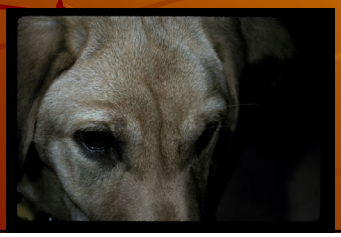
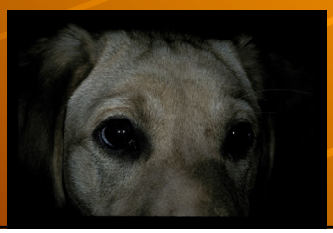
UPDATED FILLER AND NEUROMODULAR TECHNIQUES

Ronald L. Moy, M.D, Beverly Hills, CA
No financial conflicts of interests.

Botox before



Botox after



Neuromodulator/filler pearls, perils, and pitfalls

Risks, happy, unhappy- higher doses, fewer injection sites, less pain, better value, better education.

Patient comfort

- Chill skin with ice pack before treatment or Zimmer cold air
- Relaxed environment, spa like
- Reconstituted neuromodulator with .9 % preserved saline
- Topical anesthetic, 32 guage needle
- Distraction-pinch, vibrator
- Fewer injection sites

Higher doses give longer results

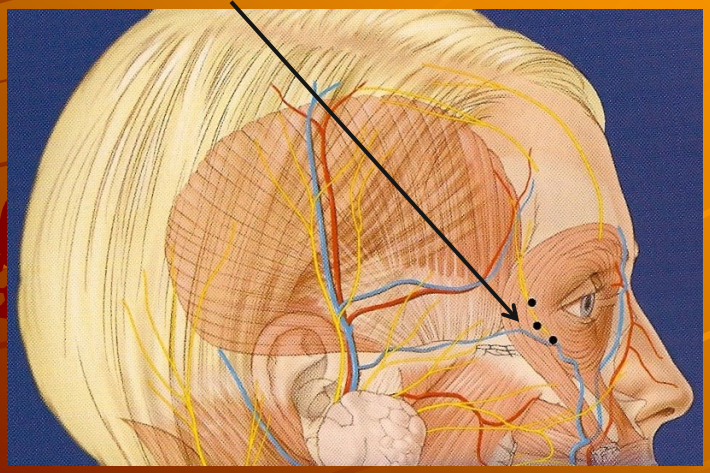
- Carruthers A, Carruthers J, Cohen J. A prospective, double-blinded, randomized, parallel-group, dose-ranging study of botulinum toxin type A in female subjects with horizontal forehead rhytides. Dermatol Surg 2003; 29(5):461-67.

- Comparing efficacy and safety of three doses of BTX-A in females with horizontal forehead rhytides.
- Improvements at all dosages (16U, 32U, 48U) Higher dosage gave longer duration
- Highest dose 48U (24U to forehead) greater efficacy and longer duration of effect.

- Avoid ASA, NSAIDs if possible.
- Compression > ice after injecting
- Superficial Intradermal (bleb) injections to avoid venous plexus at lateral orbital rim

Niamtu J. Complications in fillers and botox. Oral Maxillofac Surg Clin North Am. Feb 2009;21(1):13-21.

Management of Crow's feet
Three "Traditional" injection sites



Mang W. Manual of aesthetic surgery-1. Springer 2002. 247-49

Crow's feet – Our technique

- Single intradermal injection
- 12 U onabotulinumtox inA per side
- Superficial bleb

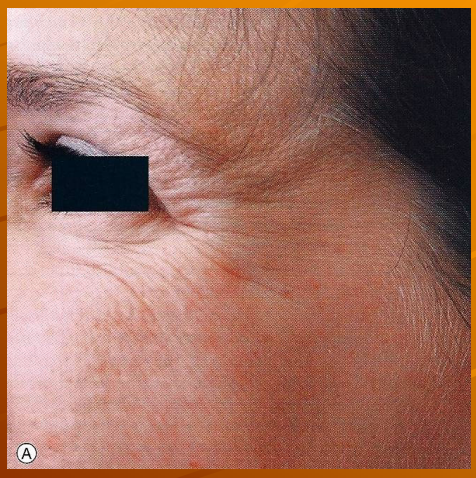
Avoid prominent veins

Superficial blebs
will give less
chance of bruising.

Inject superficially between veins in the crows feet area followed by pressure

Single intradermal injection 36U each side Dysport® abobotulinum toxinA for "Crows Feet"

Crow's feet pre-treatment



Carruthers A, Carruthers J. Use of botulinum toxin type A in facial rejuvenation. Surgery of the Skin-Procedural Deramtology. Elsevier 2005: 506.

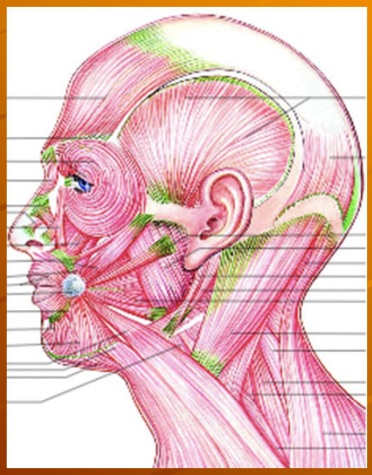
Crow's feet post-treatment- requires higher doses

Carruthers A, Carruthers J. Use of botulinum toxin type A in facial rejuvenation. Surgery of the Skin-Procedural Deramtology. Elsevier 2005; 506.

Complications

- Treatment of infraorbital orbicularis oculi can lead to migration to zygomaticus major and minor muscles.
- Inability to raise ipsilateral lip

Anatomy



Hemostasis

- Apply immediate pressure to injection site
- Have patient or assistant hold pressure for several minutes
- Consider ice-packs

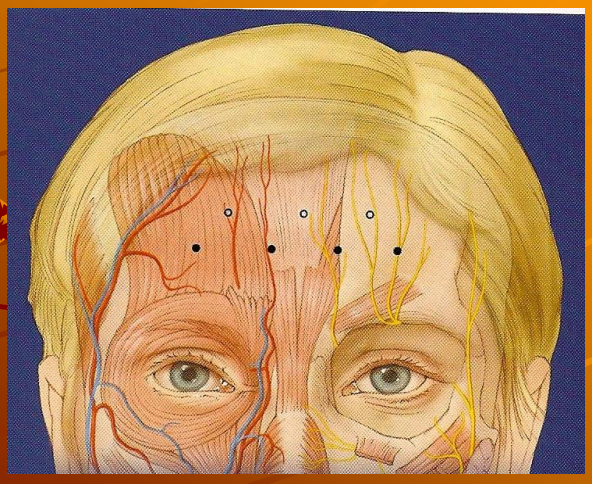
Treatment of the Forehead Musculature & Injection Zones

Frontalis presents with 2 common muscle patterns.

Classic anatomy illustrates frontalis as 2 distinct muscle bands, separated centrally.

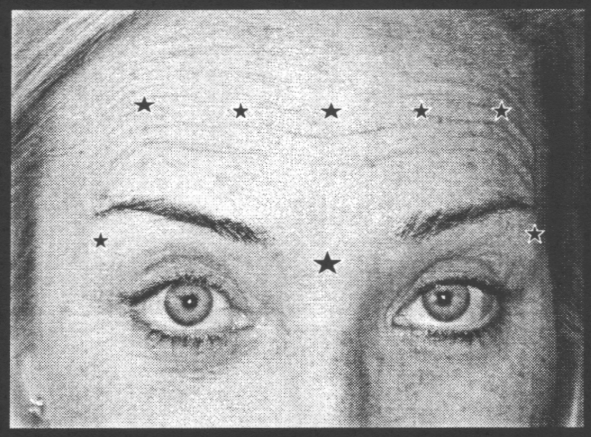
More common presentation is 1 broad muscular band with no separation.

Forehead



Mang W. Manual of aesthetic surgery-1. Springer 2002. 247-49

Injection Technique: Wide Brow



Forehead

- Treat 1-2 cm above orbital rim to minimize risk brow ptosis
- Less toxin to lateral forehead
- 48 U abobotulinum-toxinA (Dysport®)

Forehead

- Treat 1-2 cm above orbital rim to minimize risk brow ptosis
- Less toxin to lateral forehead
- 16 U onabotulinum-toxinA (Botox®)

Bassichis B, Thomas R. The use of botox to treat glabellar rhytids. Facial Plast Surg Clin N Am 2003;11:453-56.

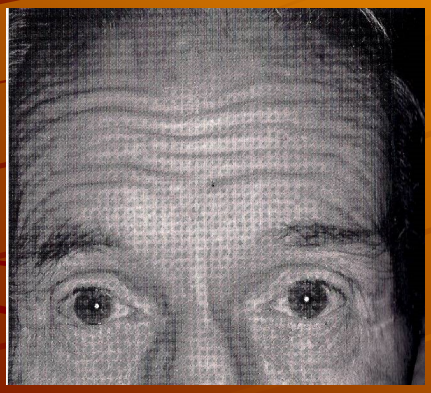
Forehead - Before

Carruthers A, Carruthers J. Use of botulinum toxin type A in facial rejuvenation. Surgery of the Skin-Procedural Deramtology. Elsevier 2005; 506.

Forehead - After

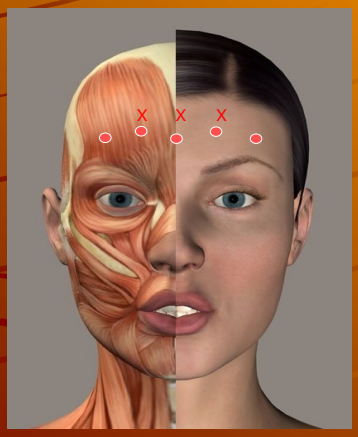
Carruthers A, Carruthers J. Use of botulinum toxin type A in facial rejuvenation. Surgery of the Skin-Procedural Deramtology. Elsevier 2005; 506.

Forehead



- Elderly may compensate for blepharocholasis with frontalis muscle.
- Caution with botox near brow
- Less like to use in elderly

Treatment of the Forehead Typical Approach



Forehead lines treated through BoNT-A injections into the frontalis.

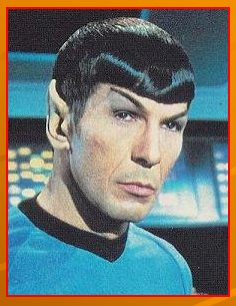
Typical approach is 4 to 8 injection points across middle of forehead (red "X"s indicate optional injection points).

Lateral injection points determine degree of eyebrow movement.

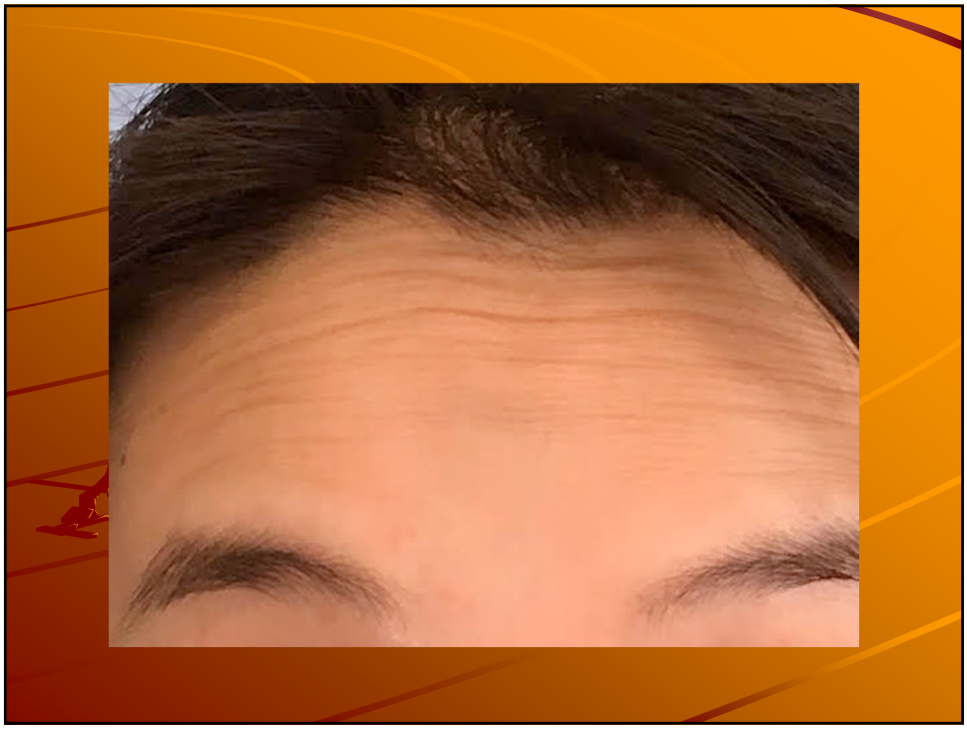
Tip: Keep injections well above brow to avoid brow ptosis and loss of expression.

Complications "Nicholson/Spock"

Vartanian J, Dayan S. Complications of botulinum toxin A use in facial rejuvenation. Facial Plast Surg Clin N Am 2003;11:483-92.



Leonard Nimoy as "Spock" Star Trek 1966



Complications

- Insufficient placement toxin lateral forehead allows unopposed elevation brow.
- Correction: 3-4U onabotulinumtoxinA or 9-12U abobotulinumtoxinA at lateral brow.

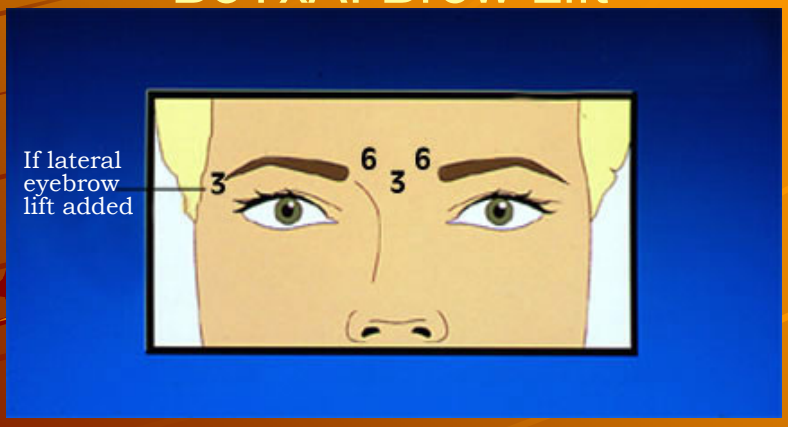
Niamtu J. Complications in fillers and botox. Oral Maxillofac Surg Clin North Am. Feb 2009;21(1):13-21.

Complications

"Ideal" male eye brow, positioned at the supra-orbital rim with an almost horizontal shape.

"Ideal" female eye brow, with a gentle gull-wing shape.

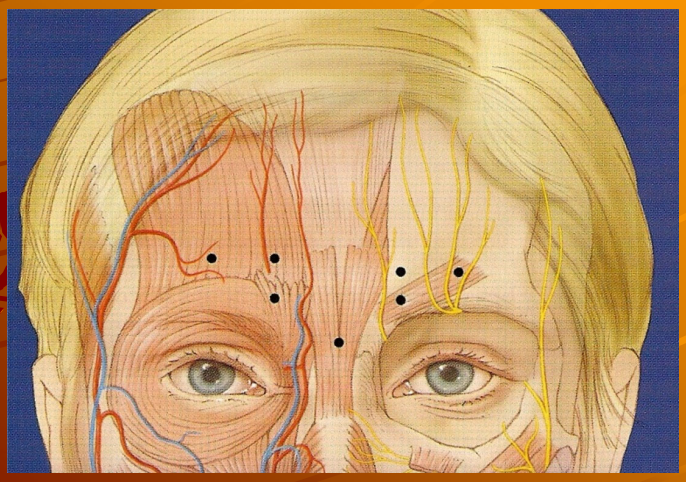
BoTxA: Brow Lift



BoTxA: Brow Lift

Hexsel D, Dal'Forno T. Type A botulinum toxin In the upper aspect of the face. Clinics in Dermatology 2003;21:488-97.

Glabella – "Traditional" injection sites



Mang W. Manual of aesthetic surgery-1. Springer 2002. 247-49

Botox dosing glabella

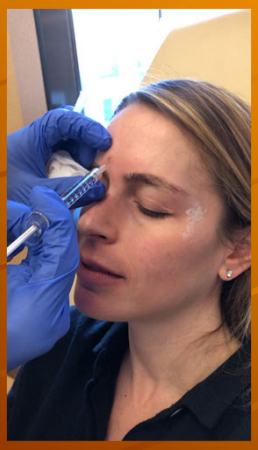
- Carruthers A, Carruthers J, Said S. Dose-ranging of botulinum toxin type A in the treatment of glabellar rhytids in females. Dermatol Surg April 2005;31(4):414-22.
- Comparison of efficacy, safety and duration of effect of four doses BTX-A in glabellar rhytids in females.
- 20-40U of BTX-A is significantly more effective than 10U for reducing glabellar lines.

Glabella – Our Technique

- Single injection into each corrugator
- 20U onabotulinumtoxin A or 60U abobotulinumtoxin A or .4 cc average dose in females

Pena M, Alam M, Yoo S. Complications with the use of botulinum toxin type A for cosmetic applications and hyperhidrosis. Semin Cutan Med Surg 2007;26:29-33.

30 guage vs 32 guage



Glabella – Our Technique

- Single injection into each corrugator
- 20U Botox or 60U abobotulinumtoxinA starting doses in females

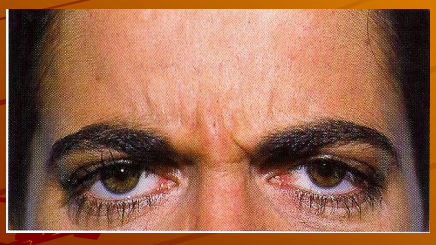
Glabella – Before 20U onabotulinumtoxinA

Glabella – After 20U onabotulinum toxinA

Glabella – Before 24U onabotulinum toxinA

Glabella – After 24U onabotulinum toxinA

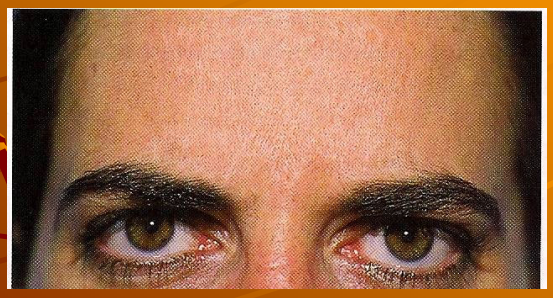
Glabella



- Males may require more toxin due to larger corrugator muscle

Mang W. Manual of aesthetic surgery-1. Springer 2002. 247-49.

Glabella-post treatment



Mang W. Manual of aesthetic surgery-1. Springer 2002. 247-49.

Complications

- Eyelid ptosis
- Prevention-inject 1 cm above orbital rim

Niamtu J. Complications in fillers and botox. Oral Maxillofac Surg Clin North Am. Feb 2009;21(1):13-21.

Blepharoptosis

- Carruthers A, Lowe N, Menter A, et al. A multicenter, double-blind, randomized, placebo-controlled study of the efficacy and safety of botulinum toxin type A in the treatment of glabellar lines. JAAD 2002 June 46 (6):840-849.
- Blepharoptosis in 5.4% (11/203) of patients.
- 4 cases of moderate blepharoptosis with average duration 40 days.
- No cases of complete ptosis.

Blepharoptosis

- Moy R, Maas C, Monheit G et al. Long-term Safety and Efficacy of a new Botulinum Toxin Type A in Treating Glabellar Lines: Results from a Phase 3, Open-label Extension Clinical Trial. Arch Facial Plast Surgery
- Open label phase 3 clinical trial of 1200 subjects receiving new BTX-A (Reloxin) over 13 months.
- 45 subjects had a total of 55 events of ptosis during the study after 4,214 treatments with BTX-A (1.3%.)

Treatment lid + brow ptosis

- **Apraclonidine** 0.5% or **phenylephrine** 2.5% ophthalmic solution, 1-2 drops to affected eye TID.
- (**Apraclonidine** 1% also available; may consider increased dose and/or frequency.)
- Alpha-adrenergic receptor agonist
- **Müller muscle:** upper eyelid smooth muscle innervated by sympathetic nerves producing 1-2 mm eyelid elevation

Omoigui S ,IreneS. Treatment of ptosis as a complication of botulinum toxin injection. Pain Medicine. 2005;6(2):149-51

Treatment of eyelid ptosis

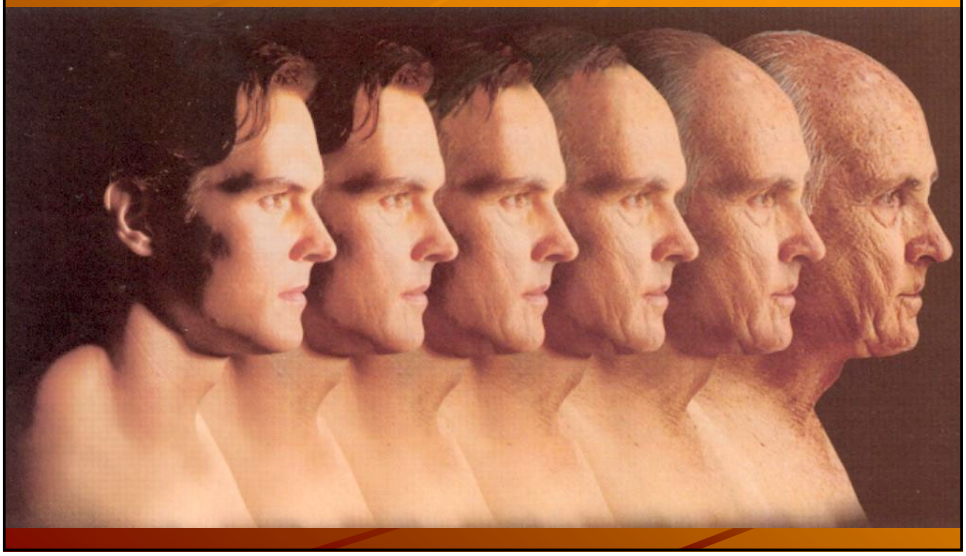
- 48y/o female with eyelid ptosis after Botox-A.
- h/o allergic reaction to alpha-adrenergic eyedrops.
- 60 mg oral **pyridostigmine** with 4-8 hours of relief of ptosis
- Slows breakdown of acetylcholine in neuromuscular junct
- Caution with S.E. of hypersalivation, N/V, diarrhea.

Karami M, Taheri A, Mansoori P. Treatment of botulinum toxin-induced eyelid ptosis with anticholinesterases. Dermatol Surg Nov. 2007;33(11):1392-95.

Conclusions

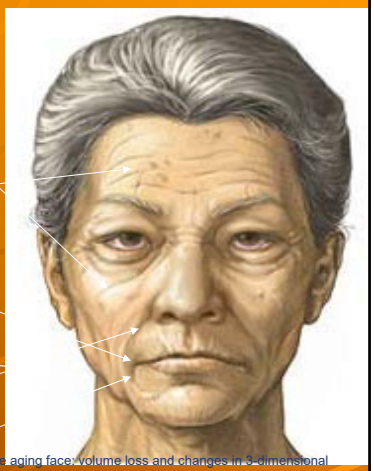
- All Neuromodulators work equally well
- Patient satisfaction hinges on results and comfort, perception, listening, price
- Avoid complications by preventing bruising, less injections and knowing the anatomy
- Dosage can affect how long it lasts and complications
- Combined therapies lead to happier pts

Age-Associated Skin Changes: Epidermis, Dermis, Fat



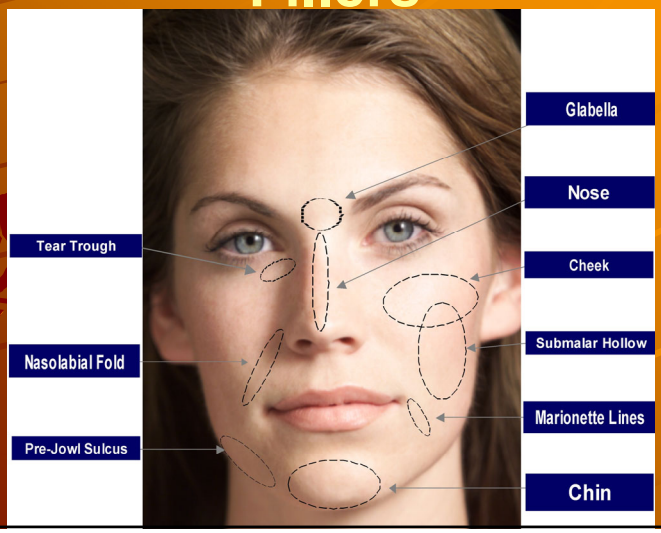
Hallmarks of the Aging Face

- Dermal Thinning and fat pad atrophy
- Loss of elasticity
- Greater visibility of bony landmarks, blood vessels, wrinkles, and furrows
- Transverse forehead lines
- Lowering of the eyebrows
- Descent of the corners of the mouth
- Prejowl Depression
- Prominence of the nasolabial folds
- Deepening of the nasolabial groove
- Ptosis of commissure (marionette lines)

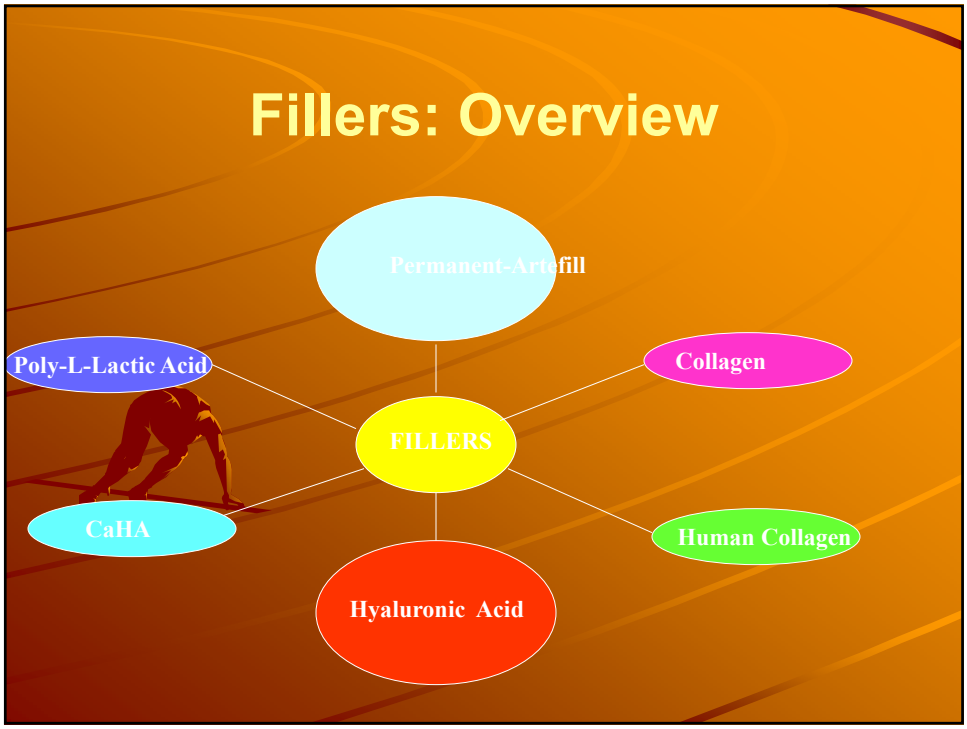


Coleman SR, Grover R. The anatomy of the aging face: volume loss and changes in 3-dimensional topography. *Aesthetic Surg J.* 2006;26;S4-S9; Donofrio LM. Fat distribution: a morphologic study of the aging face. *Dermatologic Surg.* 200;26:1107-1112; Lambros V. Observations on periorbital and midface aging. *Am J Plast Reconstr Surg.* 2007;120: available online for subscribers at www.plasreconsurg.com.

Correction of Age Associated Changes with Fillers



Fillers: Overview



Filler: Side Effects

- Unilateral blindness from opthalmic artery embolus subsequent to glabellar injection (rare)
- Glabellar necrosis
  - Larger amounts may be more prone to causing necrosis due to compression of surrounding vessels.
  .
- Injection site reactions

Avoid Glabellar Injections

Dermatol Surg. 2006 Feb;32(2):276-81.
J Drugs Dermatol Jan 2003
J Am Acad Dermatol. 1991 25(2 Pt 1):319-26.

- Necrosis is a complication of injection of dermal fillers into the glabella.
- Thought to be a function of its unique vascular distribution.
  - Complication does not discriminate on the basis of specialty of the injector or with use of cannula vs needle

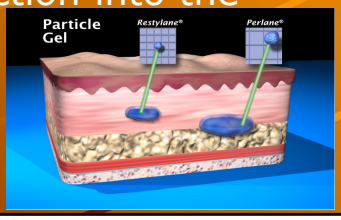
http://www.emedicine.com/derm/topic515.htm

The HA Filler Family

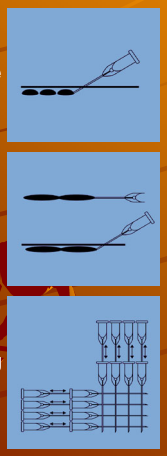
- There are many HA fillers that are FDA approved

When to use which filler

- –*Some are* designed for supportive volume to correct facial wrinkles and folds
- –*Some* with its larger gel particle size, is intended for injection into the deep dermis to superficial subcutis
- –*Some*, with its smaller gel particle size, is intended for injection into the mid to deep dermis

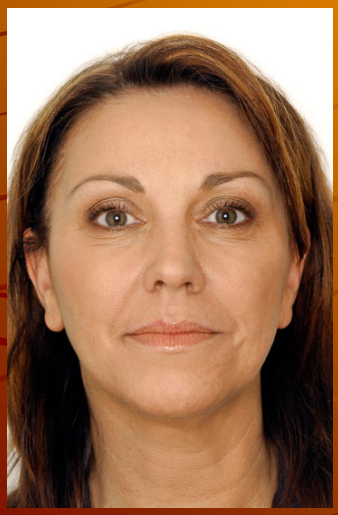


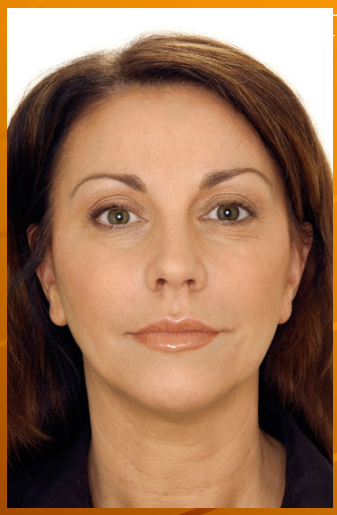
Basic Injection Techniques



- Serial puncture
  - Closely spaced puncture injections beneath wrinkles and folds
- Linear threading 27 guage,
  - Filler is injected as "threads" during needle withdrawal along length of facial wrinkle or fold
  - Some physicians report less bruising by injecting during needle insertion, i.e., "push ahead"
- Serial threading
  - A combination of the serial puncture and linear threading techniques with 27 guage, 1 ¼ "
- Cross-hatching
  - Technique similar to linear threading
  - A series of "threads" are injected approximately 5-10 mm apart and a new series is injected at right angles to the first series

Before & After Nasolabial Folds





Before & After Nasolabial Folds

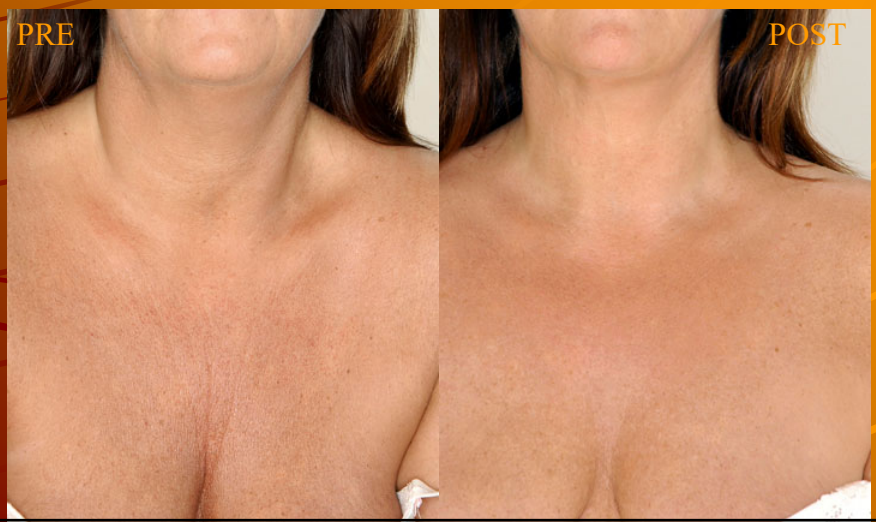
Before & After Nasolabial Folds

P T

Before & After Hands

PRE POST

Before & After
Furrows on Midchest



Before & After
Nasolabial Folds

PRE

POST

After 2 cc of Perlane

Before & After Nasolabial Folds

PRE

POST

After 2.5 cc

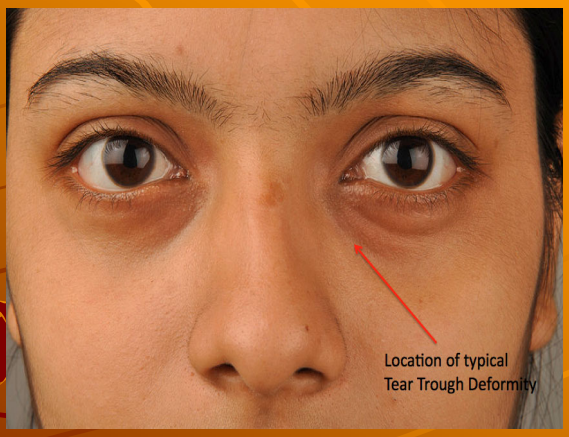
Impending necrosis after use of HA filler can be managed with hyaluronidase

3 days after Juvederm

3 days after HAase

10 days after HAase

J Drugs Dermatol. 2007 Mar;6(3):325-8.



Tear Trough Deformity

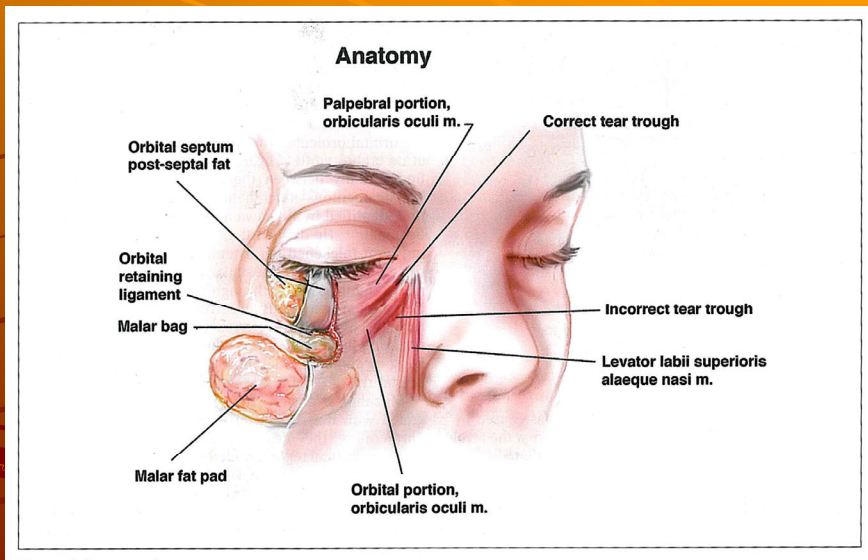


Figure 2. Tear trough anatomy.

Evaluate the factors

- Thick, smooth skin does better
- More defined hollow does better with filler
- Large fat pads difficulty to improve with fillers
- The color will not improve with filler

- Lambros. Hyaluronic acid injections for correction of the tear trough deformity. Plast Reconst Surg 2007;120:74s-80s.

Codner and Stutman

- With patient seated tear trough is marked
- HA injected deep in preperiosteal
- Combination cross hatching and linear threading

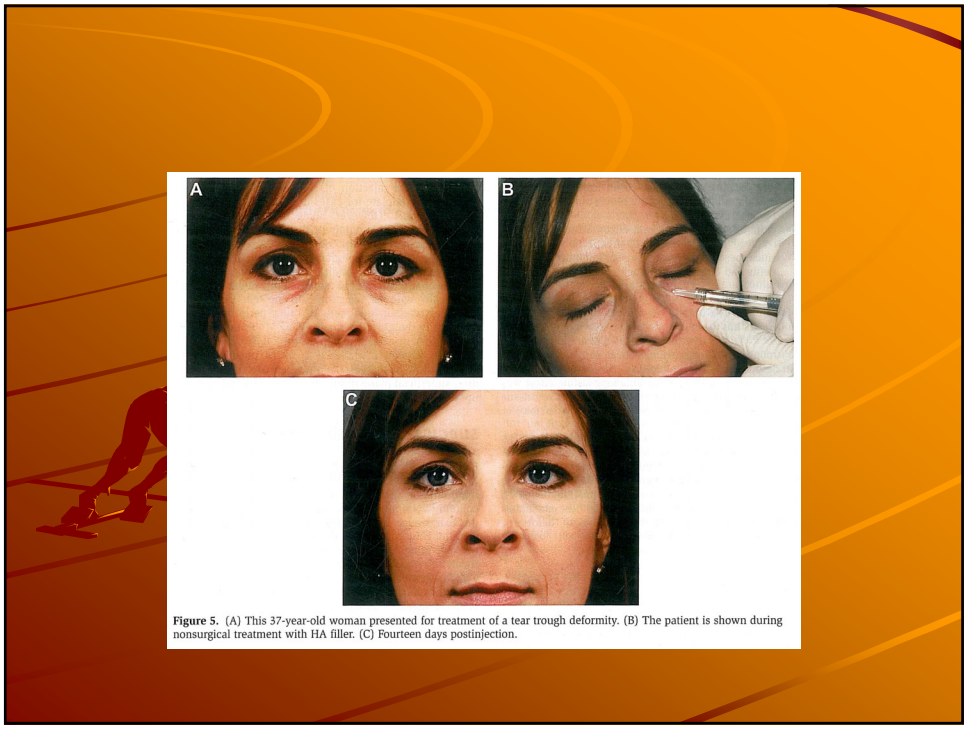
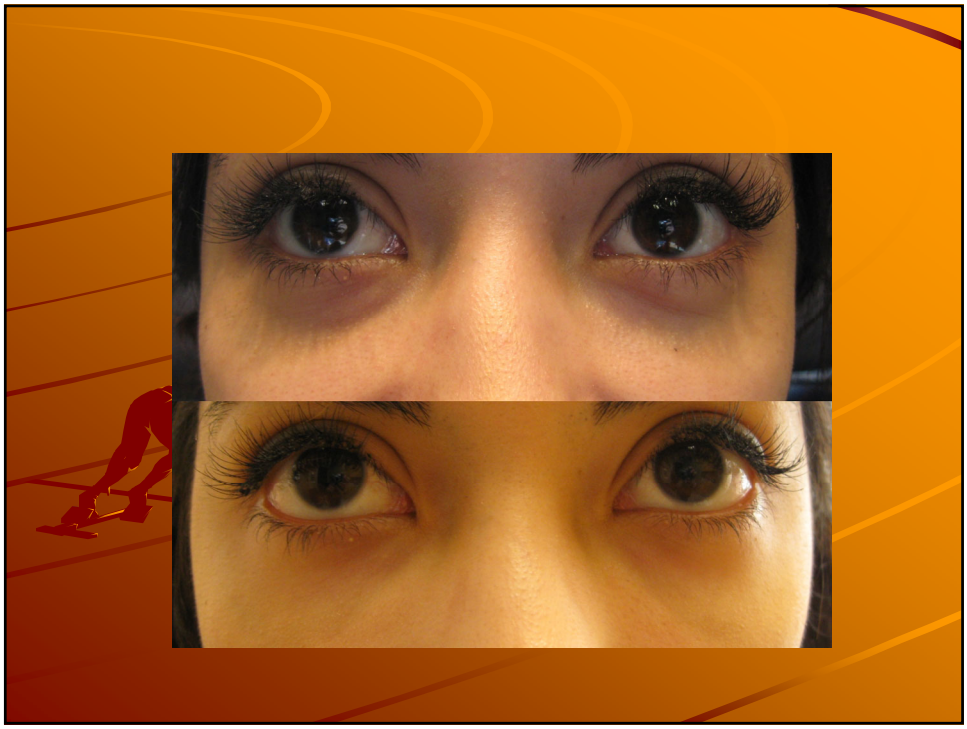
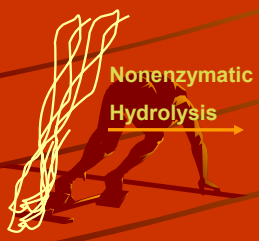


Figure 5. (A) This 37-year-old woman presented for treatment of a tear trough deformity. (B) The patient is shown during nonsurgical treatment with HA filler. (C) Fourteen days postinjection.



PLLA: Neocollagenesis, Increased Skin Thickness

- Initial volumetric changes after injection last for 1 week. This is followed by a delayed response resulting in fibroblast proliferation, neocollagenesis, and increased skin thickness. PLLA is ultimately completely resorbed



Brady JM, Cutright DE, Miller RA, Barristone GC. Resorption rate, route, route of elimination, and ultrastructure of the implant site of polylactic acid in the abdominal wall of the rat. J Biomed Mater Res 1973;7:155–166

Champe and Harvey. *Lippincott's Illustrated Reviews: Biochemistry*, 2nd ed; 1994:87.
Lodish et al. *Molecular Cell Biology*. 4th ed; 2000:622.

Poly-L-Lactic Acid

- Sculptra is injected every 4-6 weeks
- 2-3 injections usually required
- Addition of lidocaine lessens the pain of injection
- A 22 needle in oral commisure is recommended
- Duration of increase in skin thickness is 2+ years
- Used to treat cheeks, nasolabial folds, temples

Sculptra: Indications, Contraindications, and AEs

- Most common AE: delayed occurrence of subcutaneous papules around injection site, dyspigmentation, inflammation, bleeding from injection site, erythema, edema, ecchymosis.
- Some authors believe that allowing reconstitution of Sculptra to proceed for 24-36 h reduces the chance of granuloma formation

Sculptra product information.

Sculptra: AEs

Table 1 Treatment-Related Adverse Events at 2 Years

	VEGA Study	Chelsea and Westminster Study***	Mean Duration (Days)
Injection procedure-related			
Bruising	3 (6%)	11 (38%)	6
Edema	2 (4%)	2 (7%)	3
Discomfort	0	3 (10%)	3
Hematoma	14 (28%)	0	17
Inflammation	0	3 (10%)	3
Erythema	0	3 (10%)	3
Device-related			
Injection site subcutaneous papule*	26 (52%)	9 (31%)	Mean onset, 7 months**

*Subcutaneous papules refer to lesions of 5 mm or less, typically palpable, not bothersome, and not visible.
**Onset data available from VEGA study only. Duration not noted as most papules were ongoing at study's completion.
***Safety data collected post hoc for 27 of the patients at ~2 years from study start.

FACIAL PLASTIC SURGERY/VOLUME 20, NUMBER 2 2004

Subcutaneous granulomas following Sculptra injection

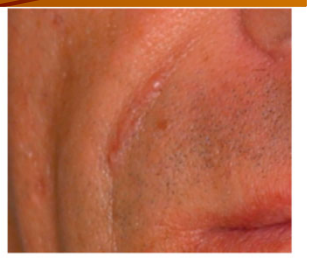


Figure 1. Persistent erythematous papules along the nasolabial fold region where prior poly-L-lactic acid injections had been placed.

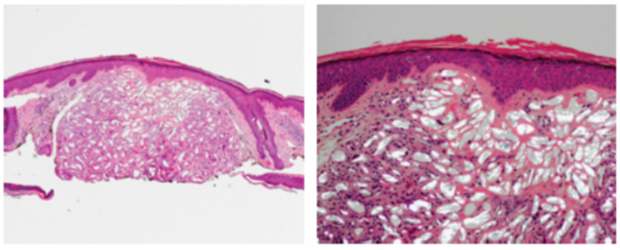


Figure 2. Skin biopsy revealing a marked foreign-body giant-cell reaction with numerous fragments of polarizable foreign material and surrounding dermal fibrosis (hematoxylin-eosin stain; original magnification, 10×/40×).

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Management of Papules and Nodules from Literature

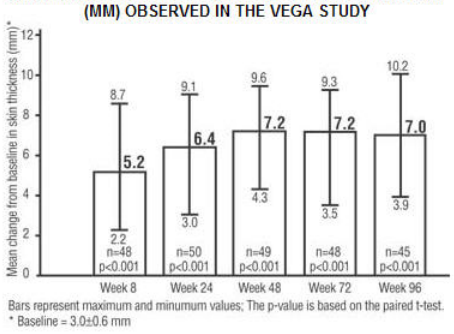
- Papules occur in 1-5% of patients[1]
- They will resolve on their own in 12-24 months[1]
- If visible or protruding nodules do not resolve[2]:
  - Inject saline to break down the lump
  - Massage the area
- Inflammatory granulomas can be treated by[2]:
  - Oral antibiotics
  - Tapered doses of corticosteroids
  - Intralesional corticosteroids
  - Excision for larger, non-resolving nodules
  - Intralesional 5-FU[1]

1. Fernandez et al. JDD 5(7):630-41 2006.
2. Vleggaar.*Plast.Reconstr.Surg.*18.2006/p52S/C2/line 6-18.

Sculptra Induces Increases in Skin Thickness: Efficacy Data

Vega Study

FIGURE 1
MEAN INCREASES ABOVE BASELINE IN SKIN THICKNESS (MM) OBSERVED IN THE VEGA STUDY



Bars represent maximum and minumum values; The p-value is based on the paired t-test.
* Baseline = 3.0±0.6 mm

61. Valantin MA, Aubron-Olivier C, Ghosn J, et al. Polylactic acid implants (New-Fill) to correct facial lipoatrophy in HIV-infected patients: results of the open-label study VEGA [see comment]. *AIDS*. 2003;17:2471-7.

Chelsea & Westminster Study

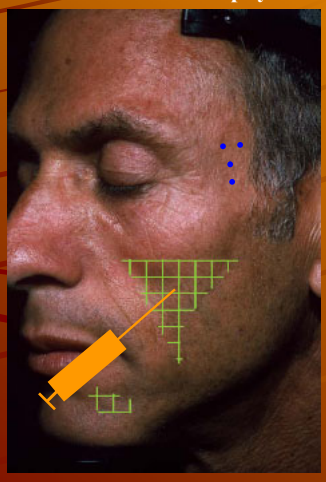
TABLE 3:
RANGE OF MEAN INCREASES IN SKIN THICKNESS FROM BASELINE

	12 WEEKS AFTER 1st TREATMENT N=27*	24 WEEKS AFTER 1st TREATMENT N=14*
Cheek Areas	3.9 - 5.7 mm	4.9mm
Nasolabial Areas	3.9 - 6.0 mm	4.9 - 5.3mm

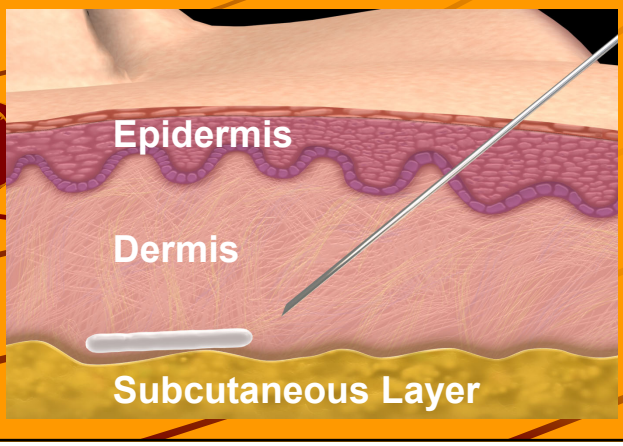
Sculptra package insert

My Sculptra Injection Technique: Access at the Oral Commissure

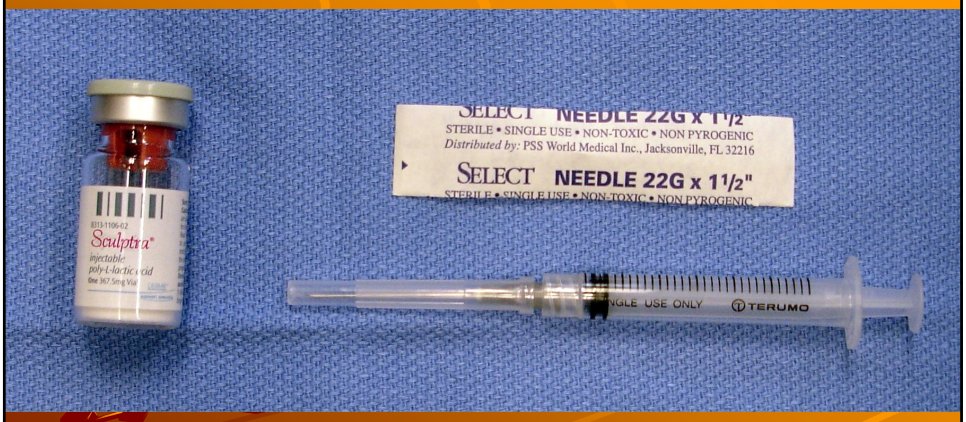
Areas of Facial Atrophy



Sculptra: The Appropriate Level of Injection



Sculptra: Poly-L-Lactic Acid



Sculptra requires reconstitution. Add 8 cc of sterile water (accompanies powder) + 1 cc of Lidocaine 1%. Allow mixture to sit for 2 h until dissolved. Inject using needle with diameter ≥26G (as recommended by company. I use a 22G needle.

Vortex Device Used For Sculptra Preparation

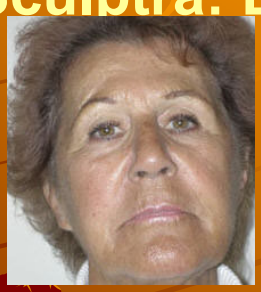
Sculptra: Before and After

Pre

After 3 treatments

Photo cortesy of Dr. Humble, http://www.perfectskincenter.com/sculptra.htm

Sculptra: Before and After



Pre

After 3 treatments

Pre

After 4 treatments

Sculptra – two injection over 2 mo

Sculptra: Before and After

Pre | After 4 treatments

Pre | After 3 treatments

CaHA: What, For Whom, Since When

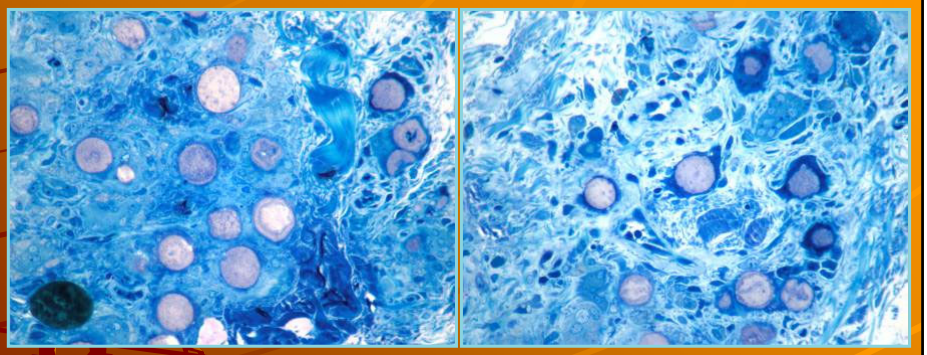
- A synthetic, biodegradable, biocompatible polymer derived from vegetable sources
- Facial lipoatrophy

CaHA Injections using 27G 1¼ needle

CaHA: Specifications

- Synthetic Calcium Hydroxylapatite (CaHA) microspheres [30%] suspended in a carboxy-methylcellulose resorbable aqueous gel carrier [70%]
- Stimulates the body to produce new collagen
- Pre-filled syringes
- No skin or allergy testing
- No special handling requirement
- Approved for treatment of facial wrinkles and folds, such as nasolabial folds, marionette lines, etc.

CaHA Supports Natural Collagen Integration



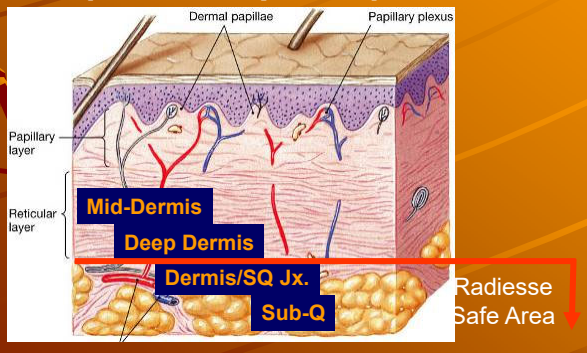
6-Month Human Skin Histology

Tissue infiltration (Light Blue Stain)

J. Cosmetic Laser Therapy 2004; 6: 223-226 by Ellen S Marmur MD, Robert Phelps MD and David J Goldberg MD, "Clinical, histologic and electron microscopic findings after injection of a calcium hydroxylapatite filler"

Where is CaHA Injected?

- **Results are best when Radiesse is laid down in fine threads and placed in the dermis:subcutaneous junction (aka, subdermal plane)**
- **Radiesse is also successfully placed in the subcutaneous space to fill in deep depressions or to obtain a volume effect- more product may be required**



CaHA is Safe- AE Profile Similar to Other Fillers

- Hundreds of thousands of patients have been successfully injected with Radiesse worldwide
- In another head-to-head clinical study comparing Radiesse to Restylane®, the adverse event profiles were similar for both products

Multiple Documented Studies Demonstrate the Efficacy and Safety of CaHA

Indication	Location	Number of Sites	Number of Patients
Nasolabial Fold	US	4	117
Facial Lipoatrophy	US	3	100
Facial Lipoatrophy	Canada	1	30
RADIESSE vs. Restylane	Europe	2	60
RADIESSE vs. Juvederm/Perlane	Europe	5	205
Stress Urinary Incontinence	US	14	296
Vesicoureteral Reflux	US	10	98
Vocal Fold Insufficiency	Worldwide	12	103
			1,009 patients

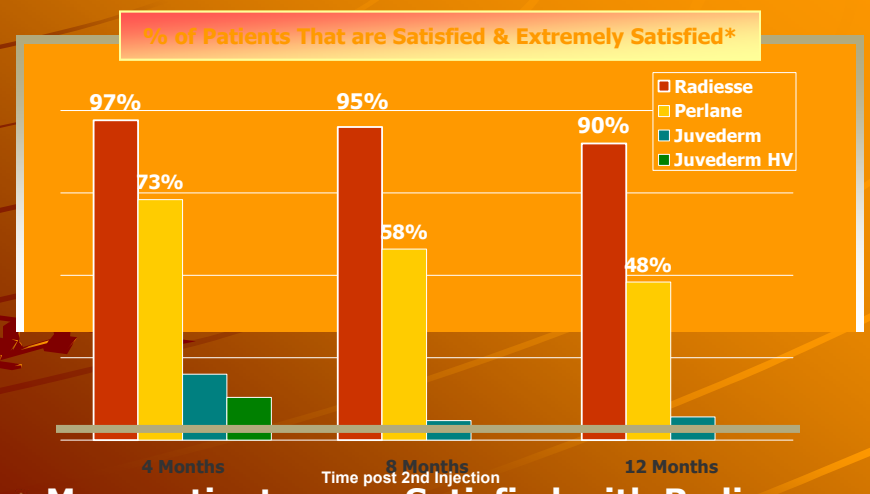
* Urological applications used Radiesse's sister product, Coaptite in clinical studies (75-125 microns)

Adding Lidocaine to Radiesse

We mix 0.1-0.2 cc Lido 1% ± epi 1:100000 with Radiesse using a Sterile Rapid-Fill™ Connector Luer Lock-to-Luer Lock.

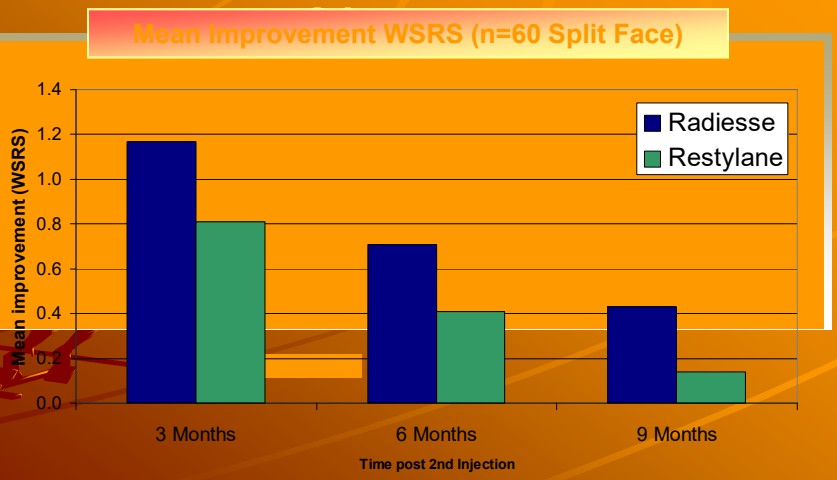
Connector is available from Baxa (Englewood, CO)
Order No. REF: 13901
www.baxa.com

Patient Satisfaction - Radiesse vs. Juvederm & Perlane



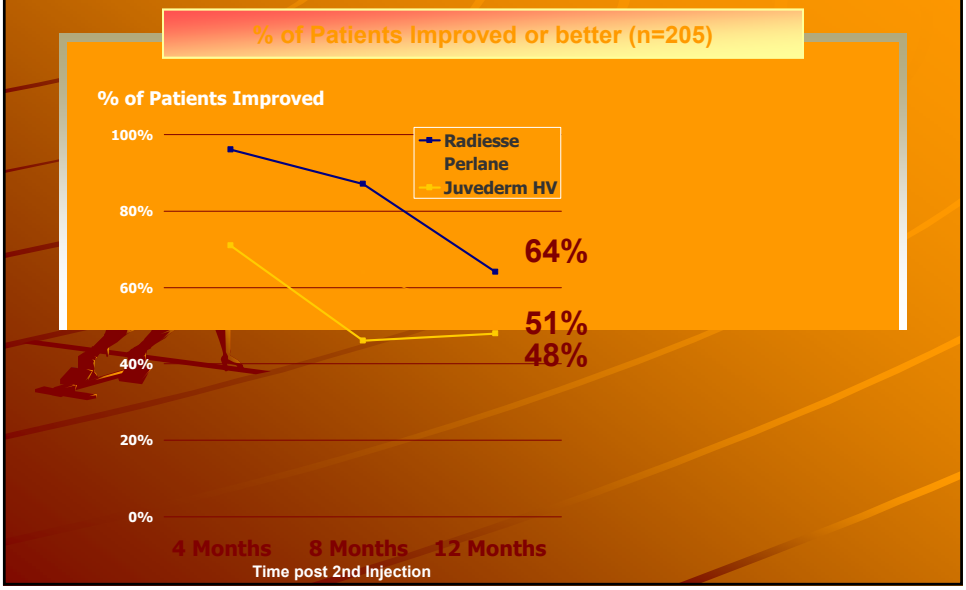
- More patients were Satisfied with Radiesse than were with Perlane & Juvederm

Mean Improvement Radiesse vs. hyaluronic



- Radiesse delivers better correction at every time-point
- Even at 3 Months, Radiesse correction is greater

Improvement lasts longer than hyaluronic acid fillers



Nasolabial Folds with Radiesse

Miles Graivier, MD
Roswell, GA.

Marionette Lines and Mental Crease with Radiesse

Before

After 3 Months
(1.3 cc total)

R. Allan Bexton, MD
Bakersfield, CA

HIV Facial Lipoatrophy

Baseline

Month 6

Month 12

Month 18

40 y/o
Male

Total Volume
8.0 mL

Nasolabial Folds with Radiesse

Steven Bloch, MD
Highland Park, IL

Summary: My Choices for Fillers

- Fine lines on the lip: no fillers, CO2 laser
- Nasolabial Folds: all fillers work to soften
- Marionette Lines: all fillers work
- Malar atrophy: all fillers work
- Lip augmentation: hyaluronic acid
- Nasojugular groove: hyaluronic acid deep and tissue tightening
- Glabellar lines: **don't do it.**

What are the 4 most common areas of blindness with fillers?

- Nose
- Glabellar complex
- Periorbital area
- Forehead
- Nasolabial fold