NEUROTOXINS AND AESTHETICS

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DISCLOSURES

• No affiliation with products mentioned (Allergan - Juvederm/Botox®, Upneeq®, Lumify®, Babe Lash, Latisse, Lash Boost)

• Owner of Optometric Aesthetics, LLC

• Neurotoxin trainings, iLight IPL machine and trainings
OVERVIEW

• Beauty and the aging face
• Neurotoxins – Therapeutic & Cosmetic
• Dermal Fillers
• Pharmaceuticals for aesthetics
• Lumps and bumps removal
• Other facial treatments
The beauty industry is a 500 billion industry

Great opportunity for optometrists

Merriam-Webster definition for Aesthetics - Relating to art or beauty; done or made to improve a person's appearance or to correct defects in a person's appearance

Why do aesthetics?

- It's fun, it pays well, and no billing to insurance
- Your patients are doing this anyway, why not help them?
THE AGING FACE

• With age there is wisdom and experience but it also comes with other changes

• Deep creases are formed from facial expressions

• Fines lines formed by sun damage, smoking and natural degeneration

• Looser skin from loss of collagen and elastin

• Puffy or dark circles under eyes
• Fat pads shrink and migrate downward

• Decrease in bone density
THE AGING FACE
RHYTIDS “WRINKLES”

- Dynamic vs. static
- Dynamic rhytids are lines when expressions are made
- Static rhytids are lines when face is at rest
NEUROTOXINS FOR COSMETICS

Botox, Dysport, Xeomin, Jeuveau
NEUROTOXINS

- Onabotulinumtoxin-A (Botox)
- Incobotulinumtoxin-A (Xeomin)
- Abobotulinumtoxin-A (Dysport)
- Prabotulinumtoxin-A (Jeuveau)
NEUROTOXIN HISTORY

• 1895 Botulinum toxin first identified
• 1978 FDA approved Type “A” for testing in humans
• 1989 First Botox FDA approval for Strabismus and Blepharospasm
• 2000 Botox FDA approval for Cervical Dystonia
• 2002 Botox FDA approval for Glabella Lines
• 2012 Botox FDA approval for Chronic Migraines
• 2013 Botox FDA approval for lateral Canthal Folds (Crows Feet)
• 2015 Botox FDA approval for Overactive Bladder
• 2017 Botox FDA approval Forehead Rhytids, Dysport FDA approved for glabella
• 2019 Jeuveau FDA approved for glabella
MECHANISM OF ACTION

- Derived from Clostridium Botulinum
- 8 serotypes (A, B, C, D, E, F, G, H)
- Botox cleaves SNAP-25 on motor neuron
- Blocks release of Acetylcholine at NM junction
- Prevents release of ACh and muscle contraction
NEUROTOXIN COSMETIC

• NOT good candidates:
  • Allergy to botulinum toxin
  • Pregnant or nursing (category C)
  • Skin infections at target site
  • Neuromuscular conditions (myasthenia gravis, muscular dystrophy, ALS)
INJECTION DEPTHS

• The angle of insertion will determine the depth of the needle
NEUROTOXIN COSMETIC

Lateral canthid rhytids
“Crows feet”

Glabella complex rhytids
“I 1’s”

Frontallis rhytids
“Forehead wrinkles”
BOTOX COSMETIC - ON-LABEL

The following injection sites are recommended for on-label treatment with BOTOX® Cosmetic (onabotulinumtoxinA):

- Moderate to severe forehead lines associated with frontalis muscle activity
- Moderate to severe lateral canthal lines associated with orbicularis oculi activity
- Moderate to severe glabellar lines associated with corrugator and/or procerus muscle activity

The distance between the eyebrow and lower treatment row should be at least 2 cm.
GLABELLA COMPLEX “11’S”

BEFORE

AFTER

BOTOX
COSMETIC
FRONTALIS RHYTIDS
LATERAL CANTHID RHYTIDS

BEFORE

AFTER

BOTOX COSMETIC
BOTOX THERAPEUTIC
100 and 200 unit bottles
For blepharospasm, strabismus, hemi-facial spasms
BLEPHAROSPASM

- Blepharospasm - focal dystonia of the obicularis oculi
- Involuntary repetitive blinking or sustained closed lids
- Onset usually between 5th and 7th decade of life*
- Symptoms include: Excessive blinking, dry eyes, light sensitivity, ocular pain

* Brin et al
BLEPHAROSPASM CONT.

- Treatments:
  - Treat dry eye
  - Neurotoxins
  - Surgery - Myectomy
BLEPHAROSPASM CONT. 

• Botox for blepharospasm

• Three FDA approved injection sites
  
  1.25 to 2.5 units each site, then add more in 2 weeks if necessary

• Avoid levator palpebrae superioris to prevent ptosis

• Avoid medial LL to prevent diplopia (inferior oblique muscle paresis)

• Adverse reactions: Ptosis (21%), SPK (6%), dry eyes (6%)
HEMIFACIAL SPASM

• Involuntary twitching of facial muscles due to pressure against the facial nerve, often near brain stem

• Diagnosis by MRI - May be from malpositioned artery, artery loop or tumor

• Treatments
  • Microvascular decompression surgery (MVD)
  • Neurotoxins (off-label)
HEMIFACIAL SPASM CONT.

- Treatment
  - Microvascular decompression surgery (MVD)
  - Sponge is placed between the artery and the facial nerve
  - Possible side effects (low risk) - facial numbness, diplopia, infection, bleeding, hearing and balance issues, paralysis
  - 15% chance of recurrence
HEMIFACIAL SPASM CONT.

- Treatment with Neurotoxin
  - 2 - 10 U Neurotoxin injected in the twitching muscles
  - Discuss possible side effects (ptosis, change in smile, etc)
- Myokymia? Treat it like we normally would…(reduce stress, more sleep, less caffeine, maybe glasses)
- Chronic? MRI to rule out hemifacial spasm
- Quinine (found in tonic water), beta blocker (timolol)
DERMAL FILLERS
WHAT ARE DERMAL FILLERS

• Dermal Fillers are used to fill in volume loss due natural loss of fat and bone density

• Most are made of hyaluronic acid
  - Dissolvable by hyaluronidase

• Sculptra - Poly-L-Lactic acid (PLLA) stimulates collagen, but not dissolvable

• Good for deep wrinkles and restore volume loss
WHERE ARE DERMAL FILLERS USED

• Dermal fillers are used almost everywhere in the face and can be used all over the body

• Upper face - Temples, hollowing of eyes, glabella

• Mid face - Cheeks, under eye (tear trough), nose

• Lower face - jawline, nasolabial folds, marionette, *LIPS
DERMAL FILLERS CONT.

• Dermal fillers can have a bad rep…
DERMAL FILLERS CONT
DERMAL FILLERS CONT.
DERMAL FILLERS CONT.
DERMAL FILLERS CONT.

- Possible complications:
  - Vascular occlusion - occlusion of any vessel including CRAO, necrosis
  - Bruising/edema - face is highly vascularized
  - Lumps and bumps
DERMAL FILLERS CONT.

• Safer alternative to dermal fillers

• PRP (platelet-rich plasma) therapy - inject patients own platelets, growth factors, and cytokines to build new collagen and soft tissue growth
  
  • Also used for injuries/pain, hair growth, post surgical healing, etc

• PRF (platelet-rich fibrin) - blood centrifuged at lower speeds to retain fibrin, white blood cells, stem cells, up to 10x the amount of platelets
  
  • Coagulates within 15-20 minutes, thickens under skin and stays longer
Figure 2 (A) Before and (B) after PRF for dark circles in combination with filler. Images courtesy of Anil Rajani, MD

Figure 3 (A) Before and (B) after treatment for brown spots and the tear trough. Images courtesy of Anil Rajani, MD
UNDER EYES

Dark circles, wrinkles, puffy
UNDER EYES

- Hyperpigmentation
- Wrinkles
- Puffiness
<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CHALLENGE</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under-Eye Darkness</td>
<td>Melanin banding (natural pigmentation patterning)</td>
<td>Gentle lighteners, including low-concentration hydroquinone products</td>
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<tr>
<td></td>
<td>Hemoglobin deposits under the eye</td>
<td>Products that chelate the hemoglobin</td>
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<tr>
<td></td>
<td>Sun damage</td>
<td>Skin lighteners with DNA-reparation properties</td>
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<tr>
<td></td>
<td>Thin skin, which allows blood vessels to become visible</td>
<td>Products to improve the skin’s tone and texture; makeup</td>
</tr>
<tr>
<td>Fine Lines, Sagging, and Wrinkles</td>
<td>Muscle contraction</td>
<td>Neuromuscular inhibitors, which are medical-grade products that contain collagen- and elastin-building properties</td>
</tr>
<tr>
<td></td>
<td>Loss of volume (fat)</td>
<td>Injectable fillers, which are medical-grade products that promote dermal tissue building</td>
</tr>
<tr>
<td></td>
<td>Collagen and elastin loss</td>
<td>Medical-grade products that contain collagen- and elastin-building properties</td>
</tr>
<tr>
<td>Puffiness</td>
<td>Water accumulation in the capillaries</td>
<td>Teach clients the proper effleurage technique; to clients, used medical-grade products to seal capillary leakage</td>
</tr>
<tr>
<td></td>
<td>Fat accumulation</td>
<td>Teach clients the proper effleurage technique to clients</td>
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<tr>
<td></td>
<td>Fat pad migration (movement)</td>
<td>Blepharoplasty</td>
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PHARMACEUTICALS

Used for aesthetics
UPNEEQ - BLEPHAROPTOSIS

- Alpha-adrenergic agonist

- Works similar to phenylephrine in that it targets Müller's muscle and elevate eye lid but with less dilation effects

- Peak affects from 5 min to 2 hours, duration 6 -14 hours

- Side efffects: 1-5% SPK, hyperemia, dry eye, blurred vision, instillation site pain, eye irritation and headache

- Retail?
UPNEEQ - BLEPHAROPTOSIS

Acquired Ptosis

Normal

Mild

Moderate

Severe

Aesthetic²

Cosmetic Concerns
Sleepy Appearance
Asymmetrical Ocular Appearance

Functional¹⁻³

Visual Impairment
Neck Pain
Brow Ache
Headaches
LUMIFY

- Selective Alpha 2 agonist - mainly constricts venules
- Provides redness relief for up to 8 hours
- Maintains oxygen availability to surrounding tissue
PROSTAGLANDINS FOR LASH GROWTH

• Babe Lash, Latisse, Lash Boost (Methylamido Dihydro Noralfaprostal (MDN), Bimatoprost, isopropyl cloprostenate)

• Possible side affects: eye redness, skin/iris discoloration
BUMP REMOVAL
BUMP REMOVAL

- Indications:
  - Skin papillomas/skin tags
  - Seborrheic keratoses
  - Verruca
  - Chalazion
  - Sebaceous cysts
  - Benign Nevi
  - Cyst of Moll
  - Pyogenic Granulomas
  - Xanthelasma
BUMP REMOVAL CONT.

- Electrosurgery – passes high frequency current through tissue, using the tissue as the heating element
- AKA Radiofrequency Surgery
- Chemical cautery - dichloroacetic acid
- Wescott scissors
- Scalpel #15 blade
BUMP REMOVAL CONT.

- Electrosurgery
  - Uses electricity to cause thermal destruction of tissue by coagulation or vaporization
  - Anesthetize with lidocaine (injectable)
  - Cuts and coagulates at the same time to prevent bleeding
    - Pure cut, pure coagulate, and blend settings
BUMP REMOVAL CONT.

• Advantages and capabilities of electrosurgery

• Remove bumps quick and very precise

• Treat trichiasis

• Punctual cautery - coag mode

• Conjunctival chalasis surgery (video) - using capsulorhexis forceps and coag blend mode with low energy
BUMP REMOVAL CONT.

• Chemical cautery - fast, easy, safe

• Wear gloves, use cotton swab or toothpick to dip in acid and touch the lesion

• Turns white immediately, then darkens over the next couple days

• Keep out of sun, use erythromycin ung TID x 1 week
CHEMICAL CAUTERY
OTHER AESTHETICS

Most common treatments done
OTHER AESTHETIC TREATMENTS

- Chemical peels - Each peel targets specific skin concerns and can address more than one concern at a time
- Facials - Treats common skin concerns; aging, hyper pigmentation, dryness
- Microneedling - Tightens and firms skin, helps reverse sun damage and pigmentations
- RF skin tightening - Reduce the appearance of fine lines and wrinkles
- CO2 resurfacing - More aggressive way to reduce wrinkles and improve skin texture
- Microdermabrasion - Exfoliates and removes dead skin cells
- Hydrofacial - Exfoliates and removes dead skin cells
QUESTIONs?

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