beautifying products. They are generally well tolerated, but any one of them may occasionally produce adverse side effects. Adverse effects usually last as long as the filler is in the skin, which means that short-lived fillers have short-term side effects and permanent fillers may induce life-long adverse effects. The main goal is to prevent them, however, this is not always possible. Utmost care has to be given to the prevention of infections and the injection technique has to be perfect. Treatment of adverse effects is often with hyaluronidase or steroid injections and in some cases together with 5-fluorouracil plus allopurinol orally. Histological examination of biopsy specimens often helps to identify the responsible filler allowing a specific treatment to be adapted.

BACKGROUND: Esthetic interventions are an integral part of today's dermatology. A plethora of novel agents and techniques is currently being launched on the market accompanied by a variety of side effects. METHOD: We summarize the most common adverse events of fillers, laser treatments, and injection of botulinum toxin and present feasible means of prevention and management. RESULTS: The profile of adverse events is more favorable in temporary fillers such as hyaluronic acid than in permanent ones. The most common filler-related adverse events include changes of skin color and unspecific swelling. Neural and vascular dysfunctions are observed less frequently, but may result in severe tissue necrosis or loss of vision. Undesirable events of laser treatments largely depend on the applied modality, localization, and indication. Local effects comprise erythema, swelling, crusting, blister formation, and weeping in extreme cases. The formation of laser-induced scarring is more likely to occur in lasers with high energies. Most adverse events of botulinum toxin are mild and transient. Pain and redness around the sites of injection are common. However, a poor injection technique and injection of too many units can trigger major motoric impairment with ptosis and dysarthria. CONCLUSION: Excellent results can be achieved with esthetic interventions. To guarantee a maximum amount of safety and to minimize risks it is of paramount importance to work with clear indications and respect contraindications. It is important to recognize early adverse events to achieve satisfactory results and avoid severe complications.

Long-term follow-up data following 2 breast enhancement treatments with stabilized hyaluronic acid (HA) gel are limited. Although HA gel is no longer marketed for breast enhancement, there is a clinical need for information about follow-up of previously treated women. A multicenter, noncomparative study was conducted in women seeking
breast enhancement. Subjects received 1 treatment of HA gel (maximum, 100 mL/breast); a subgroup underwent retreatment 9 months later. Follow-up was conducted for 24 months after last treatment; endpoints included magnetic resonance imaging for estimation of gel degradation, adverse events, breast examinations, Global Esthetic Improvement Scale, and satisfaction ratings. Seventy-one subjects received 1 treatment, with 22 (31%) receiving retreatment after 9 months. Twenty-four months after last treatment, the mean percentage of remaining gel was 17% in the single-treatment group and 21% in the retreatment group; complete degradation had not occurred in any subject. The most commonly reported treatment-related adverse events were implant-site nodules, medical device implantation events, capsular contracture associated with breast implant, and injection-site nodules; most were mild to moderate and required no intervention. Based on subject Global Esthetic Improvement Scale ratings, 36% of breasts in the single-treatment group and 50% of breasts in the retreatment group were improved 24 months after last treatment, but subject satisfaction had returned to baseline levels. Some gel remained in all subjects 24 months after last treatment. Although single treatment and retreatment were generally well tolerated, physicians need to be aware of common treatment-related complications to manage them adequately.

Since introduction of the first fillers in the 1980s a multitude of substances has been developed and approved for facial contour augmentation and correction of skin defects. Here we present the interesting case of a patient who presented to us with a delayed infection 6 weeks after augmentation of the upper lip with a hyaluronic acid. We observed full convalescence after operative and high-dose antibiotic treatment of the abscesses. Generally speaking, complications after augmentation with resorbable fillers are rare. However, complications might occur even within unexpected time periods and therefore need our special attention.

BACKGROUND: A variety of fillers is commonly used for tissue augmentation as well as skin rejuvenation, and consist of a large heterogeneous group of biomaterials. The objective was to provide an overview and classification of the most commonly injected filler materials and filler-related complications including therapy. METHOD: A summary of the current literature and common associated side effects is provided from a personal clinical perspective. RESULTS: According to degradability, filler materials can be classified as temporary (degradable), semi-permanent, and permanent (nondegradable). Temporary fillers such as hyaluronic acid and collagen are completely degraded by the surrounding tissue within several months. Semi-permanent fillers are degradable, but may induce longer-lasting secondary effects. Permanent fillers such as silicone and mineral oil derivatives are not biodegradable and have been increasingly abandoned because of severe and irreversible side effects. The most common filler-related adverse events include pigmentation changes, edema and post-injection deformations. Visible or palpable nodules can be due to filler accumulation, formation of granuloma, or infection. CONCLUSIONS: Substantial knowledge of the chemical and clinical features of the injected materials is indispensable for safe and efficient application. Early recognition of filler-related adverse effects is important to avoid severe complications and to achieve optimal results.

BACKGROUND: Hyaluronic acid (HA) dermal fillers are effective and safe for correction of facial rhytides. A new volumizing HA filler, 20 mg/ml HA dermal filler (Juvederm(R) Voluma(R), Allergan Inc., Irvine, CA), is the only HA filler with a FDA indication for facial volumization due to age-related facial volume loss. OBJECTIVE: Evaluate the biological properties, including biochemical, biophysical and rheological, of this new 20 mg/ml HA dermal filler and discuss the importance of these properties in clinical applications.

METHODS AND MATERIALS: A systematic search of the computerized bibliographic databases Medline, Embase, Embal, Biosis, SciSearch, Pascal, HCAPlus, IPA, and Dissertation Abstracts with key term "Voluma." Four articles on the biological properties of this new 20 mg/ml HA dermal filler were suitable for inclusion in this review. RESULTS: Biological analysis of elasticity and viscosity values of this new 20 mg/ml HA dermal filler demonstrated intermediate properties in three studies and high in one study compared to other HA dermal fillers. This 20 mg/ml HA dermal filler retained the highest elasticity and viscosity values at temperature of 37 degrees C. Histology demonstrated that this 20 mg/ml HA dermal filler has an intermediate pattern of distribution within the superficial and deep reticular dermis. CONCLUSION: This 20 mg/ml HA dermal filler demonstrated volumizing ability, and maintaining viscosity and free-flowing characteristics for easy injection, tissue lifting, and molding. We hope future research incorporates biological properties analysis of this HA dermal filler in clinical trials.


BACKGROUND: Dermal fillers are important for facial aesthetic enhancement as patients are favoring non-surgical procedures with minimal recovery time. Voluma is a volumizing hyaluronic acid filler, 20 mg/ml HA dermal filler, which was FDA-approved in 2013 as the first dermal filler for treatment of age-related volume loss in the midface. OBJECTIVE: We sought to systematically review clinical studies and expert opinions of this 20 mg/ml HA dermal filler and to provide evidence-based recommendations and expert opinions.

METHODS AND MATERIALS: A search of the computerized bibliographic databases Medline, Embase, Embal, Biosis, SciSearch, Pascal, HCAPlus, IPA, and Dissertation Abstracts was performed on August 18th 2014. RESULTS: Thirteen articles met inclusion and were included in our review: clinical trials with this 20 mg/ml HA dermal filler (10) and expert opinions and questionnaire survey studies of experts (3). This 20 mg/ml HA dermal filler has shown consistent, favorable results for treatment of age-related facial volume loss, aesthetic enhancement, and HIV facial lipoatrophy. CONCLUSION: HA fillers are safe and effective with minimal recovery time and complications. Future studies with longer follow-up period and use of this 20 mg/ml HA dermal filler on areas other than midface may provide additional efficacy and safety outcomes.


Although cosmetic facial soft tissue fillers are generally safe and effective, improper injections can lead to devastating and irreversible consequences. We represent the first known case of posterior ciliary artery occlusion caused by hyaluronic acid. A 41-year-old female presented with right visual loss 7 hours after receiving cosmetic hyaluronic acid injections into her forehead. Examination revealed no light perception in the right eye and multiple dark ischemic area of injection over the forehead and nose. The right fundus revealed a pink retina with optic nerve edema. Fluorescein angiogram showed several
filling defects in the choroidal circulation and late hyperfluorescence in the choroid. A right posterior ciliary artery occlusion and embolic occlusion of facial artery branches was diagnosed. With hyaluronidase injection, hyperbaric oxygen therapy, oral aspirin, oral acetazolamide and dexamethasone venotransfuse treatment, the patient's forehead and nasal skin improved and vision recovered to hand movements. With proper technique, vascular occlusion is rare following facial filler injection. Vision consequences can be severe if filler emboli enter the ocular circulation. Physicians should be aware of this potential side effect, recognize its presentation, and be knowledgeable of effective management.

The tear trough or infraorbital hollow is a challenging area to treat, and only a few fillers are suitable for this delicate area. We report on a European case series of six subjects with mild to severe tear troughs who received treatment with cohesive polydensified matrix (CPM(R)) technology hyaluronic acid gel (Belotero(R) Balance). The product was injected as small depots (up to ten small boli 0.2 mL maximum each per side) at the supraperiosteal level along or below the orbital rim. Follow-up visits took place at 1, 3, 6, and 9 months after injection for independent evaluation of the clinical effect using the Merz Aesthetics Scale for infraorbital hollows and the Global Aesthetic Improvement Scale. Adverse events were also recorded. Mean hollowness scores were considerably improved compared with baseline in all subjects. In all women, the improvements remained throughout the 9-month study, with none reverting to their baseline score. Subjects' satisfaction with treatment was very high throughout the study, and all women stated that they would repeat treatment with the same product. The CPM hyaluronic acid gel was well tolerated. CPM hyaluronic acid gel is a safe and effective treatment for the tear trough area.

The tear trough or infraorbital hollow is a challenging area to treat, and only a few fillers are suitable for this delicate area. We report on a European case series of six subjects with mild to severe tear troughs who received treatment with cohesive polydensified matrix (CPM(R)) technology hyaluronic acid gel (Belotero(R) Balance). The product was injected as small depots (up to ten small boli 0.2 mL maximum each per side) at the supraperiosteal level along or below the orbital rim. Follow-up visits took place at 1, 3, 6, and 9 months after injection for independent evaluation of the clinical effect using the Merz Aesthetics Scale for infraorbital hollows and the Global Aesthetic Improvement Scale. Adverse events were also recorded. Mean hollowness scores were considerably improved compared with baseline in all subjects. In all women, the improvements remained throughout the 9-month study, with none reverting to their baseline score. Subjects' satisfaction with treatment was very high throughout the study, and all women stated that they would repeat treatment with the same product. The CPM hyaluronic acid gel was well tolerated. CPM hyaluronic acid gel is a safe and effective treatment for the tear trough area.

This study was conducted for evaluation of the ability to maintain efficacy and biocompatibility of cross-linked dextran in hydroxypropyl methylcellulose (DiHM) and cross-linked dextran mixed with PMMA in hydroxypropyl methylcellulose (PDiHM), compared with hyaluronic acid (HA) filler. Saline and HA solution was administered in the negative and positive control groups, and DiHM and PDiHM were administered in the test groups (n = 10 in each group). The site of cranial subcutaneous injection was the midpoint of the interpupillary line, and the site of intraoral submucosal injection was the ridge crest 2 mm below the cervical line of the mandibular left incisor. Before and immediately after filler injection, intraoral photos and lateral cephalometric radiographs were taken for analysis and comparison of the effect of the filler on the injection sites. The filler injected areas were converted into sequential size changes (%) of the baseline. Histomorphologic examination was performed after 12 weeks. The smallest value in the filler injected area was observed during the experimental period in the normal saline group (p < 0.001), which was almost absorbed at 4 weeks (7.19% +/- 12.72%). The HA group exhibited a steady decrease in sequential size and showed a lower value than the DiHM and PDiHM groups (saline < HA < DHiM, PDHiM, p < 0.001). DiHM and PDiHM tended to increase for the first 4 weeks and later decreased until 12 weeks. In this study on DiHM and PDiHM, there was no histological abnormality in cranial skin and oral mucosa. DiHM and PDiHM filler materials with injection system provide an excellent alternative surgical method for use in oral and craniofacial fields.


BACKGROUND: Facial aging in the midface reflects cumulative results of multiple intrinsic and extrinsic factors over time. Midfacial rejuvenation procedures can make a positive impact on facial attractiveness and patient satisfaction., OBJECTIVE: To review evidence and clinical experience using combination treatments for midfacial rejuvenation to achieve optimal outcomes., MATERIALS AND METHODS: This article provides a review of published scientific evidence supporting the use of combination therapy in midfacial rejuvenation. In addition, the authors share their cumulative clinical experience and best practices for combination treatments in the midface., RESULTS: Clinical experience and evidence shows that combining multiple aesthetic therapies targeting multiple aspects of the aging process provides optimal results, with greater overall efficacy and a higher level of patient satisfaction., (C) 2016 by the American Society for Dermatologic Surgery, Inc. Published by Wolters Kluwer Health, Inc. All rights reserved.


BACKGROUND: Hyaluronic acid (HA) fillers and poly-L-lactic acid (PLA) fillers are frequently used to correct facial wrinkles. AIM: To compare the efficacy and safety of a novel injectable poly-L-lactic acid (PLA) filler and a well-studied biphasic HA filler for the treatment of moderate to severe nasolabial folds. METHODS: In this multicentre, randomized, evaluator-blinded, comparative study, subjects were randomized for injections with PLA or HA into both nasolabial folds. Efficacy was determined by calculating the change in Wrinkle Severity Rating Scale (WSRS) relative to baseline. Local safety was assessed by reported adverse events. RESULTS: At week 24, mean improvement in WSRS from baseline was 2.09 +/- 0.68 for the PLA side and 1.54 +/- 0.65 for the HA side. Both injections were well tolerated, and the adverse reactions were mild
and transient in most cases. CONCLUSIONS: PLA provides noninferior efficacy compared with HA 6 months after being used to treat moderate to severe nasolabial folds.


BACKGROUND: Hyaluronic acid dermal fillers are most frequently used for unwanted wrinkles. Recently, lidocaine has been incorporated into hyaluronic acid fillers to reduce injection discomfort. METHODS: A randomized, multicenter, double-blind, intraindividual trial was designed to compare a new lidocaine-containing monophasic hyaluronic acid filler (Neuramis Deep Lidocaine) with a lidocaine-containing biphasic hyaluronic acid filler (Restylane Perlane-L) in moderate to severe nasolabial folds. Fifty-eight patients with moderate to severe nasolabial folds were randomized to an injection of Neuramis or Perlane-L in the left or right side of the face. Clinical efficacy and safety were assessed by blinded investigators, independent expert panels, and patients based on the Wrinkle Severity Rating Scale and the Global Aesthetic Improvement Scale at weeks 8, 16, and 24 after the injection. RESULTS: Wrinkle Severity Rating Scale improvement from baseline with Neuramis (1.64 +/- 0.74) was significantly greater than with Perlane-L (1.45 +/- 0.54) at week 24 (p < 0.05). The mean Global Aesthetic Improvement Scale score at week 24 was 2.36 +/- 0.55 for Neuramis and 2.00 +/- 0.50 for Perlane-L (p < 0.05). However, the difference in pain reduction between Neuramis- and Perlane-L-treated sides was not statistically significant. CONCLUSIONS: The efficacy and safety of Neuramis are comparable to those of Perlane-L in Wrinkle Severity Rating Scale and Global Aesthetic Improvement Scale improvement for the management of nasolabial folds. Furthermore, the difference in pain reduction between the two fillers was not clinically significant.

CLINICAL QUESTION/LEVEL OF EVIDENCE: Therapeutic, I.


As demonstrated by American Society of Plastic Surgeons statistics (2013), patients seeking nonsurgical facial rejuvenation are increasing. A variety of temporary and semipermanent soft-tissue fillers, such as hyaluronic acid, poly-L-lactic acid, and calcium hydroxylapatite, are readily available; however, they have not been proven effective in treating facial acne scarring. Patient tolerance for the inconvenience and repeat cost of short-term, temporary fillers is waning as newer generation fillers with longer durations are coming on the market. Permanent injectable fillers, such a Bellafill (Suneva Medical Inc., San Diego, Calif.), represent a desirable solution for patients who want a long-term result. With the recent Food and Drug Administration approval for the treatment of moderate-to-severe, atrophic, distensible facial acne scars on the cheek(s) in patients over the age of 21 years, Bellafill (polymethylmethacrylate collagen) represents an effective solution for the treatment of facial acne scarring of the face while maintaining an excellent safety profile.

Facial changes with aging include thinning of the epidermis, loss of skin elasticity, atrophy of muscle, and subcutaneous fat and bony changes, all which result in a loss of volume. As temporal bones become more concave, and the temporalis atrophies and the temporal fat pad decreases, volume loss leads to an undesirable, gaunt appearance. By altering the temporal fossa and upper face with hyaluronic acid filler, those whose specialty is injecting filler can achieve a balanced and more youthful facial structure. Many techniques have been described to inject filler into the fossa including a "fanned" pattern of injections, highly diluted filler injection, and the method we describe using a three-injection approach. Complications of filler in the temporal fossa include bruising, tenderness, swelling, Tyndall effect, overcorrection, and chewing discomfort. Although rare, more serious complications include infection, foreign body granuloma, intravascular necrosis, and blindness due to embolization into the ophthalmic artery. Using reversible hyaluronic acid fillers, hyaluronidase can be used to relieve any discomfort felt by the patient. Injectors must be aware of the complications that may occur and provide treatment readily to avoid morbidities associated with filler injection into this sensitive area.


BACKGROUND: There are several treatments for wrinkles and depressed areas of the face, hands, and body. Hyaluronic acid is effective, but only for 6 months to 1 year. Autologous fat grafting may cause damage during tissue harvest. METHODS: In this study, patients were injected with platelet-rich plasma plus basic fibroblast growth factor (bFGF). Platelet-rich plasma was prepared by collecting blood and extracting platelets using double centrifugation. Basic fibroblast growth factor diluted with normal saline was added to platelet-rich plasma. There were 2005 patients who received platelet-rich plasma plus bFGF therapy. RESULTS: Of the 2005 patients treated, 1889 were female and 116 were male patients; patients had a mean age of 48.2 years. Treated areas included 1461 nasolabial folds, 437 marionette lines, 1413 nasojugal grooves, 148 supraorbital grooves, 253 midcheek grooves, 304 foreheads, 49 temples, and 282 glabellae. Results on the Global Aesthetic Improvement Scale indicated that the level of patient satisfaction was 97.3 percent and the level of investigator satisfaction was 98.4 percent. The period for the therapy's effectiveness to become apparent was an average of 65.4 days. Platelet-rich plasma plus bFGF therapy resulted in an improved grade on the Wrinkle Severity Rating Scale. Improvement was 0.55 for a Wrinkle Severity Rating Scale grade of 2, 1.13 for a Wrinkle Severity Rating Scale grade of 3, 1.82 for a Wrinkle Severity Rating Scale grade of 4, and 2.23 for a Wrinkle Severity Rating Scale grade of 5. CONCLUSIONS: Platelet-rich plasma plus bFGF is effective in treating wrinkles and depressed areas of the skin of the face and body. The study revealed that platelet-rich plasma plus bFGF is an innovative therapy that causes minimal complications. CLINICAL QUESTION/LEVEL OF EVIDENCE: Therapeutic, IV.


Hyaluronic acid (HA) fillers have been widely used for soft-tissue augmentation. However, there can be various complications following HA filler injection. Skin necrosis is rare but one of the most disastrous side effects that, if not treated promptly and effectively, can result in permanent and potentially disfiguring scarring. Thus, early proper management is important. Herein we report a patient who experienced tissue necrosis of the glabellar
area after receiving filler injections that was successfully treated using platelet-rich plasma and provide full follow-up clinical photographs.


The authors previously reported that cultured human fibroblasts suspended in a hyaluronic acid filler can produce human dermal matrices with extended in vivo stability in animal and clinical studies. The present study was undertaken to determine the optimal viscosity and particle shape of hyaluronic acid filler as a scaffold for cultured human dermal fibroblasts to enhance the maximal viability of injected cells. The fibroblasts were suspended in either 1 of 3 hyaluronic acid viscosities at 2 different particle shapes. The viscosities used in this study were low (600,000-800,000 centipoises), moderate (2,000,000-4,000,000 centipoises), and high (8,000,000-12,000,000 centipoises). The particle shape was evaluated by testing round and irregular shapes. The fibroblast mixed bioimplants were injected into the back of individual athymic nude mice. The levels of type I collagen were measured using fluorescent-activated cell sorting (FACS) and immunohistochemical staining at 16 weeks after the injections. Results of FACS demonstrated that the mean cell ratio with human collagens in the moderate viscosity group was greater than those of control, low, and high viscosity groups. An immunohistochemical study showed similar results. The moderate viscosity group demonstrated the highest positive staining of human collagens. However, there were no significant differences between groups of irregular and round shape particles. A hyaluronic acid bioimplant with moderate viscosity is superior to that with low or high viscosity in the viability for human fibroblasts. However, the particle shape does not influence the viability of the fibroblasts.


Hyaluronic acid (HA) is biocompatible, easy to use and reversible. HA fillers are considered to be safe, although some complications can occur. At this time, hyaluronidase is used off-label for correction. A 41-year-old woman presented to our clinic for focal erythematous plaque on hyaluronidase injection site. She got the injection for correction of HA filler excess. The skin lesion continued for 7 days. Histopathologic findings were nonspecific. On intradermal skin test, allergic reaction to hyaluronidase were confirmed. Adverse effects of this hyaluronidase are uncommon with local injection site reactions most frequently reported. Allergy to hyaluronidase should be included in the differential diagnosis when focal erythema and swelling occur after hyaluronidase injection.


Cosmetic facial filler-related ophthalmic artery occlusion is rare but is a devastating complication, while the exact pathophysiology is still elusive. Cerebral angiography provides more detailed information on blood flow of ophthalmic artery as well as surrounding orbital area which cannot be covered by fundus fluorescein angiography. This study aimed to evaluate cerebral angiographic features of cosmetic facial filler-related ophthalmic artery occlusion patients. We retrospectively reviewed cerebral angiography of 7 patients (4 hyaluronic acid [HA] and 3 autologous fat-injected cases) showing
ophthalmic artery and its branches occlusion after cosmetic facial filler injections, and underwent intra-arterial thrombolysis. On selective ophthalmic artery angiograms, all fat-injected patients showed a large filling defect on the proximal ophthalmic artery, whereas the HA-injected patients showed occlusion of the distal branches of the ophthalmic artery. Three HA-injected patients revealed diminished distal runoff of the internal maxillary and facial arteries, which clinically corresponded with skin necrosis. However, all fat-injected patients and one HA-injected patient who were immediately treated with subcutaneous hyaluronidase injection showed preserved distal runoff of the internal maxillary and facial arteries and mild skin problems. The size difference between injected materials seems to be associated with different angiographic findings. Autologous fat is more prone to obstruct proximal part of ophthalmic artery, whereas HA obstructs distal branches. In addition, hydrophilic and volume-expansion property of HA might exacerbate blood flow on injected area, which is also related to skin necrosis. Intra-arterial thrombolysis has a limited role in reconstituting blood flow or regaining vision in cosmetic facial filler-associated ophthalmic artery occlusions.

68. Kim, Z. H., et al. (2015). "A composite dermal filler comprising cross-linked hyaluronic Acid and human collagen for tissue reconstruction." J Microbiol Biotechnol 25(3): 399-406. In this study, we developed a composite filler comprising cross-linked hyaluronic acid (HA) and human collagen (COL) derived from the human umbilical cord with the aim of improving its biocompatibility and longevity compared with commercially available fillers. After HA/ COL composite fillers were made in two different ratios (10:1 and 5:1), the physical properties of the fillers were evaluated. The interior morphologies and in vivo weight change of these hydrogels were also characterized at 1-16 weeks after injection into mice. To evaluate their biocompatibility and durability in vivo, we injected the composite fillers into nude mice subcutaneously. The variations of injected gel weight were measured and compared with the commercial dermal fillers (Restylane and TheraFill). The composites showed improved or similar physical properties (complex viscosity of 19-22 x 10(5) cP, and injection force of 10-12 N) over the commercial dermal fillers. Sixteen weeks following the injection, the ratio of remaining composite filler weight to initial weight (75.5 +/- 16.9%; 10:1) was shown to be greater than that of the commercial fillers (43.2 +/- 8.1%, Restylane; 12.3 +/- 5.3%, TheraFill). In addition, immunohistochemical analysis with angiogenesis-related markers such as isolectin and vWF revealed newly formed blood vessels and cellular influx into the composite filler, which were not observed in the other fillers. These results clearly suggest that the HA/COL composite filler is a superior candidate for soft tissue reconstruction. The filler we developed may be a suitable candidate as an injectable dermal filler for tissue augmentation in humans.


70. Ko, E. J., et al. (2015). "Correction of midface volume deficiency using hyaluronic acid filler and intradermal radiofrequency." J Cosmet Laser Ther 17(1): 46-48. Hyaluronic acid (HA) fillers are increasingly used for midface augmentation, which can be performed for facial rejuvenation. Previous study proved that radiofrequency (RF) treatment prior to HA filler injection may provide synergistic and long-lasting effects for the reduction of nasolabial fold wrinkles. Here, we report a case in which the efficacy of two different treatments using RF and HA filler and HA filler alone was assessed using a split-face design. In conclusion, the intradermal needle RF with HA filler may be a more
safe and effective method than HA filler alone for correcting midface volume deficit. Appropriate volume loss replacement should correct the flattening and furrowing of the central area of the mid-cheek, which is a consequence of the aging process. Also, it will provide a more youthful appearance. Hyaluronic acid (HA) fillers are an established intervention for correcting facial volume deficiency. In a previous study (1), radiofrequency (RF) was used to overcome the short duration of HA fillers and resulted in a good outcome.

In our contemporary postmodern society, a modified perception of the human body is accompanied by an increasing demand for body shaping procedures. The treatment needs to be effective but it is just as important that they are safe and can be easily integrated into the daily working and routine schedule. While the options for minimally invasive volume addition are largely limited to injectable implants based on hyaluronic acid or autologous fat, a multitude of options are available for volume reduction. Before deciding on the method of choice, the following needs to be considered: which indications need to be treated, the extent of the reduction in volume and how much pain and possible undesired reactions the patient is prepared to accept.

BACKGROUND: Early degradation is a common complaint for hyaluronic acid fillers. Although the combination of hyaluronic acid fillers with botulinum neurotoxin type A presented improved clinical results, objective measurement of hyaluronic acid volumes has not been previously assessed. METHODS: In this study, the authors have split the calvaria of the rabbit to mimic the glabellar region in humans. In this model, the authors applied hyaluronic acid alone to one side and hyaluronic acid combined with botulinum neurotoxin type A to the contralateral side. Two days and 3 months after the filler injection, magnetic resonance imaging was performed to assess the filler volumes. RESULTS: Average initial volume of filler only and filler combined with botulinum neurotoxin type A was 0.61 cm on both sides, and there was no difference between initial volumes of the two sides (p = 0.735). At the end of 3 months, average degraded volumes of filler-only and filler combined with botulinum neurotoxin sides were 0.33 cm and 0.19 cm, respectively, and the degradation difference was significant between the two groups (p = 0.001). End volumes for the filler-only and filler combined with botulinum neurotoxin sides were 0.28 cm and 0.42 cm, respectively, and end volumes between two sides were also statistically significant (p < 0.001). CONCLUSION: This study showed that hyaluronic acid filler application in combination with botulinum neurotoxin type A significantly decreases the degradation process and increases the remaining volume of the hyaluronic acid fillers at the end of the paralyzed period.

OBJECTIVE: In general, needling and injection are painful procedures, especially when the face is the target. Although local anesthetics (cream or tape) can be used to reduce the pain, they are not sufficiently effective. It has been suggested that vibration can reduce pain. The aim of this case study was to determine whether application of a vibration device to an area adjacent to the facial target area to be injected/needled would relieve pain. METHODS: Consecutive women scheduled to undergo facial injection with
hyaluronic acid or botulinum toxin were recruited. Half of the face was injected with concomitant vibration, whereas the other half was injected without vibration. The pain experienced by the women during both procedures was assessed using the Numeric Rating Scale. The safety of injection with vibration was also assessed. RESULTS: Of the 32 patients, 28 indicated that vibration relieved the pain, 3 stated that it had no effect, and 1 (who received deep botulinum toxin injections to the masseter muscle) complained that it made the pain worse. Vibration did not affect the safety of the injections. The average Numeric Rating Scale scores for the no-vibration and vibration injections were 4.5 +/- 1.5 and 2.3 +/- 0.9, respectively (P < .001). CONCLUSIONS: The Gate Control Theory of Pain explains why vibration reduces pain.


Hyaluronic acid (HA) is the most commonly used filler in aesthetic medicine. However, overcorrections are frequent even with experienced practitioner. Hyaluronidase is an enzyme that hydrolyzes HA. Hyaluronidase has been recently proposed to correct unsatisfactory results of HA injections in aesthetic medicine (overcorrection, asymmetry, Tyndall effect) and to treat immediate complications such as arterial or venous thrombosis. The objective of this technical note was to summarize the literature data regarding the efficacy, safety and technique of use of hyaluronidase. Hyaluronidase may be responsible for allergies. The practitioner should take this risk and the possible drug interactions into account before using this antidote in order to weigh up the risk/benefit ratio.


Understanding the role of volume loss in the aging face has resulted in a paradigm shift in facial rejuvenation techniques. Injectable materials for volume restoration are among the most widespread cosmetic procedures performed. A new approach to the aesthetics of facial aging is necessary to allow the greatest improvement from volumetric techniques while maintaining natural appearing results. Examining the face in terms of facial frames and facial shadows provides the fundamental basis for our injectable analysis.


BACKGROUND: Most of the complications associated with hyaluronic acid (HA) fillers can be addressed by hyaluronidase. Extensive experience with this enzyme was accumulated in ophthalmology and anesthesia. In dermatologic use multiple aspects still remain controversial. OBJECTIVE: To elucidate questions with regard to hyaluronidase use in HA-induced complications, including appropriate dosage, timing, and technique of delivery, differences in the activity of hyaluronidases of different origins, interaction between the enzymes and different HA gels, and safety issues. MATERIALS AND METHODS: Extensive review of the relevant literature was conducted. The conclusions are based on this review and personal author's experience. RESULTS: FDA-approved hyaluronidases provide predictable results and can be used interchangeably. A physician has to be closely familiar with specific characteristics of other hyaluronidases. Different brands of HA fillers have different sensitivity to degradation by hyaluronidase. For filler overcorrection or misplacement, low dose of the enzyme has to be injected directly into the palpable HA mass. In case of vascular accident, flushing of the ischemic area with high doses of hyaluronidase is required. Hypersensitivity reactions to hyaluronidase are so far not
reported in dermatologic literature. CONCLUSION: With increased popularity of HA fillers, hyaluronidase had become an indispensable tool in dermatology office. It is safe and reliable for treatment of HA-induced complications.


Loss of viscoelasticity is one of the primarily signs of skin aging, followed by appearance of visible wrinkles. Hyaluronic acid (HA)-based fillers are widely used to fill wrinkles and compensate for volume loss. Recent clinical observations demonstrate persistence of the filling effect longer than the biological availability of the filler. Stimulation of new collagen by cross-linked HA and up-regulation of elastin have been suggested as possible explanation to this observation and have been supported experimentally. Cross-linked HA substitutes for fragmented collagen in restoring extracellular matrix required for normal activity of fibroblasts, such as collagen and elastin production. To restore extracellular matrix efficiently, serial monthly treatments are required. Boosting of facial and nonfacial skin through fibroblast activation is a new indication for HA-based products. Injectable HA has also been recently registered in Europe as agents specific for the improvement of skin quality (Restylane Skinboosters). Further explanation of the possible mechanisms supported by long-term clinical examples is presented herein.


BACKGROUND: The upper face and periocular region is a complex and dynamic part of the face. Successful rejuvenation requires a combination of minimally invasive modalities to fill dents and hollows, resurface rhytides, improve pigmentation, and smooth the mimetic muscles of the face without masking facial expression., METHODS: Using review of the literature and clinical experience, the authors discuss our strategy for combining botulinum toxin, facial filler, ablative laser, intense pulsed light, microfocused ultrasound, and microneedle fractional radiofrequency to treat aesthetic problems of the upper face including brow ptosis, temple volume loss, A-frame deformity of the superior sulcus, and superficial and deep rhytides., RESULTS: With attention to safety recommendations, injectable, light, laser, and energy-based treatments can be safely combined in experienced hands to provide enhanced outcomes in the rejuvenation of the upper face., CONCLUSION: Providing multiple treatments in 1 session improves patient satisfaction by producing greater improvements in a shorter amount of time and with less overall downtime than would be necessary with multiple office visits., (C) 2016 by the American Society for Dermatologic Surgery, Inc. Published by Wolters Kluwer Health, Inc. All rights reserved.


A foreign body granuloma is a non-allergic chronic inflammatory reaction that is mainly composed of multinucleated giant cells. Foreign body granulomas may occur after the administration of any dermal filler. Factors such as the volume of the injection, impurities present in the fillers, and the physical properties of fillers affect granuloma formation. The formation of granulomas involves five phases: protein adsorption, macrophage adhesion, macrophage fusion, and crosstalk. The clinical and pathologic features of granulomas vary.
depending on the type of filler that causes them. Foreign body granulomas can be treated effectively with intralesional corticosteroid injections. Surgical excisions of granulomas tend to be incomplete because granulomas have ill-defined borders and moreover, surgical excisions may leave scars and deformities.


**BACKGROUND:** Asians have distinct facial characteristics due to underlying skeletal and morphological features that differ greatly with those of whites. This together with the higher sun protection factor and the differences in the quality of the skin and soft tissue create a profound effect on their aging process. Understanding of these differences and their effects in the aging process in Asians is crucial in determining effective utilization and placement of injectable products to ensure optimal aesthetic outcomes. **METHODS:** For younger Asian women, the main treatment goal is to address the inherent structural deficits through reshaping and the provision of facial support. Facial injectables are used to provide anterior projection, to reduce facial width, and to lengthen facial height. In the older group, the aim is for rejuvenation and also to address the underlying structural issues that has compounded due to age-related volume loss. **CONCLUSION:** Asian women requesting cosmetic procedures do not want to be Westernized but rather seeking to enhance and optimize their Asian ethnic features.


**BACKGROUND:** Asians increasingly seek non-surgical facial esthetic treatments, especially at younger ages. Published recommendations and clinical evidence mostly reference Western populations, but Asians differ from them in terms of attitudes to beauty, structural facial anatomy, and signs and rates of aging. A thorough knowledge of the key esthetic concerns and requirements for the Asian face is required to strategize appropriate facial esthetic treatments with botulinum toxin and hyaluronic acid (HA) fillers. **METHODS:** The Asian Facial Aesthetics Expert Consensus Group met to develop consensus statements on concepts of facial beauty, key esthetic concerns, facial anatomy, and aging in Southeastern and Eastern Asians, as a prelude to developing consensus opinions on the cosmetic facial use of botulinum toxin and HA fillers in these populations. **RESULTS:** Beautiful and esthetically attractive people of all races share similarities in appearance while retaining distinct ethnic features. Asians between the third and sixth decades age well compared with age-matched Caucasians. Younger Asians' increasing requests for injectable treatments to improve facial shape and three-dimensionality often reflect a desire to correct underlying facial structural deficiencies or weaknesses that detract from ideals of facial beauty. **CONCLUSIONS:** Facial esthetic treatments in Asians are not aimed at Westernization, but rather the optimization of intrinsic Asian ethnic features, or correction of specific underlying structural features that are perceived as deficiencies. Thus, overall facial attractiveness is enhanced while retaining esthetic characteristics of Asian ethnicity. Because Asian patients age differently than Western patients, different management and treatment planning strategies are utilized. **LEVEL OF
EVIDENCE V: This journal requires that authors assign a level of evidence to each article. For a full description of these Evidence-Based Medicine ratings, please refer to Table of Contents or the online Instructions to Authors www.springer.com/00266.


The lips and the eyes enhance facial beauty, and they have been highlighted since time immemorial. Rejuvenating the lips with fillers, frequently hyaluronic acid (HA), is a common procedure but requires expertise. The objective of this text is to describe the procedure in detail and cover the practical aspects of injecting lips with fillers. An analysis of treating lips with needles and cannulae has been made with special emphasis on achieving optimum results.


Injection of synthetic fillers for soft tissue augmentation is increasing over the last decade. One of the most common materials used is hyaluronic acid (HA) that is safe and temporary filler for soft tissue augmentation. We present a case of 54-year-old female who experienced vascular occlusion and nasal alar necrosis following HA injection to the nasolabial folds. She suffered from pain, necrosis, infection, and alar loss that finally required a reconstructive surgery for cosmetic appearance of the nose. The case highlights the importance of proper injection technique by an anesthesiologist, as well as the need for immediate recognition and treatment of vascular occlusion.


The common principle of injections in esthetic medicine is to treat and to prevent the signs of aging with minimal doses and with more precision and efficiency. This relies on functional, histological, ultrasound or electromyographic analysis of the soft tissues and of the mechanisms of facial skin aging (fine lines, wrinkles, hollows). These injections may be done with hyaluronic acid (HA) and botulinum toxin. The aim of this technical note was to present four delivery techniques allowing for more precision and low doses of product. The techniques of "vacuum", "interpores" and "blanching" will be addressed for HA injection and the concept of "Face Recurve" for botulinum toxin injection.


Injectable soft tissue filler procedures are becoming increasingly important for rejuvenating the aging face. The variety of available dermal fillers is increasing, and an understanding of their individual characteristics allows optimal outcomes. We provide an overview of the dermal fillers that were approved by the US Food and Drug Administration over the last 5 years.


Although various injection techniques of hyaluronic acid (HA) filler for facial rejuvenation have been developed, correction of deep wrinkles/grooves, such as the nasolabial fold (NLF), with intradermal or subdermal injections remains difficult. We tested the intradermal HA injection method to place multiple HA struts by (1) inserting a small needle perpendicularly to the wrinkle and (2) injecting HA as intradermal struts with the
skin fully stretched by the practitioner’s fingers. The results of both NLFs in 10 patients suggest that this technique improves NLFs and maintain the effects more consistently than conventional techniques, although the effects of both methods were almost lost after 6 months. Selective and/or combined application of this technique may enhance the current approach to facial rejuvenation with dermal fillers.


Although manufacturers’ instructions for use of dermal fillers ordinarily direct injection in the superficial, mid or deep dermis, or, in some cases, the hypodermis (subcutis), the precise depth of injection may not always be for injectors. In this article, investigators report findings gathered from histopathology, ultrasound, "live" one on one training injections, as well as application of a mathematical formula for depth calculation of the various layers within the dermis. Areas of particular interest are the superficial reticular dermis and the mid dermis. Following the depth measurements detailed by Della Volpe et al in 2012, investigators compare and contrast their own depth findings of the various layers, arriving at the conclusion that the depth of the dermis is not as deep as had been previously assumed. The investigators also develop an argument for the appropriate angles of injection for placement of dermal filler into the various layers, demonstrating that the heretofore widely used angles of 30 and 45 are far more acute than required. <br /> <br /> <em>J Drugs Dermatol.</em> 2016;15(4):483-490.


BACKGROUND: Combination treatments using hyaluronic acid (HA) fillers and botulinum toxin Type A (BoNT-A) are common in aesthetic medicine; however, this has been evaluated in only a few clinical studies. OBJECTIVE: To evaluate subject satisfaction, efficacy, and safety of BoNT-A (Speywood Unit; s.U) and a range of HA fillers for full-facial aesthetic rejuvenation. MATERIALS AND METHODS: A 6-month, multicenter, open-label clinical study, using BoNT-A (s.U) and 5 HA fillers to treat up to 13 facial zones. Subject satisfaction questionnaires were administered 3 weeks and 6 months after the last injection. Global aesthetic improvement and improvement on each treated zone as well as safety were evaluated. RESULTS: A high level of satisfaction was achieved throughout the study, with 96.5% of subjects at least satisfied with the full-facial aesthetic outcome at 3 weeks, and 92.9% at 6 months. More than 91% considered the treatment outcome to meet or surpass their expectations, and more than 94% would recommend the treatment to others. At Week 3, subject and investigator assessment showed aesthetic improvement for all subjects. The treatment was well tolerated. CONCLUSION: The combination of BoNT-A (s.U) and HA fillers results in high patient satisfaction and in an overall improvement of aesthetic outcomes and quality of life.

Glans penis augmentation (GPA) has received little attention from experts despite the existence of a subset of patients who may be dissatisfied with a small glans or poor tumescence of the glans during erection. Recently, GPA using an injectable filler or implantation of a graft or filler has been developed. Despite a demanding injection technique and inevitable uneven undulation of the glandular surface, GPA using injectable hyaluronic acid (HA) gel is a novel and useful therapy and an effective and safe procedure for soft tissue enhancement. For long-term presence of implants, timed supplementation can be used similar to that for fascial plasty. In complications such as mucosal necrosis of the glans penis, most cases occur from the use of non-HA gel or an unpurified form and misunderstanding of the management protocol for immediate side effects. Currently, GPA using injectable HA gel is not recommended in the International Society for Sexual Medicine guideline due to possible sensory loss. In a 5-year long-term follow-up of GPA by subcutaneous injection of HA gel, the residual volume of implants decreased by 15% of the maximal glandular circumference, but was still effective for alleviating the hypersensitivity of the glans penis in premature ejaculation patients. For efficacy in premature ejaculation, selection of appropriate candidates is the most important factor for success. GPA does not harm erectile function and is less invasive and irreversible compared to dorsal neurectomy. To refine the procedure, more interest and well-designed studies are required for the establishment of the procedure.


Skin aging is a combination of multifactorial mechanisms that are not fully understood. Intrinsic and extrinsic factors modulate skin aging, activating distinctive processes that share similar molecular pathways. One of the main characteristics of youthful skin is its large capacity to retain water, and this decreases significantly as we age. A key molecule involved in maintaining skin hydration is hyaluronic acid (HA). Concentration of HA in the skin is determined by the complex balance between its synthesis, deposition, association with cellular structures, and degradation. HA bio-equivalency and bio-compatibility have been fundamental in keeping this macromolecule as the favorite of the skincare industry for decades. Scientific evidence now shows that topically applied HA is unable to penetrate the skin and is rapidly degraded on the skin surface. SkinMedica's HA Rejuvenating Hydrator (SkinMedica Inc., an Allergan company, Irvine, CA) promotes restoration of endogenous epidermal HA homeostasis and provides instant smoothing and hydration of the skin. These dual benefits are accomplished through the combination of 2 breakthrough technologies: 1) a unique blend of actives powered by SkinMedica proprietary flower-derived stem cell extract that restores the endogenous production of HA; and 2) a proprietary mix of 5 HA forms that plump the skin, decreasing the appearance of fine lines/wrinkles. Pre-clinical studies demonstrated that HA induces expression of key epidermal differentiation and barrier markers as well as epidermal HA synthases. A decrease expression of hyaluronidases was also observed upon HA application. Initial clinical studies showed that within 15 minutes of application, HA instantly improves the appearance of fine lines/wrinkles and skin hydration. Subjects that continue using HA (for 8 weeks) demonstrated significant improvements in fine lines/wrinkles, tactile roughness, and skin hydration. In summary, the blend of these 2 key


BACKGROUND: The HARMONY study is the first clinical trial to assess the impact of a global approach to facial rejuvenation with several minimally invasive modalities, using patient-reported outcome measures. OBJECTIVE: Provide details of this treatment approach and describe investigators' experiences and recommendations based on this study.

METHODS: This multicenter, 4-month study evaluated subject satisfaction with and psychological impact of combined treatment with VYC-20L (Juvederm Voluma XC), HYC-24L (Juvederm Ultra XC), HYC-24L+ (Juvederm Ultra Plus XC), onabotulinumtoxinA (Botox), and bimatoprost 0.3% ophthalmic solution (Latisse). Treatment-naive adults with moderate-to-severe facial lines and folds and eyelash hypotrichosis received on-label, staged treatment with fillers. Bimatoprost was self-administered once daily for 17 weeks from day 1. OnabotulinumtoxinA was administered for glabellar lines, crow's feet lines, or both at month 3.

RESULTS: Overall, 100 subjects received bimatoprost for eyelash hypotrichosis, 96 received onabotulinumtoxinA for glabellar lines and/or crow's feet lines, and 96 received VYC-20L for midface volume deficit. From 17 to 96 subjects received HYC-24L and/or HYC-24L+ for nasolabial folds, oral commissures, marionette lines, perioral lines, or radial cheek lines. Injections of filler generally progressed from cranial to caudal, with midface injected first. Investigator-reported factors that may have contributed to the potential benefits of this approach include the critical role of the midface in facial aesthetics, use of lower volumes of filler in individual facial areas, and anesthetic effects.

CONCLUSION: The investigators' perspectives and experience with the injection pattern, sequencing, volumes, and techniques may provide valuable guidance for a multimodal approach to facial aesthetic treatment.

(C) 2016 by the American Society for Dermatologic Surgery, Inc. Published by Wolters Kluwer Health, Inc. All rights reserved.


BACKGROUND: The main application of hyaluronic acid filling, in esthetic medicine, is the augmentation of soft tissues. The carbon dioxide therapy, instead, improves quality and elasticity of the dermis and increases the oxygen release to the tissue through an enhancing of the Bohr's effect. The aim of the study was to compare the efficacy, tolerability, and effect duration of hyaluronic acid fillers and the use of carbon dioxide therapy plus hyaluronic acid in the cosmetic correction of nasolabial folds.

MATERIALS AND METHODS: Forty healthy female patients received a blinded and randomized treatment on nasolabial folds (hyaluronic acid in group A and hyaluronic acid plus subcutaneous injections of carbon dioxide in group B) for cosmetic correction of the nasolabial folds. The results were evaluated by two blinded plastic surgeons after the implant (1 week, 4 and 6 months) using a 1-5 graduated scale (GAIS), and at the same time, each patient was asked to express her opinion about the cosmetic result.

RESULTS: Any long-term adverse reaction was reported. The blinded evaluation at 4 and 6 months from the implant shows in all patients a maintenance of a good cosmetic result higher for the side treated with carbon dioxide therapy plus hyaluronic acid. CONCLUSIONS: At the control visit, 6 months after the treatment, the patients treated with hyaluronic acid plus carbon dioxide therapy maintain a satisfactory esthetic result while the nasolabial fold
treated only with hyaluronic acid shows, in almost all patients, a come back to pretreatment appearance.


**BACKGROUND:** The terms "biphasic" and "monophasic" have been used frequently as a means of differentiating hyaluronic acid (HA) fillers. This type of categorization is based on misinterpretations of the term "phase" and provides no help to the practitioner when selecting the most appropriate product for each indication, patient, and injection technique. **OBJECTIVE:** The purpose of this study was to analyze the properties of 2 HA filler families; Juvederm (JUV) (Allergan), often stated to be monophasic and Restylane (RES) (Galdema), often stated to be biphasic, and discuss what properties may have led to the use of the terms monophasic and biphasic. **MATERIALS AND METHODS:** Three different methods were used for JUV and RES: determination of extractable HA; determination of water uptake; and microscopy. **RESULTS:** The analyzed products were shown to contain both observable gel particles and extractable HA and have the ability to absorb added water. **CONCLUSION:** The categorization of HA fillers as biphasic or monophasic was shown to be scientifically incorrect and should therefore be avoided. Further analytical measurement of the properties leading to this misinterpretation can provide information to discriminate and categorize HA fillers on a sounder scientific basis.


**BACKGROUND:** Photodamaged skin of the chest is characterized by skin laxity, lines/wrinkles, hyperpigmentation, erythema, tactile roughness, atrophy, and telangiectasias., **METHODS:** A MEDLINE search was performed on combination treatments in chest rejuvenation, and the results are summarized. Practical applications for these combinations of procedures are discussed., **RESULTS:** Reports of injectable poly-L-lactic acid (PLLA), hyaluronic acid (HA), and chemical peels, along with lasers and light therapies such as intense pulsed light (IPL), vascular lasers, photodynamic therapy (PDT), nonablative fractionated lasers (NAFLs), ablative fractionated lasers (AFLs), and microfocused ultrasound (MFU) have been reported for chest rejuvenation. Few articles were discovered pertaining to combination therapy. The authors review their approaches to combination therapy., **CONCLUSION:** Multiple options exist alone or in combination for minimally invasive rejuvenation of the skin of the chest including PLLA, HA, chemical peels, IPL, vascular lasers, PDT, NAFL, AFL, and MFU. Little was found in the literature pertaining to the safety and efficacy of combining such procedures and devices. The authors’ experience in clinical practice is that combination, same day chest rejuvenation techniques can be performed safely. A combination approach often produces the most optimal outcome for the patient seeking chest rejuvenation., (C) 2016 by the American Society for Dermatologic Surgery, Inc. Published by Wolters Kluwer Health, Inc. All rights reserved.


Hyaluronic acid (HA)-based injectable fillers three-dimensionally restore the natural contours of the lips and perioral area, thereby reducing some signs of aging lips. To evaluate the short-term aesthetic impact of treatment with the HA dermal filler Juvederm(R) VOLBELLA(R) with Lidocaine, formulated utilizing VYCROSS(R) technology,
for enhancement or correction of asymmetry of the lips, evaluated using a patient-centric approach. Sixty-two subjects were enrolled in this study, conducted at two sites in Germany. Primary endpoints were satisfaction with improvement, look and feel of the lips, assessed by subject and physician at first visit and 4 weeks post-treatment. Immediately after injection at first visit, 83.6% of subjects were Extremely Satisfied, Very Satisfied or Satisfied with improvement in the lips, which increased to 94.1% and 93.0% of subjects with/without top-up treatment at follow-up, respectively. After injection at first visit, 61.7% of subjects rated the look and feel of their lips as Extremely Natural or Very Natural, which increased to 75.0% and 93.0% of subjects with/without top-up treatment, respectively. The HA dermal filler was associated with minimal discomfort, bruising or swelling of the lips; almost two-thirds of subjects (62%) returned to social engagements on the same day. The high degree of subject satisfaction with aesthetic improvement in the lips, as well as the natural look and feel, indicates that this HA dermal filler represents an effective treatment option for patients requiring lip enhancement.


The identification of specific fat compartments of the face has greatly improved the plastic surgeon's approach to facial rejuvenation. These superficial and deep compartments are discretely partitioned into multiple independent units by fascial barriers and undergo age-dependant volumetric changes. This knowledge has created a topographical map allowing for the direct and precise augmentation of those compartments that are deflated preferentially. These include the deep medial cheek, nasolabial, superficial middle, and lateral cheek compartments. Once this volume loss has been addressed, the overlying superficial musculoaponeurotic system and skin envelope can be treated to address laxity and bridge the compartments, creating a smooth cheek contour. Facial augmentation can be performed alone in the correct patient; however, it most often complements face-lifting. It is, therefore, important to have a thorough understanding of this anatomy and the changes that occur during aging.


INTRODUCTION: Hyaluronidase (HA) degrades hyaluronic acid, allowing flexibility in the use of hyaluronic acid-based fillers commonly used in facial correction. Potentially differing properties of available hyaluronidases and fillers may influence their interaction, leading to important differences in ultimate cosmetic results. This study examines the physical properties of various fillers after exposure to commonly available hyaluronidases in vitro to better inform their in vivo clinical use. METHODS: Four commonly used HA fillers were exposed to varying concentrations of Vitrase (ovine testicular hyaluronidase) and Hylenex (human recombinant hyaluronidase) in vitro. The gross properties of these fillers were then observed to evaluate time- and dose-response; photographs were obtained to allow visual comparison at 1 minute and 5 minutes post-exposure. RESULTS: At a concentration of 0.1 mL Vitrase to 0.2 mL filler, Restylane dissipated most followed by Juvederm; Belotero most retained its form. Hylenex at the same concentration showed similar results, again affecting Restylane most and Belotero least. Response to treatment with both hyaluronidases increased substantially over time, increasing progressively from exposure to 5 minutes post-exposure. When exposed to Hylenex at 15 U and 30 U to 0.2 mL filler, Belotero retained its form most, followed by Juvederm, Juvederm Voluma, and
then Restylane. The effects on filler structure increased with 30 U concentration vs 15 U concentration of Hylenex. DISCUSSION: Available hyaluronidases and HA fillers appear to have differing physical properties that influence their interaction in a time and dose-dependent manner. Knowledge of the ways in which specific fillers interact with different hyaluronidases may help achieve desired cosmesis when aiming to adjust delicate facial fillers.


BACKGROUND: Juvederm (R) Volbella (R) with Lidocaine is a hyaluronic acid filler suited for lip enhancement. OBJECTIVE: Evaluate the safety and effectiveness of Juvederm Volbella with Lidocaine versus non-animal stabilized hyaluronic acid with Lidocaine (Restylane-L(R)). METHODS: This study randomized 280 subjects desiring lip enhancement to Juvederm Volbella with Lidocaine or Restylane-L. Investigators rated outcomes using Allergan’s Lip Fullness Scale (LFS), Perioral Lines Severity Scale, and Oral Commissures Severity Scale. Independent central reviewers (ICRs) assessed 3-dimensional photographs using these scales. Noninferiority of Juvederm Volbella with Lidocaine to Restylane-L was based on ICR assessment of LFS responders (>/= 1-point improvement from baseline) at month 3. Subjects were evaluated up to 12 months and after repeat treatment. RESULTS: Juvederm Volbella with Lidocaine was noninferior to Restylane-L at 3 months. Investigator assessments showed significant improvements in lip fullness (P </= .03), perioral lines (P </= .04), and oral commissures (P </= .03) with Juvederm Volbella with Lidocaine versus Restylane-L at months 6 to 12. There was less acute swelling and fewer severe injection site responses with Juvederm Volbella with Lidocaine. Safety and effectiveness of repeat treatment with Juvederm Volbella with Lidocaine was comparable to initial treatment, regardless of initial filler. CONCLUSIONS: Juvederm Volbella with Lidocaine is safe and effective for lip and perioral enhancement, with effectiveness lasting up to 12 months.


BACKGROUND: Hyaluronic acid (HA) fillers are frequently used for the correction of facial soft-tissue defects. OBJECTIVE: To compare the efficacy and safety of a novel monophasic HA filler (mono-HA), and a well-studied biphasic HA filler (bi-HA), in the treatment of moderate to severe nasolabial folds. METHODS: In this randomized, evaluator-blinded, split-face comparative study, subjects were randomized for injections with mono-HA or bi-HA on the left or right side of the face. Efficacy was determined by calculating the change in the Wrinkle Severity Rating Score (WSRS) relative to baseline. Local safety was assessed on the basis of subject diary entries which recorded erythema, swelling, induration, pruritus, irritation, mass, hematoma, pain, and dryness. RESULTS: At week 24, the mean improvement in the WSRS from baseline was 2.18 +/- 0.42 for the mono-HA side and 2.16 +/- 0.41 for the bi-HA side. Both fillers were well-tolerated and adverse reactions were mild and transient in most cases. CONCLUSIONS: Mono-HA has a non-inferior efficacy to bi-HA in the treatment of moderate to severe nasolabial folds.


Soft tissue augmentation is a process of implanting tissues or materials to treat wrinkles or soft tissue defects in the body. Over the years, various materials have evolved to correct soft tissue defects, including a number of tissues and polymers. Autogenous
dermis, autogenous fat, autogenous dermis-fat, allogenic dermis, synthetic implants, and fillers have been widely accepted for soft tissue augmentations. Tissue engineering technology has also been introduced and opened a new venue of opportunities in this field. In particular, a long-lasting filler consisting of hyaluronic acid filler and living human mesenchymal cells called "injectable tissue-engineered soft tissue" has been created and applied clinically, as this strategy has many advantages over conventional methods. Fibroblasts and adipose-derived stromal vascular fraction cells can be clinically used as injectable tissue-engineered soft tissue at present. In this review, information on the soft tissue augmentation method using the injectable tissue-engineered soft tissue is provided.


BACKGROUND: Although the use of filling agents for soft-tissue augmentation has increased worldwide, most consensus statements do not distinguish between ethnic populations. There are, however, significant differences between Caucasian and Asian faces, reflecting not only cultural disparities, but also distinctive treatment goals. Unlike aesthetic patients in the West, who usually seek to improve the signs of aging, Asian patients are younger and request a broader range of indications. METHODS: Members of the Asia-Pacific Consensus group-comprising specialists from the fields of dermatology, plastic surgery, anatomy, and clinical epidemiology-convened to develop consensus recommendations for Asians based on their own experience using cohesive polydensified matrix, hyaluronic acid, and calcium hydroxylapatite fillers. RESULTS: The Asian face demonstrates differences in facial structure and cosmetic ideals. Improving the forward projection of the "T zone" (i.e., forehead, nose, cheeks, and chin) forms the basis of a safe and effective panfacial approach to the Asian face. Successful augmentation may be achieved with both (1) high- and low-viscosity cohesive polydensified matrix/hyaluronic acid and (2) calcium hydroxylapatite for most indications, although some constraints apply. CONCLUSION: The Asia-Pacific Consensus recommendations are the first developed specifically for the use of fillers in Asian populations. CLINICAL QUESTION/LEVEL OF EVIDENCE: Therapeutic, V.


Aging of the hands results from both natural processes and chronic ultraviolet light exposure. Together, these cause textural and pigmentary changes, excess skin laxity, rhytides, and soft tissue atrophy that presents as prominent bones and tendons with easily visible veins. Many options are available for the reversal of these changes. Photoaging can be improved with chemical peels and light-based treatments (such as Q-switched lasers), resurfacing lasers, intense pulsed light, and photodynamic therapy. Soft tissue atrophy can be corrected with autologous fat, nonanimal stabilized hyaluronic acid, calcium hydroxylapatite, and poly-L lactic acid injections. The literature shows that these treatments have favorable outcomes for most patients; but in order to reduce known complications, it is important to understand the proper use and limitations of each modality.

BACKGROUND: The mid-dermal injection of stabilized hyaluronic acid-based gel of nonanimal origin has been shown to be an effective method for skin rejuvenation. The previous manual technique, using a prefilled syringe, made it difficult to precisely control the injection into the mid-dermal layers and to achieve an even distribution of gel across the area. This single-center, evaluator-blinded, prospective, split-face, randomized controlled trial investigated the efficacy and safety of nonanimal stabilized hyaluronic acid using a stamp-type electronic multineedle injector. METHODS: Twenty-five patients (aged 27 to 59 years) were recruited into this study. Each participant submitted to a single treatment with a nonanimal stabilized hyaluronic acid injection to one side of the lower cheek. The skin hydration, melanin content, erythema, and elasticity of both cheeks were evaluated at each follow-up visit, at 1, 2, 4, 8, and 12 weeks after treatment. RESULTS: Stratum corneum hydration was significantly improved after injection. Although no significant improvement was observed at 1 week after treatment, the Corneometer readings for the treated side were significantly higher than those for the untreated side after the 2-, 4-, 8-, and 12-week treatment visits. Skin elasticity was also significantly improved during the study. The injection had no significant effect on the melanin and erythema indices throughout the follow-up period. The treatment was well tolerated, and no serious adverse events were reported. CONCLUSIONS: Nonanimal stabilized hyaluronic acid treatment resulted in improved hydration and elasticity of the facial skin. The specialized stamp-type electronic multineedle injector enables the hyaluronic acid filler to rejuvenate the skin effectively and safely. CLINICAL QUESTION/LEVEL OF EVIDENCE: Therapeutic, II.


BACKGROUND: The upper eyelid of young people is characterized by a proper fullness and projection. Aging eyes show upper eyelid volume loss, symmetric or asymmetric hollowing with too much upper lid showing, dermatochalasis with skin excess. While in the past blepharoplasty surgery was the only approach used to improve eye appearance in the last years, hyaluronic acid (HA) filling of the upper eyelid area has been found very effective in reaching good eye rejuvenation and use of traditional surgical techniques can be limited. METHODS: A total of 154 patients were enrolled in this study to improve eye appearance. One hundred twenty-eight patients were treated with HA injections in the upper eyelid only, 21 patients underwent surgical treatment followed by HA injections to ensure full correction, and 5 patients underwent blepharoplasty surgery only. The correct approach has been evaluated on the basis of standardized criterion. RESULTS: Twelve-month clinical follow-up was used to evaluate the results and the degree of patient satisfaction was high. The results are very lasting and no modifications after 2 years are common. CONCLUSIONS: HA filling is an effective means to rejuvenate the upper eyelid and in several cases it is the only approach able to restore the proper fullness of the upper eyelids. Surgical techniques should be used in the presence of dermatochalasis with excess skin. HA injections in the upper eyelid are easy to perform but it is important to use the correct technique and follow proper indications. This method is a manageable, lasting, and low-cost treatment. LEVEL OF EVIDENCE III: This journal requires that authors assign a level of evidence to each submission to which Evidence-Based Medicine rankings are applicable. This excludes Review Articles, Book Reviews, and manuscripts that concern Basic Science, Animal Studies, Cadaver Studies, and Experimental Studies. For a full
description of these Evidence-Based Medicine ratings, please refer to the Table of Contents or the online Instructions to Authors www.springer.com/00266.


BACKGROUND: The blue hue of skin overlying injected hyaluronic acid (HA) fillers in certain cases has been hypothesized in the literature as related to the Tyndall effect. This investigation aims to understand the relevant optical concepts and to discuss the plausibility of this assertion. METHODS: Theoretic and physical aspects of relevant optical theories including the Tyndall effect, the Raleigh criterion and the Mie Solution are discussed, with simple examples. The physical properties of the system (both HA and subcutaneous tissue) are explored. Alternate concepts of dermal hue generation are discussed. RESULTS: The Tyndall effect (and Rayleigh criterion) describe optical phenomenon that occur as light passes through colloidal solutions containing uniform spherical particles of sizes less than the length of a wavelength of visible light. HA fillers are complex, large, non-spherical, cross-linked hydrogels, and thus are not well characterized by these theories. Skin is a complex optical surface in which shorter wavelengths of light are selectively filtered at superficial depths. Light passing through to subdermal HA would have low blue light amplitude, minimizing what light could be preferentially scattered. Further, should blue hues be 'generated' subdermally, the same skin filters work in reverse, making the blue light poorly detectable by an external observer. CONCLUSIONS: The Tyndall effect is unlikely to cause dermal hue changes in HA filler instillation. Optical and perceptual processes explaining superficial vein coloration may better describe subdermal HA hue changes. Vein coloration is thought to be related to three processes: the reflective properties of the skin, the absorptive properties of blood and the perceptive properties of an observer's eyes. Subdermal HA may simulate these phenomena by a number of undetermined, yet plausible mechanisms.


BACKGROUND: Volume loss in facial adipose tissue plays a critical role in the aesthetics of facial aging. Furthermore, the facial adipose system is a complex network of distinct compartments, and a detailed understanding of these compartments is essential for optimal facial volume restoration. OBJECTIVE: To review the facial adipose system, age-related changes, and the role of volume restoration products for facial rejuvenation. METHODS: Publications including deceased donors' dissection studies and more recent studies using computed tomography were reviewed to provide an up-to-date understanding of the facial adipose system anatomy and age-related changes. Current volume restoration treatment options including hyaluronic acid, calcium hydroxylapatite, and poly-L-lactic acid are discussed. RESULTS: Facial aging is associated with volume loss in superficial and deep adipose compartments, including those of the forehead, cheek, lip, chin, and jowl areas. Volume restoration products can be used to address the age-related changes of the facial adipose compartments. CONCLUSION: Understanding the complex network of facial adipose compartments and their age-related changes allows for the optimal use of injectable volume restoration products for facial rejuvenation that can be customized to the anatomical needs of each patient.

BACKGROUND: Various methods attempting to correct sagging of the lower face focus mainly on manipulation of the superficial musculoaponeurotic System. Each technique has its own limitation. The authors propose a relatively simple, conservative method utilizing hyaluronic acid injection just above the superficial musculoaponeurotic System.

OBJECTIVE: To address a novel hyaluronic injection technique to lift the lower face.

METHODS: Details of the injection techniques are described. The Position of the hyaluronic acid injected and the effect of hyaluronic acid on the superficial musculoaponeurotic System were confirmed by ultrasonography in one of the cases.

RESULTS: Sonogram images demonstrated the location of the injected hyaluronic acid and pressure effect of hyaluronic acid on the superficial musculoaponeurotic System, confirming the ability to manipulate the superficial musculoaponeurotic System by this injection technique. The lifting result of this Single injection technique was immediately visible and maintained for at least 26 weeks.

CONCLUSION: This is a less invasive, reproducible method that provides a sustained face lifting result. The authors propose the term "supraSMAS lift" for this novel injection technique.


BACKGROUND: Facial aging is characterized by skin changes, sagging and volume loss. Volume is frequently addressed with reabsorbable fillers like hyaluronic acid gels.

MATERIALS AND METHODS: From an anatomical point of view, the deep and superficial fat compartments evolve differently with aging in a rather predictable manner. Volume can therefore be restored following a technique based on restoring first the deep volumes and then after the superficial volumes. We called this strategy "dual plane". A series of 147 consecutive patients have been treated with fillers using the dual plane technique in the last five years.

RESULTS: An average of 4.25 session per patient has been carried out for a total of 625 treatment sessions. The average total amount of products used has been 12 ml per patient with an average amount per session of 3.75 ml. We had few and limited adverse events with this technique.

CONCLUSION: The dual plane technique is an injection technique based on anatomical logics. Different types of products can be used according to the plane of injection and their rheology in order to obtain a natural result and few side effects.


BACKGROUND: A stabilized hyaluronic acid (HA)-based lidocaine-containing gel of nonanimal origin has been developed for lip enhancement. OBJECTIVE: To evaluate the efficacy, safety, and injection procedure of the HA gel in subjects seeking lip enhancement.

METHODS: Thirty subjects were treated in the upper and lower lips. Retreatment was offered at 3 months. Efficacy was assessed over 9 months using the Global Aesthetic Improvement Scale (GAIS), the Medicis Lip Fullness Scale, and a subject questionnaire. Safety was assessed by a 14-day subject diary and recording of adverse events (AEs) during the whole study.

RESULTS: Over 9 months after treatment, 86% to 97% of subjects and independent evaluators assessed both lips as improved. At all study visits, 72% to 93% of the subjects were satisfied with their lips and >/=96% reported that their lips had a natural look. Most AEs were mild-to-moderate local injection site
reactions. CONCLUSION: Lip enhancement with this HA-based gel generated high subject satisfaction and natural-looking lips. The effect lasted for up to 9 months according to the GAIS ratings by subjects and independent evaluators. The product was well tolerated; most AEs were mild-to-moderate local injection site reactions.


BACKGROUND: Demand for minimally invasive cosmetic procedures have led to an increased market of available products for facial rejuvenation. OBJECTIVE: To characterize trends in the usage of aesthetic products, specifically the use of botulinum toxins and dermal fillers, by United States physicians. METHODS: Data from the National Ambulatory Medical Care Survey was analyzed from 1993 to 2010 to evaluate the use of dermal fillers and neurotoxins in the United States outpatient setting. The types of physician specialties administering these products and their preferences in products were characterized.

RESULTS: There were an estimated 100,000 annual cosmetic visits at which a dermal filler was administered from 1993 to 2010. From 2002 to 2010, there were 140,000 annual cosmetic visits for a dermal filler and 440,000 visits for a neurotoxin. While collagen was the most common filler used over the entire study period, its use declined eight percent annually. Hyaluronic acid fillers were preferred from 2002 to 2010, followed by calcium hydroxylapatite filler, representing 50 percent and 16.1 percent of visits, respectively. The leading neurotoxin was onabotulinumtoxin A, used at 87.1 percent of visits. Dermatologists were the leading specialty for the cosmetic use of both dermal fillers and neurotoxins. CONCLUSION: Providers’ preference for cosmetic products appears to be influenced by their familiarity with them, with products that first came to market, such as the neurotoxin onabotulinumtoxin A and the hyaluronic acid fillers being used most frequently from 2002 to 2010.


The use of natural products for the treatment of disease is one of the oldest cultures that exists. Currently, the research of new drugs using natural products shows a poorly explored biodiversity and a great interest of marketing. The enzymatic inhibition by some natural products investigated among these is the inhibition of hyaluronidase and the consequent reduction of the degradation of hyaluronic acid. So there is a reduction of inflammation and angiogenesis. This study reports the main natural species studied in inhibiting human hyaluronidase that can be the subject of future research for new drugs.


The use of fillers in esthetic rejuvenation or reshaping has been well established and is one of toughest techniques for beginners due to segmental attachments and proximity to important anatomical structures in the infraorbital area making it difficult to achieve smooth esthetic results. To make filling easy, smooth, and repeatable, anatomical points were marked through specific surface measurements. Patients were injected with 0.5-1 mL of hyaluronic acid filler using the identified anatomical point. All patients treated have achieved restoration of the ogee curve with no bruising and minimal downtime with results lasting for 12-36 months. The results of the study suggest the use of single repeatable injection at the crucial point and if required at multiple identified anatomical points along the ligamental attachment to satisfy the esthetic outcome of the patient.
Injection of filler at infraorbital points could instantly lift the face up, elevating the point of shadow and shifting the point of highest light reflection to the ideal malar point.


The growing use of dermal fillers, specifically the use of hyaluronic acid, can be explained by their effectiveness and versatility as well as their favorable safety profiles. Nevertheless, early and late complications with varying levels of severity may occur. The incidence of complications is low and the majority of adverse events are mild (edema, erythema, and local ecchymosis) and of limited duration. However, more severe events, such as ischemia and necrosis, may occur. The symptoms of ischemia can occur immediately after the injection or several hours after the procedure. Here, the authors report three cases of necrosis after hyaluronic acid injection with the first symptoms presenting only several hours after the procedure. The patients were treated immediately after the diagnosis. The aim of this review is to communicate the possibility of the delayed-type presentation of necrosis, present the signs and symptoms that lead to early diagnosis, and review the treatment possibilities of this severe complication.


BACKGROUND: Although there are several case reports of facial skin ischemia/necrosis caused by hyaluronic acid filler injections, no systematic study of the clinical outcomes of a series of cases with this complication has been reported. METHODS: The authors report a study of 20 consecutive patients who developed impending nasal skin necrosis as a primary concern, after nose and/or nasolabial fold augmentation with hyaluronic acid fillers. The authors retrospectively reviewed the clinical outcomes and the risk factors for this complication using case-control analysis. RESULTS: Seven patients (35 percent) developed full skin necrosis, and 13 patients (65 percent) recovered fully after combination treatment with hyaluronidase. Although the two groups had similar age, sex, filler injection sites, and treatment for the complication, 85 percent of the patients in the full skin necrosis group were late presenters who did not receive the combination treatment with hyaluronidase within 2 days after the vascular complication first appeared. In contrast, just 15 percent of the patients in the full recovery group were late presenters (p = 0.004). CONCLUSIONS: Nose and nasolabial fold augmentations with hyaluronic acid fillers can lead to impending nasal skin necrosis, possibly caused by intravascular embolism and/or extravascular compression. The key for preventing the skin ischemia from progressing to necrosis is to identify and treat the ischemia as early as possible. Early (<2 days) combination treatment with hyaluronidase is associated with the full resolution of the complication. CLINICAL QUESTION/LEVEL OF EVIDENCE: Therapeutic, IV.


BACKGROUND: Fine lines and crepey skin are dermal manifestations of multilevel, age-related volume loss. It is, therefore, logical to combine intradermal volumetry for fine lines with subcutaneous volumetry for contours. This publication provides evidence-
experience-based rationales for application of cohesive polydensified matrix hyaluronic acid filler (Belotero Balance). METHODS: Evidence level II data demonstrate efficacy of this product and longevity for up to a year or more with intradermal, superficial blanch injection. Its softness, flow tendencies, and homogeneous tissue integration are informed by low elasticity (G') and viscosity, high cohesivity, and high tan delta. Ultrastructural analysis confirms variable-density cross-linking, intended to confer resilience, and absence of detectable particles, minimizing Tyndall effect. RESULTS: Scientific properties of Belotero Balance predict its 3-dimensional tissue expansion with prominent horizontal vectoring. We define this as superficial flow volumetry. High cohesivity and resilience can maintain structural integrity in typically mobile facial areas with strong muscular forces, uneven pressure, and significant hyaluronidase activity. This facilitates a natural appearance, both in repose and animation. CONCLUSIONS: Based on available evidence and experience, cohesive polydensified matrix hyaluronic acid is a notably efficacious fine line filler. The ideal fine line filler would restore dermis structurally and dynamically-moving as one with it, efficaciously expanding it, withstanding mechanical stress, swelling minimally, and potentially stimulating collagenesis. The relative contributions of space-filling, water binding, and collagenesis have implications for efficacy. A focus of current research is to determine the impact of filler cohesivity and tissue integration on these ideal qualities.


BACKGROUND: Combination of fillers and botulinum toxin for aesthetic applications is increasingly popular. Patient demographics continue to diversify, and include an expanding population receiving maintenance treatments over decades. METHODS: A multinational panel of plastic surgeons and dermatologists convened the Global Aesthetics Consensus Group to develop updated guidelines with a worldwide perspective for hyaluronic acid fillers and botulinum toxin. This publication considers strategies for combined treatments, and how patient diversity influences treatment planning and outcomes. RESULTS: Global Aesthetics Consensus Group recommendations reflect increased use of combined treatments in the lower and upper face, and some midface regions. A fully patient-tailored approach considers physiologic and chronologic age, ethnically associated facial morphotypes, and aesthetic ideals based on sex and culture. Lower toxin dosing, to modulate rather than paralyze muscles, is indicated where volume deficits influence muscular activity. Combination of toxin with fillers is appropriate for several indications addressed previously with toxin alone. New scientific data regarding hyaluronic acid fillers foster an evidence-based approach to selection of products and injection techniques. Focus on aesthetic units, rather than isolated rhytides, optimizes results from toxin and fillers. It also informs longitudinal treatment planning, and analysis of toxin nonresponders. CONCLUSIONS: The emerging objective of injectable treatment is facial harmonization rather than rejuvenation. Combined treatment is now a standard of care. Its use will increase further as we refine the concept that aspects of aging are intimately related, and that successful treatment entails identifying and addressing the primary causes of each. CLINICAL QUESTION/LEVEL OF EVIDENCE: Therapeutic, V.

BACKGROUND: Hyaluronic acid (HA) is a popular ingredient in topical formulations for cosmetic improvement of the skin. Most formulations contain linear, non-crosslinked HA oligomers, low molecular weight (LMW) HA, and/or high molecular weight (HMW) HA. Crosslinking of HA enhances its clinical longevity and mechanical characteristics. The objective of this study was to characterize the topical effects of a new, crosslinked resilient HA (RHA) that is also available as a cohesive, tissue-integrating injectable filler, compared with non-crosslinked HMW HA and LMW HA. Living human skin explants that preserve the 3-dimensional structure of in vivo skin were used to maximize clinical relevance.

METHODS: Standardized doses of each HA product were applied daily for 9 days to human skin explant surfaces. Untreated explants served as controls. Water content of the stratum corneum and entire epidermis was analyzed by Raman spectroscopy. Transepidermal water loss (TEWL) was measured to assess skin barrier function. Explant morphology and microrelief were evaluated by optical and scanning electron microscopy.

RESULTS: Crosslinked RHA achieved a significant increase in epidermal water content (7.6%) over the control. Spectral cartography confirmed a higher epidermal water content with RHA than with HMW HA or LMW HA. TEWL was reduced by 27.8% with RHA, and by 15.6% with HMW HA, but increased by 55.5% with LMW HA. Cutaneous microrelief improved with RHA. Corneocyte cohesion improved with RHA and HMW HA.

CONCLUSIONS: This comparative, multimodal study demonstrated greater benefits of topical crosslinked RHA over linear HMW HA or LMW HA in reducing TEWL, retaining and redistributing water within the epidermis, maintaining skin integrity, and improving skin barrier structure and function. RHA was a more efficacious humectant than LMW HA, and a more efficacious occlusive moisturizer than HMW HA. These integrative epidermal repair activities are of significant value for addressing primary deficits of aging skin, improving tolerance to retinoids and other topical agents, and optimizing procedural outcomes. A combination of topical and injectable HA provides an elegant model of synergistic, multi-level skin restoration.


BACKGROUND: Biophysical characteristics of hyaluronic acid gel fillers reflect individual manufacturing processes. They confer rheologic properties that provide scientific rationale with Evidence Level II clinical correlation for selection of appropriate fillers for specific clinical applications. Cohesivity, a key property, maintains gel integrity, contributes to tissue support with natural contours, and diminishes surface irregularities. In this publication, a new, standardized visual assay for hyaluronic acid cohesivity is presented, applied, and discussed. METHODS: Colored hyaluronic acid gel specimens were automatically extruded under standardized conditions into sterile water stirred at a constant rate. Based on 90 digital images showing ratios of intact to dispersed gel during assay of 10 Communaute Europeenne-marked fillers, the five-point visual Gavard-Sundaram Cohesivity Scale was developed. Six plastic surgeons and dermatologists performed pilot validation of the scale, subsequently used to evaluate six U.S. Food and Drug Administration-approved fillers. RESULTS: Validation of the Gavard-Sundaram Cohesivity Scale showed substantial repeatability and interrater consistency. Mean cohesivity scores from three assays of each tested filler showed significant differences. Cohesivity was high for Cohesive Polydensified Matrix (Belotero Balance), medium-high for Hylacross (Juvederm Ultra 2/Ultra XC and Ultra 3/Ultra Plus XC), low-medium for
Vycross (Juvederm Voluma), and low for non-animal-stabilized hyaluronic acid (Restylane and Perlane). CONCLUSIONS: An evidence-based approach requires clinical corroboration of in vitro data. This new, reproducible cohesivity assay may have value together with elasticity ($G'$) and viscosity measurements to understand and leverage distinct tissue distribution patterns and clinical behaviors of different hyaluronic acid products. CLINICAL QUESTION/LEVEL OF EVIDENCE: Therapeutic, V.


BACKGROUND: Botulinum toxin type A injection remains the leading nonsurgical cosmetic procedure worldwide, with a high rate of efficacy and patient satisfaction. METHODS: A multinational, multidisciplinary group of plastic surgeons and dermatologists convened the Global Aesthetics Consensus Group to develop updated consensus recommendations with a worldwide perspective for botulinum toxin and hyaluronic acid fillers. This publication on botulinum toxin type A considers advances in facial analysis, injection techniques, and avoidance and management of complications. RESULTS: Use of botulinum toxin has evolved from the upper face to also encompass the lower face, neck, and midface. The Global Aesthetics Consensus Group emphasizes an integrative, diagnostic approach. Injection dosage and placement are based on analysis of target muscles in the context of adjacent ones and associated soft and hard tissues. The indication for selection of botulinum toxin as a primary intervention is that excessive muscular contraction is the primary etiology of the facial disharmony to be addressed. Global Aesthetics Consensus Group recommendations demonstrate a paradigm shift toward neuromodulation rather than paralysis, including lower dosing of the upper face, more frequent combination treatment with hyaluronic acid fillers, and intracutaneous injection where indicated to limit depth and degree of action. CONCLUSIONS: The accumulation of clinical evidence and experience with botulinum toxin has led to refinements in treatment planning and implementation. The Global Aesthetics Consensus Group advocates an etiology-driven, patient-tailored approach, to enable achievement of optimal efficacy and safety in patient populations that are rapidly diversifying with respect to ethnicity, gender, and age. CLINICAL QUESTION/LEVEL OF EVIDENCE: Therapeutic, V.


BACKGROUND: In nonsurgical facial rejuvenation, autologous fat and dermal fillers have become an effective method to achieve symmetry and balance of the midface. Nonsurgical techniques that target the dynamic anatomical relationships existing in the midface can improve rejuvenation outcomes in this commonly augmented region. OBJECTIVES: The authors described techniques for fat compartment and potential space volumization of the midface via a standardized and reproducible technique. They placed emphasis on access to anatomical spaces and compartments within the midface. METHODS: In 11 hemifacial cadavers, hyaluronic acid filler homogenized with red dye was injected via 3 midfacial ports that were anatomically designed to access the superficial fat compartments, deep fat compartments, or traverse the prezygomatic space. Specimens were dissected in a layered fashion to analyze relationships between the injected filler and midfacial anatomy. We have described 4 site-specific procedural techniques and created a video containing anatomical renderings of each targeted viaduct accompanied by technique demonstrations. RESULTS: We found that Beat techniques 1 through 4 can...
be performed through 3 midfacial viaducts. Port placement 1.5 cm inferolateral to the alar base in the nasolabial crease created a medial midface viaduct, suitable for access to the deep medial cheek fat, medial superficial fat compartment, premaxillary space, and adjacent superior nasolabial cheek compartment. Port placement within the nasojugal groove provided a middle midface viaduct to access the middle superficial fat compartment and medial suborbicularis oculi fat (SOOF). Port placement 1.5 cm inferolateral to the lateral canthus created a lateral midface viaduct to approach the preperiosteal fat, prezygomatic space, lateral SOOF, and infraorbital fat compartment. CONCLUSIONS: Our findings indicate that anterior and lateral cheek projection, V-deformity correction, rhytid softening, and tear trough effacement can be achieved through the midfacial viaducts. Systematic assessment and site-specific nonsurgical rejuvenation of the midface may lead to increased safety, accuracy, and technique reproducibility in this commonly injected region.

BACKGROUND: The use of facial fillers has been rapidly increased as the range of injectable products and indications continues to expand. Complications may arise from improper placement or technique. This article highlights the importance of anatomic knowledge when using injectable fillers in the face. METHODS: A detailed review of the clinical anatomy of the upper face is performed. Regional approaches are described using the applied anatomy to efficiently and safely augment the different subunits of the upper face. RESULTS: Key aspects of safe and successful injection of fillers in the upper face include a thorough knowledge of the location of fat compartments and neurovascular structures. Awareness of these structures enables the practitioner to maximize injections, while avoiding damage to important nerves and vessels. CONCLUSION: A detailed knowledge of the anatomy and properties of the product is paramount to maximize the efficacy while minimizing the risk of complications.

BACKGROUND: Volume restoration is an essential part of facial rejuvenation. OBJECTIVE: To assess long-term full-facial volume restoration using HAEL Volume Lidocaine hyaluronic acid filler. METHODS: An 18-month open study in 60 subjects with at least Grade 2 on the 4-point volume loss scale (VLS) for full face and at least 2 indications affected among chin, temporal areas, jawline, cheeks, cheekbones, and nasolabial folds (NLF). Performance was assessed by VLS, Lemperle rating scale (LRS), investigator Global Aesthetic Improvement Scale (GAIS), and 3-dimensional (3D) imaging. RESULTS: Most subjects (71.6%) had 3 or 4 indications injected, most commonly cheekbones (96.7%) and NLF (93.3%). At 18 months, at least a 1-grade improvement in VLS was observed for full face (68.3% of subjects), chin (77.8%), temporal areas (73.7%), cheeks (66.6%), cheekbones (58.6%), jawline (43.1%), and NLF (71.4%; LRS). For all indications, more than 60% of the volume gained at 3 weeks was sustained at 18 months based on 3D digital imaging. At 18 months, 95.0% of subjects had improved full-face GAIS and all subjects were satisfied with their aesthetic outcome. One subject (1.6%) had treatment-related adverse events. CONCLUSION: Full-facial volume restoration was well sustained over 18 months with high patient satisfaction and good tolerability.

PURPOSE: Upper eyelids of the Asian population have several unique anatomical characteristics that result in the characteristic absence of a native eyelid fold; however, 40% to 60% of the Asian population do exhibit a naturally occurring fold. Aging-associated soft tissue atrophy and loss of skin elasticity can lead to periorbital volume loss and subsequent development of multiple eyelid folds in patients previously with a native single-fold. The authors describe a nonsurgical technique for the management of multiple eyelid folds in Asian patients using hyaluronic acid gel (HAG) injection. METHODS: In this retrospective review, 6 upper eyelids of 5 Asian patients who underwent HAG injection for multiple eyelid folds were identified. Patients were injected with HAG superior to the native eyelid fold in a superficial plane just deep to the orbicularis oculi muscle and in the suborbicularis oculi plane of the superior sulcus. RESULTS: Five Asian patients with prior history of a single naturally occurring upper eyelid fold who developed age-related unilateral multiple eyelid folds underwent injection with HAG. All patients tolerated the procedure well and without complication. Restoration of a single-fold with bilateral upper eyelid symmetry was achieved successfully in all patients. CONCLUSIONS: Multiple eyelid folds may occur in Asian patients with an established naturally occurring single eyelid fold as a result of periorbital volume loss. HAG injection in the periorbital region provides a nonsurgical solution to restore volume and reform a single eyelid fold.


CONTEXT: Facial fillers have revolutionized the field of cosmetic facial rejuvenation as it has become the prime sought-after rejuvenation procedure offering youthful, 3-dimensional look with minimal invasiveness. Fillers are expensive and need to be redone periodically hence a sound understanding of structural basis on which they are laid is important in reducing the quantity of filler required in each sitting as well as increasing the longevity of results. AIM: The aim of the following study is to analyse a novel method of facial filling "The pillars pyramids and tie beams (PPT)" technique and its advantages over the conventional methods. SUBJECTS AND METHODS: A novel technique of injecting the facial fillers was employed on 67 patients visiting our clinic. These patients were followed-up for a period of 3 years. RESULTS: We observed that the amount of filler material required in initial sitting remains the same, however the frequency of touch up visits is decreased and so is the amount of filler material required for follow-up injections. CONCLUSION: Facial contour remodelling is being revolutionised by the new filler materials for volume augmentation and no uniform consensus has been reached on the techniques currently used in clinical practice. We advocate this novel PPT technique of facial filling in facial rejuvenation to restore a youthful look as a primary goal.


BACKGROUND: Hyaluronic acid (HA) formulations are used for aesthetic applications. Different cross-linking technologies result in HA dermal fillers with specific characteristic visco-elastic properties. OBJECTIVE: Bio-integration of three CE-marked HA dermal fillers, a cohesive (monophasic) polydensified, a cohesive (monophasic) monodensified and a non-cohesive (biphasic) filler, was analysed with a follow-up of 114 days after injection. Our aim was to study the tolerability and inflammatory response of these fillers, their patterns of distribution in the dermis, and influence on tissue integrity. METHODS: Three
HA formulations were injected intradermally into the iliac crest region in 15 subjects. Tissue samples were analysed after 8 and 114 days by histology and immunohistochemistry, and visualized using optical and transmission electron microscopy. RESULTS: Histological results demonstrated that the tested HA fillers showed specific characteristic bio-integration patterns in the reticular dermis. Observations under the optical and electron microscopes revealed morphological conservation of cutaneous structures. Immunohistochemical results confirmed absence of inflammation, immune response and granuloma. CONCLUSION: The three tested dermal fillers show an excellent tolerability and preservation of the dermal cells and matrix components. Their tissue integration was dependent on their visco-elastic properties. The cohesive polydensified filler showed the most homogeneous integration with an optimal spreading within the reticular dermis, which is achieved by filling even the smallest spaces between collagen bundles and elastin fibrils, while preserving the structural integrity of the latter. Absence of adverse reactions confirms safety of the tested HA dermal fillers.

133. Vanaman, M. and S. G. Fabi (2015). "Decolletage: Regional Approaches with Injectable Fillers." Plast Reconstr Surg 136(5 Suppl): 276s-281s. BACKGROUND: Patients increasingly request rejuvenation of the aging and photodamaged decolletage. Rhytides in this area can be addressed with injectables such as poly-L-lactic acid and hyaluronic acid products and energy-based devices, such as fractionated ablative and nonablative lasers and microfocused ultrasound with visualization. METHODS: This article will review the anatomy of the chest wall as it pertains to injectables that can be utilized in this area and injection technique. A review of the literature and the authors’ experience will be discussed. CONCLUSION: Cosmetic injectables can be utilized safely and effectively to improve the appearance of rhytides on the decolletage.

134. Vanaman, M., et al. (2016). "Complications in the Cosmetic Dermatology Patient: A Review and Our Experience (Part 1)." Dermatol Surg 42(1): 1-11. BACKGROUND: Over recent decades, the options available to patients for cosmetic rejuvenation have expanded dramatically. The range of options commonly available to patients now includes neuromodulators, fillers, sclerotherapy, chemical peels, liposculpture, lasers, and lights and other energy devices and continues to grow. As with all therapeutic interventions, these cosmetic dermatologic procedures are not without risk. Timely recognition of complications and intervention are paramount for optimal patient outcomes. OBJECTIVE: Part 1 of this review will focus on the common complications of injectable cosmetic procedures, such as neuromodulators, fillers, and sclerotherapy. The second part will discuss the complications of chemical peels, lasers, light and energy devices, and fat removal procedures. MATERIALS AND METHODS: A MEDLINE search was performed on cosmetic dermatology complications from 1989 to 2015, and results are summarized. Practical considerations of these complications are also provided. RESULTS: Reports of complications after neuromodulator, injectable hyaluronic acid, calcium hydroxylapatite, poly-L-lactic acid, polymethylmethacrylate, sclerotherapy, fat transfer, liposuction, cryolipolysis, chemical peels, lasers, and light sources, such as Q-switched laser, intense pulsed light, nonablative and ablative resurfacing lasers, were found. CONCLUSION: Review of the literature revealed multiple management options for potential complications of the multitude of cosmetic dermatology procedures now available to patients.

**BACKGROUND:** Over recent decades, the options available to patients for cosmetic rejuvenation have expanded dramatically. The range of options commonly available to patients now includes neuromodulators, fillers, sclerotherapy, chemical peels, lasers, lights and other energy devices, and liposculpture and continues to grow. Like all therapeutic interventions, these cosmetic dermatologic procedures are not without risk. Timely recognition of complications and intervention are paramount for optimal patient outcomes.

**OBJECTIVE:** The second part will discuss the complications of chemical peels, lasers, light and energy devices, and fat removal/sculpture procedures. MATERIALS AND METHODS: A MEDLINE search was performed on cosmetic dermatology complications from 1989 to 2015, and results are summarized. Practical considerations of these complications are also provided. RESULTS: Reports of complications after neuromodulator, injectable hyaluronic acid, calcium hydroxylapatite, poly-L-lactic acid, polymethylmethacrylate, sclerotherapy, fat transfer, liposuction, cryolipolysis, chemical peels, lasers, and light sources, such as Q-switched laser, intense pulsed light, and nonablative and ablative resurfacing lasers, were found. CONCLUSION: Review of the literature revealed multiple management options for potential complications of the multitude of cosmetic dermatology procedures now available to patients.


**BACKGROUND:** Aging of the neck is characterized by changes that include skin dyspigmentation, laxity, rhytides, loss of the mandibular contour, widening of the cervicomental angle, accumulation of submental fat, volume loss and prominence of the platysmal bands. Many cosmetic options exist to address these changes individually, but little literature exists about the safety and efficacy of combining such procedures and devices.

**OBJECTIVE:** To review the existing literature and the authors' experience in safely and effectively combining aesthetic rejuvenation modalities for the neck. METHODS: A Medline search was performed on combination treatments for neck rejuvenation, and results are summarized. Practical applications for combining these procedures are discussed.

**RESULTS:** Studies examining the efficacy and safety of intense pulsed light, ablative fractional lasers, nonablative fractional lasers, microfocused ultrasound with visualization, thermistor-controlled subsurface monopolar radiofrequency, cryolipolysis, ATX-101, liposuction, laser lipolysis, neuromodulators, and hyaluronic acid dermal fillers in the neck were found. The authors review their experience in combining these techniques.

**CONCLUSION:** Review of the literature revealed options for non- and minimally-invasive rejuvenation of the skin and volume restoration of the neck, but little literature was found on the safety and efficacy of combining such procedures. The authors' experience in clinical practice is that many neck rejuvenation techniques can be combined safely. A combination approach often produces the most optimal outcome for the patient seeking neck rejuvenation.

Zero-length crosslinked hydrogels have been synthesized by covalent linking of three natural polymers (collagen, hyaluronic acid and sericin), in the presence of 1-ethyl-3-(3-dimethylaminopropyl) carbodiimide and N-hydroxysuccinimide. The hydrogels have been investigated by FT-IR spectroscopy, microcalorimetry, in vitro swelling, enzymatic degradation, and in vitro cell viability studies. The obtained crosslinked hydrogels showed a macroporous structure, high swelling degree and in vitro enzymatic resistance compared to uncrosslinked collagen. The in vitro cell viability studies performed on normal human dermal fibroblasts assessed the sericin proliferation properties indicating a potential use of the hydrogels based on collagen, hyaluronic acid and sericin in skin tissue engineering.


BACKGROUND: Patients increasingly seek to enhance the appearance of their legs. Elimination of unwanted leg veins, reduction of epidermal photo-aging changes such as solar lentigines and keratoses, tightening of skin laxity and reduction of adipose tissue are among the most commonly requested goals. Many patients require a combination approach to address their concerns. It is important for dermatologists to be aware of the multitude of procedures that can be performed, often in combination, to rejuvenate the leg.

OBJECTIVE: The purpose of this review article was to discuss procedures for improving the appearance of the leg and to share the authors' experience, especially in the combination approach to leg rejuvenation.

METHODS: A literature search was performed to investigate cosmetic procedures being performed on the leg, with an emphasis on controlled or randomized studies. In addition, the authors contributed their personal experience.

RESULTS: Our discussion of the literature review highlights the treatments for leg veins, unwanted fat, cellulite, and photodamage of the legs that are most supported in peer-reviewed publications.

CONCLUSION: A synergistic, combination approach to leg rejuvenation works best. This includes the use of injectable agents, energy-based devices, and more invasive surgical procedures.

(C) 2016 by the American Society for Dermatologic Surgery, Inc. Published by Wolters Kluwer Health, Inc. All rights reserved.


In midface rejuvenation, hyaluronic acid (HA) fillers are commonly used as a versatile tool to improve appearance and to correct V-deformities and loss of volume. The induction of collagen as a major constituent of extracellular matrix (ECM) has been considered to be a basic effect of the rejuvenation procedure. Although commonly described as "dermal" soft fillers, histologic studies localized HA filler in the subcutaneous adipose tissue. Deep injection whenever possible lead to prolonged efficacy. Since volumizing HA filler induce mechanical stress not only to fibroblasts but adipocytes and deep injection itself causes minor trauma in the subcutaneous adipose tissue we suggest that the activation of adipose tissue-derived mesenchymal stem cells (ADMSC) is responsible for the observed clinical effects. We present a concept of filler action that discusses interactions of HA with adipocytes, ECM fiber network and ADMSC. Such a concept can explain the prolonged efficacy of deep midfacial filler placement and offers a new understanding to tailor HA fillers in the future.

Facial aging is a major indication for minimal invasive esthetic procedures. Dermal fillers are a cornerstone in the approach for facial sculpturing. But where to start? Our concept is midfacial volume restoration in first place. This will result in a healthy and youthful appearance creating a facial V-shape. But midfacial filler injection does not only improve the malar area. It has also beneficial effects on neighboring esthetic units. We report on such improvements in periorcular and nasolabial region, upper lips and perioral tissue, and the jaw line and discuss anatomical background. We hypothesize that midfacial deep filler injections also may activate subdermal white adipose tissue stem cells contributing to longer lasting rejuvenation.

Logical correction of aging contour changes of the face is based on understanding its structure and the processes involved in the aging appearance. Aging changes are seen at all tissue levels between the skin and bone although the relative contribution of each component to the overall change of facial appearance has yet to be satisfactorily determined. Significantly, the facial skeleton changes profoundly with aging as a consequence of significant resorption of the bones of dental origin in particular. The resultant loss of skeletal projection gives the visual impression of descent while the reduced ligamentous support leads to laxity of the overlying soft tissues. Understanding the specific changes of the face with aging is fundamental to achieving optimum correction and safe use of injectables for facial rejuvenation.

The use of facial fillers has greatly expanded over the past several years. Along with increased use comes a rise in documented complications, ranging from poor cosmetic result to nodules, granulomas, necrosis, and blindness. Awareness of the potential types of complications and options for management, in addition to the underlying facial anatomy, are imperative to delivering the best patient care. This article defines the complications and how to treat them and provides suggestions to avoid serious adverse outcomes.

BACKGROUND: The aging arm is characterized by increased dyspigmentation, a proliferation of ectactic blood vessels, excessive adiposity, excessive skin laxity, and actinic keratosis. A variety of laser, energy, and surgical techniques can be used to improve these features., OBJECTIVE: The objective of this article is to describe the treatment modalities that have proven efficacious in rejuvenating the aging arm and combination therapies that have the potential to optimize patient outcomes while maintaining safety and tolerability., METHODS: A Medline search was performed on nonsurgical aesthetic combination treatments because it relates to arm rejuvenation, and results are summarized. Practical applications for these combination treatments are also discussed., RESULTS: Although there is significant evidence supporting the effective use of nonsurgical treatments for arm rejuvenation, little in the literature was found on the safety and efficacy of combining such procedures and devices. However, in the authors' clinical experience, combining arm rejuvenation techniques can be done safely and often
result in optimal outcomes., CONCLUSION: Arm rejuvenation can be safely and effectively achieved with combination nonsurgical aesthetic treatments., (C) 2016 by the American Society for Dermatologic Surgery, Inc. Published by Wolters Kluwer Health, Inc. All rights reserved.

BACKGROUND: The desire for and use of nonsurgical injectable esthetic facial treatments are increasing in Asia. The structural and anatomical features specific to the Asian face, and differences from Western populations in facial aging, necessitate unique esthetic treatment strategies, but published recommendations and clinical evidence for Injectable treatments in Asians are scarce. METHOD: The Asian Facial Aesthetics Expert Consensus Group met to discuss current practices and consensus opinions on the cosmetic use of botulinum toxin and hyaluronic acid (HA) fillers, alone and in combination, for facial applications in Southeastern and Eastern Asians. Consensus opinions and statements on treatment aims and current practice were developed following discussions regarding pre-meeting and meeting survey outcomes, peer-reviewed literature, and the experts' clinical experience. RESULTS: The indications and patterns of use of injectable treatments vary among patients of different ages, and among Asian countries. The combination use of botulinum toxin and fillers increases as patients age. Treatment aims in Asians and current practice regarding the use of botulinum toxin and HA fillers in the upper, middle, and lower face of patients aged 18 to >55 years are presented. CONCLUSIONS: In younger Asian patients, addressing proportion and structural features and deficiencies are important to achieve desired esthetic outcomes. In older patients, maintaining facial structure and volume and addressing lines and folds are essential to reduce the appearance of aging. This paper provides guidance on treatment strategies to address the complex esthetic requirements in Asian patients of all ages. LEVEL OF EVIDENCE V: This journal requires that the authors assign a level of evidence to each article. For a full description of these Evidence-Based Medicine ratings, please refer to the Table of Contents or the online Instructions to Authors www.springer.com/00266.

Hyaluronic acid fillers are used to improve the appearance of nasolabial folds (NLF). This study aimed to compare the efficacy, safety, and durability of a new hyaluronic acid gel (BioHyalux) versus Restylane for the correction of NLF. This was a multicenter, double-blinded, randomized, controlled, non-inferiority clinical trial involving 88 subjects with moderate to severe NLF. Subjects were randomized to BioHyalux and Restylane on either sides of the NLF. NLF was assessed before and right after injection, and at 1 week, 1, 3, and 6 months. Patients were followed up for 13-15 months to evaluate the durability and long-term safety. A clinically meaningful response was predefined as at least one-point improvement on the Wrinkle Severity Rating Scale, which is a five-point scale. At 6 months, the response rate of BioHyalux was not inferior to that of Restylane (P < 0.05). At the 13-15 months follow-up, the response rate by investigators was 58.0 % on the BioHyalux side versus 63.8 % on the Restylane side. The response rate by subjects showed similar results, which was 56.5 % on the BioHyalux side versus 60.9 % on the Restylane side at 13-15 months. The subjects' Global Aesthetic Improvement Scale (GAIS) showed that most subjects felt improvements on both sides of NLF (P > 0.05) at all time points. At 6 months, 100 % reported improvements on both side; at 13-15 months, 60 % of subjects...
reported improvements with BioHyalux versus 64 % with Restylane. Adverse events were transient and predominantly mild or moderate in severity including injection site swelling, pain, itching, bruising, and tenderness. BioHyalux had reliable safety and tolerance, and could be an effective injectable filler for correcting NLF.


BACKGROUND: The hyaluronic acid (HA) dermal filler, Juvederm® Ultra, which employs Hylacross® technology, produces a gel with a smooth consistency and has demonstrated effectiveness in correcting nasolabial folds (NLFs) in Caucasian populations.<br />

OBJECTIVE: To evaluate the safety and effectiveness of Juvederm Ultra vs Restylane® for the correction of moderate NLFs in Chinese subjects.<br />

METHODS: In this double-blind randomized study, adult Chinese subjects with moderate NLFs received Juvederm Ultra (24 mg/mL) in 1 NLF and Restylane injectable gel (20 mg/mL) in the other NLF. NLFs were evaluated using the validated 5-point photonic numeric Allergan NLF Severity Scale (NLFSS); scores ranged from 0 ("no wrinkle") to 4 ("very deep wrinkle"). Response was defined as ≥1-point improvement at 6 months. Investigator-assessed responder rate (primary outcome), NLF mean improvement, and subject-assessed responder rate and preference were assessed.<br />

RESULTS: Among the 104 subjects who completed the study, median initial volumes (mL) were 0.8 (range, 0.2-1.4) for Juvederm Ultra and 0.8 (0.3-1.5) for Restylane; median touch-up volumes were 0.3 (0.1-0.5) and 0.3 (0.1-0.5), respectively. At 6 months, investigator-assessed responder rates were 87.3% for both products, indicating that Juvederm Ultra was noninferior to Restylane; mean improvement in NLFSS scores from baseline was 1.0 for both products. At 6 months, Juvederm Ultra and Restylane subject-assessed responder rates were 86.3% and 79.4%, respectively, and mean improvement in NLFSS scores from baseline was 1.2 and 1.0, respectively. Among subjects who expressed a preference, 57.9% preferred Juvederm Ultra. For both products, the most commonly reported treatment site responses were swelling, firmness, and tenderness; treatment site responses were generally mild or moderate in severity. Juvederm Ultra had fewer severe responses than Restylane.<br />

CONCLUSIONS: Juvederm Ultra is noninferior to Restylane and is a safe and effective treatment for correcting moderate NLFs in Chinese subjects. <br />


BACKGROUND: Soft-tissue augmentation with fillers is an aesthetic procedure for restoring age-related volume loss. OBJECTIVE: To compare neocollagenesis and elastin production stimulated by Radiesse® (calcium hydroxyapatite; CaHA, Merz Pharmaceuticals GmbH) and a hyaluronic acid-based filler (HA; Juvederm® VOLUMA®).<br />

METHODS: Twenty-four women, aged 35-45, participated in this split-face, comparative study. Punch biopsies were taken 4 and 9 months after supraperiostal injection of each filler into the ipsilateral or contralateral postauricular area. Samples were analyzed for collagens type I and III, elastin, Ki-67, and inflammatory and angiogenic markers. RESULTS: At month 4, collagen type III was greater with CaHA vs HA (P=0.0052). By month 9, type I staining was higher with CaHA vs HA (P=0.0135), whereas type III was lower with CaHA.
than HA (P=0.0019). Staining for elastin, Ki-67 and angiogenesis was greatest with CaHA at both timepoints. Inflammatory markers increased most with HA treatment.

CONCLUSIONS: CaHA resulted in more active, physiologic remodeling of the extracellular matrix than HA by stimulating a two-step process whereby collagen type I gradually replaced type III. Increased elastin stimulated by CaHA also indicates active remodeling. The results of this study suggest that, in the first 9 months after treatment, by reconstituting tissue homeostasis without inducing inflammation suggests CaHA has more desirable characteristics for a dermal filler than HA.


BACKGROUND: Acne scarring can be classified into atrophic icepick, boxcar, and rolling scars in addition to keloidal and hypertrophic scars. Additionally, these scars can be erythematous, hyperpigmented, and/or hypopigmented. Each scar type has a different structural cause warranting a customized approach. Many cosmetic options exist to address these changes individually, but little literature exists about the safety and efficacy of combining such procedures and devices. METHODS: A Medline search was performed on combination treatments because it relates to facial acne scarring, and results are summarized. Practical applications for these combinations of procedures are also discussed. RESULTS: Studies examining the efficacy and safety of ablative, nonablative, fractionated, and nonfractionated lasers, dermabrasion, chemical peels, needling, subcision, radiofrequency, stem cell therapy, fat transplantation, platelet-rich plasma, and hyaluronic acid dermal fillers for acne scars were found. The authors review their experience in combining these techniques. CONCLUSION: Review of the literature revealed multiple single options for facial acne scarring treatment with minimal evidence in the literature found on the safety and efficacy of combining such procedures and devices. The authors' experience is that combining acne scar treatment techniques can be performed safely and synergistically with optimal patient outcomes.

(C) 2016 by the American Society for Dermatologic Surgery, Inc. Published by Wolters Kluwer Health, Inc. All rights reserved.