Clinical Overview of Dermal Fillers

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Agenda

- Background
- Use of Dermal Fillers
- Indications for Use
- Benefits and Risks

Dermal Fillers

- Also known as injectable implants, soft tissue fillers, wrinkle fillers
- Used to help create a smoother and/or fuller appearance in certain anatomic areas of the face and back of the hands
- May be intended to correct age-related deficits or other body structures for aesthetic purposes
  - E.g. augmentation of the cheek, chin, or lips

Increasing and Evolving Use

- 2nd most common minimally invasive procedure
  - ~ 2.7 million dermal filler treatments/year in the US*
- Modern landscape of dermal fillers has transformed considerably since Zyderm approval (1981)
  - Indications now specifically target augmentation and changes in contour
  - Fillers are used increasingly by patients of diverse background and by younger adult patients

*https://www.plasticsurgery.org/documents/News/Statistics/2019/plastic-surgery-statistics-full-report-2019.pdf

Device Description

- Composed of a variety of materials
  - Natural vs synthetic
  - Absorbable vs non-absorbable

- Some fillers contain analgesics (approved drugs) to reduce pain
  - Combination products
  - Also regulated by Center for Drug Evaluation and Research (CDER)

Dermal Filler Material	Description/Unique Considerations
Collagen - Animal derived	Zyderm/Zyplast (PMA P800022) • First injectable devices approved by the FDA in 1981 • Utilized bovine collagen (required skin testing before injection)
Collagen - Human derived	CosmoDerm/CosmoPlast (PMA P800022/S050) • Absorbable, recombinant human collagen • Dermal fillers made of collagen (animal or human derived) have an approximate duration of effect of 2-3 months

*these collagen-based filler products are no longer marketed

Dermal Filler Material	Description/Unique Considerations
Hyaluronic Acid-Naturally derived	• Absorbable, naturally occurring polysaccharide, generally derived from bacterial fermentation • First HA filler approved by FDA - Restylane in 2003 (PMA P020023) • Duration of effect varies depending on the material properties (e.g., degree of crosslinking, molecular weight of HA) • HA is often cross-linked with 1,4-butanediol diglycidyl ether (BDDE) • The duration of effect reported in approved PMAs ranges from: o 6 months (Belotero Balance SSED P090016) o 24 months (Juvederm Voluma SSED P110033) The effects of HA may be reversed using enzymatic degradation by hyaluronidase, as advocated by some professional societies

Dermal Filler Material	Description/Unique Considerations
Synthetic – Absorbable	Poly-L-lactic Acid (PLLA) – Sculptra • Composed of PLLA microspheres reconstituted in sterile water • Results last for up to 2 years in most patients (Sculptra Labeling) Calcium Hydroxylapatite (CaHA) – Radiesse • Composed of spherical CaHA particles suspended in a gel carrier • Results last for 1 year in all patients (Radiesse Labeling)
Synthetic – Non-absorbable	Polymethylmethacrylate (PMMA) – Bellafill • Composed of PMMA microspheres suspended in a gel containing 3.5% bovine collagen and 0.3% lidocaine hydrochloride. • Requires skin testing for hypersensitivity reactions • Results are lasting, microspheres can only be removed surgically

Use of Dermal Fillers

- Location (depth) of Injection of Dermal Fillers
  - Mid to deep dermis
  - Subcutaneous
  - Supraperiosteal

- Method of Injection of Dermal Fillers
  - Needle
  - Cannula

Indication	Naturally-derived			Synthetic		
	Absorbable					Non-absorbable
	Collagen	Hyaluronic Acid – animal source	Hyaluronic Acid – bacterial source	Poly-L-lactic Acid	Calcium Hydroxyl-apatite	Poly-methyl-methacrylate
Chin						
Cheek/ Midface						
Lip						
Perioral Lines						
Hands						
Nasolabial Folds						
Acne Scars						
Scars						
HIV Lipoatrophy						

Filler Benefits and Risks

- Benefits
  - Correction of age-related deficits
  - Augmentation of body structures for aesthetic purposes

- Risks
  - Local adverse events
  - Less common but serious adverse events (e.g. blindness)

Risks of Dermal Fillers

Common risks	Less common risks

• Swelling
• Pain/tenderness
• Firmness (induration)
• Bruising
• Redness
• Discoloration
• Itching
	• Granuloma
	• Lumps/nodules
	• Injection site infection
	• Open or draining wounds
	• Allergic reaction
	• **Inadvertent intravascular injection:**
	  ▪ Skin necrosis
	  ▪ Damage to facial structures
	  ▪ Vision impairment/blindness
	  ▪ Stroke

FDA 2015 Safety Communication: Risk of Intravascular Filler Injection

Recommended clinician labeling changes:

- Warning:
  - Introduction of product into the vasculature may lead to embolization, occlusion of the vessels, ischemia, or infarction …
  - Rare but serious adverse events associated with the intravascular injection of soft tissue fillers in the face have been reported and include temporary or permanent vision impairment, blindness, cerebral ischemia or cerebral hemorrhage, leading to stroke, skin necrosis, and damage to underlying facial structures…
  - Patients should receive prompt medical attention and possibly evaluation by an appropriate health care practitioner specialist should intravascular injection occur

https://www.fda.gov/media/92608/download

FDA 2015 Safety Communication: Risk of Intravascular Filler Injection

Recommended clinician labeling changes:

- Precaution:
  - In order to minimize the risks of potential complications, this product should only be used by health care practitioners who have appropriate training, experience, and who are knowledgeable about the anatomy at and around the site of injection
- Precaution:
  - Health care practitioners are encouraged to discuss all potential risks of soft tissue injection with their patients prior to treatment and ensure that patients are aware of signs and symptoms of potential complications

https://www.fda.gov/media/92608/download

FDA 2017 Safety Communication: Risk of Injectable Silicone

There are **no** FDA-approved injectable silicone filler products

https://www.fda.gov/consumers/consumer-updates/fda-warns-against-injectable-silicone-body-contouring-and-enhancement


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