Cosmetic Considerations

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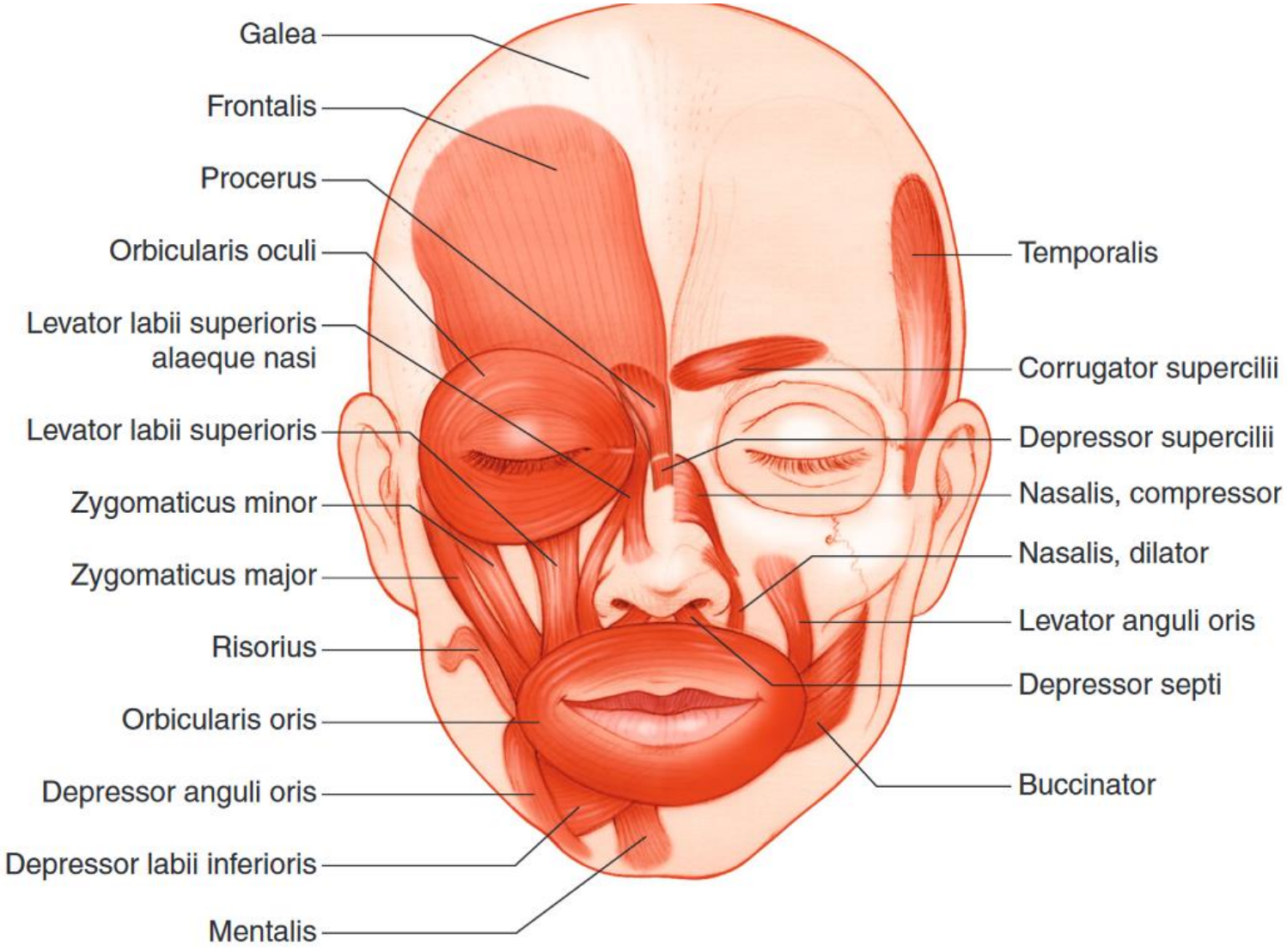
Financial Disclosure

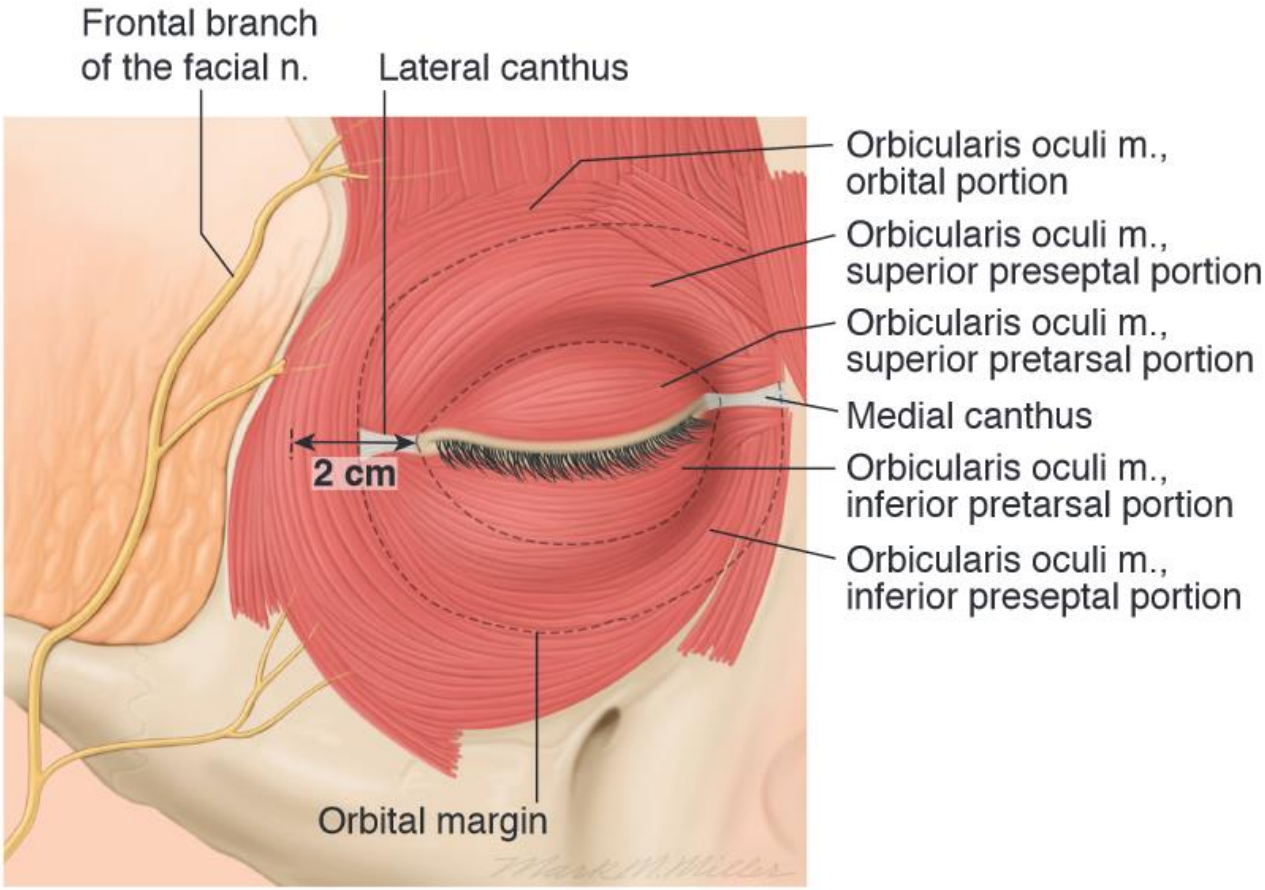
- Lumenis – Speaker

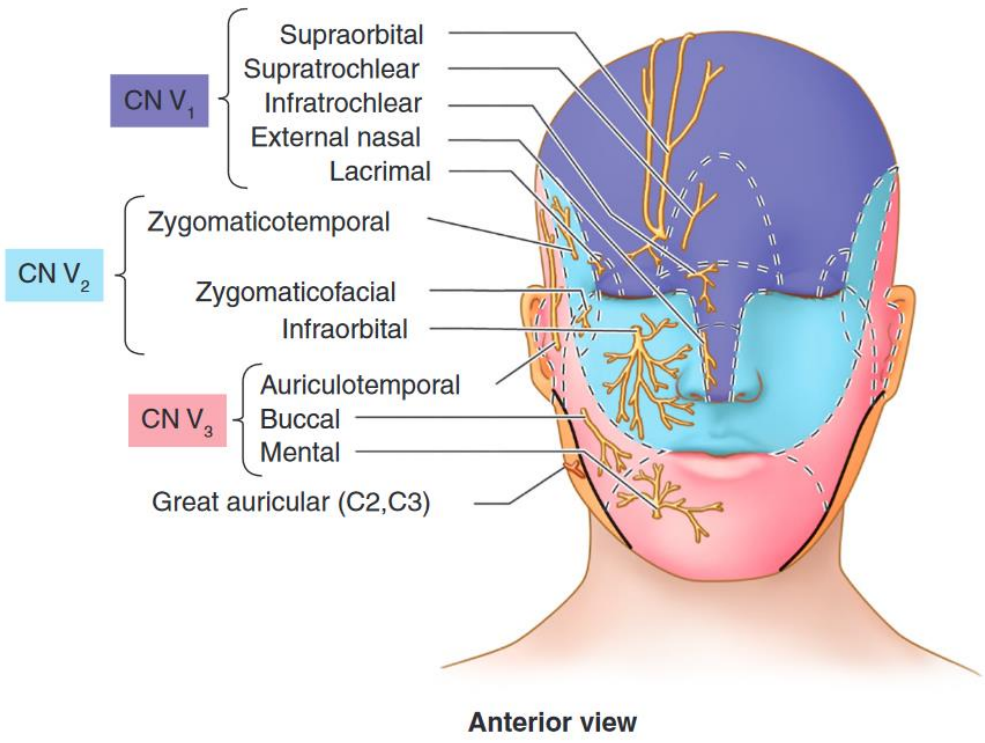
- All relevant relationships have been mitigated

Objectives

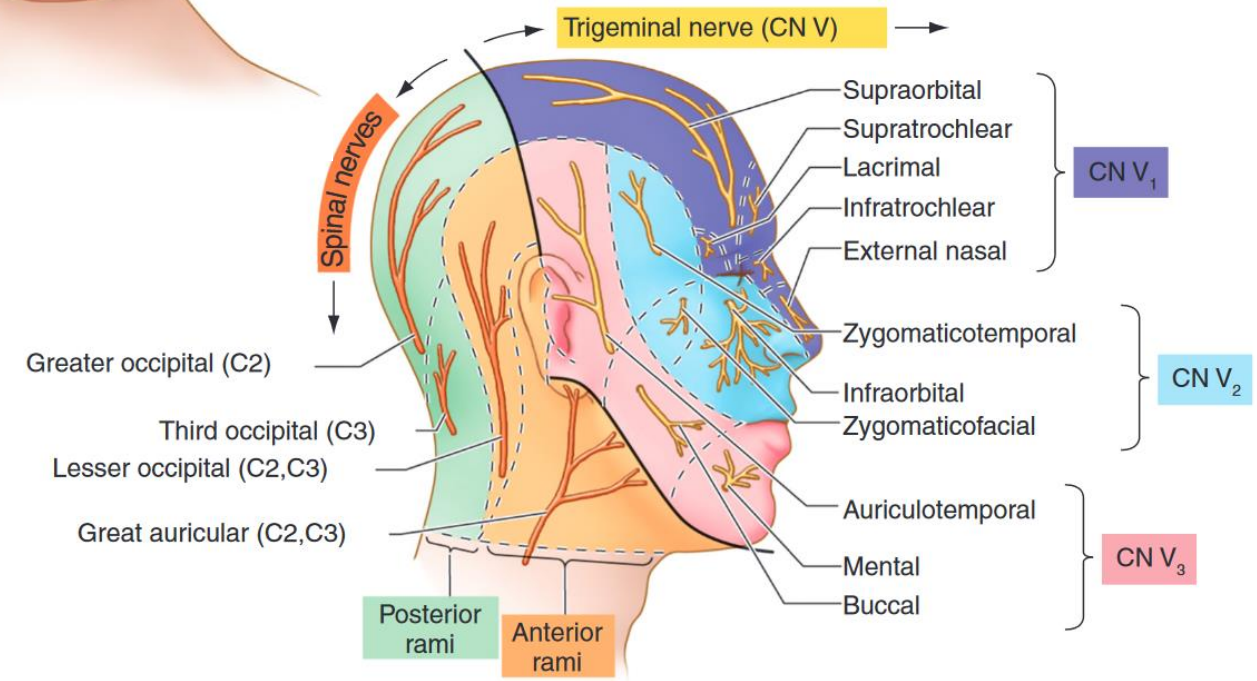
- Review introductory landmarks
- Wrinkle control
- Botulinum toxin
- Xanthelasma


Galea
Frontalis
Procerus
Orbicularis oculi
Levator labii superioris alaeque nasi
Levator labii superioris
Zygomaticus minor
Zygomaticus major
Risorius
Orbicularis oris
Depressor anguli oris
Depressor labii inferioris
Mentalis
Temporalis
Corrugator supercilii
Depressor supercilii
Nasalis, compressor
Nasalis, dilator
Levator anguli oris
Depressor septi
Buccinator

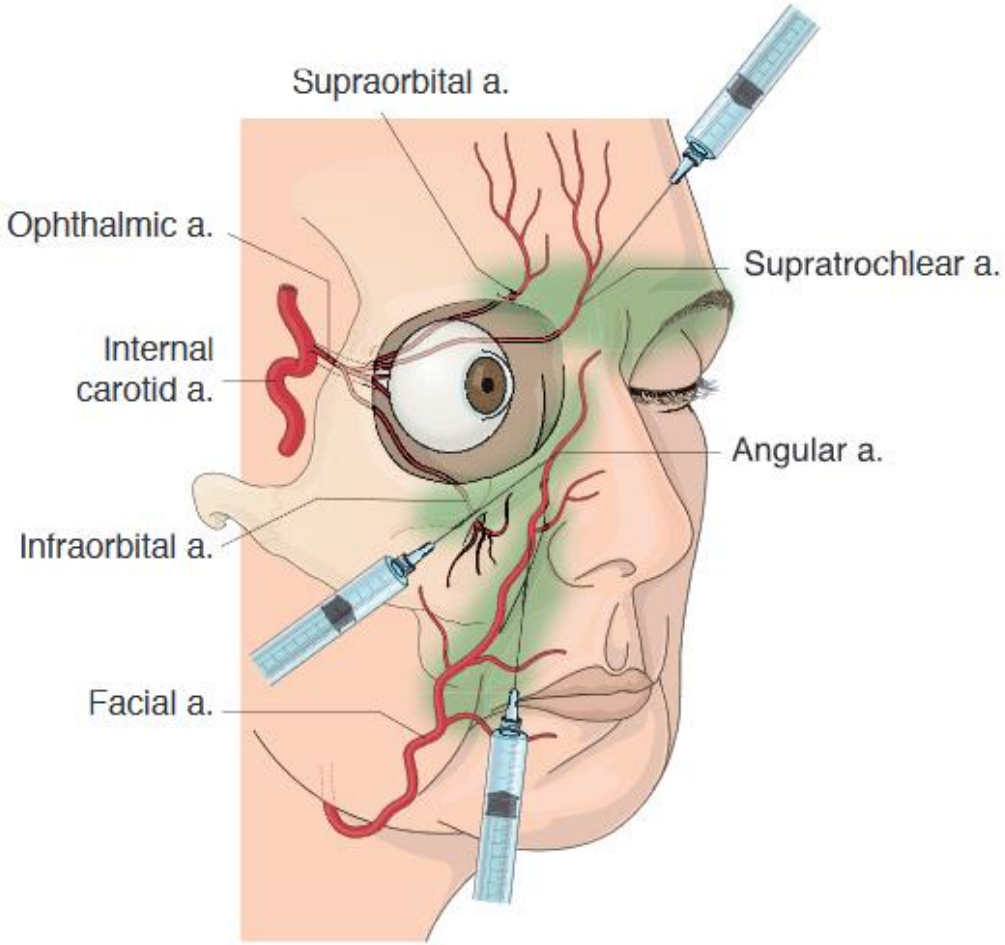

Frontal branch
of the facial n.
Lateral canthus
Orbicularis oculi m.,
orbital portion
Orbicularis oculi m.,
superior preseptal portion
Orbicularis oculi m.,
superior pretarsal portion
Medial canthus
Orbicularis oculi m.,
inferior pretarsal portion
Orbicularis oculi m.,
inferior preseptal portion
2 cm
Orbital margin

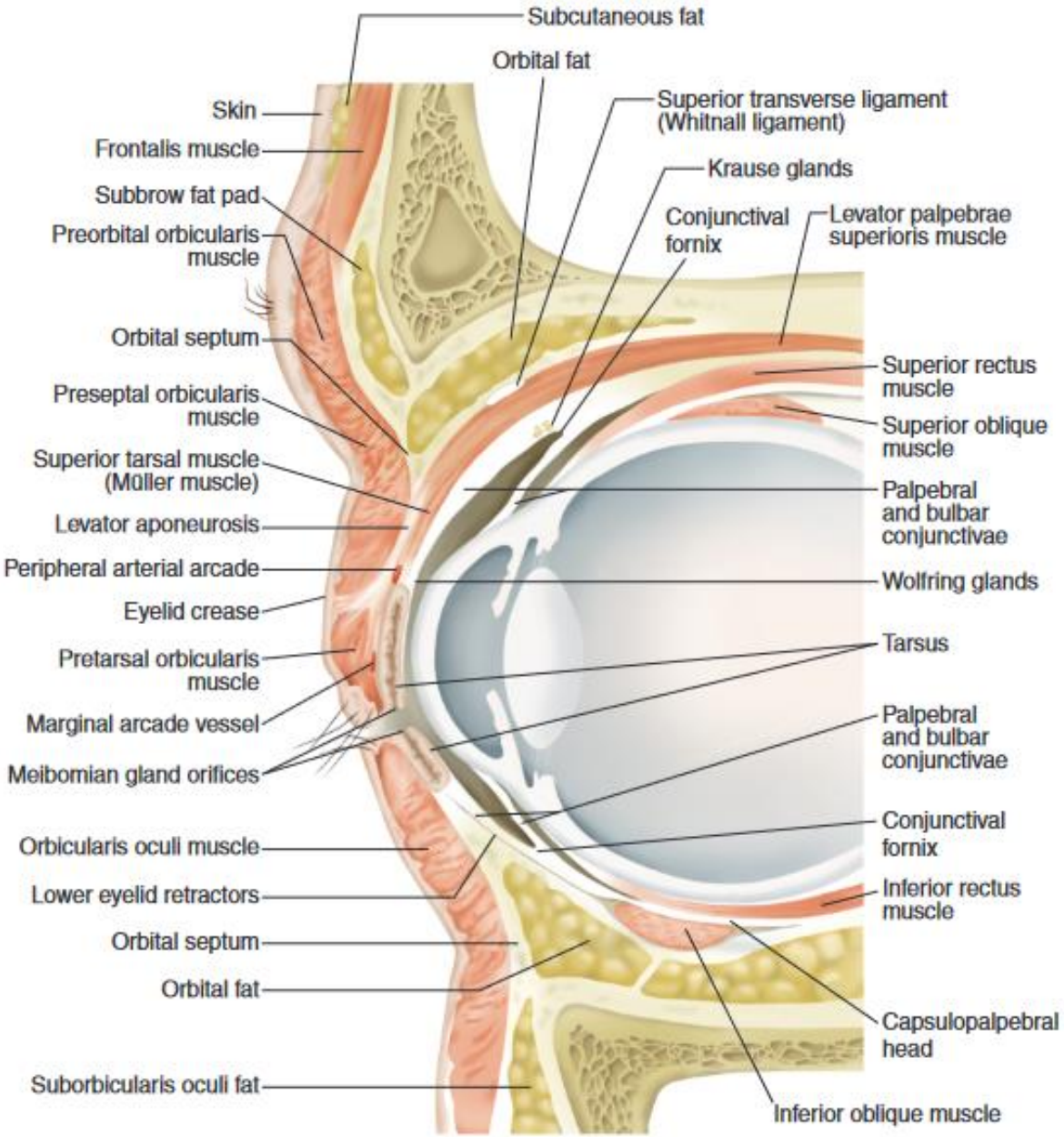


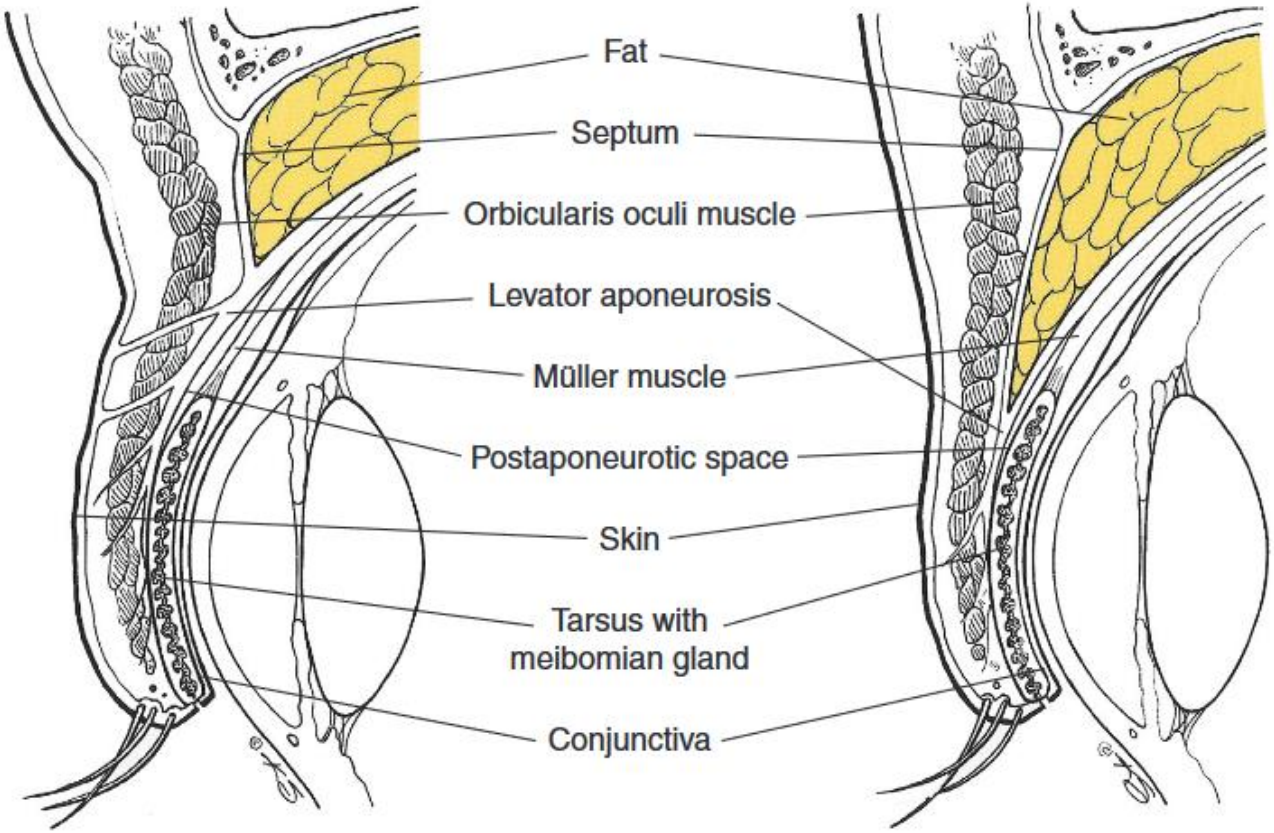
Anterior view

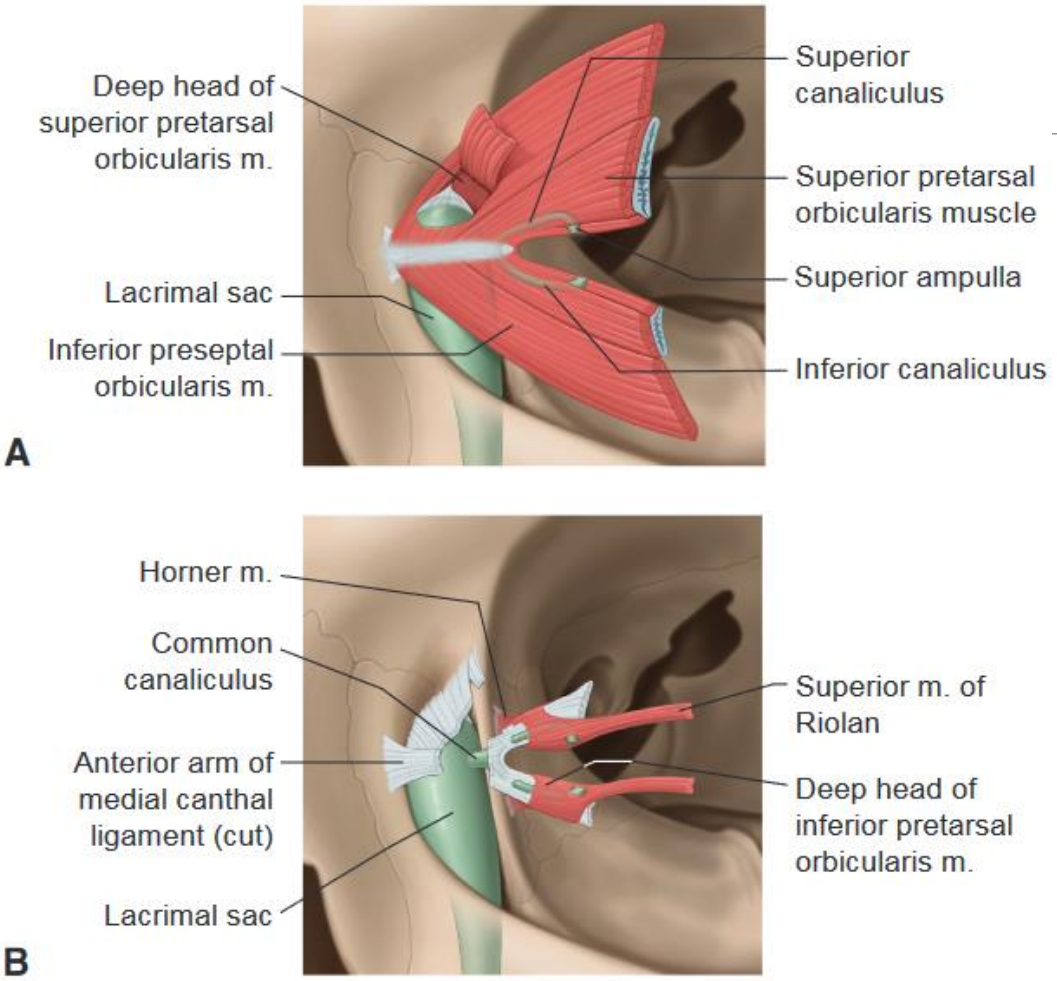


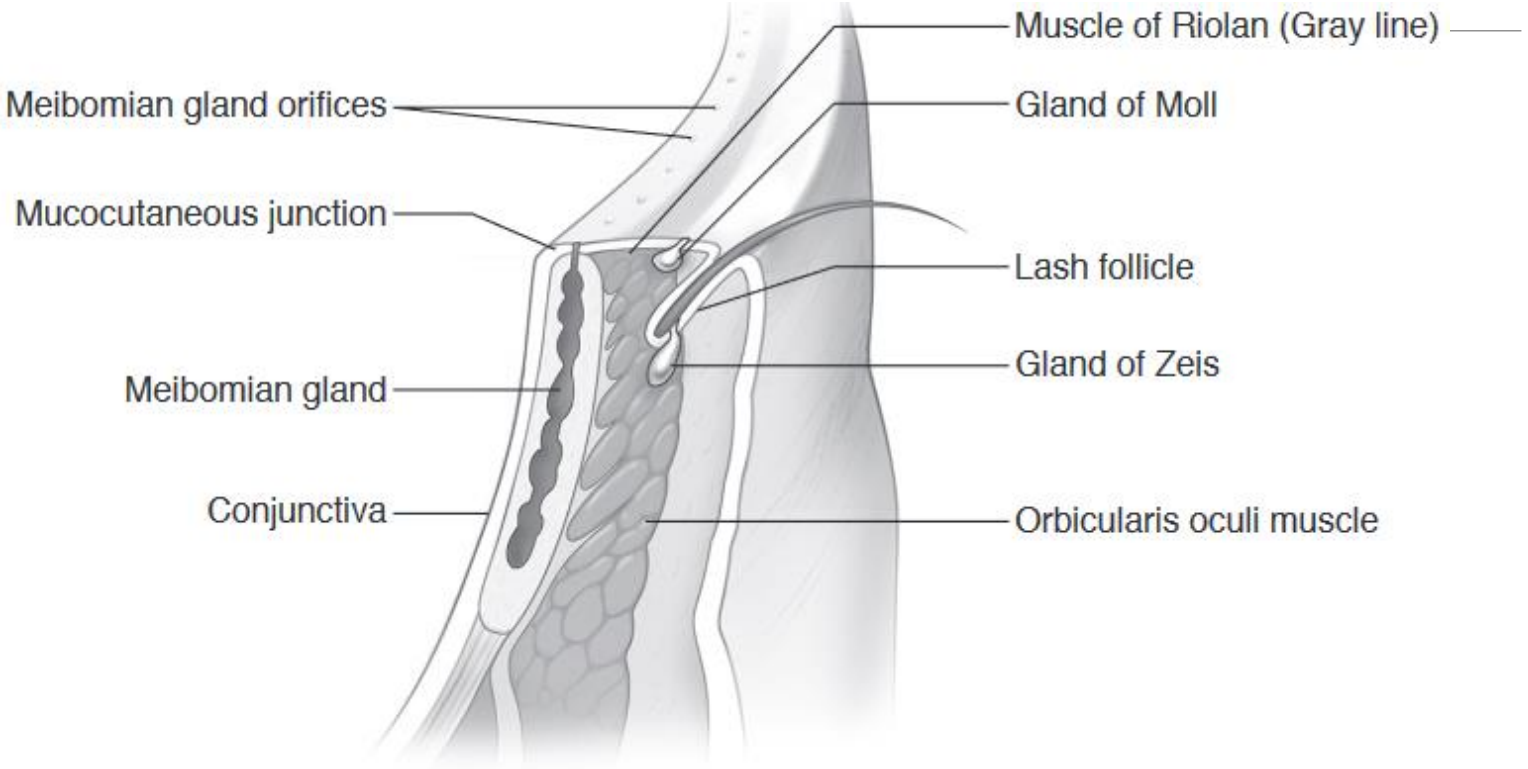
Lateral view


Supraorbital a.
Ophthalmic a.
Supratrochlear a.
Internal carotid a.
Angular a.
Infraorbital a.
Facial a.


Subcutaneous fat
Orbital fat
Skin
Frontalis muscle
Subbrow fat pad
Preorbital orbicularis muscle
Orbital septum
Preseptal orbicularis muscle
Superior tarsal muscle (Müller muscle)
Levator aponeurosis
Peripheral arterial arcade
Eyelid crease
Pretarsal orbicularis muscle
Marginal arcade vessel
Meibomian gland orifices
Orbicularis oculi muscle
Lower eyelid retractors
Orbital septum
Orbital fat
Suborbicularis oculi fat
Superior transverse ligament (Whitnall ligament)
Krause glands
Conjunctival fornix
Levator palpebrae superioris muscle
Superior rectus muscle
Superior oblique muscle
Palpebral and bulbar conjunctivae
Wolfring glands
Tarsus
Palpebral and bulbar conjunctivae
Conjunctival fornix
Inferior rectus muscle
Capsulopalpebral head
Inferior oblique muscle


Fat
Septum
Orbicularis oculi muscle
Levator aponeurosis
Müller muscle
Postaponeurotic space
Skin
Tarsus with
meibomian gland
Conjunctiva


Deep head of superior pretarsal orbicularis m.
Lacrimal sac
Inferior preseptal orbicularis m.
A
Superior canaliculus
Superior pretarsal orbicularis muscle
Superior ampulla
Inferior canaliculus
Horner m.
Common canaliculus
Anterior arm of medial canthal ligament (cut)
Lacrimal sac
B
Superior m. of Riolan
Deep head of inferior pretarsal orbicularis m.


Muscle of Riolan (Gray line)
Meibomian gland orifices
Gland of Moll
Mucocutaneous junction
Lash follicle
Meibomian gland
Gland of Zeis
Conjunctiva
Orbicularis oculi muscle

Wrinkle Removal

- Radiofrequency device using heat targeted at the dermal layers

- Natural aging and sun damage diminishes collagen and causes elastin changes causing
  - Skin sagging
  - Fine and deep wrinkles
  - Loss of elasticity
  - Thinned skin

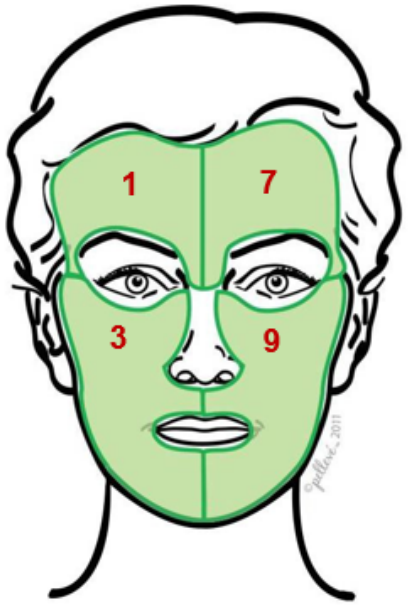
- Procedure tightens collagen, increases elastin uniformity, and promotes new collagen formation

Wrinkle Removal

- Indicated for mild to moderate rhytids for all skin types
- Precautions are warranted with pacemakers, implantable cardioverter defibrillator, or other electronic implantable devices
- Corneal shields may be indicated, no anesthetic should be used (need patient feedback)
- Should not be performed on patients with nerve insensitivity
- Should not be performed on damaged or infected skin
- Facial hair should be removed prior to treatment

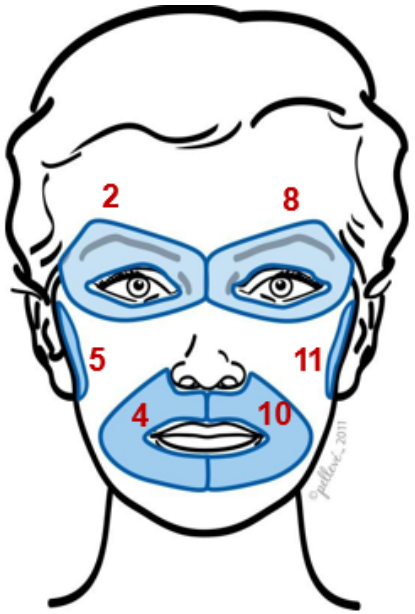
Wrinkle Removal

- 3-4 treatments spaced 1 month apart
- Immediate after effects may include mild erythema or edema
- Neocollagenesis may begin at 1 month and continue over 6 months



1/7 Forehead

3/9 Mid/lower Face



2/8 Periorbital & crow's feet

4/10 Nasal labial folds

5/11 Preauricular

How Much Heat is Required?

Not Safe

- Heating sufficient to cause complete collagen fiber dissolution (collagen turns into gelatin)
- Tissue necrosis, scarring, burning, etc.

Safe, Effective

- Heating to partially disrupt collagen fibril structure
- Contraction along the length of collagen fibers occurs
- Thermally mediated healing response causes new collagen formation
- Treatment within Pellevé labeling

Safe, Not Effective

- Heating insufficient to disrupt collagen fibril structure
- No clinical effect observed

Kirsch KM, Zelickson BD, Zachary CB, Tope WD. Ultrastructure of collagen thermally denatured by microsecond domain pulsed carbon dioxide laser. Arch Dermatol. 1998 Oct;134(10):1255-9.

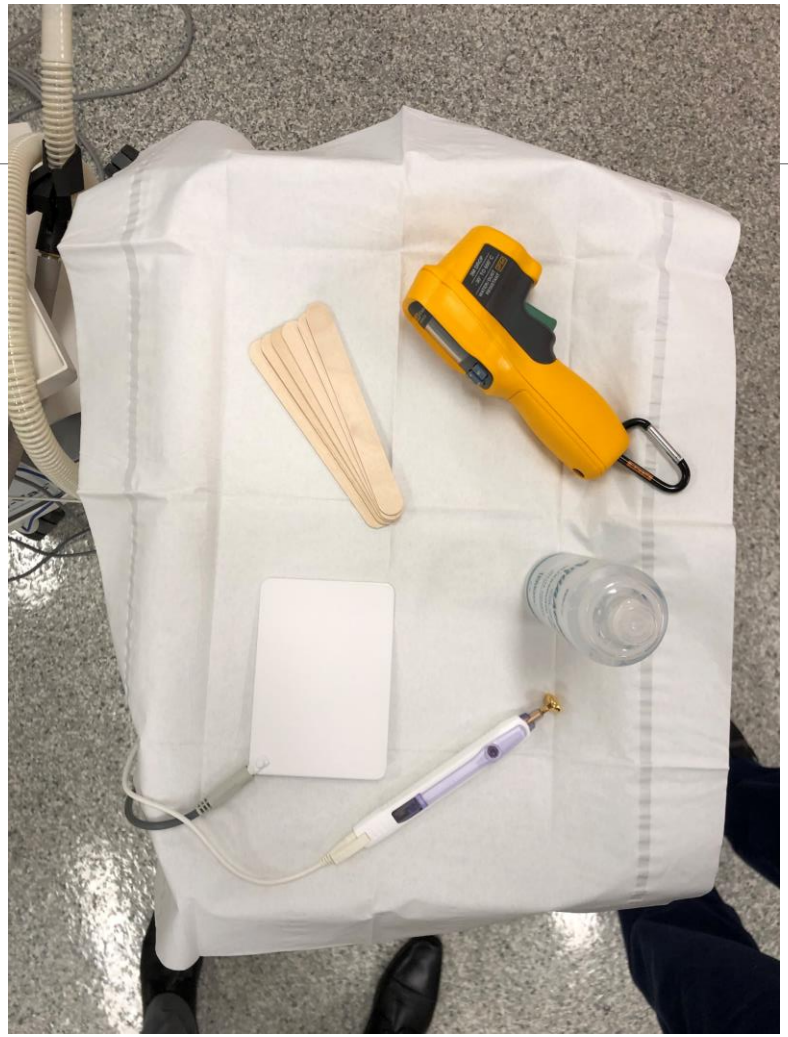
Wrinkle Removal

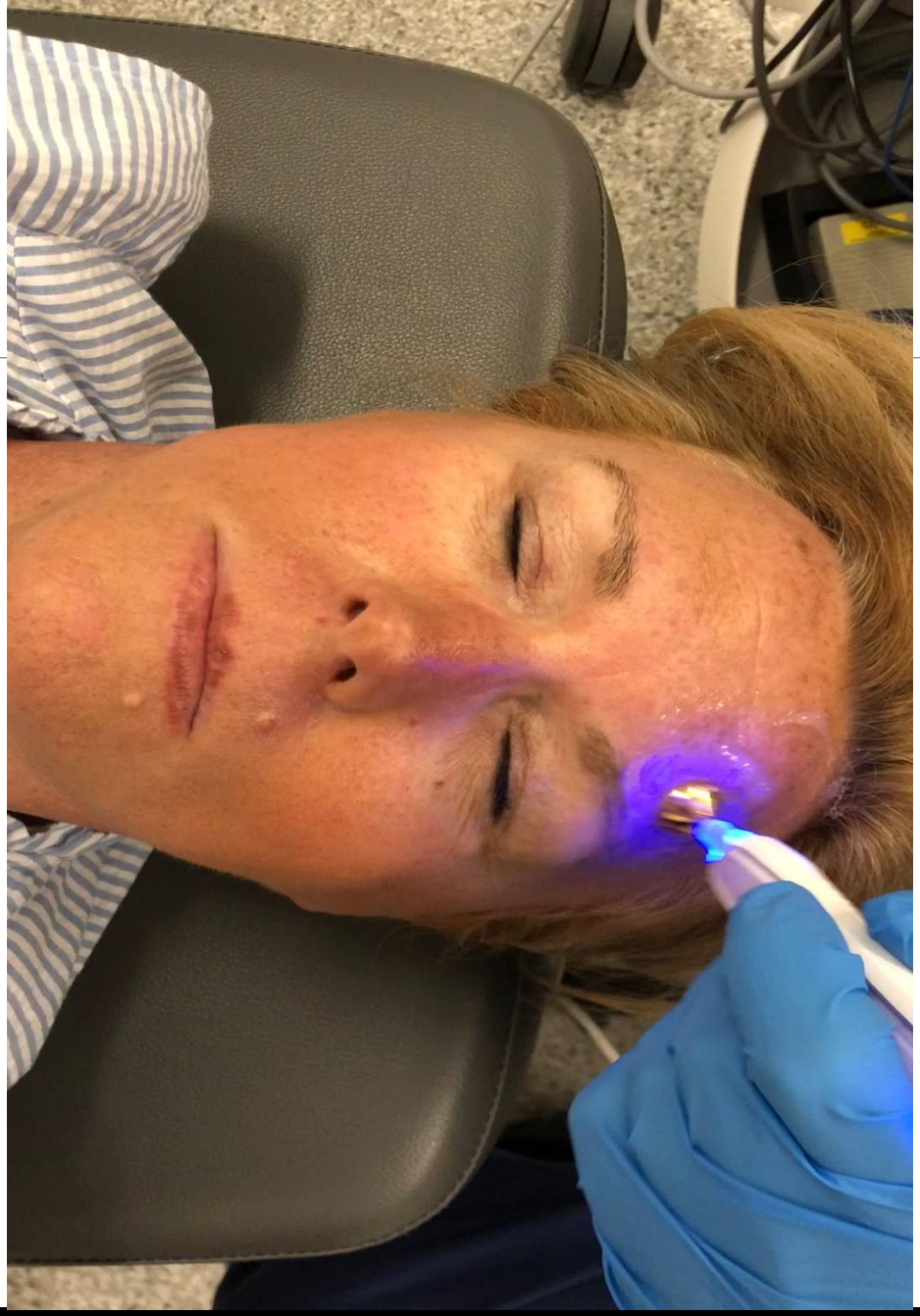
- Need:
  - Device
    - Set to machine's "CUT" mode, brows/periocular ~10, forehead ~15
      - (tissue not cut, that is just the mode it needs to be in)
  - Treatment gel
  - IR thermometer
    - Need to maintain heat at 40-42 degrees Celsius
    - Hold 5-10 inches from skin for average tissue temperature
  - Plate/return electrode
  - Hand piece [(smaller = shallow/mid dermal) (larger = deep dermal)]
    - 7.5mm – periocular, forehead
    - 10mm – periocular, forehead, mid-face
    - 15mm – forehead, nasolabial, pre-auricular
    - 20mm – mid-face

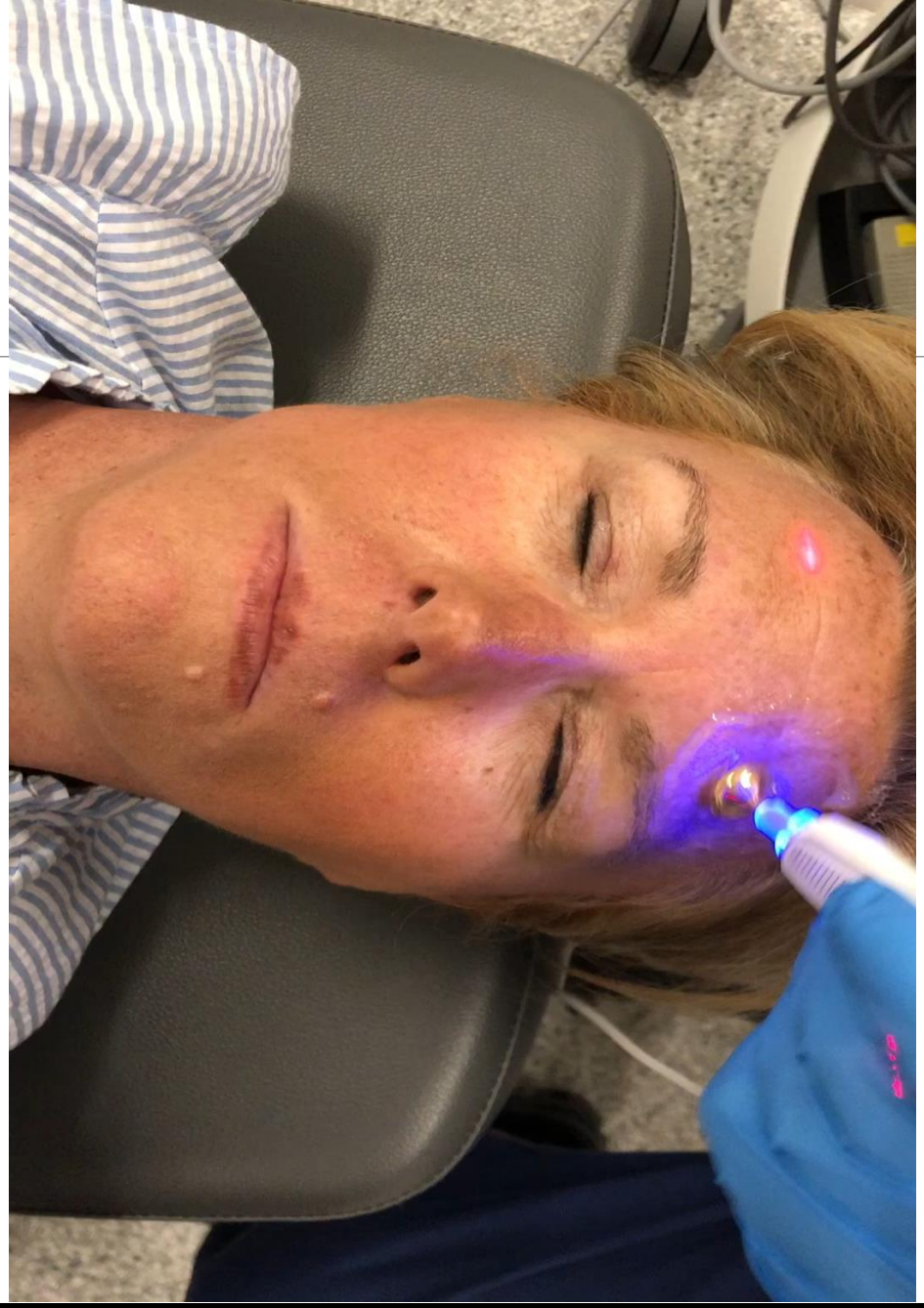
Wrinkle Removal

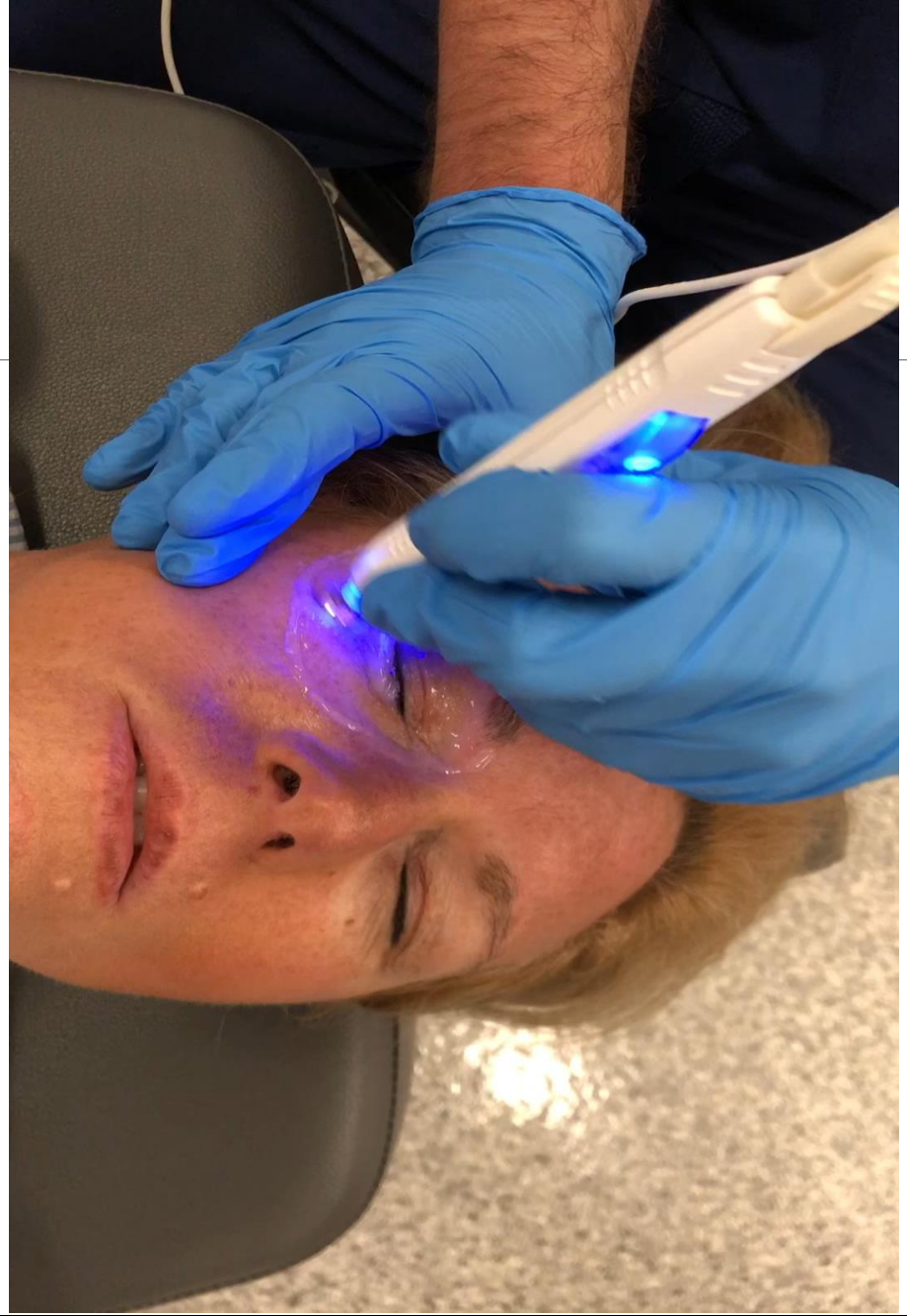
- Treat area in a corkscrew motion both vertically and horizontally
- 5 minutes with the treatment per site
- Keep skin taught but not overly stretched

- After treatment can resume normal activity
- Clean skin and use moisturizers
- Can use makeup
- Encourage sun screen to prevent further sun damage, has nothing to do with procedure and post-photosensitivity
- Avoid irritations to the area for 3-5 days after, including other cosmetic topical skin therapies, wait around 2 weeks for RF wrinkle removal after botulinum toxin









Botulinum Toxin

- Botulinum toxin (BoNT) is produced by the gram-positive anaerobic bacterium, Clostridium botulinum

- The molecule is a well-established neurotoxin, isolated in 1928, with 7 different serotypes of varying toxicity

- Botulinum toxin works on the presynaptic neuromuscular junction to prevent acetylcholine release, resulting in flaccid muscle paralysis

Botulinum Toxin

- BoNTs are relevant in areas of disease, medical therapy, and cosmetic therapy
- As optometric scope evolves, botulinum toxin remains an applicable, but lesser discussed, topic with increasing popularity
- According to the American Society of Plastic Surgeons, in 2019 over 5 million botulinum toxin type A injections were given, and the number is up over 450% since 2000

Mechanism of Action

- BoNT binds presynaptically cholinergic nerve terminals, decreasing release of acetylcholine

- Blocks the neuromuscular effect

- Onset typically takes noticeable affect around 3 days
  - Reaches maximal affect at 7-8 days and up to 14 days

Indications

- Bladder dysfunction
- Chronic migraine
- Spasticity
- Cervical dystonia
- Primary axillary hyperhidrosis
- **Blepharospasm**
- Hemi-facial spasm
- Strabismus
- **Cosmetic**

Blepharospasm

- Benign essential blepharospasm
  - A form of focal dystonia of unknown cause
  - Causes involuntary closure of eyelids
  - Bilateral
  - Symptoms may often begin as mild uncontrollable blinking
    - May progress to more frequent and forceful blinks to complete functional blindness due to prolonged closure of the eyelids
  - May accompany hemi-facial spasm
  - By definition is an idiopathic condition

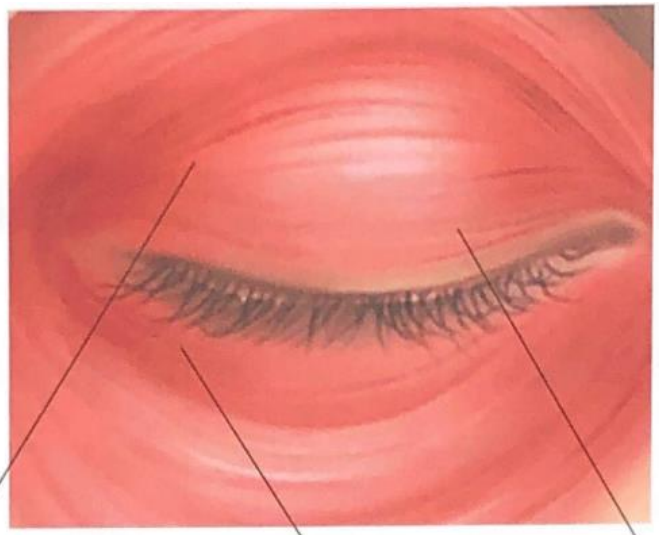
- Secondary blepharospasm is due to an underlying condition or syndrome

- Treatment may employ botulinum toxin injections into the orbicularis oculi, corrugator supercilii, and procerus

Blepharospasm

- Differential diagnosis
  - Hemi-facial spasm
  - Eyelid myokymia
  - Ocular irritation (dry eye, external/intraocular inflammation, photosensitivity)
  - Meige Syndrome
  - Tardive dyskinesia
  - Brainstem and basal ganglia lesions
    - Parkinson's, Wilson's, Huntington's, progressive external ophthalmoplegia, progressive supranuclear palsy, tumors
  - Aberrant regeneration and synkinesis of CN7
  - Cerebral palsy
  - Trauma
  - Seizure
  - Brain infections, inflammations

Blepharospasm (onabotulinumtoxinA)



Lateral pretarsal orbicularis oculi (upper lid)
1.25 Units to 2.5 Units

Lateral pretarsal orbicularis oculi (lower lid)
1.25 Units to 2.5 Units

Medial pretarsal orbicularis oculi (upper lid)
1.25 Units to 2.5 Units

Note: These are general areas, not the specific injection sites.

Contraindications

- Any allergies to ingredients that may be in the formulations:
  - Serum albumin
- Gross motor weakness in treatment zone (like Bell's Palsy)
- Amyotrophic lateral sclerosis (ALS)
- Myasthenia gravis
- Lambert-Eaton syndrome
- Myopathies
- Known infection or severely immunocompromised
- Certain medications such as aminoglycosides and muscle relaxants can interact with therapy
- Botulinum toxin is unknown to cause harm fetus or during nursing
  - Therapy is not recommended
- Allergic to or recent (4 months) injection with:
  - onabotulinumtoxinA
  - rimabotulinumtoxinB
  - abobotulinumtoxinA
  - incobotulinumtoxinA

Adverse Effects

- Effects of BoNT may affect areas away from injection and cause serious symptoms
  - Paresis, diplopia, ptosis, dysphonia, dysarthria, incontinence, dysphagia, dyspnea

- Blepharospasm specific most common adverse effects
  - Ptosis, dry eye, diplopia, blur

Reconstitution (onabotulinumtoxinA)

- Vacuum-dried vial
- Inject ONLY sterile preservative free 0.9% sodium chloride
- Draw up proper amount of diluent in an appropriate size syringe
- Slowly inject into onabotulinumtoxinA vial
- *Discard a vial if the diluent is not easily pulled into the vacuum without force of injection*
- Rotate vial gently
- Mark date and time of reconstitution on vial
- Administer within 24-hours of reconstitution
- Must store in refrigerator 2-8 degrees Celsius up to 24-hours until use
- Single dose only, must discard all unused portion
- Should be clear and colorless after reconstitution
- Clean and prepare treatment area as you would other types of intradermal and intramuscular injections

Reconstitution (onabotulinumtoxinA)

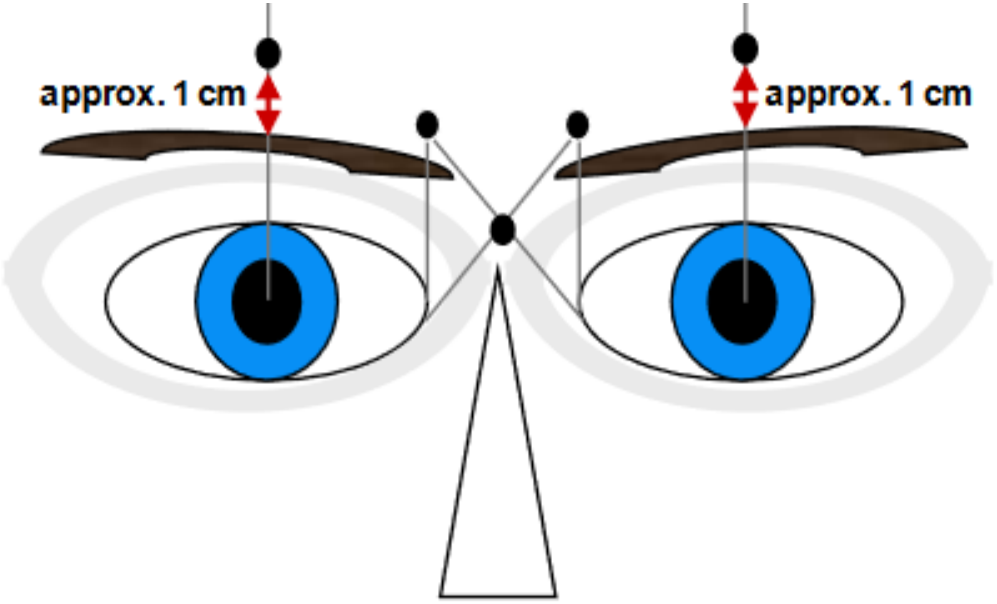
Diluent Added to 100 Unit Vial	Resulting Dose Units per 0.1 mL	Diluent Added to 200 Unit Vial	Resulting Dose Units per 0.1 mL
1 mL	10 units	1 mL	20 units
2 mL	5 units	2 mL	10 units
4 mL	2.5 units	4 mL	5 units
8 mL	1.25 units	8 mL	2.5 units
10 mL	1 unit	10 mL	2 units

Reconstitution (incobotulinumtoxinA)

***Volume of** Preservative-free 0.9% Sodium Chloride Injection, USP*	**50 Unit Vial:** Resulting dose in Units per 0.1 mL	**100 Unit Vial:** Resulting dose in Units per 0.1 mL	**200 Unit Vial:** Resulting dose in Units per 0.1 mL
0.25 mL	20 Units	-	-
0.5 mL	10 Units	20 Units	40 Units
1 mL	5 Units	10 Units	20 Units
1.25 mL	4 Units	8 Units	16 Units
2 mL	2.5 Units	5 Units	10 Units
2.5 mL	2 Units	4 Units	8 Units
4 mL	1.25 Units	2.5 Units	5 Units
5 mL	1 Unit	2 Units	4 Units

Glabellar Complex (incobotulinumtoxinA)

- Total recommended dose is 20 units, divided into 5 equal IM injections 4 units per
  - 2 in each corrugator
  - 1 in the procerus



Considerations

- Pay attention to individual patient normal anatomic variations
  - Not uncommon to perform touch ups or make adjustments for the next time treatment is scheduled for depending on initial responses

- 7-8 days for typical therapeutic onset

- Affects last 3 months, may be as soon as 2 months in some cases

- Typical follow up is 3 months for reinjection

- Initial treatment for blepharospasm with onabotulinumtoxinA is recommended at 1.25 to 2.5 units at 3 injection sites per side
  - Temporal palpebral portion superior lid
  - Nasal palpebral portion superior lid
  - Temporal palpebral portion inferior lid
  - (*avoid levator*)

- Cosmetic incobotulinumtoxinA
  - 4 units at 5 locations in glabella (2 each corrugator and 1 procerus)
  - 2 units in each frontalis site, usually 3-5 sites per side of face, avoid 1/3 lower forehead, too far temporally, and straight central where aponeurosis exists
  - Crows feet may have up to 3 sites per side of face at 1-4 units per site

Xanthelasma Palpebrarum

- Xanthelasma palpebrarum (XP) is a well-established eyelid lesion that is the most common cutaneous xanthoma
- In Western civilization general population incidence varies (0.56-1.5%), with females affected more than males
- They are characterized by a yellowish plaque frequently found along the upper medial eyelids, although it may extend to all 4 eyelid areas as focal or diffuse lesions
- Plaques are often associated hyperlipidemia, thyroid dysfunction, diabetes mellitus, or other disease of lipoidal dysfunction

Xanthelasma Palpebrarum

- Xanthelasma palpebrarum do not carry malignant potential, and the main differential diagnoses are:
  - Necrobiotic xanthogranuloma, syringoma, adult-onset asthma and periocular xanthogranuloma, palpebral sarcoidosis, and sebaceous hyperplasia

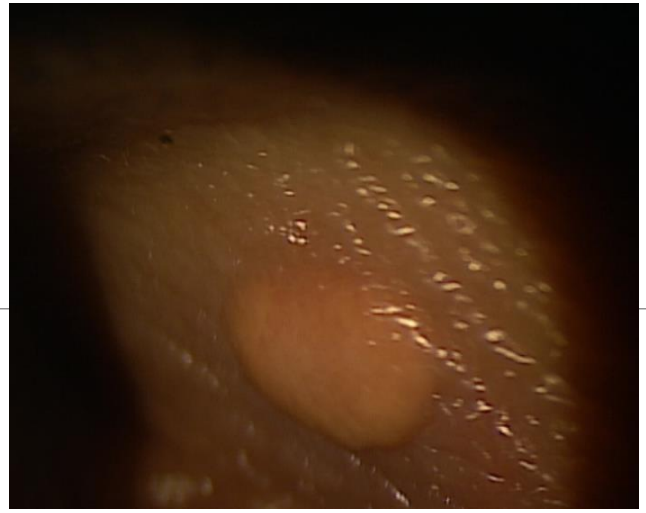
- The lesions are composed of xanthoma or foam cells primarily located in the superior reticular dermis and perivascular areas
  - Less commonly, deeper lesions may extend through the reticular dermis and contact the subcutaneous superficial orbicularis oculi

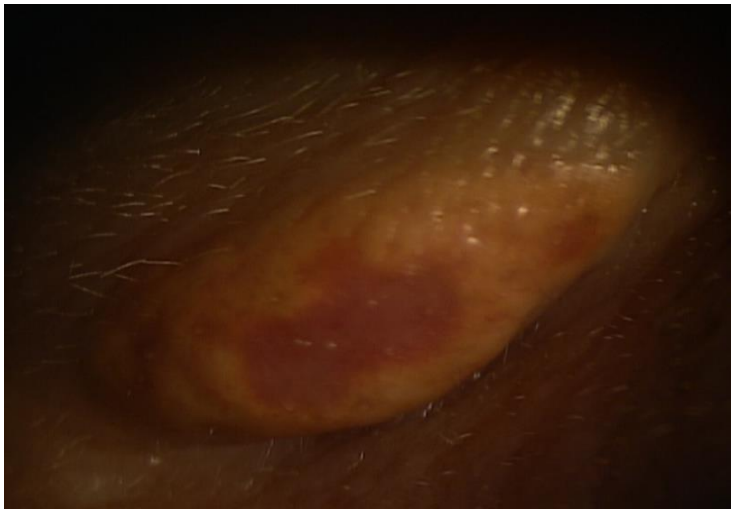
- There are numerous techniques available for lesion removal, each with advantages and disadvantages depending on the type and location XP

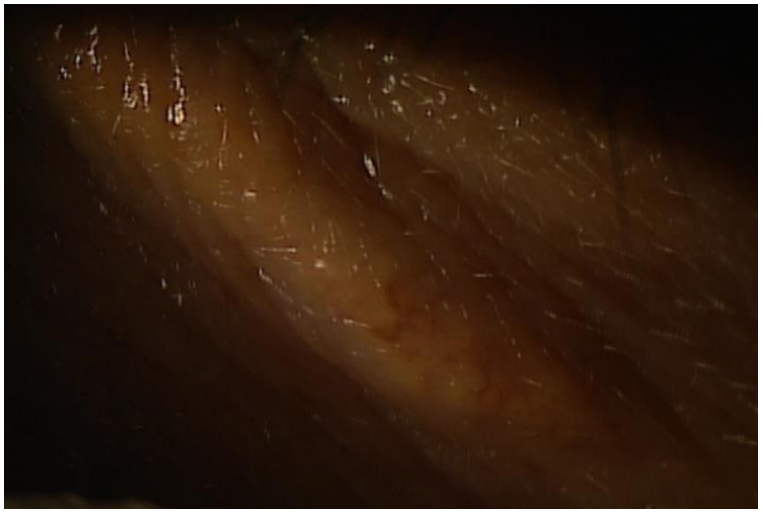
- Simple surgical excision and primary closure remains the mainstay of treatment for lesions of the deep dermis and those infiltrating the underlying muscle

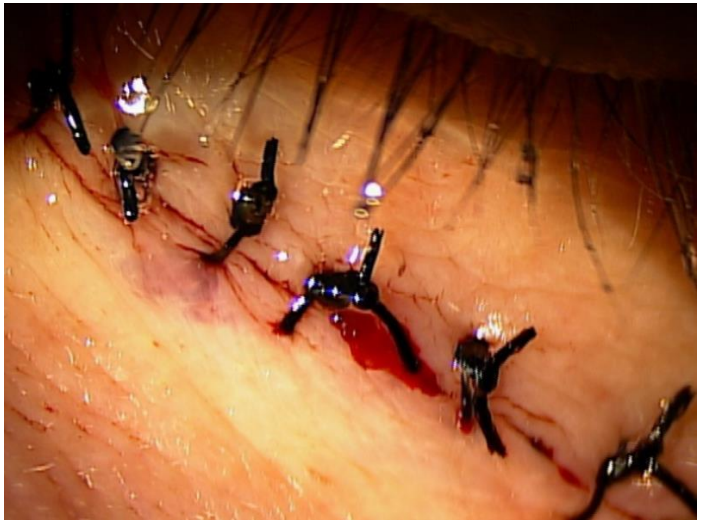
Xanthelasma Palpebrarum Other Treatment Options

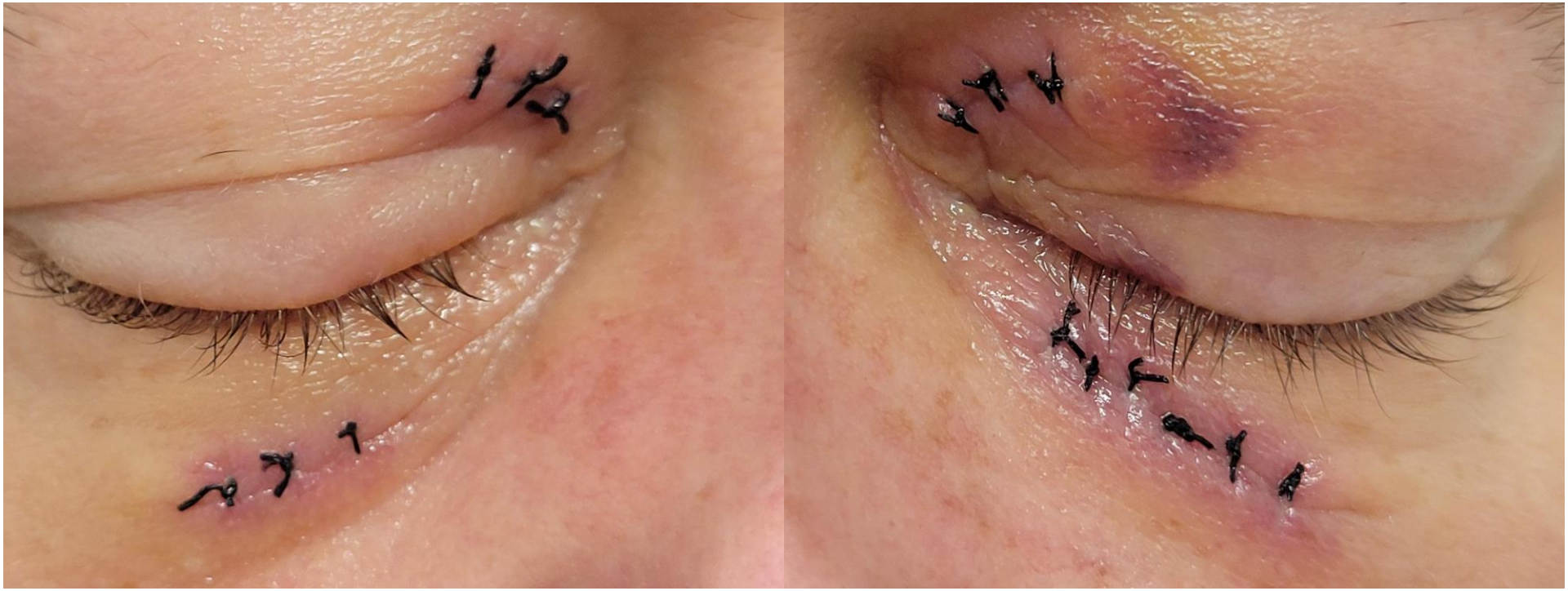
- Systemic:
  - Probucol
  - Alirocumab
- Topical:
  - Trichloroacetic acid (TCA)
  - Cryotherapy
  - Pingyangmycin
- Energy Device
  - RF
  - CO2
  - Nd:YAG
  - Er:YAG
  - Argon
  - Pulsed-dye
  - Potassium titanyl
  - Diode
- Primary excision and closure

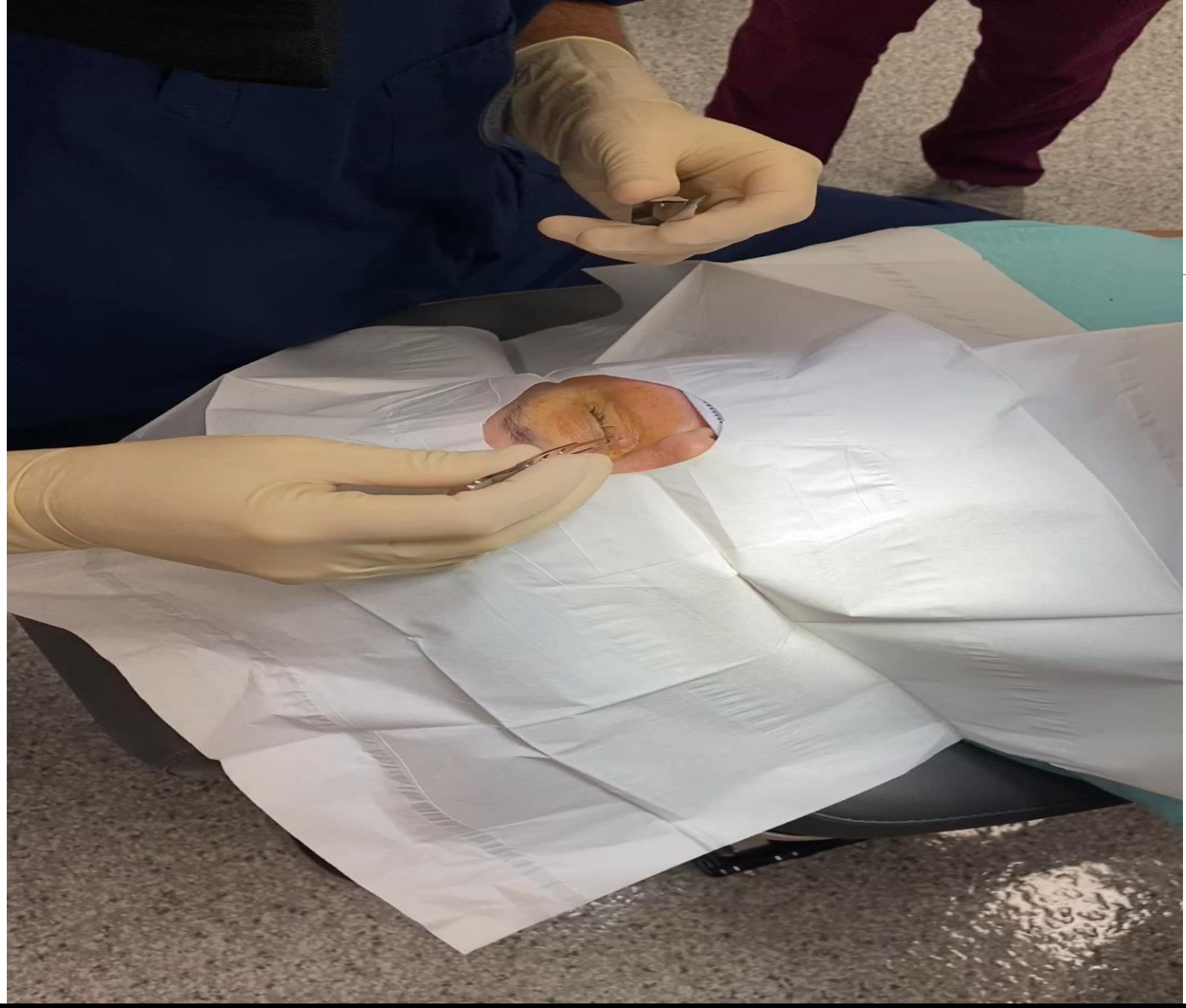


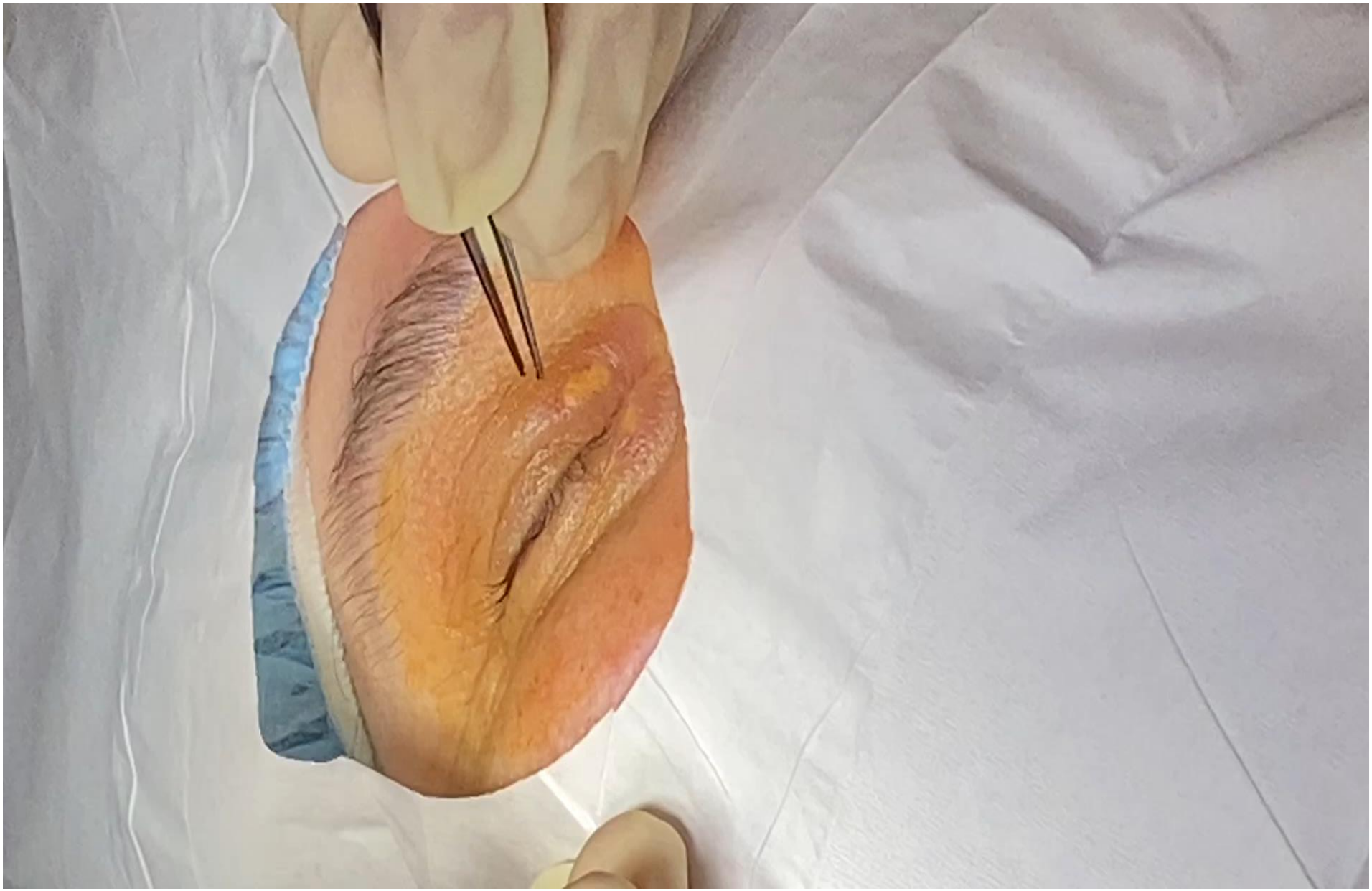


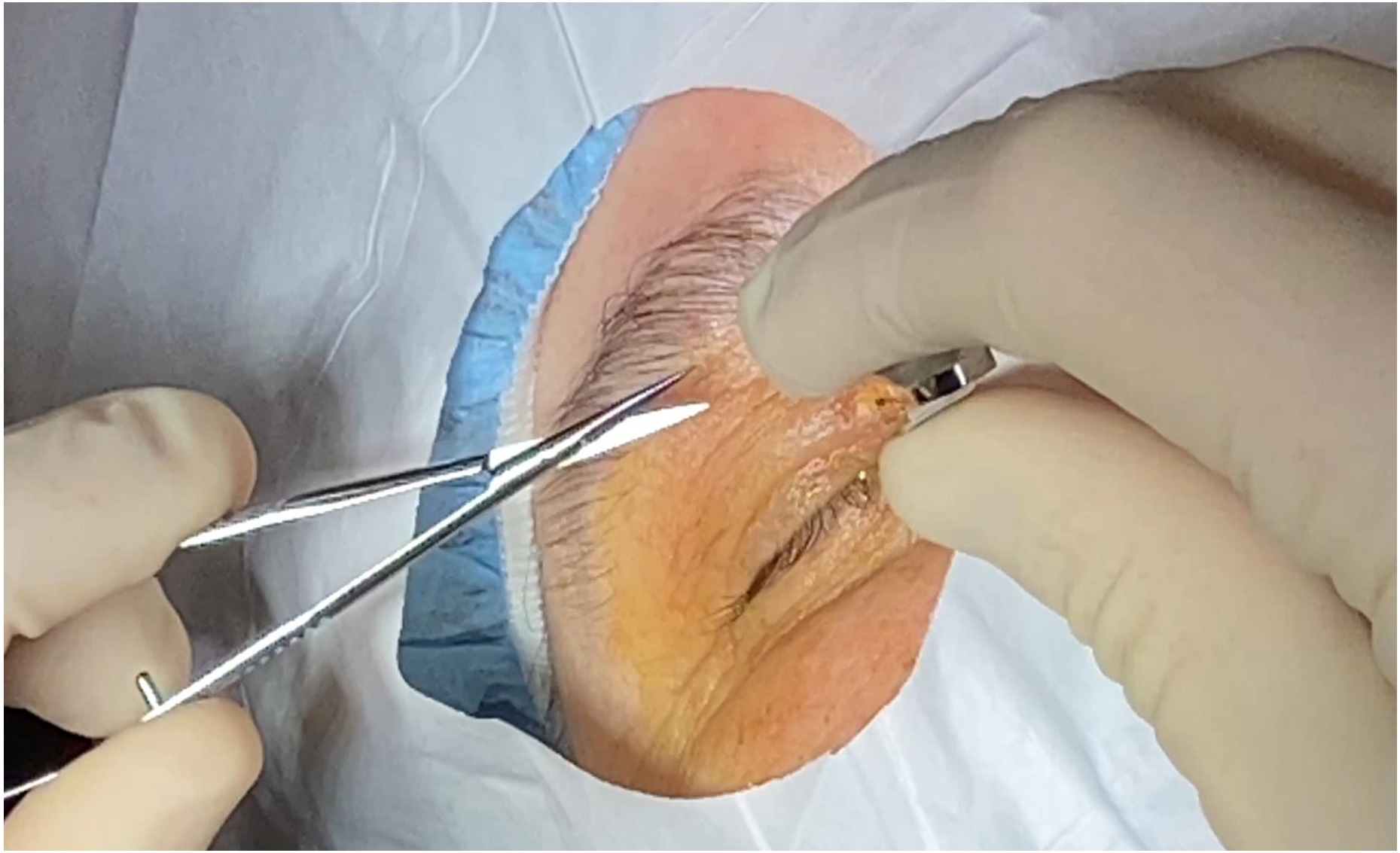


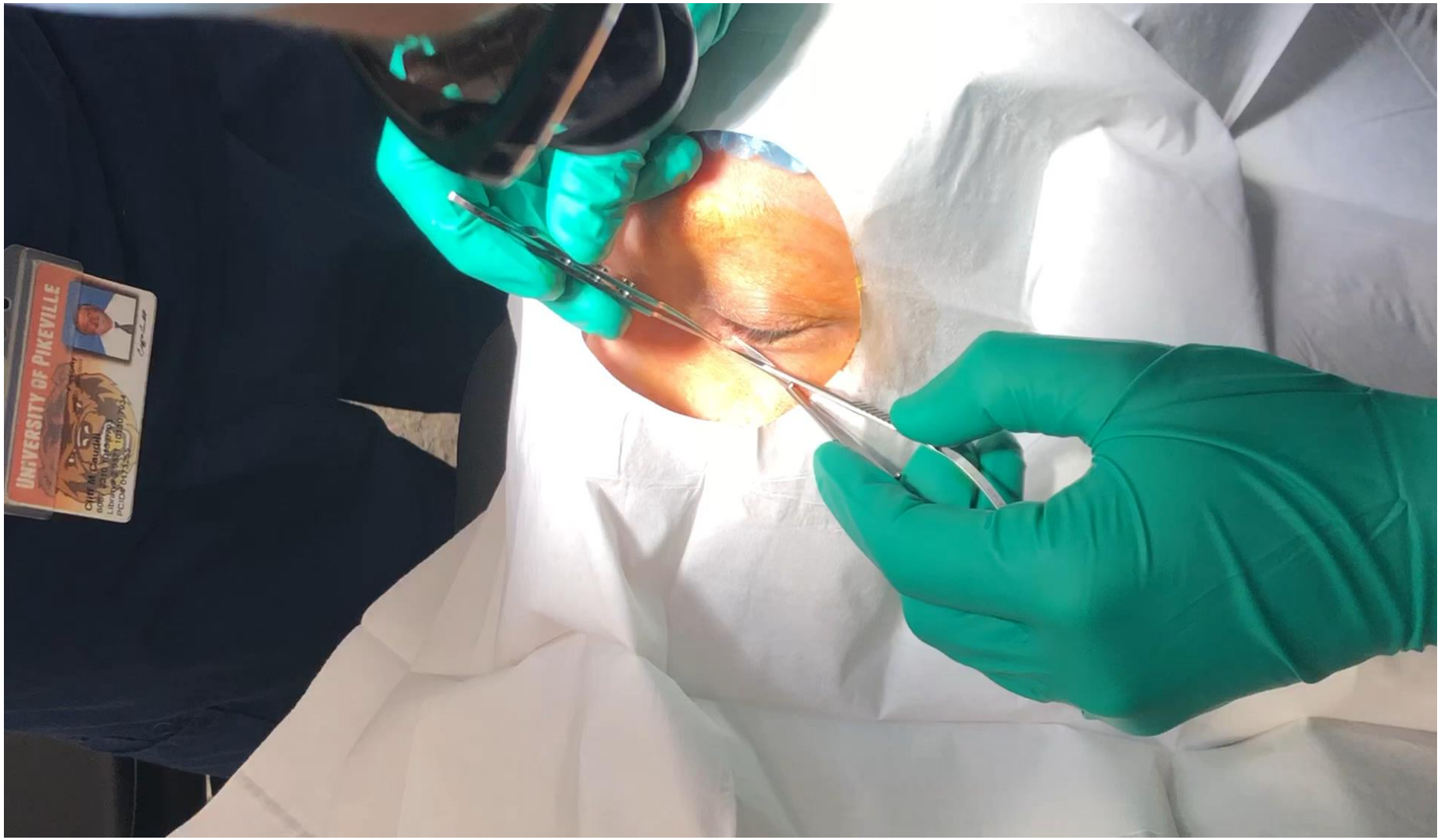








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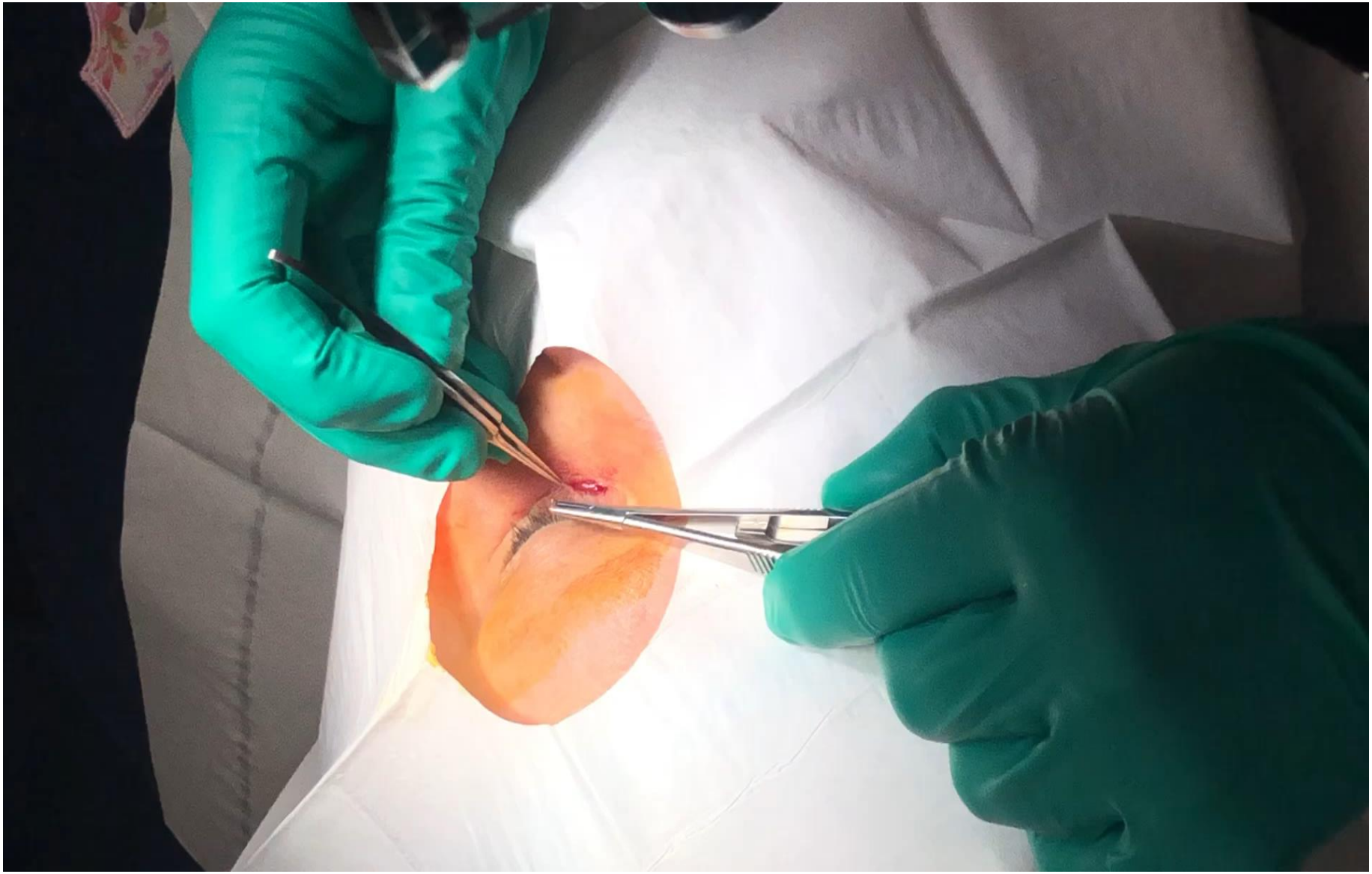

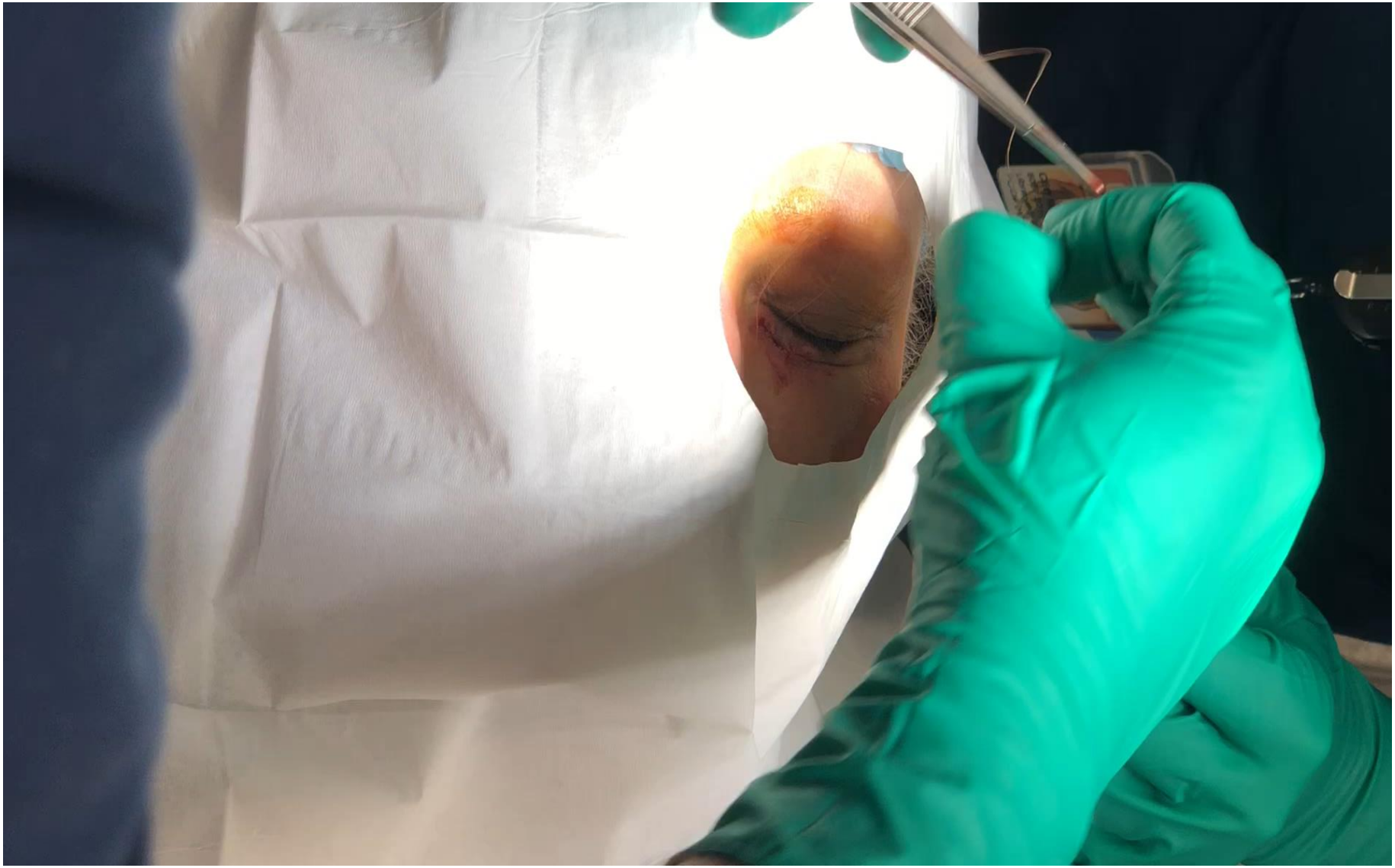

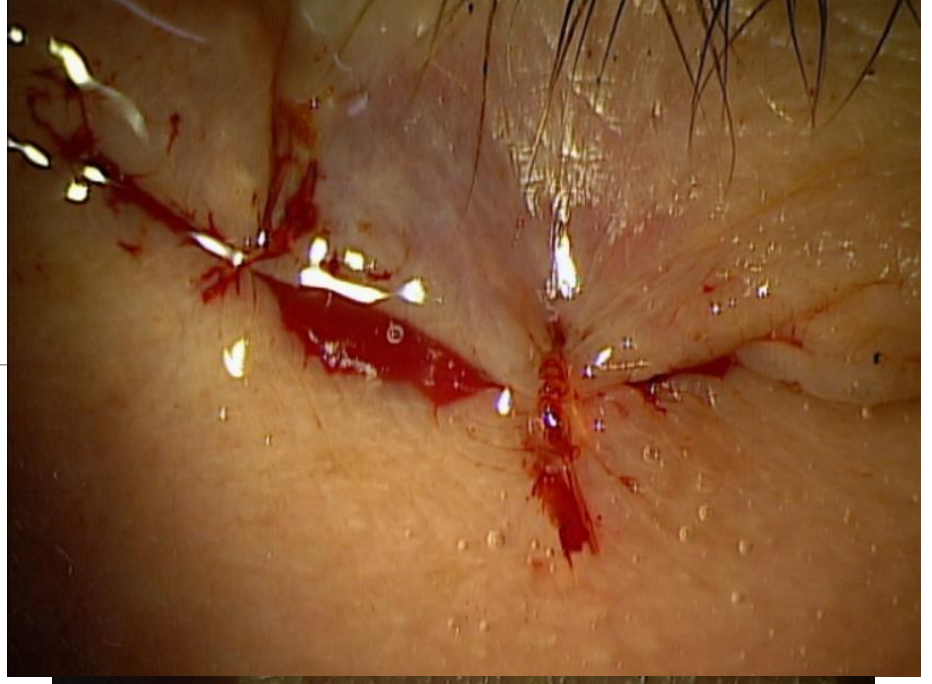

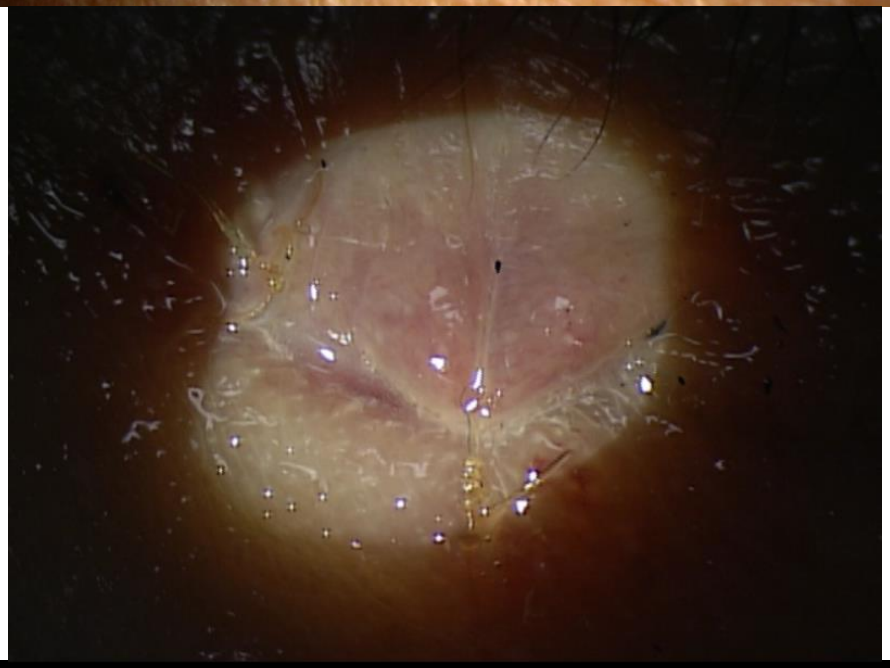

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