COMPLICATIONS - MANAGEMENT
Chemical denervation, Dermal fillers

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Contraindications – Botulinum toxin

• Botulinum toxin is relatively contraindicated in individuals with neuromuscular disease such as Eaton-Lambert syndrome, amyotrophic lateral sclerosis, myasthenia gravis.

• Known hypersensitivity to Botulinum Toxin
  • anaphylaxis, serum sickness, urticaria, soft tissue edema, dyspnea

• Presence of infection at injection sites

• Experience with botulinum toxin in pregnant and lactating women is extremely limited, and thus, caution is warranted in these cases. Based on animal data, may cause fetal harm
  (Pregnancy Category C)
Contraindications

Drug Interactions

- Subjects taking aminoglycosides should receive lower doses of botulinum toxin (effect of the toxin may be potentiated).
- Use of anticholinergic drugs after administration of BOTOX may potentiate systemic anticholinergic effects.
- Excessive weakness may also be exaggerated by administration of a muscle relaxant before or after administration of BOTOX.
Distant Spread of Toxin Effect

Postmarketing reports indicate that the effects of BOTOX® Cosmetic and all botulinum toxin products may spread from the area of injection to produce symptoms consistent with botulinum toxin effects.

These may include asthenia, generalized muscle weakness, diplopia, blurred vision, ptosis, dysphagia, dysphonia, dysarthria, urinary incontinence, and breathing difficulties.

These symptoms have been reported hours to weeks after injection. Swallowing and breathing difficulties can be life threatening and there have been reports of death. The risk of symptoms is probably greatest in children treated for spasticity but symptoms can also occur in adults treated for spasticity and other conditions, particularly in those patients who have underlying conditions that would predispose them to these symptoms.

In unapproved uses, including spasticity in children and adults, and in approved indications, cases of spread of effect have occurred at doses comparable to those used to treat cervical dystonia and at lower doses.

No definitive serious adverse event reports of distant spread of toxin effect associated with cosmetic use
All Products contain albumin, a derivative of human blood.

- Based on effective donor screening and product manufacturing processes, it carries an extremely remote risk for transmission of viral diseases.
- No cases of transmission of viral diseases or CJD have ever been reported for albumin.
Adverse events

- **Overdose**: symptoms of are likely not to be present immediately following injection. Should accidental injection or oral ingestion occur, medical supervision for several weeks for signs and symptoms of excessive muscle weakness or paralysis.

Antitoxin raised against botulinum toxin: available from the Centers for Disease Control and Prevention (CDC) in Atlanta, GA (1-770-488-7100)

  - will not reverse any botulinum toxin-induced effects already apparent
Adverse events

- **Cardiovascular events**
  arrhythmia, MI (patients with risk factors including pre-existing cardiovascular disease)

- **Headache**
  not clear etiology, possible tensional causes

- **Dry eye, ocular pain**
  impairment to innervation of lacrymal gland

- **Corneal Exposure and Ulceration**
  in treating blepharospasm. Reduced blinking from denervation of the orbicularis muscle
Area of denervation associated with each point of injection due to toxin diffusion is about 2-2.5cm.

The concentration gradient decreases with distance.
## Adverse events

### In glabellar lines

<table>
<thead>
<tr>
<th>Adverse Reactions by System Organ Class</th>
<th>BOTOX Cosmetic (N=405)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Disorders and Administration Site Conditions</td>
<td></td>
</tr>
<tr>
<td>Facial pain</td>
<td>6 (1%)</td>
</tr>
<tr>
<td>Nervous System Disorders</td>
<td></td>
</tr>
<tr>
<td>Facial paresis</td>
<td>5 (1%)</td>
</tr>
<tr>
<td>Eye Disorders</td>
<td></td>
</tr>
<tr>
<td>Eyelid ptosis</td>
<td>13 (3%)</td>
</tr>
<tr>
<td>Musculoskeletal and Connective Tissue Disorders</td>
<td></td>
</tr>
<tr>
<td>Muscular Weakness</td>
<td>6 (1%)</td>
</tr>
</tbody>
</table>

### In Crow’s feet

<table>
<thead>
<tr>
<th>Adverse Reactions by System Organ Class</th>
<th>BOTOX Cosmetic 24 Units (N=526)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye disorders</td>
<td></td>
</tr>
<tr>
<td>Eyelid edema</td>
<td>5 (1%)</td>
</tr>
</tbody>
</table>
Adverse events

- Local bruising
  injection technique (stay superficial)
  patient selection (meds, etc)
  no attention to post-treatment instructions

- Ice (pre-op)
- Pressure
- More ice
- Arnica creams
- Concealer and patience
  yellow base - for blue bruises
  green base - for red bruises
  white base - for brown bruises
  lavender base - for yellow bruises
Adverse events

- **Brow ptosis:** lowering the eyebrow
  experience – patient selection
  lower concentration migrate easier
Adverse events

• Brow ptosis: lowering the eyebrow

Prevention
don’t inject frontalis in pts with ptosis
inject frontalis above lowest fold – 3cm above brow

Treatment
no effective treatment
Adverse events

- Upper Eyelid Ptosis
diffusion under orbital rim affecting levator palpebrae superioris (LPS)
Adverse events

• Upper Eyelid Ptosis
  Prevention
  good technique – injections 1cm superior to orbital rim
  large dilution – increased volume – may diffuse inferiorly

Treatment
  Apraclonidine (Lopidine) 0.5% sol
  Directions: 1-2 gtts tid until resolution
Adverse events

• Upper Eyelid Ptosis
  Apraclonidine (Lopidine) 0.5% sol

  selective alpha-2-adrenergic agonist
  reduces aqueous flow – decreases intraocular pressure
  stimulates Müller’s muscle – compensates for weak LPS

  attention with patients on MAO inhibitors
Adverse events

• Cocked eyebrow:
  leaving the lateral part of frontalis completely unaffected will result in a “evil” look
Adverse events

• Cocked eyebrow:
  leaving the lateral part unaffected will result in a sinister look
Adverse events

• Cocked eyebrow prevention and treatment
• If treating just glabella keep it more medial
• Inject few units in lateral frontalis
Adverse events

Most side effects result from undesired muscle weakening caused by the diffusion of toxin to non-targeted muscles in close proximity to the injection site.

Diplopia – when extra-ocular muscles are affected
Drooping mouth corners – when the zygomaticus major is affected
Mouth incopetency – overzealous Tx of the perioral area
Dysphagia – large, deeper doses to the neck (platysma)
Adverse events

Dissatisfaction
• Not adequate treatment - residual lines persist (most common in the glabella)
• Upper eyelid skin redundancy gets exaggerated
• Fat herniation becomes exaggerated

Proper treatment planning
Patient communication
Selecting appropriate methods for enhancing facial esthetics
Immunogenicity

- Formation of neutralizing antibodies to botulinum toxin type A may reduce the effectiveness of BOTOX treatment by inactivating the biological activity of the toxin.
- BOTOX injections at more frequent intervals or at higher doses may lead to greater incidence of antibody formation.
- The potential for antibody formation may be minimized by injecting with the lowest effective dose given at the longest feasible intervals between injections.
- Formulation change in 1997, complexing protein load from 25 ng/100 U to 5 ng/100 U
- Mostly anecdotal and considered very rare (for cosmetic applications)
Contraindications – Hyaluronic Acid

• Patients with severe allergies manifested by Hx of anaphylaxis

• Patients with Hx of allergies to G+ bacterial proteins (contains trace amounts)

• Patients with bleeding disorders

• Sites with active inflammatory process

• Safety in pregnant and lactating women and patients under 18 years has not been established
Adverse events – fillers

• Immediate onset

• Under or over correction
Adverse events – fillers

- Immediate onset

- Too superficial injection

**Treatment**
- Firm massage
- Hyaluronidase (for HA)
- Dermabrasion or surgical shaving
## Adverse events – fillers

- **Immediate onset**

<table>
<thead>
<tr>
<th>Vascular compromise</th>
<th>Arterial embolization</th>
<th>Venous occlusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>presentation</td>
<td>Skin blanching, geographical pattern, pain</td>
<td>Delayed dull pain, swelling, dark discoloration</td>
</tr>
<tr>
<td>management</td>
<td>Attempt aspiration massage</td>
<td>massage</td>
</tr>
<tr>
<td></td>
<td>Warm compresses</td>
<td>Warm compresses</td>
</tr>
<tr>
<td></td>
<td>Hyaluronidase (If HA)</td>
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</tr>
<tr>
<td></td>
<td>Abx (topical, PO) in case of skin breakdown</td>
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<tr>
<td></td>
<td>Conservative debridement Frequent follow-up</td>
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<tr>
<td>prevention</td>
<td>Smallest possible needle Smallest possible volume Proper plane of injection</td>
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- **Smallest possible needle**
- **Proper plane of injection**
- **HBO if impending massive skin necrosis**
Adverse events – fillers

- Immediate onset
  - Vascular compromise
Adverse events – fillers

- Immediate onset
  
  **Blindness**
  
  - Described for all types of injectables around the eye and the glabella
  - Extremely rarely
  - Injection into the supratrochlear artery, connected to ophthalmic artery
  - Needle has to be resting, not moving
Adverse events – fillers

- **Early onset (3-14 days)**
- **Local bruising**
  injection technique (stay superficial, needle bore, vascular site)
  patient selection (thin skin, meds, etc)
  no attention to post-treatment instructions

- Manage anticoagulants, anti-PLT meds
- Ice (pre-op)
- Pressure
- More ice
- Arnica creams
- Concealer and patience
Adverse events – fillers

- Early onset (3-14 days)

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<tr>
<th>Nodules</th>
<th>Non-inflammatory</th>
<th>Inflammatory</th>
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<tbody>
<tr>
<td>Massage</td>
<td></td>
<td><strong>Fluctuant</strong> – I &amp; D, culture Abx</td>
</tr>
<tr>
<td>Hyaluronidase (If HA) (10–75 U)</td>
<td></td>
<td><strong>Non-fluctuant</strong> Empiric Abx f/u in 2 days No improvement – Bx and cultures Abx 4-6 weeks When infection subsides consider hyaluronidase (if HA) to remove nidus or intralesional corticosteroids</td>
</tr>
</tbody>
</table>
Adverse events – fillers

• Early onset (3-14 days)
  Nodules
Adverse events – fillers

Early onset (3-14 days)

• Infection (remove make-up, antisepsis)
• Herpes simplex activation (Valtrex or Acyclovir)

• Angioedema
  very rare
  related with protein contaminants in the product

Hyaluronic acid is particularly hydrophilic. An acceptable amount of localized edema is expected.
Adverse events – fillers

- Delayed-Onset (>14 Days)
  - Persistent erythema
  - Delayed on-set nodules and granulomas (*fillers are foreign bodies*) Chronic inflammatory reaction
Adverse events – fillers

• **Delayed-Onset (>14 Days)**
  - Hypertrophic Scarring
    - too superficial injection
    - pt prone to hypertrophic scarring

  intralesional steroids
Considerations

- Local anesthesia. Excessive may distort contours
- Thin skin (around the eyes)
- Temporary lip treatment before permanent filler (scars beneath vermillion border)
- Laser treatment after dermal fillers. Fillers in deep wrinkles can withstand Tx
- Permanent makeup on top of injectables (delivered to the upper papillary dermis)
- Compatibility of different fillers (no proof of adverse events)
- Immunodepressed patients (not necessarily a contraindication)