IN OFFICE PROCEDURES

Selina R. McGee, OD, FAAO

LUMPS AND BUMPS

LID LESION OVERVIEW

Benign Lid Lesions

- Chalazion
- Skin tag/papilloma
- Verrucae
- Seborrheic Keratosis
- Cyst of Moll & Zeiss
- Sebaceous Cyst
- Freckle/nevus

Precursors To Cancer

- Actinic Keratosis
- Keratoacanthoma

Cancer

- Basal Cell Carcinoma
- Squamous Cell Carcinoma
- Malignant Melanoma
- Sebaceous Gland Carcinoma

CHALAZION PATHOPHYSIOLOGY

Obstructed meibomian gland retains sebaceous secretions

May rupture and release lipid into surrounding tissue, causing granulomatous inflammation

Risk factors: Rosacea, blepharitis (meibomitis)

- Often previous episodes (but beware of same location!)

CHALAZION SIGNS & SYMPTOMS

Non-tender, firm lesion

Varying size

Time since onset varies

Generally contained within the tarsus

- Not easily moveable

No discharge with palpation

No lash loss

DIFFERENTIAL DIAGNOSIS

Hordeolum

Sebaceous Gland Carcinoma

Basal Cell Carcinoma

Squamous Cell Carcinoma

Molluscum

Epithelial inclusion cyst

Dermatitis

Insect bite

DIFFERENTIAL DIAGNOSIS

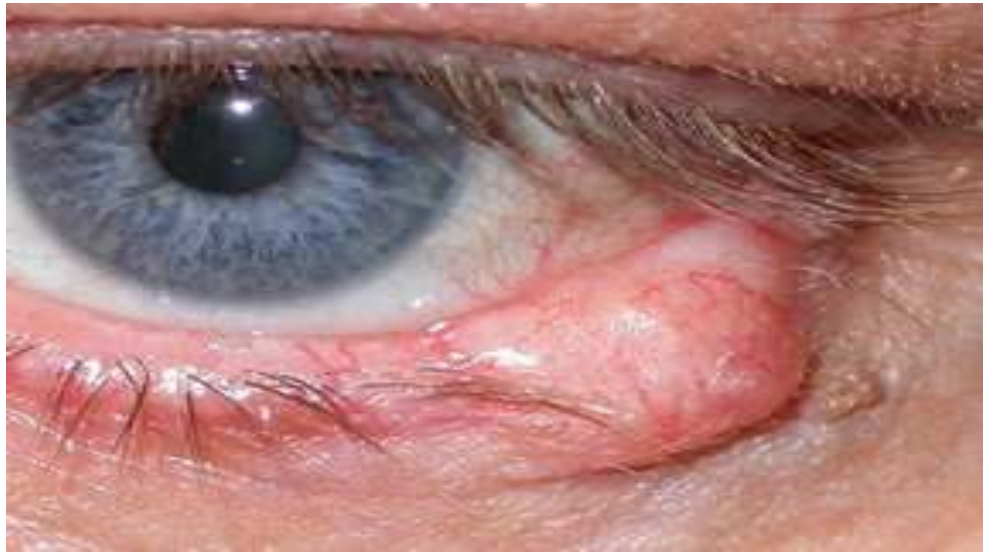
Hordeolum

- Inflamed, tender
- May form chalazion after acute infectious phase resolves

DIFFERENTIAL DIAGNOSIS

Sebaceous Gland Carcinoma

- Must be considered with in cases of recurrent chalazia
- Strong tendency to metastasize
- Presentations are variable
  - Lash loss



DIFFERENTIAL DIAGNOSIS

Sebaceous Gland Carcinoma

- Variable presentations
- Be cautious!

DIFFERENTIAL DIAGNOSIS

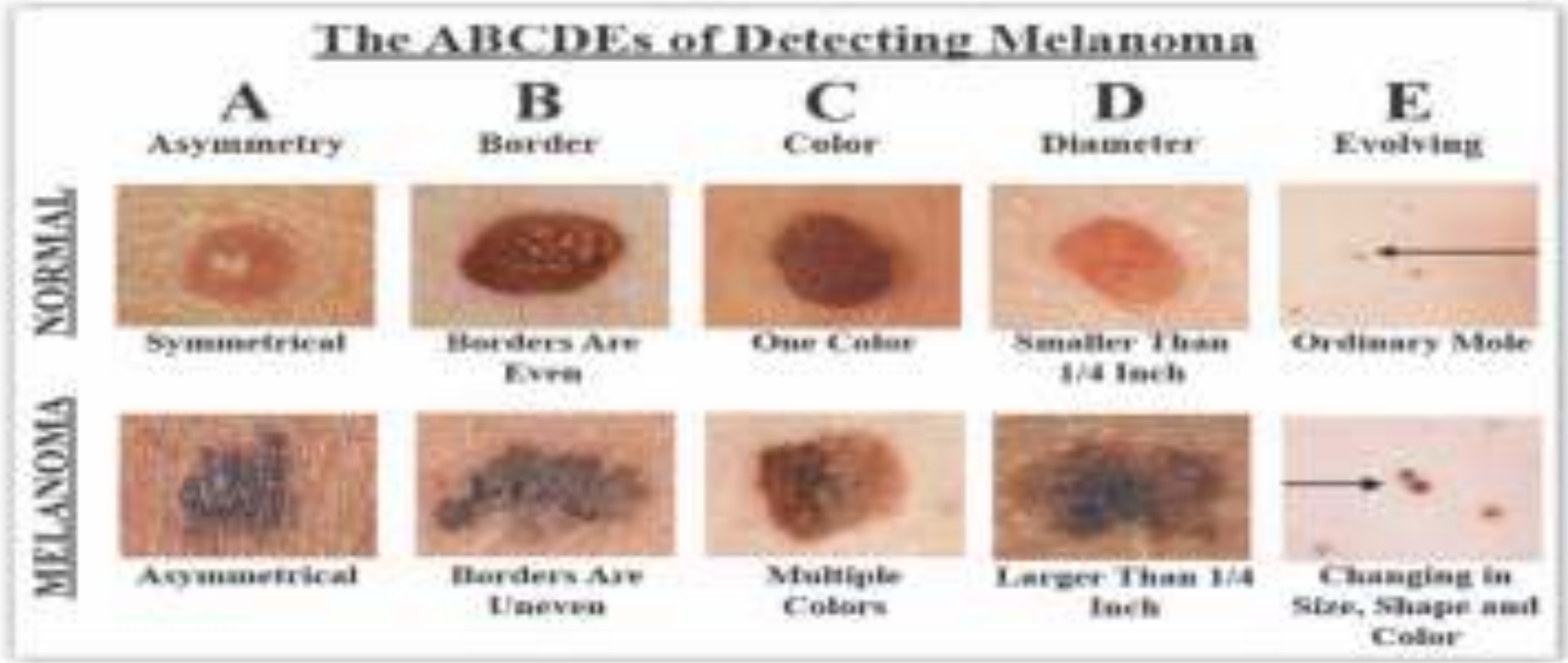
Sebaceous Gland Carcinoma

DIFFERENTIAL DIAGNOSIS

Basal Cell Carcinoma

- 90% of eyelid malignancies
  - Most commonly lower lid
- Ulcerated with raised, pearly borders
- Lash loss
- Rarely metastatic

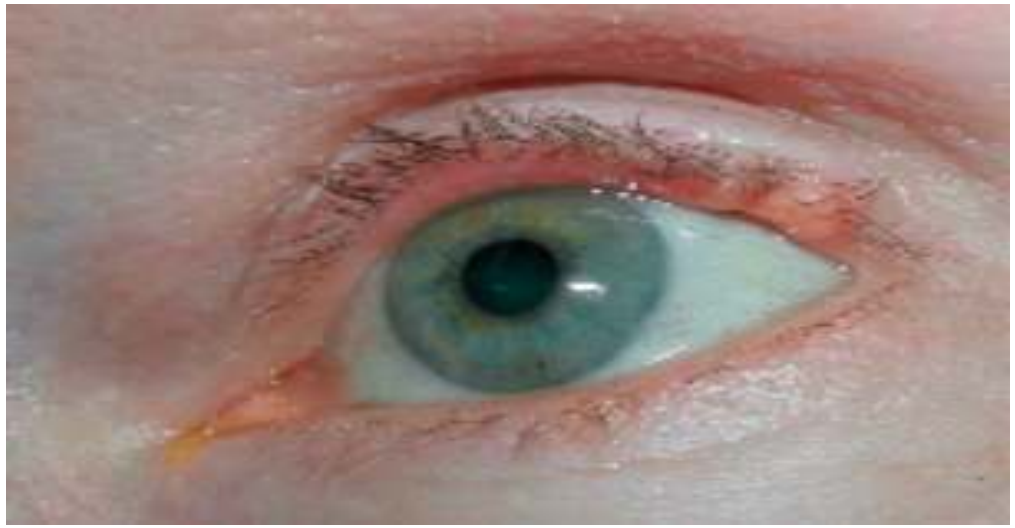
Malignant Eyelid Lesions: Malignant Melanoma



DIFFERENTIAL DIAGNOSIS

Squamous Cell Carcinoma

- 2nd-3rd most common eyelid malignancy (~5%)
- Variable presentations
  - Difficult to diagnose clinically
  - Nodular
  - Irregular rolled edges
  - Central ulceration



DIFFERENTIAL DIAGNOSIS

Molluscum Contagiosum

- Waxy, nodular appearance
- Central umbilication
- Viral cause

DIFFERENTIAL DIAGNOSIS

Epidermal Inclusion Cyst

- Benign
- Filled with keratin
- Excised and expressed
- Removal of intact cyst wall minimizes recurrence rate

DIFFERENTIAL DIAGNOSIS

Inflammation

- Dermatitis
- Insect bite

Itch

Soft edema

EXAMINATION AND HISTORY

Detailed history of chalazion

- Onset, growth, bleeding, **previous episodes**, itch, pain, history of cancer

Photodocument

Sign informed consent

- Risks, benefits, alternatives

Blood pressure/pulse

Visual acuity

Allergies?

CHALAZION TREATMENT OPTIONS

Medical (“Conservative”) therapy

Intralesional steroid injection

Incision & Curettage (I&C)

Intense Pulsed Light (IPL)

Important to educate the patient on every option

MEDICAL THERAPY

Specific approaches vary

- Warm compresses
- Lid Scrubs
- Doxycycline
- Topical antibiotic/steroid

Success rate?

- Literature varies
- Variation in practitioner preferences
- Likely 50-75% effective

MEDICAL THERAPY

Indications

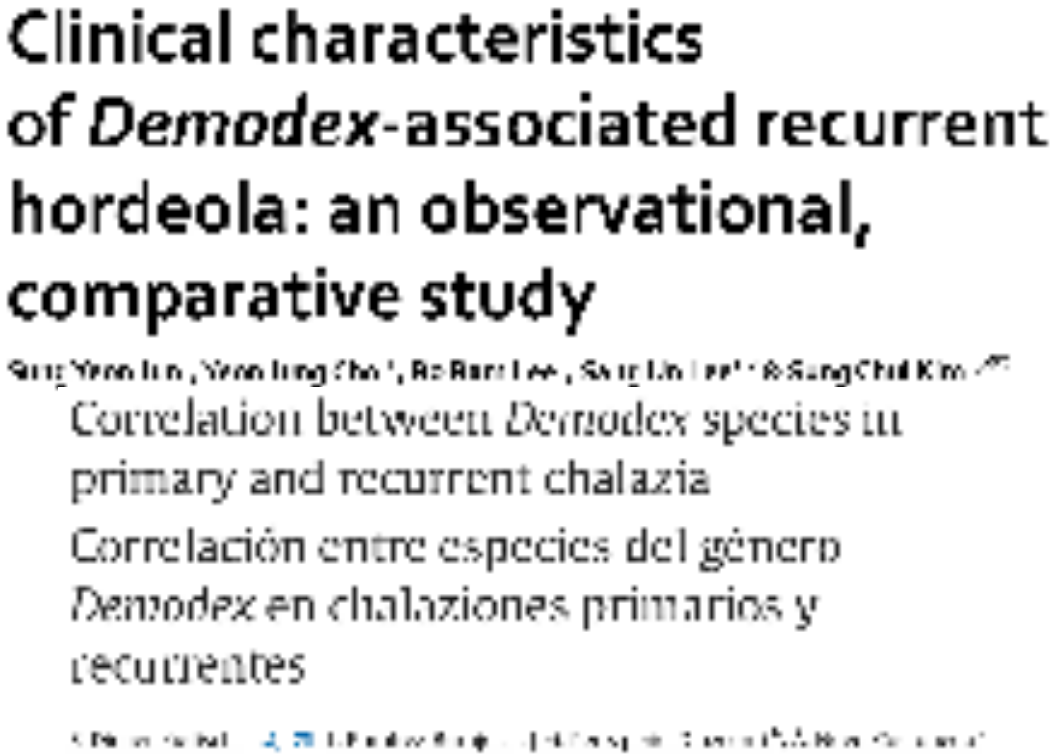
- Frequently first line of treatment
- Small lesion (< 6 mm)
- Lesion present less than 6 months
- Lesion in medial aspect of lid near punctum
- Patient choice of treatment

Contraindications?

- If doxycycline is contraindicated

Risks and Complications

- Treatment failure
- Drug hypersensitivity


Clinical characteristics of *Demodex*-associated recurrent hordeola: an observational, comparative study

Correlation between Demodex species in primary and recurrent chalazia

Correlación entre especies del género *Demodex* en chalaziones primarios y recurrentes

Liang L, Ding X, Tseng SC. High prevalence of demodex brevis infestation in chalazia. Am J Ophthalmol. 2014 Feb;157(2):342-348.e1. doi: 10.1016/j.ajo.2013.09.031. Epub 2013 Oct 2. PMID: 24332377.

Schear MJ, Milman T, Steiner T, Shih C, Udell IJ, Steiner A. The Association of Demodex with Chalazia: A Histopathologic Study of the Eyelid. Ophthalmic Plast Reconstr Surg. 2016 Jul-Aug;32(4):275-8. doi: 10.1097/IOP.0000000000000500. PMID: 26108058.

CHALAZIA TREATMENT-INCISION FREE, INJECTION FREE, SCAR FREE MANAGEMENT-PIONEERED BY DR. LAURA PERIMAN

CHALAZIA MANAGMENT

Settings: Periman Protocol with extra pulses on the lesion. Used small light guide with Toyos settings x 2 and then 560nm 3.0ms 25ms 18 J/cm^2

CHALAZIA TREATMENT-INCISION FREE, INJECTION FREE, SCAR FREE MANAGEMENT-

1 TX WITH IPL-NEXT DAY

INTRALESIONAL STEROID INJECTION

Indications

- Failure of conservative treatment
- Located in medial aspect of lid (won't be able to do incision & curettage)
- Patient and/or surgeon choice

Contraindications

- Allergy/sensitivity to steroid
- Darkly pigmented skin?

INTRALESIONAL STEROID INJECTION

Injection of triamcinolone acetonide (Kenalog) directly into the chalazion

Success rate 75-90%

May require two injections (~25%)

- Generally separated by 2-6 weeks

INTRALESIONAL STEROID INJECTION

Risks and Complications

- Depigmentation
- Infection
- Bleeding
- Bruising
- Allergic reaction to medicine
- No resolution of lesion (2 injections?)
- Recurrence
  - Alters histology
- Local fat atrophy
- Vision loss

Intralesional Steroid Injection

Alcohol swab on cap

Air in syringe

Inject air into vial

Draw kenalog into syringe

Alcohol cap again

Multiple dose vial

10-40 mg/ml

- May dilute 40

INTRALESIONAL STEROID INJECTION

Topical anesthetic

Evert the lid??? often don't

Clamp??? often don't

25 or 27 gauge needle

Make sure you're not in a blood vessel

Inject at an angle, not perpendicular to the lid

- Stabilize hand on patient's head

Inject 0.2-0.4cc of 10, 20, or 40 mg/ml

INTRALESIONAL STEROID INJECTION

Pressure with gauze for 2-3 minutes if bloody tears

Antibiotic drop in-office

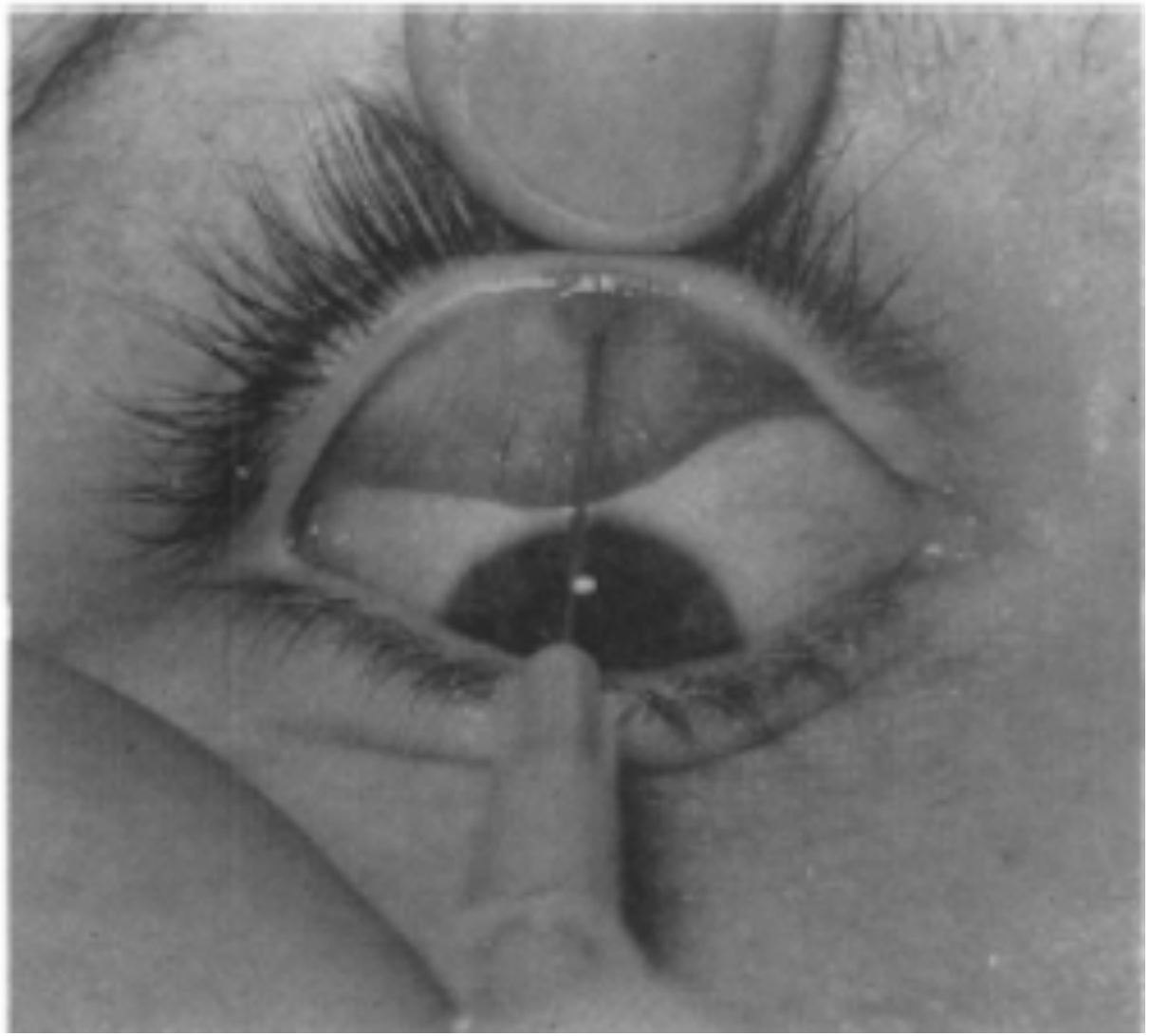
Rx antibiotic?

Resume warm compresses BID in 2-3 days

RTC 2-4 weeks

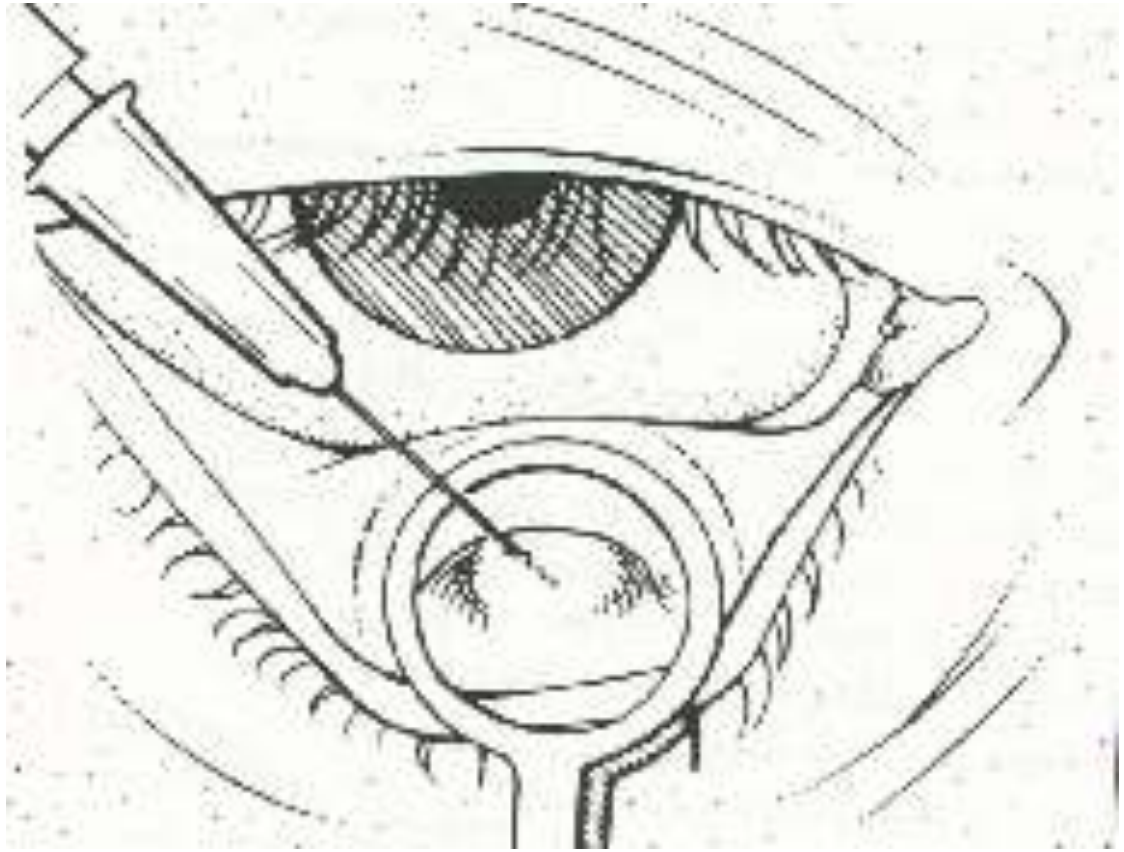
Goawalla et. al 2007

Ben Simon et. al 2005

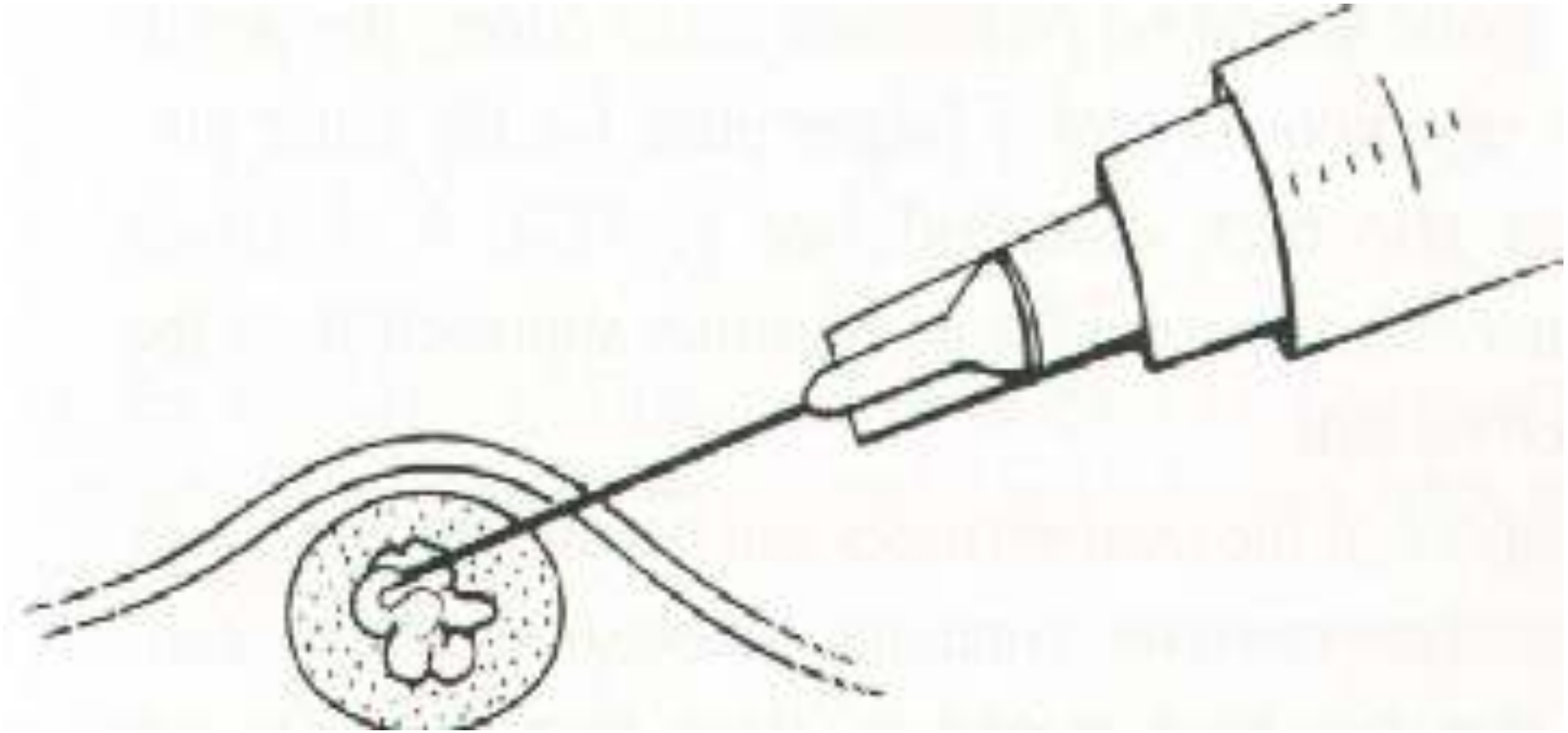


Watson 1984

INTRALESIONAL STEROID INJECTION TECHNIQUE



INTRALESIONAL STEROID INJECTION TECHNIQUE-ASPIRATE!



CHALAZION INCISION AND CURETTAGE

Surgically incise and drain chalazion

Often attempted after conservative measures

Effective when medical treatment/ steroid injection are not

CHALAZION INCISION AND CURETTAGE

Indications

- Particularly large chalazions (>6mm)
- Chronic chalazions (>3-6 months)
- Failure of injection to resolve lesion
- Patient and/or surgeon choice

Contraindications

- Allergy/Sensitivity to anesthetic
- Unable to hold still
- Medial aspect, near punctum

INCISION AND CURETTAGE

Risks and Complications

- Incomplete removal
- Infection
- Allergy to anesthetic
- Recurrence
- Scarring
- Lid notching
- Permanent gland damage

INCISION AND CURETTAGE

Topical anesthetic OU

Betadine for 3 minutes or alcohol swab

Dot the external surface

Inject 0.3-0.5 cc 1% lidocaine/epinephrine 1:200,000 *adjacent* to chalazion

- Digital massage to spread anesthesia.

Clamp (smallest possible)

- Tight enough to prevent slippage
- Ask about discomfort

INCISION AND CURETTAGE

Vertical incision

- Cut away from the globe
- Stop 2-3 mm from lid margin
- Feather blade vs Ellman (no tactile feedback)

Remove capsular contents with curette

May excise fibrotic capsule with forceps and scissors

- Cut “X” and snip corners

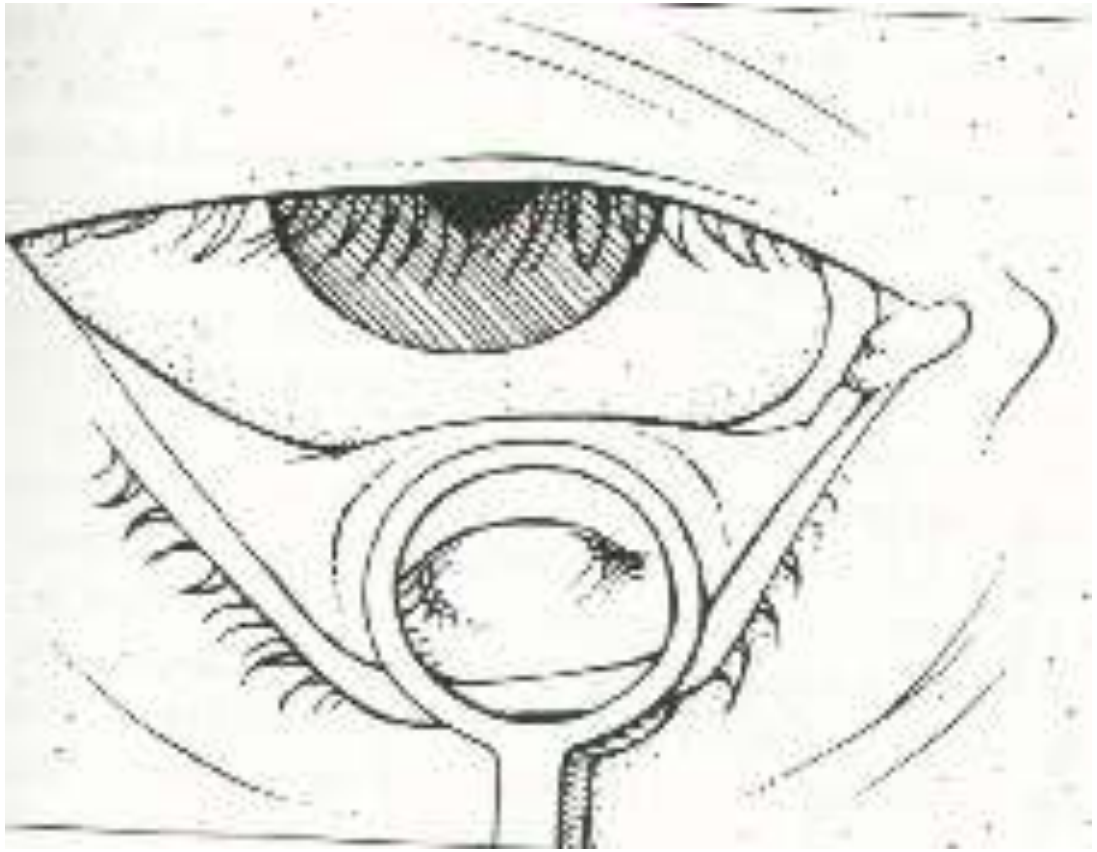
+/- intralesional steroid

Pressure for 3 minutes to achieve hemostasis

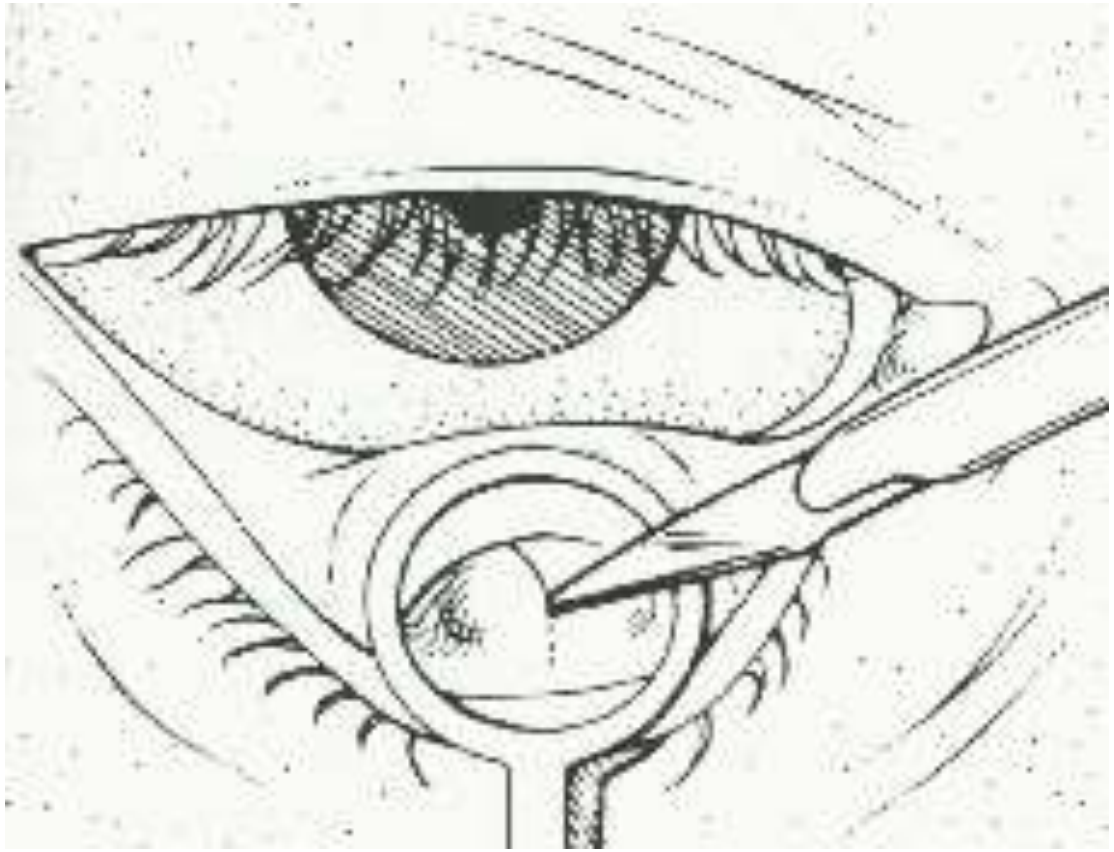
Palpate to make sure you got it all

Saline rinse and erythromycin on CTA

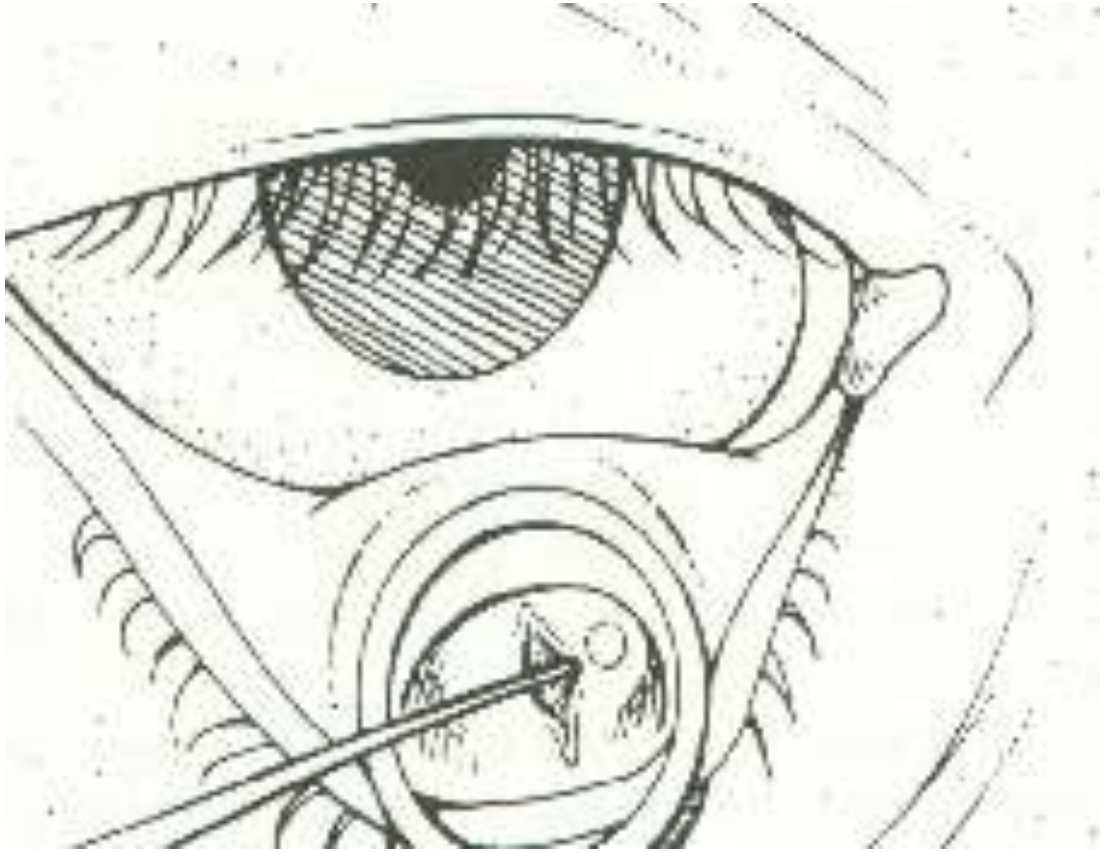
CHALAZION INCISION AND CURETTAGE



CHALAZION INCISION AND CURETTAGE



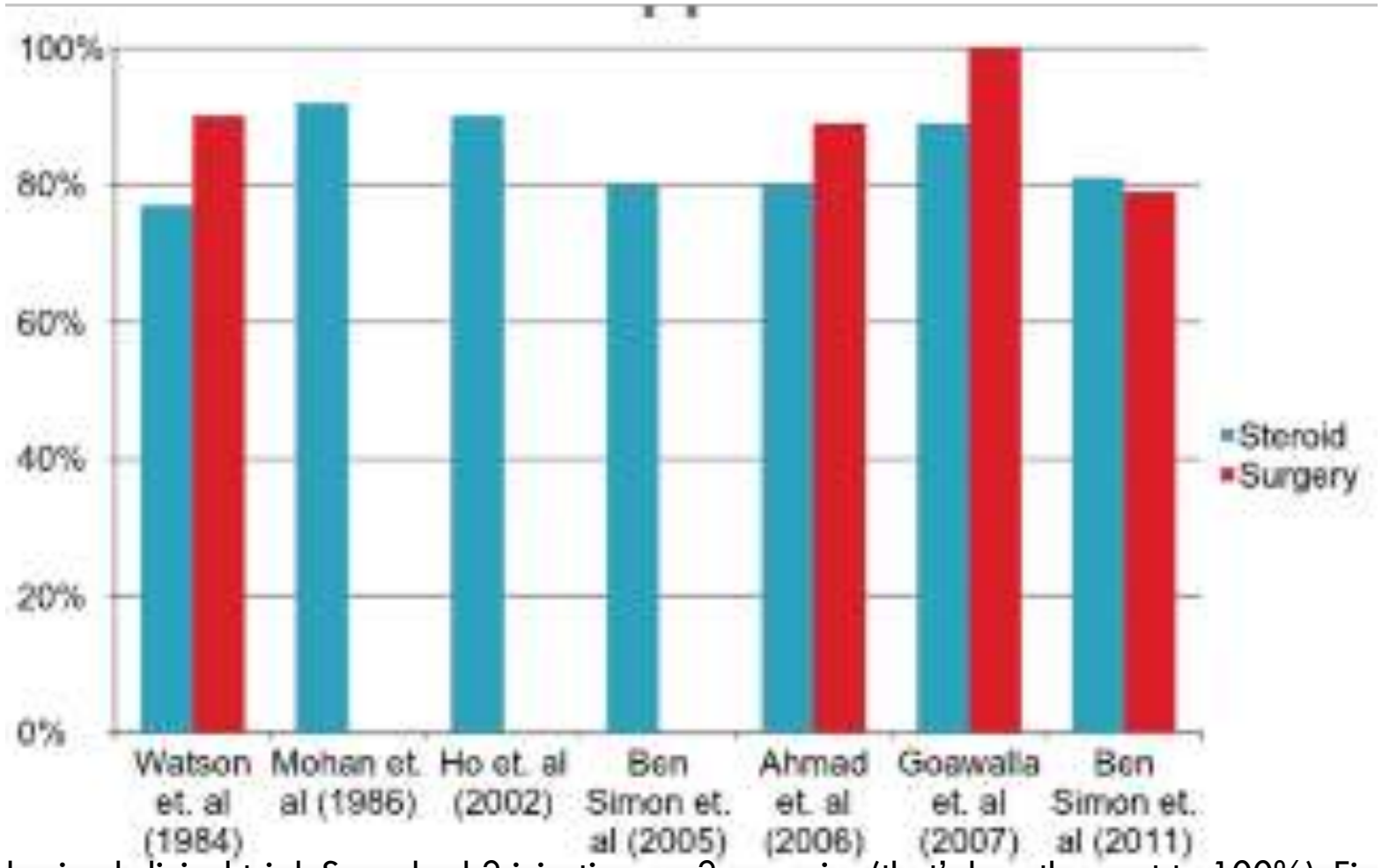
CHALAZION INCISION AND CURETTAGE



CHALAZION INCISION AND CURETTAGE

Postop instructions:

- Antibiotic ointment and/or steroid ung x 4-7 days
  - Erythromycin or Tobradex ung BID-TID
- No warm compresses for 2 days
- Pressure dressing?
- RTC 1-4 weeks



- Goawalla: prospective randomized clinical trial. Some had 2 injections or 2 surgeries (that's how they got to 100%). First round was 84% and 87%. Subjective pain scores better in steroid vs surgery. Overall satisfaction scores equal between steroid and surgery.
- Ben simon 2011 was prospective rct. All pts had failed conservative tx.
- If someone comments on <100% resolution for i&c: it's not an easy procedure. Can be frustrating if no cheesy material. Then you have to excise capsule. Difficulty is reflected in these %s. most of these surgeries were done by general omd. failed surgeries went to plastics

EQUIPMENT LIST

Incision & Curettage

- 1-3cc syringe
- 27 gauge or 30 gauge needle (0.5 inch length)
- Chalazion clamp
- Feather blade scalpel or Ellman unit
- Curette
- 1% Lidocaine with/without epinephrine 1:200,000
- 4% topical lidocaine
- Jaeger plate (optional)
- Sterile gauze 4”x4”
- Cotton tipped applicators
- Erythromycin ung
- Betadine swabs or alcohol pads

VERRUCA

EXCISION WITH RADIOFREQUENCY

Advantages of Radiosurgery

- Quick and easy (to do and to learn)
- Nearly bloodless field
- Minimal Post-op pain
- Rapid healing
- Fine control with variety of tips
- No muscle contractions or nerve stimulation from radiowaves (Farraday effects)

#1 RECOMMENDATION

A Radiofrequency Surgical Device

- RF surface ablation
- Incisions
- Excisions
- Hemostasis/cautery
- RF Epilation
- RF punctal occlusion
- Telangiectasias

CRYOSURGERY | PROS

Well tolerated

Minimally invasive

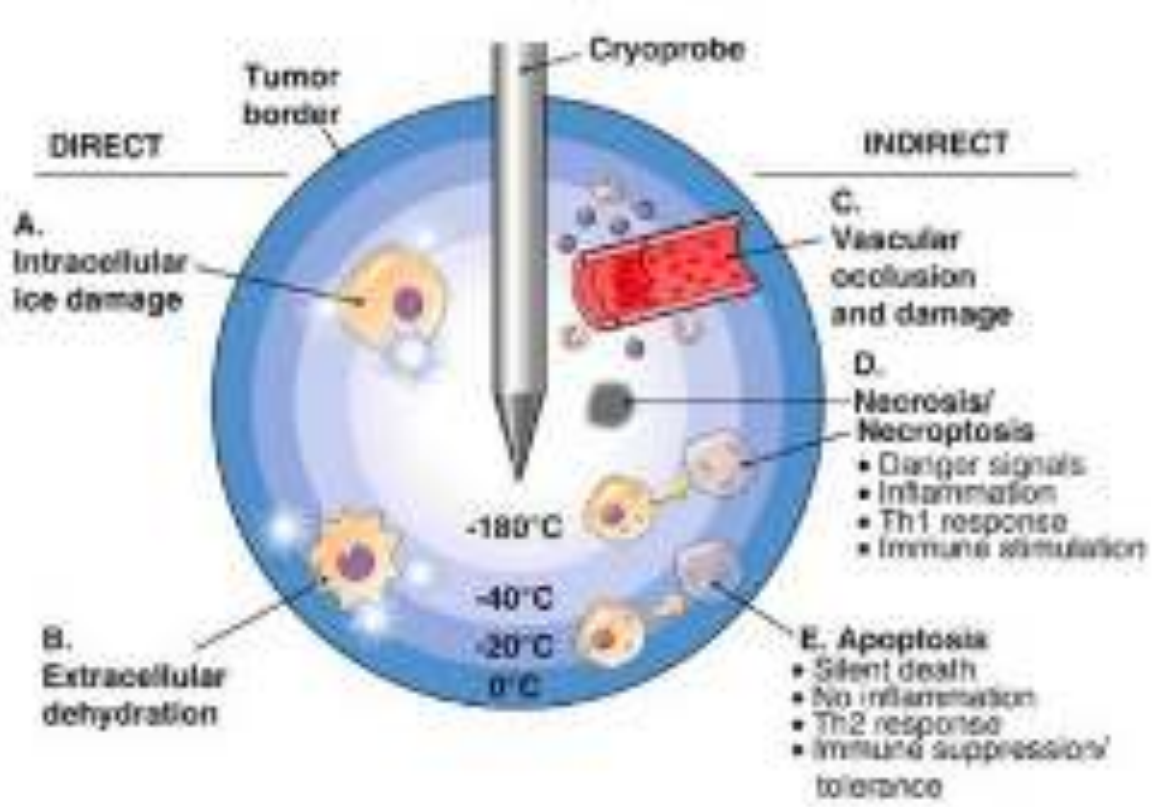
Low cost

Good cosmesis

CRYOSURGERY | MECHANISMS OF CELL DEATH

Cryosurgery induces cell death by direct and indirect mechanisms including:

- Necrosis
- Necroptosis
- Apoptosis
- Vascular damage
- Cryogen = liquid nitrogen (-320°F)



CRYO

ELLMAN UNIT VACUUM

ELECTRODE SIZE

Assortment of sizes, shapes and lengths

Depends on tissue to be incised

Size proportional to power required

Smaller electrode

- Higher current concentration
- Lower Power
- Decreased lateral heat

Larger electrode, loop or triangular

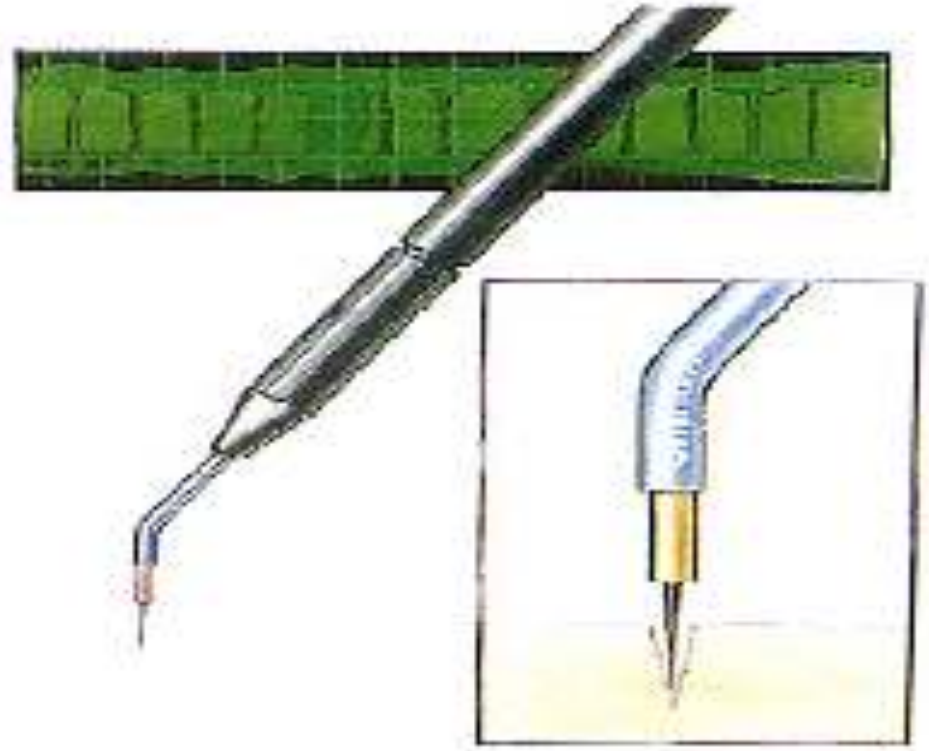
- More power
- More scar tissue
- More lateral heat

Benefits of High Frequency Radiosurgery

Low Frequency/High Temperature/More Lateral Heat (Electrosurgery)

High Frequency/Low Temperature/Less Lateral Heat (Radiosurgery)

SETTING 1
FILTERED FULLY RECTIFIED WAVE FORM – PURE CUTTING ACTION



Fully filtered and fully rectified

90% Cutting

10% Coagulation

Cutting current: high frequency sine wave that is not dampened.

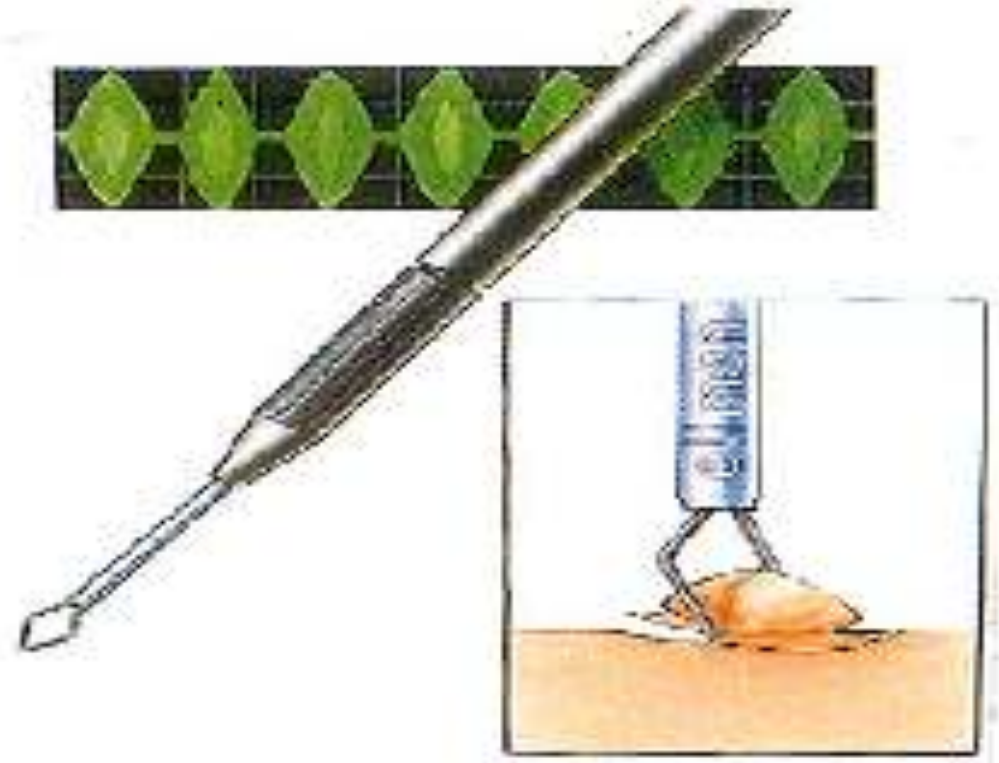
Produces very focused heat buildup that ruptures tissue through either molecular activity or through production of steam microbubbles

Minimal lateral heat

Use for biopsy, incisions, chalazion

Power ≈ 3.0 (old unit) or 20 (newer unit)

SETTING 2
RECTIFIED WAVEFORM (BLENDED)
CUT AND COAG



50% Cutting

50% Coagulation

When don't need biopsy

Helps greatly with bleeding during procedure

Very useful in vascular regions

Great for excising
- Skin tags, verruca

Waveform we use the most

Power ≈ 3.0 (old unit) or 20 (newer unit)

SETTING 3
PARTIALLY RECTIFIED WAVEFORM
COAGULATION/HEMOSTASIS

90% Coagulation

10% Cutting

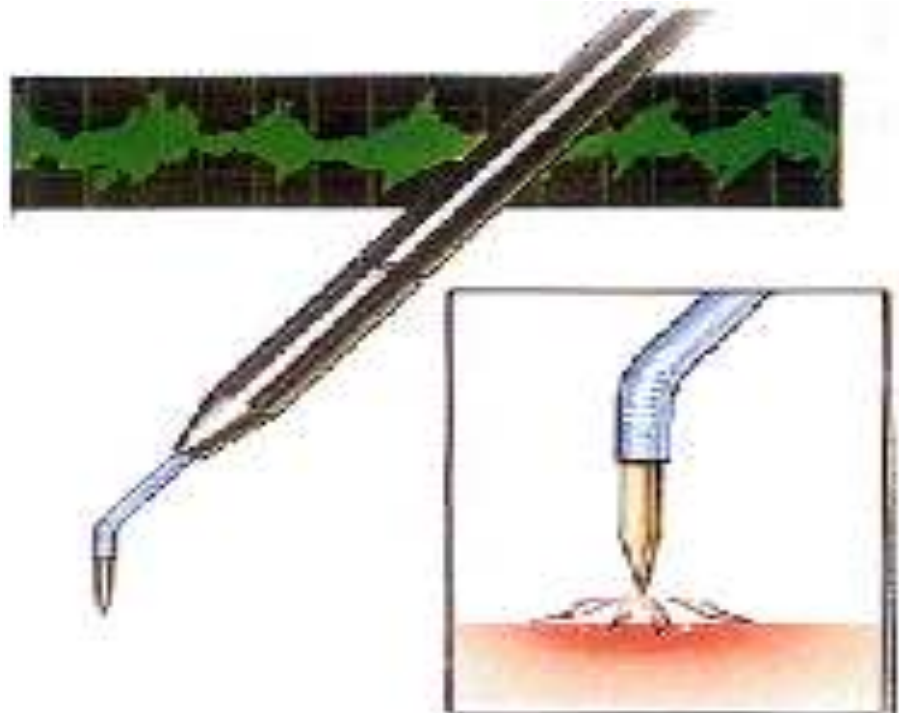
Coagulating current: high frequency but dampened (rectified) sine wave.

Produces oscillation of molecules leading to generation of intracellular heat that ultimately causes tissue dehydration/coagulation (hemostasis)

Epilation, punctal occlusion

Power ≈ 2.5 (old unit) or 20 (newer unit)

SETTING 4
FULGURATION – COAGULATION AND DESTRUCTION



- Spark gap fulgurating current (hyfrecation) for superficial cautery
- Doesn't penetrate deeply – superficial treatment
- Electrodessication (papilloma bed)
- Destruction of cyst remnants
- Intentional destruction of diseased tissue
  - BCC
  - SCC

Power ≈ 8 (old unit) or 80 (newer unit)

TRICHIASIS PROCEDURE TECHNIQUE

Cut offending lashes

Anesthetize???

Grab lash with forcep

Use microinsulated needle

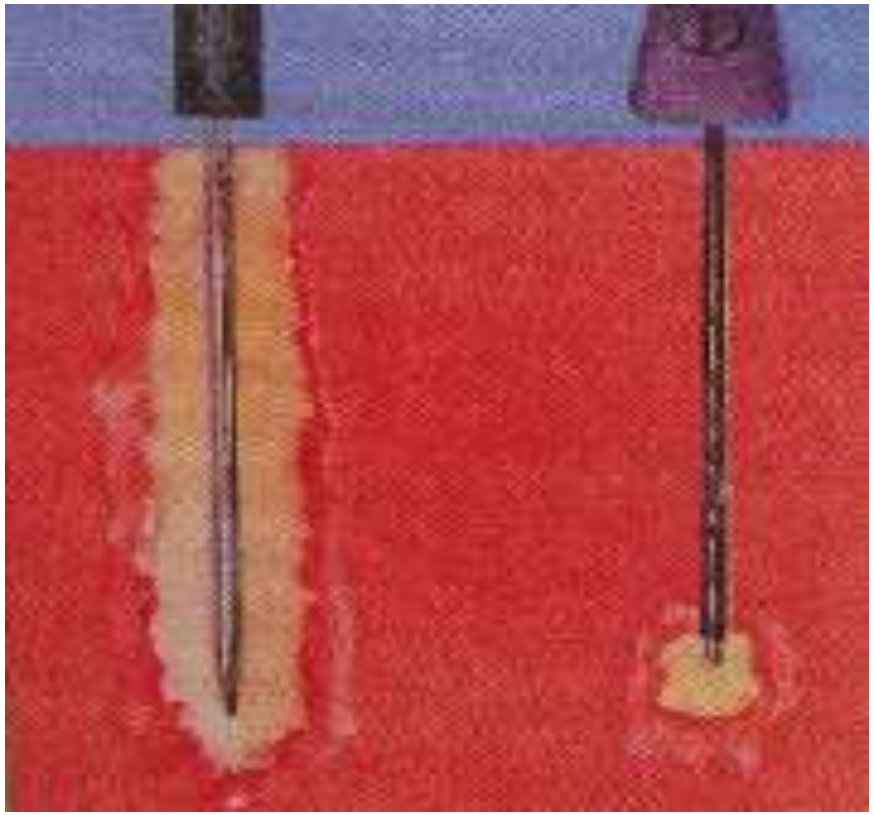
Put needle beside lash shaft into follicle until cannot go further

Lowest power setting, Coag

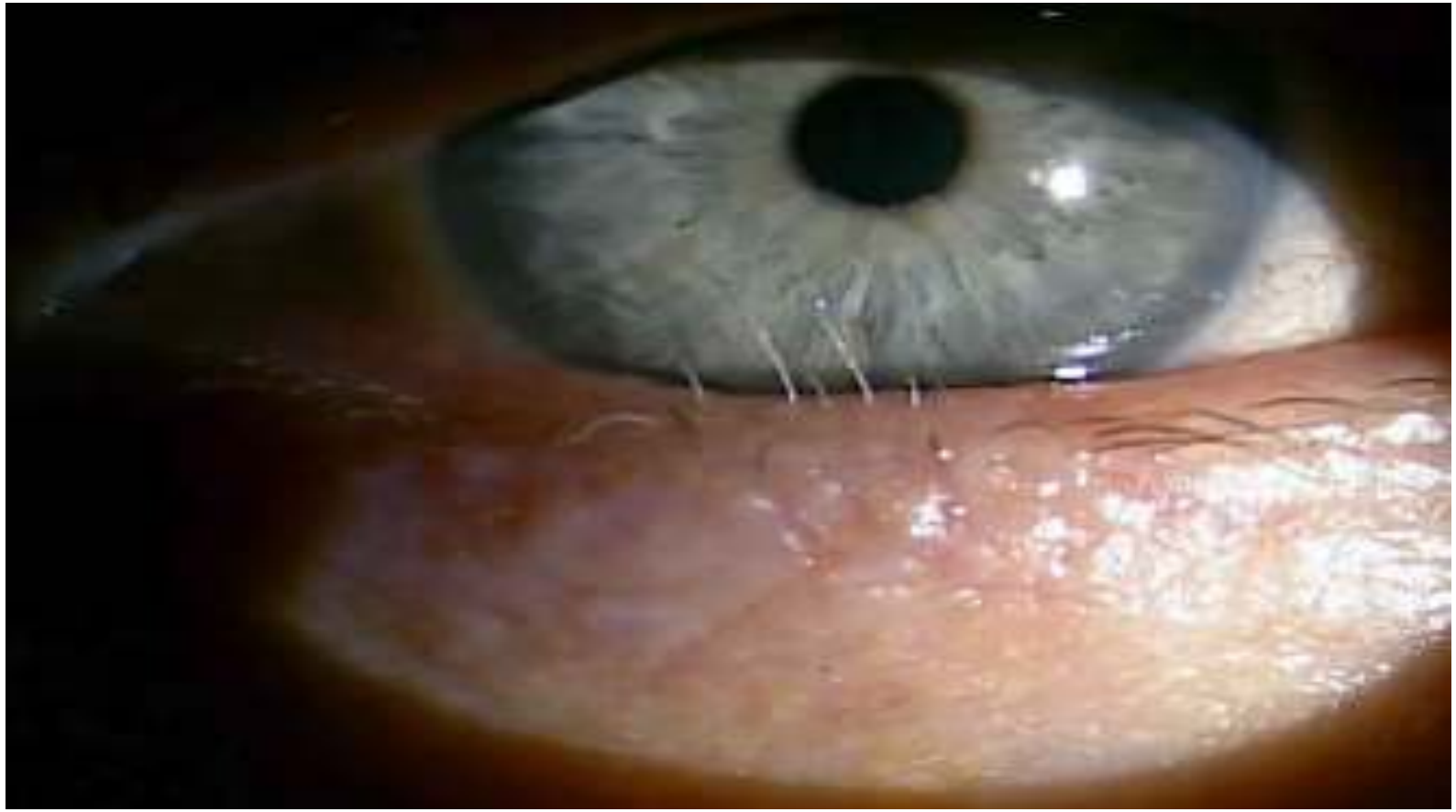
Touch and let off immediately of footplate

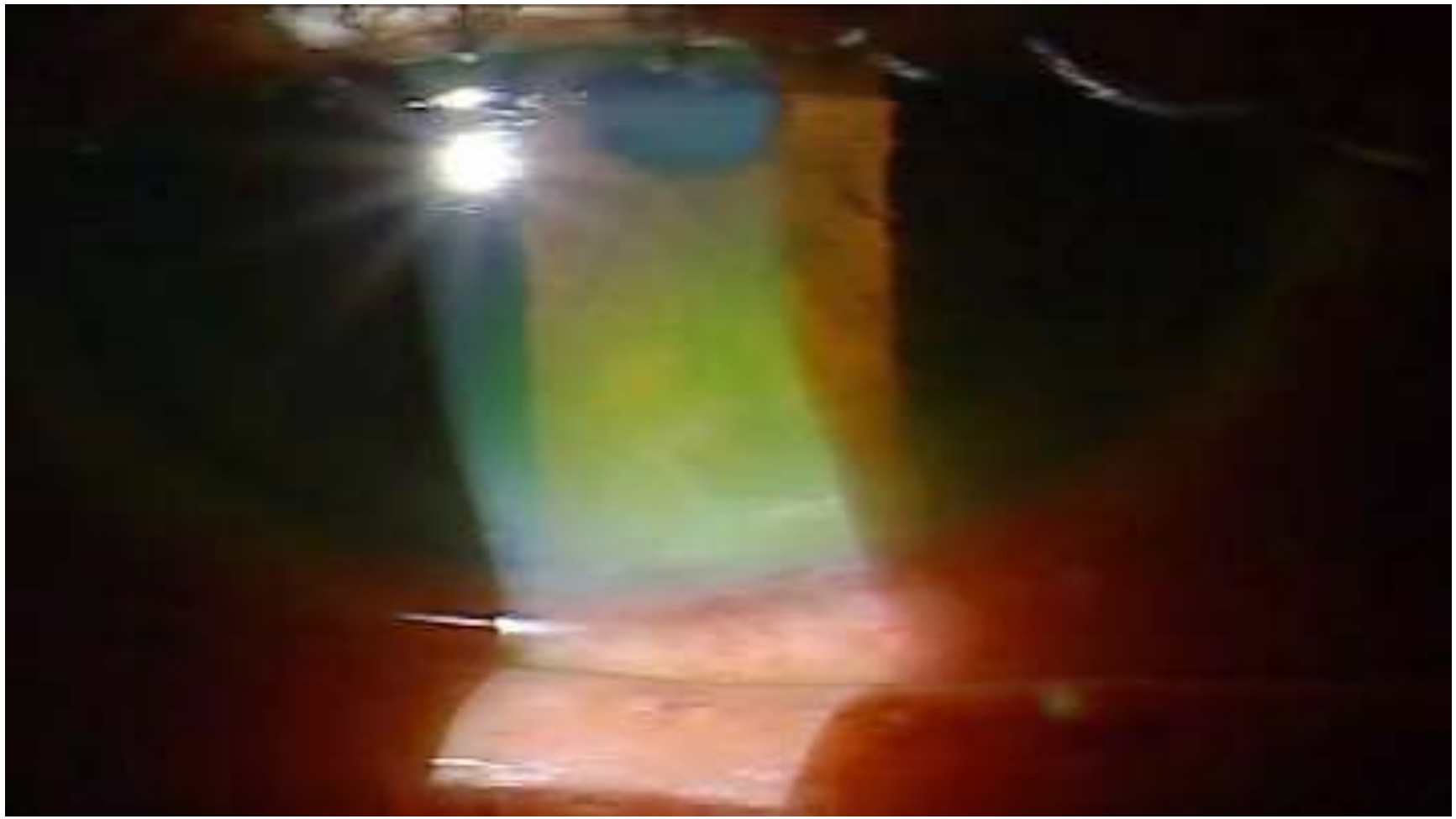
Gently tug lash – if comes out smooth are done

If not treat quickly again



Power ≈ 0.1-0.2 (old unit) or 1-2 (newer unit)





LATERAL HEAT

Lateral heat = $\frac{\text{time x waveform x power x electrode size}}{\text{frequency}}$

Factors Affecting Lateral Heat

Electrode contact time: slow passage = increased heat

Excessive power can lead to sparking (too little power leads to tissue drag)

Larger electrode head sizes lead to greater power/heat generation

Different waveforms are associated with different levels of heat:

- Fulguration> COAG > CUT/COAG > CUT

Higher frequency associated with less lateral heat

RADIOFREQUENCY (RF) SURGERY INDICATIONS

Skin papillomas/skin tags

Seborrheic keratoses

Verruca

Sebaceous cysts

Benign Nevi

Pyogenic Granulomas

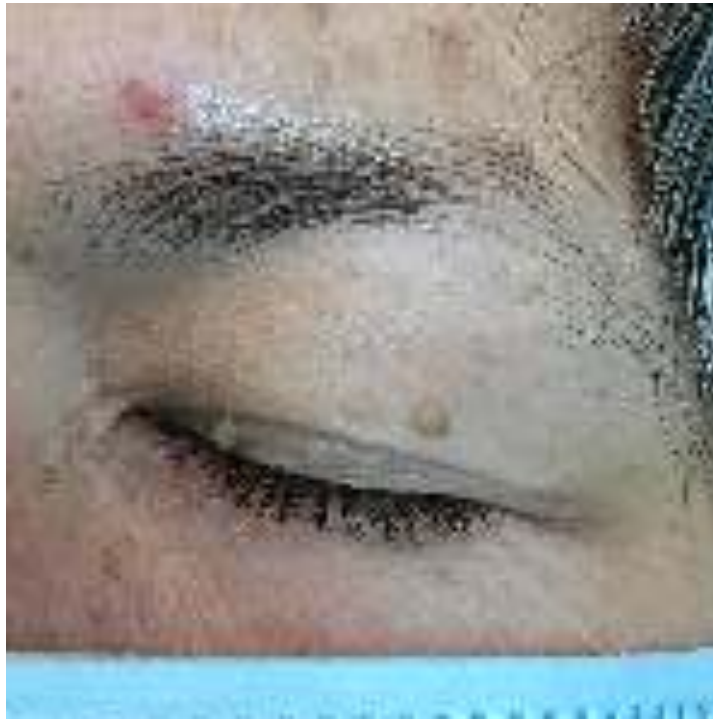
Incision into chalazion

Trichiasis

Xanthelasma

Blepharoplasty incisions

Biopsies of suspicious lesions (BCC, SCC, melanoma)



PROCEDURE TECHNIQUE

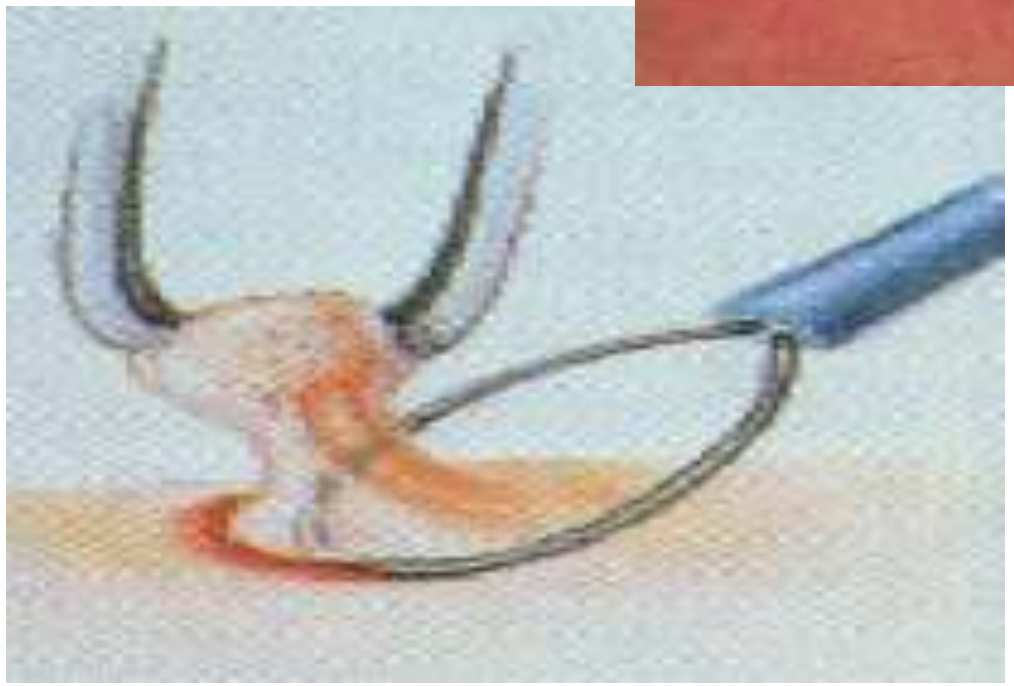
Have assistant turn on/position vacuum unit – USE vacuum and masks!

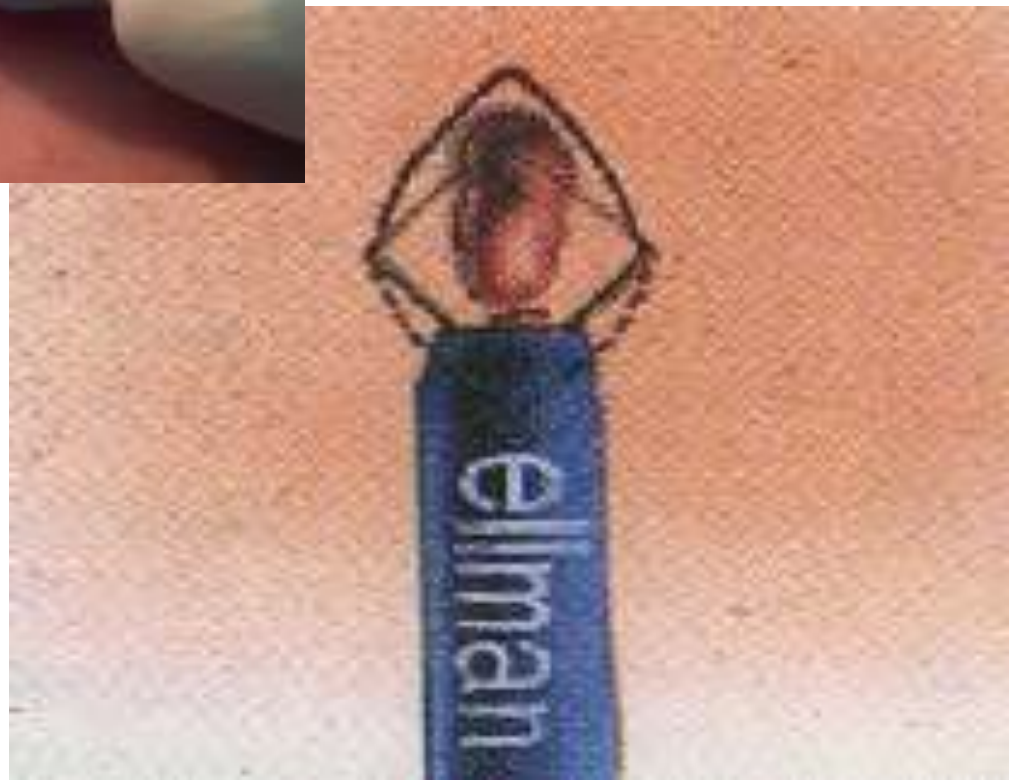
- Have isolated HPV and HIV in smoke

Place yourself in comfortable/stable position to do procedure

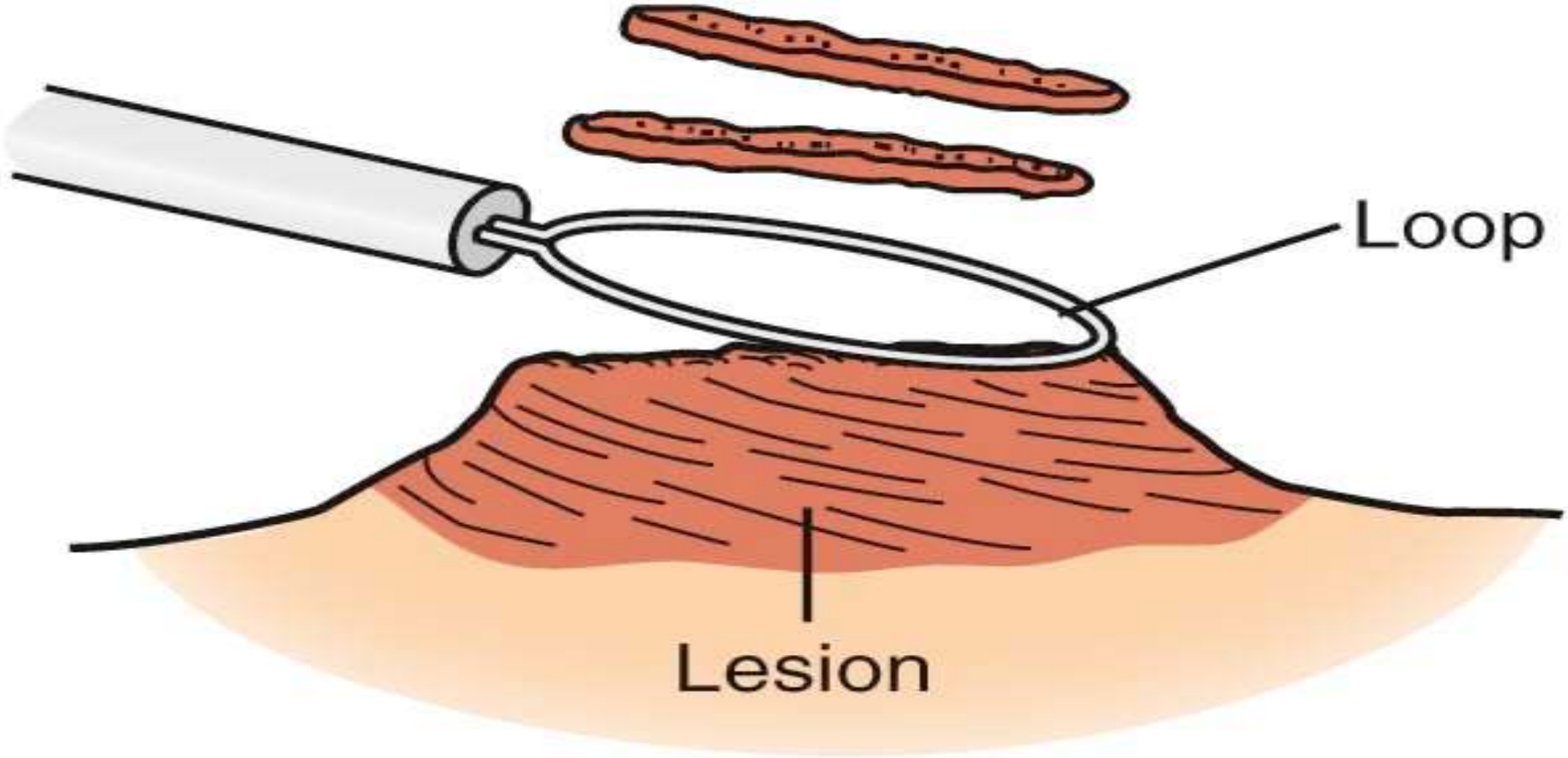
Brace your handpiece wrist on patient for stability

EXCISION TECHNIQUES





FEATHERING TECHNIQUE



PROCEDURE TECHNIQUE

Electrode tip should be applied perpendicularly to allow even distribution of energy

Press footplate activator when ready to begin procedure

Move in expeditious but controlled fashion: always keep electrode moving when contacting tissue


AIR
NON STERILE
An alcohol wipe is used to clean the skin

CCH RF TREATMENT (TECHNIQUE LEARNED FROM DR. EDWARD JACCOMA

Topical anesthetic, then 0.2cc Local lidocaine injection, Pt in upgaze @ SL

Settings: Power 4 in Cut mode

Use the forceps to grasp redundant tissue

Ball tip applies energy to CCH fornix folds

Total treatment time/eye approx. 3-5 min

Tapered course of Tobramycin/Dex drops

Treat fellow eye 4-6 wks later

ASEPSIS

Aseptic technique

- sterile equipment
- scrub hands
- sterile gloves

ASEPSIS

BLOODBORNE PATHOGENS

Universal Precautions:

Do not recap contaminated needles

Needle stick safety

Needle stick policy

You will have to be aware of these things if doing procedures in your office

INFORMED CONSENT

Indications for treatment

Description of treatment in layman's terms

Alternatives to treatment

Risks and benefit of treatment

Expected and unexpected outcomes

Patient must request procedure

PRE-OPERATIVE ACTIVITIES

check patient allergies

check vital signs (pulse, respiration, BP)

informed consent

handling patient fear

set up equipment

Inspection of equipment

Inspection of medication - discard if cloudy, expired, or container damaged

Photodocument lesion

PROCEDURE TECHNIQUE

Pre-op (photos, consent, BP and Pulse, VA)

Anesthetize (infiltrative usually)

Clean area, drape if needed

- Betadine needs 3 mins on skin!

Turn on Ellman unit: warm up for at least 30 seconds

Choose appropriate waveform

Choose initial power setting (will often need to adjust depending on tissue response to energy level chosen)

PROCEDURE TECHNIQUE

Have assistant turn on/position vacuum unit – USE vacuum and masks!

- Have isolated HPV and HIV in smoke

Place yourself in comfortable/stable position to do procedure

Brace your handpiece wrist on patient for stability

PROCEDURE TECHNIQUE

Electrode tip should be applied perpendicularly to allow even distribution of energy

Press footplate activator when ready to begin procedure

Move in expeditious but controlled fashion: always keep electrode moving when contacting tissue

PROCEDURE TECHNIQUE

Keep surgical site moist (saline gauze) to avoid tissue drag; also wipe energized tip to remove tissue stuck to it

For removing mass lesions, use loop electrode/grab with opposite hand forceps/have specimen jar ready for lab submission

When feathering down a lesion with a loop, keep perpendicular---remove until healthy tissue seen (particularly helpful with lesions on gray line)

Can use forceps closed tips to touch end of area of bleeding, touch electrode to forceps to transfer energy to area to stop bleeding

PROCEDURE TECHNIQUE

Keep the tissue around the lesion taut

Keep surgical site moist (saline gauze) to avoid tissue drag

- Removes debris on surgical field

Also wipe energized tip to remove tissue stuck to it

When feathering down a lesion with a loop, keep perpendicular---remove until healthy tissue seen

Can use forceps closed tips to touch end of area of bleeding, touch electrode to forceps to transfer energy to area to stop bleeding

POST PROCEDURE TECHNIQUE

Clean area of betadine

Apply antibiotic ung

Don't let patient jump and run as you sit them up!

Blood pressure and pulse post-op

Write op report in chart along with patient instructions on wound care and follow-up schedule

CODING FOR MINOR SURGERY

Approximate Allowables: (Oklahoma Novitas 3/22)

- 67840 $254,59 Total Exc lid lesion
- 67810 $159.25 Biopsy/Part Exc lid lesion
- 11200 $82.99 Removal <16 skin tags
- 11310 $106.02 Shave Exc < .5 cm
- 11900 $52.26 Chal injection
- 67800 $119.36 Chal I & C
- 67801 $153.15 Chal Mult S Lid
- 67805 $189.83 Chal Mult D Lid
- 67921 $425.73 Repair of entropion, suture
  - 67820 $ 47.98 Epilation by forceps
  - 67825 $121.02 Epilation by other means RF

OD Surgery Clinic Coding

CPT	Description	Global Period	Reimbursement
11200	Removal of skin tags, multiple fibrocutaneous tags, any area; up to and including 15 lesions	10	$82.99
11440	Excision, other benign lesion including margins, except skin tag (unless listed elsewhere), face, ears, eyelids, nose, lips, mucous membrane; excised diameter 0.5 cm or less	10	$125.13
11441	Excised diameter 0.6 to 1.0 cm	10	$157.29
11900	Injection, intralesional; up to and including 7 lesions	0	$52.26
67800	Excision of chalazion; single	10	$119.36
67801	Excision of chalazion, multiple, same lid	10	$153.15
67805	Excision of chalazion; multiple, different lids	10	$189.83
67810	Incisional biopsy of eyelid skin	0	$159.25
67820	Correction of trichiasis; epilation, by forceps only	0	$47.98
67825	Epilation by other than forceps (eg, by electrosurgery, cryotherapy, laser surgery)	10	$121.02
67840	Excision of lesion of eyelid (except chalazion) without closure or with simple direct closure	10	$254.59
67850	Destruction of lesion of lid margin (up to 1 cm)	10	$199.95
67921	Repair of entropion; suture	90	$425.73
68020	Incision of conjunctiva, drainage of cyst	10	$113.07
68200	Subconjunctival injection	0	$39.14
68750	Closure of the lacrimal punctum; by thermocauterization, ligation, or laser surgery	10	$187.42
68761	Closure of the lacrimal punctum; by plug, each	10	$138.03

Result Comments

f1 PRR Material

Material submitted

PART A Skin left temporal upper lid

PART B Skin, left upper brow

f2 PRR Dx

.

Diagnosis

A Skin biopsy left temporal upper lid

Compound nevus

B Skin biopsy left upper brow

Compound nevus

HBU/07/10/2017

NL

7-12-17


TelScreen
NSU Oklahoma College of Optometry

“MY EYES ARE RED! I CAN USE LUMIFY RIGHT?”

EXAM ELEMENTS

Skin-Study the Face

Head Tilt

Lid Position

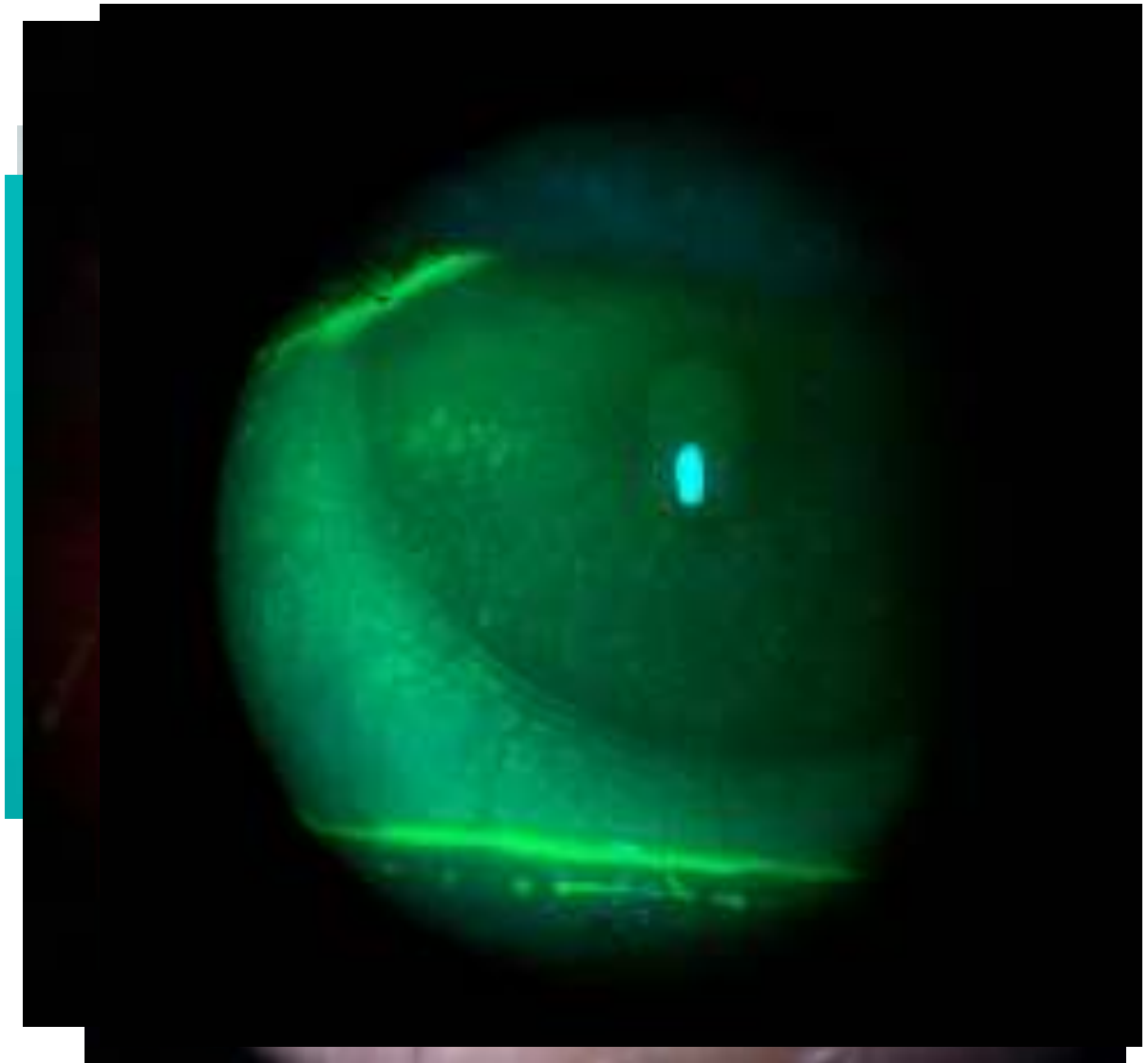
Lid Laxity

Lashes

Meibomian Glands

Telangiectasia

Cornea



DERMATOLOGICAL CONDITIONS

ECTOPIC DERMATITIS

DIOSD: DUPILIMAB-INDUCED OCULAR SURFACE DISEASE

Maiti S, Periman LM, Balani N. Intense pulsed light for the treatment of dupilimab induced ocular surface disease (DIOSD): a novel case report. JDED 2021. V5

DIFFERENTIATION OF VARIOUS DEVICES FOR SKIN

Laser Light Energies (Lasers-Light Amplification by Stimulated Emission of Radiation)

- Both ablative and non-ablative (all indications depending on wavelengths)

IPL Devices of Light Therapy (Intense Pulse Light-filtered light energies)

- Typically non-ablative devices (melanin reduction, oxy/de-oxy hemoglobin)

Radio Frequency Devices

- Typically non-ablative devices (skin tightening, collagen remodeling)

Ultrasound Devices

- Typically non-ablative devices (skin tightening, collagen remodeling)

INTENSE PULSE LIGHT (IPL)

Differences between Lasers & IPL sources

Laser Light

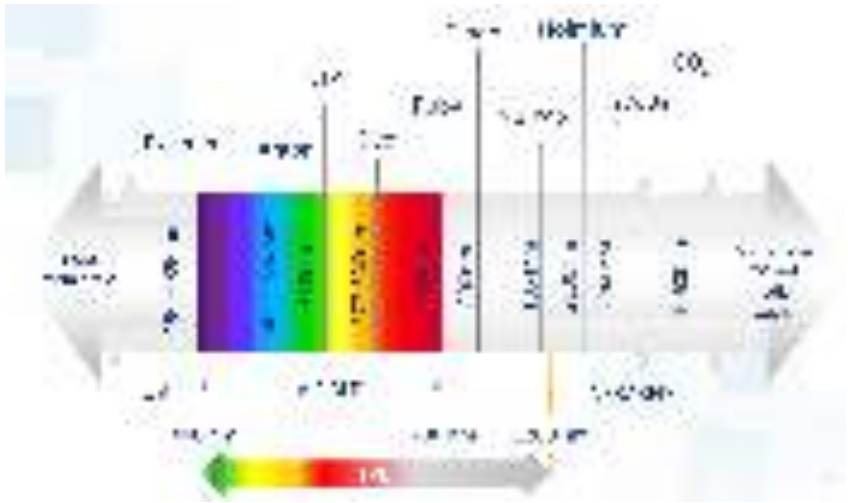
- Monochromatic
- Coherent
- Parallel

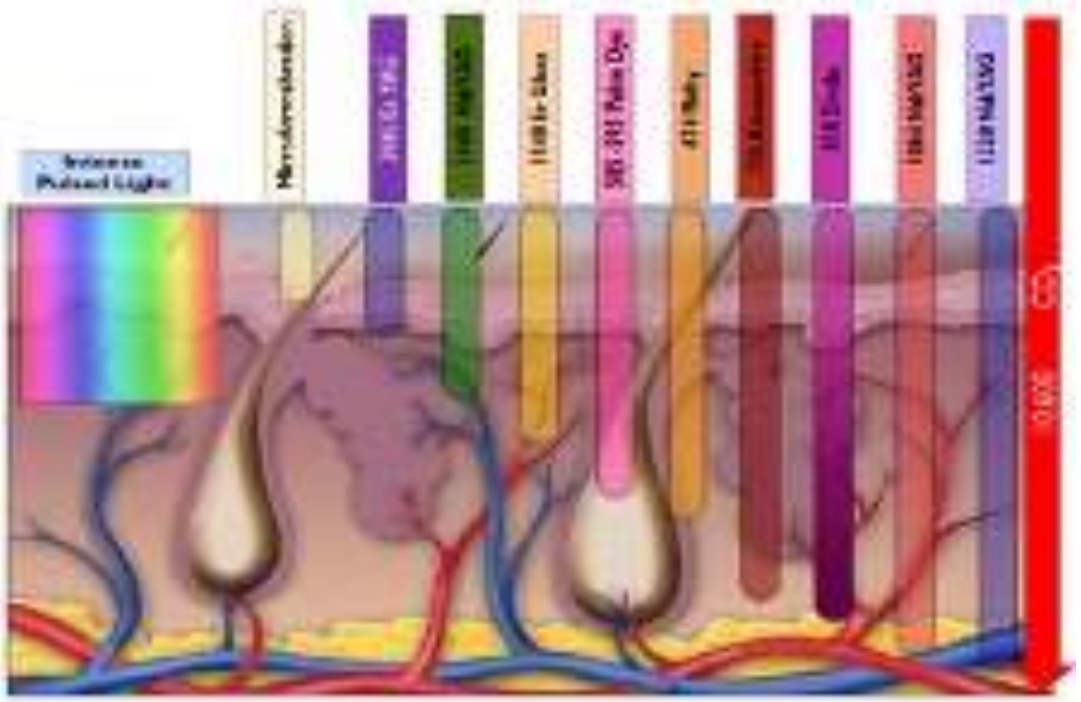
Intense Pulsed Light

- Non monochromatic
- Non coherent
- Defocused

laser		Intense pulsed light (ipl)	
	monochromatic: can tune out unwanted colors		polychromatic: broad spectrum visible light
	coherent: related in phase over long distances		non-coherent: phases cross each other
	collimated: beam spreads very little		divergent: beam spreads a lot
The diode laser works on an 810nm wavelength, targeted for hair removal		IPL's work a broad spectrum of wavelengths, ranging from 450-1200nm	

INTENSE PULSE LIGHT (IPL)

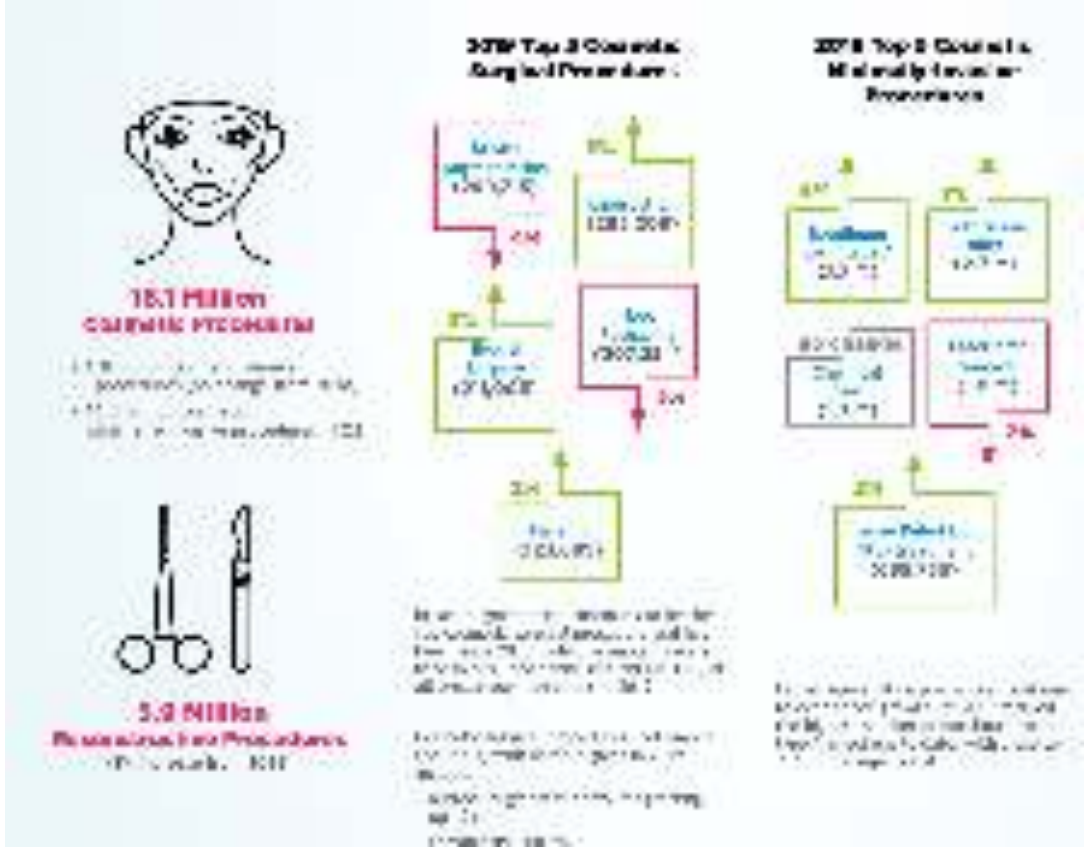




IPL (INTENSE PULSED LIGHT)

How it works

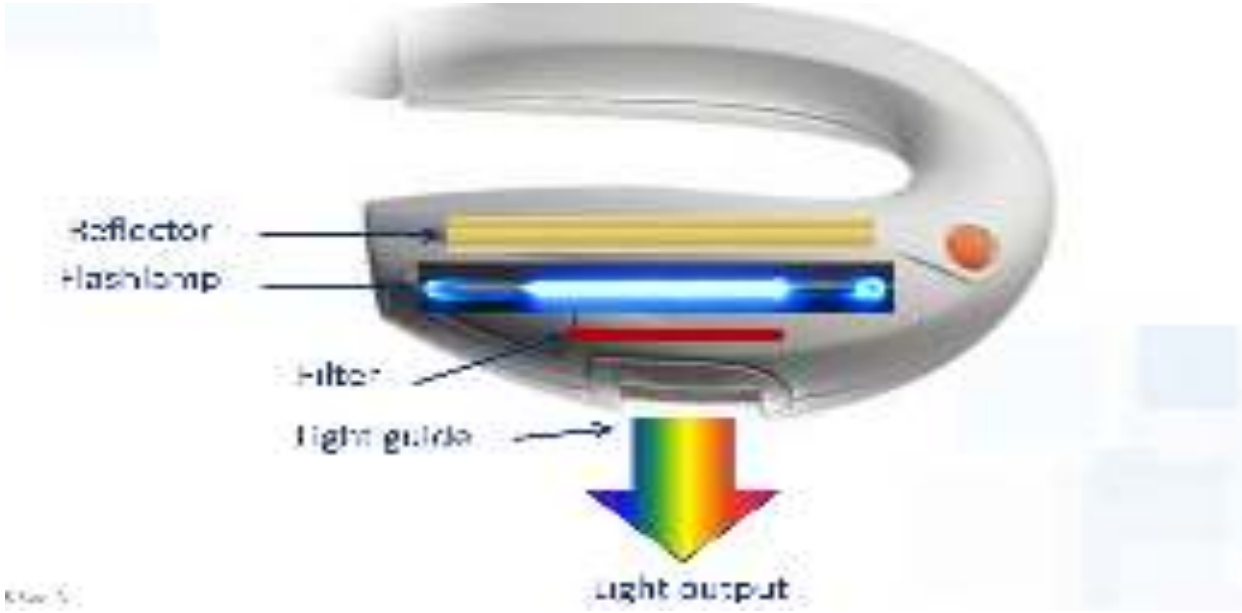
- Emits a broad, continuous spectrum of light in the range of 515–1200 nm, with the ability to apply filters to target specific *chromophores* (i.e. melanin and hemoglobin).
- Melanin absorption is in the 400–700 nm range
- Blood absorption in the 900–1,200 nm range
- Role of oxyhemoglobin
  - The light that's emitted from the flashlamp is absorbed by the oxyhemoglobin in the blood vessels → generates heat that coagulates the cells
- Think Red's & Browns!



WHAT'S A CHROMOPHORE?

IPL safely and effectively targets the inflammation

LIGHT EMITTED PASSES THROUGH A FILTER WHICH "CUTS OFF" UNDESIRED WAVELENGTHS AND MAXIMIZES THE PASS OF THE CHOSEN ONES



Filters for the M22 and OptiLight are available in 515, 560, 590, 615, 640, 695, vascular, 755, and Acne*

*Know what your license allows through your Board of Examiners!

MaxG™ Pulsewidth (ms)	Minimum Fluence (J/cm²)	Maximum Fluence (J/cm²)	Fluence Increments
1	3	11	1
2	5	21	2
3	6	30	2
5	6	36	2
10	20	54	2
15	20	60	2
20	20	68	2
25	20	74	2
30	20	80	2
40	20	80	2
60	20	80	2
80	26	80	2
100	32	80	2

Handpiece	Spot size (mm)	Repetition Rate (Hz)	Spectral Range (nm)	Fluence Range* (J/cm²)	Application
MAXG	10 x 15	.2 – 2.0	500 – 670 & 870 - 1200	Up to 80	Pigmented and Vascular Lesions (skin types I-IV)

MOST POPULAR COSMETIC SKIN PROCEDURES PERFORMED

Photofacial

- #1 Cosmetic procedure performed in the United States
- 80 million Americans have some kind of venous disorder (80% of those are cosmetic)
  - Rosacea represents 16 million alone
- Hyperpigmentation is the 2nd largest skin disorder in the US (Acne #1)

- Chang AL, Bitter PH Jr, Qu K, Lin M, Rapicavoli NA, Chang HY. Rejuvenation of gene expression pattern of aged human skin by broadband light treatment: a pilot study [published correction appears in J Invest Dermatol. 2013 Jun;133(6):1691]. *J Invest Dermatol.* 2013;133(2):394–402. doi:10.1038/jid.2012.287

American Academy of Dermatology

IPL

IPL-Intense Pulsed Light On Label
Telangiectasias
Photorejuvenation (reds & browns)
Acne
Rosacea
Hair removal
Benign Cutaneous Vascular Lesions
Angiomas, spider angiomas, leg veins,
Venous malformations
Poikiloderma
Cutaneous Lesions:warts, scars, striae
Fine lines and wrinkles-non-ablative
OPT specific IPL Now FDA Approved De Novo Label in the US
Dry Eye associated with Meibomian Gland Dysfunction

PEER REVIEWED LITERATURE

Pubmed search (2023/July 28):

Search keywords in PubMed:

(Optimal pulsed AND Meibomian) OR (Pulsed AND Meibomian) OR (IPL AND MGD) OR (IPL AND dry eye) OR (IPL AND keratoconjunctivitis) OR (intense pulsed light AND dry eye) OR (intense pulsed light AND Meibomian) OR (intense pulsed light AND MGD)

Initial Results : 108 publications

Excluding reviews, guidelines, letters, repetitions, and papers not in English:

43 +publications found in Pubmed + 2 free search publications (not found in PubMed)

Total: **45+ publications**

IPL AND "THE LITERATURE"

- Lei Y, Peng J, Liu J, Zhong J. Intense pulsed light (IPL) therapy for meibomian gland dysfunction (MGD)-related dry eye disease (DED): a systematic review and meta-analysis. Lasers Med Sci. 2022 Dec 19;38(1):1. doi: 10.1007/s10103-022-03690-1. PMID: 36534219.

ORIGINAL ARTICLE

Intense pulsed light (IPL) therapy for meibomian gland dysfunction (MGD)–related dry eye disease (DED): a systematic review and meta-analysis

Yahui Lei[1] · Jing Peng[2] · Jiayan Liu[1] · Jingxiang Zhong[1,2]

A SYSTEMATIC REVIEW AND META-ANALYSIS.

- Discussion- Primary Outcomes (OSDI & TBUT)
  - According to the quantitative analysis, the application of IPL could ameliorate the BUT of DED patients, even in a relatively short follow-up time.
  - A significant difference in the reduction in the OSDI score between the two groups may require a relatively long follow- up time to emerge.
  - Unsurprisingly, it takes time to improve tear film stability to ameliorate DED symptoms.
  - In brief, the results of our analysis showed that both IPL treatment and traditional treatments could improve the stability of tear film and subjective symptoms of patients.
  - Moreover, the effect of IPL application in improving the stability of tear film was markedly better than that of traditional treatments.

PEER REVIEWED LITERATURE

List of authors	Country	N(pts)	IPL Device Used	Design	Short summary
Lee et al., 2020	KR	23	M22	Retrospective	Improvements in TBUT, SICCA ocular staining score, Oxford staining score, lid margin irregularity, lid thickness, meibomian gland plugging, meibum color, meibum consistency, OSCI and incidence of MMP-9 immunopositivity.
Yan et al., 2020	CH	120	M22	Prospective, Randomized Controlled	TBUT, SPEED,MGYSS, CFS, and lid margin abnormalities improved in both an IPL arm and a control ARM, but in general, the improvement was significantly larger in the IPL arm.
Stefania et al., 2019	IT	11	Synchro FT- DEKA MELA	Prospective; Open label	All pts improved TBUT, Schirmer test, Tear film osmolarity, and symptoms after 2 treatments
Fan et al., 2020	CH	64	Solari (Lutronic)	Prospective; Open label	IPL reduced severity of DE symptoms and improved the overall tear film stability in pts with moderate to DED owing to MGD. In addition, visual complaints experienced by DE patients secondary to MGD significantly decreased.
Wei et al., 2020	CH	53	Unspecified but probably M22	Prospective; Open label	OSDI significantly reduced after IPL. Meibomian gland assessment scores, including meibum quality and expressibility, eyelid margin abnormalities, and corneal staining, significantly decreased after IPL. Corneal nerve fiber length (significantly increased after IPL.
Li et al, 2020	CH	30	Lumenis One	Prospective; Randomized Controlled	15 pts received normal IPL treatment (group A), and 15 received additional IPL on the upper eyelids (group B). Both groups improved, but pts in group B had better recovery of TBUT
Tang et al., 2020	CH	44	Unknown (Full text was not available)	Retrospective	SPEED, OSDI, TBUT, CFSS, MGYSS, MGYLS, and MGYCS were significantly improved after three IPL/MGX treatments, but the meiboscore and MGLS remained unchanged. In patients who had better treatment outcomes, a longer TBUT, better meiboscore, and less gland loss before IPL/MGX were noted.
Wu et al., 2020	CH	62	M22 (Lumenis) versus E>Eye (E-Swin)	Prospective; Randomized Controlled	IPL has significant clinical value in treating patients with MGD. OPT treatment (Lumenis) was more effective in improving MG function in lower eyelids and partial tear film signs than IRPL treatment (E-Swin).

Páez et al., 2020	SP	20	Unspecified in Abstract (Probably E>Eye, but full text is not available)	Retrospective	A significant clinical and visual improvement was observed, together with a decreased frequency in artificial tear use, in LASIK patients with chronic DES after IPL treatment
Ge et al., 2020	CH	60	M22 (Lumenis)	Prospective; Randomized Controlled	Cataract patients before phacoemulsification were randomly divided to IPL pre-a and post-treatment, or conventional surgery (no IPL). In most outcome measures, patients treated with IPL had better outcomes after 1 and 3 months.
Xue et al., 2020	NZ	87	E>Eye (E-Swin)	Prospective; Randomized Controlled	IPL therapy effected significant improvements in dry eye symptomology, tear film lipid layer thickness, and meibomian gland capping in MGD patients. Five-flash IPL treatment showed superior clinical efficacy to four-flash, and an initial course of at least four treatments is suggested to allow for establishment of sustained cumulative therapeutic benefits prior to evaluation of overall treatment efficacy
Fishman, Shah, Periman, 2020	US	N/A	M22 (Lumenis)	In Vitro	IPL with parameters as those of Toyos' protocol causes the death of Demodex in vitro
Yurttaser Ocak et al., 2020	TU	43	Eye Light (Espansione)	Retrospective	Following IPL treatment, OSDI, NIBUT, meibomian glad dropout scores, corneal staining scores improved in patients with mild and moderate MGD. OSDI and NIBUT started improve at 1 month, while corneal staining and meibomian gland dropout scores showed earliest improvements at 3 months. The improvements lasted until the 12-month follow-up visit. No significant improvements were observed in patients with severe MGD.
Piyacomn et al., 2020	TH	114	E>Eye (E-Swin)	Prospective; Randomized Controlled	At 6 months, TBUT, meibum quality grades, expressibility grades, and OSDI were better in the IPL group. OSDI, meibum quality, and expressibility in the IPL group began to improve at day 15, whereas the results in the sham group began to improve at day 45. No adverse event occurred after IPL.
Stefania et al., 2019	IT	11	Synchro FT- DEKA MELA	Prospective; Open label	All pts improved TBUT, Schirmer test, Tear film osmolarity, and symptoms after 2 treatments
Gao et al., 2019	CH	82	M22 (Lumenis)	Prospective; Randomized Controlled	IPL improved signs of DED and decreased the level of key inflammatory markers more than treatment with tobramycin/dexamethasone plus warm compresses.
Huang et al., 2019	CH	43	M22 (Lumenis)	Prospective; Randomized Controlled	IPL combined with intra-ductal Meibomian Gland Probing improved signs and symptoms of DED more than IPL alone or MGP alone
Ruan et al., 2019	CH	33	M22 (Lumenis)	Prospective; non-randomized Controlled	IPL combined with Meibomian Gland Expression (MGX) improved signs and symptoms of Blepharitis-Associated Keratoconjunctivitis more than MGX alone
Vigo et al., 2019	IT	28	E>Eye (E-Swin)	Prospective; Single arm	IPL improved signs and symptoms in MGD patients, while lower baseline NIBUT values were predictive of better response to IRPL
Cheng et al., 2019	CH	25	Icon Aesthetic System	Retrospective	IPL improved Meibomian gland microstructure, Demodex infestation, and other signs/symptoms of DED
Stonecipher et al., 2019	US	230	Eye Light (Espansione)	Retrospective	Combination of Low-Level Light Therapy and IPL improved signs and symptoms of DED

Toyos et al., 2019	US	19	M22 (Lumenis)	Prospective; Single arm	IPL treatment directly on the upper eyelids improved signs and symptoms of DED.
Choi et al., 2019	KR	30	M22 (Lumenis)	Prospective; Single arm	IPL treatment improved meibomian gland function, stabilized the tear film, and decreased ocular surface inflammation.
Meija et al 2019	SP	25	E>Eye (E-Swin)	Retrospective	IPL improved DED and objective tests such as TBUT, Schirmer test and Van Bijerstveld score
Li et al., 2019	CH	40	Lumenis One (Lumenis)	Prospective; paired-eye controlled	Two parameter settings of IPL treatment gradually and effectively raised the tear breakup time (BUT) and ocular surface disease index (OSDI) score
Vigo et al., 2019	IT	19	Unspecified	Prospective; Single arm	IPL improved Noninvasive break-up time and lipid layer thickness grade, but did not change meibomian gland loss and tear osmolarity
Ahmed et al., 2019	EG	12	Lumea SC2007/60 (Philips)	Prospective; Single arm	IPL improved the molecular weight and concentration of tear proteins (lysozyme, lactoferrin, albumin) and tear lipids (triglycerides, cholesterol, phospholipids).
Karaka et al., 2018	TU	26	E>Eye (E-Swin)	Prospective; Single arm	Monotherapy IPL improved tear breakup time, Schirmer's test and symptoms
Arita et al., 2019	JP	45	M22 (Lumenis)	Prospective; Randomized Controlled	both IPL+MGX and MGX improved symptoms and signs of DED, but the improvement was more pronounced in the IPL+MGX arm.
Zhang et al., 2019	CH	40	M22 (Lumenis)	Prospective; Randomized Controlled	Both IPL and topical tea tree oil (TTO) decreased the Demodex count. Rate of total eradication was higher with IPL, compared to TTO
Rong et al., 2018	CH	44	M22 (Lumenis)	Prospective; Paired-eye	Meibomian gland yielding secretion score and tear break-up time improved both in the treated side and the untreated side. Up to 6 months, improvements were larger in the treated side. At 9 months, there was no difference between the two sides.
Arita et al., 2019	JP	31	M22 (Lumenis)	Prospective; Single arm	Symptoms and quality of tear film improved after IPL + MGX
Seo et al., 2018	KR	17	M22 (Lumenis)	Prospective; Single arm	Symptoms and signs of DED improved after IPL +MGX. Some signs maintained improvement after 12 months. Other signs returned to baseline after 6 months.
Rong et al., 2018	CH	28	M22 (Lumenis)	Prospective; Paired-eye	Meibomian gland yielding secretion score and tear break-up time improved both in the treated side and the untreated side. Up to 6 months, improvements were larger in the treated side. At 9 months, there was no difference between the two sides.

PEER REVIEWED LITERATURE ON IPL FOR DED/MGD: PAGE 1 OF 2

Authors	Year	P/R	Publication	N	Key Findings
Seo et al	2018	P	*Cont Lens Anterior Eye 41(5): 430-5*	17	OSDI, TBUT, NIBUT, Staining, LM Vascularity, meibum quality, meibomian expressibility
Arita et al	2018	P	Cornea DOI: 10.1097/ICO.0000000000001687	31	SPEED, TBUT, NIBUT, Interferometric pattern, Meibum grade, Lid margin abnormality score, CFS
Yue et al.	2018	P	*Curr Eye Res 43(3):308-13*	35	OSDI, TBUT, MGE, MG morphology (confocal)
Rong et al.	2017	P	*Zhonghua Yan Ke Za Zhi* 53:675-81	44	MGYSS, SPEED, TBUT, Staining, Meibography
Liu et al.	2017	P	*AJO* 183:81-90	44	IL-17A, IL-6, PGE2, MGYCS (clear secretions)
Dell et al.	2017	P	*Clin Ophthalmol* 11:1167-73	40	TBUT, SPEED, Osmolarity, Staining, MG score
Albietz & Schmid	2017	P	*Clin Exp Optom* DOI:10.111/cxo.12541	26	OSDI, Ocular comfort index, AFT use, TBUT, staining
Gupta et al.	2016	R	*Can J Ophthalmol* 51(4):249-53	100	Lid margins, MG flow, meibum quality, TBUT, OSDI, eyelids
Vegunta et al.	2016	R	*Cornea* 35:318-22	35	SPEED2, MGE (liquid secretions)
Jiang et al.	2016	P	*J Ophthal* DOI:10.1155/2016/1910694	40	TBUT, TMH, Staining, lid margin, MGA, meibography
Toyos & Briscoe	2016	P	*J Clin Exp Ophthalm* 7(6):1-2	16	Tear film osmolarity

Authors	Year	P/R	Publication	N	Key Findings
Craig et al.	2015	P	*IOVS* 56:1965-70	28	Lipid layer grade, NIBUT, Tear evap. rate, TMH, VAS, SPEED
Vora & Gupta	2015	R	*Curr Opin Ophthalm* 26(4):314-8	37	TBUT, lid margins, eyelids, MG oil flow, meib. quality, OSDI
Toyos et al.	2015	R	*Photomed & Laser Surg* 33(1):41-6	78	TBUT, Pt satisfaction, meibum quality, lid margin
Vegunta & Shen	2014	R	ARVO , published in *IOVS* 55:2018	43	SPEED2, MGE
Shen et al.	2015	R	ARVO PN 4441/PBN A0067	9	SPEED2, OSDI, MGE, Schirmer, Staining, TBUT, lipid tear film analysis, TMH, Meibography
Kim et al.	2015	R	ARVO PN 6193/PBN C0264	53	OSDI
Craig et al.	2015	P	ARVO PN 6193/PBN C0265	28	Lipid layer grade, NIBUT
Shen	2014	R	ARVO, published in *IOVS* 55:2017	5	SPEED2, OSDI, MGE, Schirmer, Staining, TBUT, lipid tear film analysis, TMH, Meibography
Gupta	2014	R	ASCRS	37	Lid margin edema & vascularity, facial telangiectasia, meibum quality, OSDI, TBUT, oil flow score
Toyos	2013	R	ARVO, published in IOVS 54:966	91	TBUT, Self-satistfaction, Physician-judged improvement

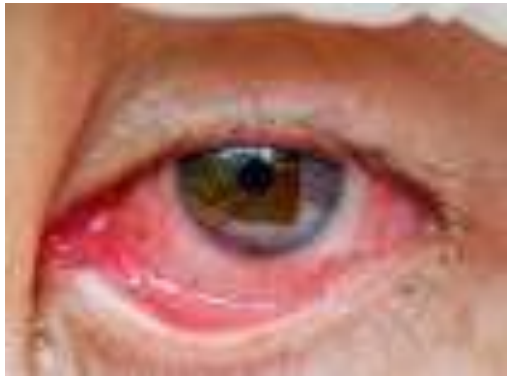
HISTORICALLY ROSACEA (A CHRONIC SKIN CONDITION) WAS CLASSIFIED INTO 4 SUBTYPES: NEW SYSTEM IS 2 DIAGNOSTIC PHENOTYPES

Erythematoustelangiectatic

Papulopustular

Phymatous

Ocular



Fixed centrofacial erythema

Phymatous changes

- Papules & Pustules
- Flushing
- Telangiectasia
- Ocular Manifestations

Gallo RL, Granstein RD, Kang S, et al. Standard classification and pathophysiology of rosacea: The 2017 update by the National Rosacea Society Expert Committee. *J Am Acad Dermatol* 2017 Oct 28. pii: S0190-9622(17)32297-1. doi: 10.1016/j.jaad.2017.08.037.

ERYTHEMATOUS-FLUSHING, TELANGIECTASIA

PAPULOPUSTULAR-PAPULES AND PUSTULES

Ocular

ROSACEA AND MGD

80 % of Rosacea patients suffer from MGD.

- Viso et al. *Eur Ophthalmic Rev* 2014;8(1):13-6

- Presence of One or More of the Following Primary Features
  - Flushing (transient erythema)
  - Nontransient erythema Papules and pustules
  - Telangiectasia
- May Include One or More of the Following Secondary Features
  - Burning or stinging
  - Red plaques
  - Dry appearance
  - Oedema
- Ocular manifestations
  Peripheral location
  Phymatous changes (most commonly rhinophyma)

20% of facial rosacea is preceded by ocular rosacea

ROSACEA ASSOCIATED MGD=WORSE PROGNOSIS

20% OF OCULAR ROSACEA PRECEDES FACIAL ROSACEA

Trigger Avoidance

- Spicy food, Alcohol, Sun, Caffeine
- Whole 30, Gluten Free, Dairy Free

Medications

- Alpha-Adrenergics Agonist (topical) Rhofade^{R}
- Beta Blockers (oral)
- Brimonidine (topical) Mirvaso^{R}
- Minocycline and low dose Doxycycline 50 mg
- Ivermectin
- Azelaic Acid
- Metronidazole
- Isoretinoin

IPL

PDL (Pulse Dye Laser)

Schaller M, et al. Rosacea treatment update: recommendations from the global ROSacea COnsensus (ROSCO) panel. BJD 2016 Nov 12. 465-471. https://doi.org/10.1111/bjd.15173

IPL TREATMENT

Face

Neck

Décolleté

Hands

Up to Fitzpatrick IV-very carefully!

PATIENT SELECTION

Get a fully-detailed medical history-No active lupus

Use of a medical questionnaire and informed consent form

Exclude any lesion with malignant potential

For any suspicion on cancerous lesion, excision biopsy may be considered

Patients with unrealistic expectations should be identified during the consultation and discouraged

DO NOT TREAT MELASMA PATIENTS!

SKIN ASSESSMENT

- Fitzpatrick Skin Type
- Amounts of Target Chromophore and Competing Chromophore
    - What's a Chromophore?
        - Water, Pigment, Oxyhemaglobin
- Any active sun or lamp exposure
- Ethnicity
- Thickness of skin
- Overall skin health
- Medical history
- Medication Review

THIS NEEDS TO BE DONE BEFORE EVERY TREATMENT!

Key questions: Any new meds? Any recent sun exposure? What is your heritage? Do you tan? How long do you hang on to a tan?

MELASMA

Sun protection

Melanocyte modulation:

www.epionce.com

www.skinmedicinals.com

Piętowska Z, Nowicka D, Szepietowski JC. Understanding Melasma-How Can Pharmacology and Cosmetology Procedures and Prevention Help to Achieve Optimal Treatment Results? A Narrative Review. Int J Environ Res Public Health. 2022 Sep 24;19(19):12084. doi: 10.3390/ijerph191912084. PMID: 36231404; PMCID: PMC9564742.

POLYCYSTIC OVARY

Unwanted facial hair

Address with hair removal settings in step 4 of Periman IPL Protocol

MALIGNANCY

SHIELDS

Anthonyproducts.com

Skip the peg!!

Innovativeoptics.com

SKIN ASSESSMENT

Fitzpatrick Skin Type

Amounts of Target Chromophore and Competing Chromophore

- What's a Chromophore?
  - Water, Pigment, Oxyhemaglobin

Any active sun or lamp exposure

Ethnicity

Thickness of skin

Overall skin health

Medical history

Medication Review

THIS NEEDS TO BE DONE BEFORE EVERY TREATMENT

CONTRAINDICATIONS

Treatment should not be attempted on patients with the following conditions in the treatment area:

- Active infections
- Dysplastic nevi
- Significant concurrent skin conditions or any inflammatory skin conditions
- Active cold sores, open lacerations or abrasions
- Chronic or cutaneous viral, fungal, or bacterial diseases
- Exposure to sun, remaining suntan or artificial tanning in the 3-4 weeks pre-op plan
- Tattoos

Treatment should not be attempted on patients with a history of skin cancer or pre-cancerous lesions on the treatment area

PRE-TREATMENT PATIENT EDUCATION

The following should be discussed with patients prior to performing IPL treatment:

Results are not guaranteed.

Not all red and brown areas will disappear.

Red and brown spots removed by treatment may recur, especially with excessive sun exposure.

Deep wrinkle lines will not be removed by the treatment.

Adverse effects include redness, swelling, burning, pain, crust formation, bruising, hyper- and hypopigmentation (including striping), and scar formation.

Multiple treatment sessions (typically three to five) are required for optimal results.

Maintenance treatments are often recommended four to six months after the initial series.

In addition, patients should be quoted a price for the treatment course.

PRE-TREATMENT INSTRUCTIONS

Do not take isotretinoin (Accutane®) for 6 months before your treatment.

If you are tanned, please reschedule your appointment.

Do not apply make-up or lotions on your day of treatment, or be prepared to remove them at our office.

If you have a history of cold sores, take your prescribed medication (e.g., Valtrex, Famvir, Zovirax) on the day before, day of, and day after treatment.

Inform the doctor before each appointment if you (1) are taking new medications or (2) have tattoos or beauty marks you do not want treated.

Inform the doctor immediately if the area being treated feels “too hot.”

Please arrive on time.

PROCEDURE CHECKLIST

Patient education form read and understood

Pretreatment instructions reviewed and understood

Informed consent signed

Skin type identified

Pretreatment test site confirmed with no adverse reaction

Confirm that patient has taken prophylactic antiviral medication (if + history of HSV) and has no contraindications for treatment

Pretreatment photograph taken

Set up procedure tray including eye shields and masks

Select treatment parameters

Perform intense pulsed light treatment

Provide verbal and written post-treatment instructions to patient

Complete procedure note including device settings

Subsequent treatment scheduled

PULSE DURATIONS

Pulse durations are selected to slowly heat vessels to coagulation while avoiding purpura. This allows patients to return to normal activities quickly rather than suffering from purpura for one or two weeks. (PDL-Pulse Dye Laser is notorious for this)

ENERGY LEVELS

Energy levels (fluence in J/cm2) are governed by clinical response. If tissue reactions do not occur, fluence levels may be increased by 1 J/cm2 (Lumenis One) or 2 J/cm2 (VascuLight SR or Quantum IPL [Lumenis, Inc.]). A good rule of thumb is to use mild to moderate erythema as the treatment end point. (If target is piament-1-2 shades darker)

Vessels should blur or disappear-no purple

TREATMENT AGGRESSIVENESS

Less Aggressive

- Higher cut-off filter
- Lower fluence
- Higher pulses
- Longer delay
- Eg. 590 nm, Triple pulse, 6 m/s delay, 4 ms

More Aggressive

- Lower cut-off filter (meaning treat longer wavelengths and more superficial treatment)
- Higher fluence
- Shorter Delay

- Fewer Pulses
- Eg. 515 nm, single pulse, 4 ms







TREATMENT SETTINGS
TREATING DEEP & LARGE TO SMALLER & MORE SUPERFICIAL

- First Pass I did: medium to deep depth 590 nm, triple pulse, 3ms-30 ms 20 J/cm ^{2}
- 2nd pass Shallow depth 560 nm, triple pulse, 3.0ms 25ms 18 J/cm^2
- Toyos settings over V2 with double pass
  590 filter, triple pulse 6.0 msec pulse, 50msce rest, 12 J/cm^2
- Eyelids-Periman Protocol **LASER Grade Corneal Shields!**
  Small rectangle light guide 3 pulses per lid with double pass,
  Stay 2 mm away from the lash line (Total 24 pulses)
  590 filter, triple pulse 5.0 msec pulse, 50msec rest,10-14 J/cm^2

AFTER 3 TREATMENTS

- First Pass is medium to deep depth (590 nm)
- Triple pulse 3.5 ms PD, 25ms D, 21J/cm^2
- Second pass was 560 nm, triple pulse, 3.5ms, 20 ms and 19 J/cm^2
- Toyos settings over V2 with double pass
  - 590 filter, triple pulse 6.0 msec pulse, 50ms rest, 12 J/cm^2

Lentinges-Spot Treat with
6mm circle

- Pigment Lesion Menu
- Type II
- Lentigines
- Light
- Epidermal
- 515 nm filter, Single Pulse, 4.0 msec pulse, 19.0 J/cm^2
- Clinical endpoint the pigment will **Immediately** turn darker-Salmon colored

Telangiectasia's-Spot treat with 6 mm circle

- Vascular Lesion Menu
- Skin Type II
- Circle
- Facial Telang
- Shallow or Medium
- Vacular Filter, Double Pulse, 3.5 ms 15 ms 28 J/cm^2
- Clinical endpoint-Vessel vaporizes-very satifsfying☺


Skintel
Connected
30
6 - 10
Tracker
Icon MaxG
ms
5
J/cm²
6
Hz
0.40
0
°C
5

CUT-OFF FILTERS

Cut-off filters are selected to optimize targeting of the chromophore while filtering out wavelengths damaging to the epidermis. These vary by skin type and target chromophore.

- 695 nm
- 640 nm
- 615 nm
- 590 nm
- 560 nm
- 515 nm

TREATMENT AGGRESSIVENESS

Less Aggressive

- Higher cut-off filter
- Lower fluence
- Higher pulses
- Longer delay
- Eg. 590 nm, Triple pulse, 6 m/s delay, 4 ms

More Aggressive

- Lower cut-off filter (meaning treat longer wavelengths and more superficial treatment)
- Higher fluence
- Shorter Delay

- Fewer Pulses
- Eg. 515 nm, single pulse, 4 ms

PEARLS

A good rule of thumb is to use mild to moderate erythema as a treatment endpoint. Darkening of target pigment also represents a treatment endpoint.

Always double-check that the settings you want to use are the settings you are using.

As a rule, darker skin types require cautious treatment with lower energies, longer pulse durations, longer delay times, and higher-wavelength filters (e.g. 590, 615, and 640 nm). Deeper in the skin.

Utilize a white make-up pencil to cover pigment that people want to keep☺

TEST 3 AND THEN MOVE ON

POST PROCEDURE

Remove gel with tongue depressor

Keeps treatment area clean by gently cleansing

Keeps on moisturizing with an emollient

Avoids direct sunlight

Renews application of sun block SPF 30-50 until next session

Avoids use of deodorants or fragrance as long as skin is sensitive or fragile

Avoids scrubbing the skin

PITFALLS

Do not press hard on the skin when treating blood vessels. If you press hard, you will squeeze the target from the vessels.

Always cover the eyebrows and other hair-bearing areas to avoid unintended hair loss. Stay 1 finger width away from hair and tattoos

Remove all makeup and lipstick before starting treatment. Dark makeup and lipstick absorb significant amounts of light, which can lead to a burn.

Do not hurry when treating vessels or pigment. Aggressive treatments can lead to burns. Remember, “You can always add more but cannot take away.”

COMPLICATIONS

Erythema (redness) and edema (swelling) of the treated area can occur

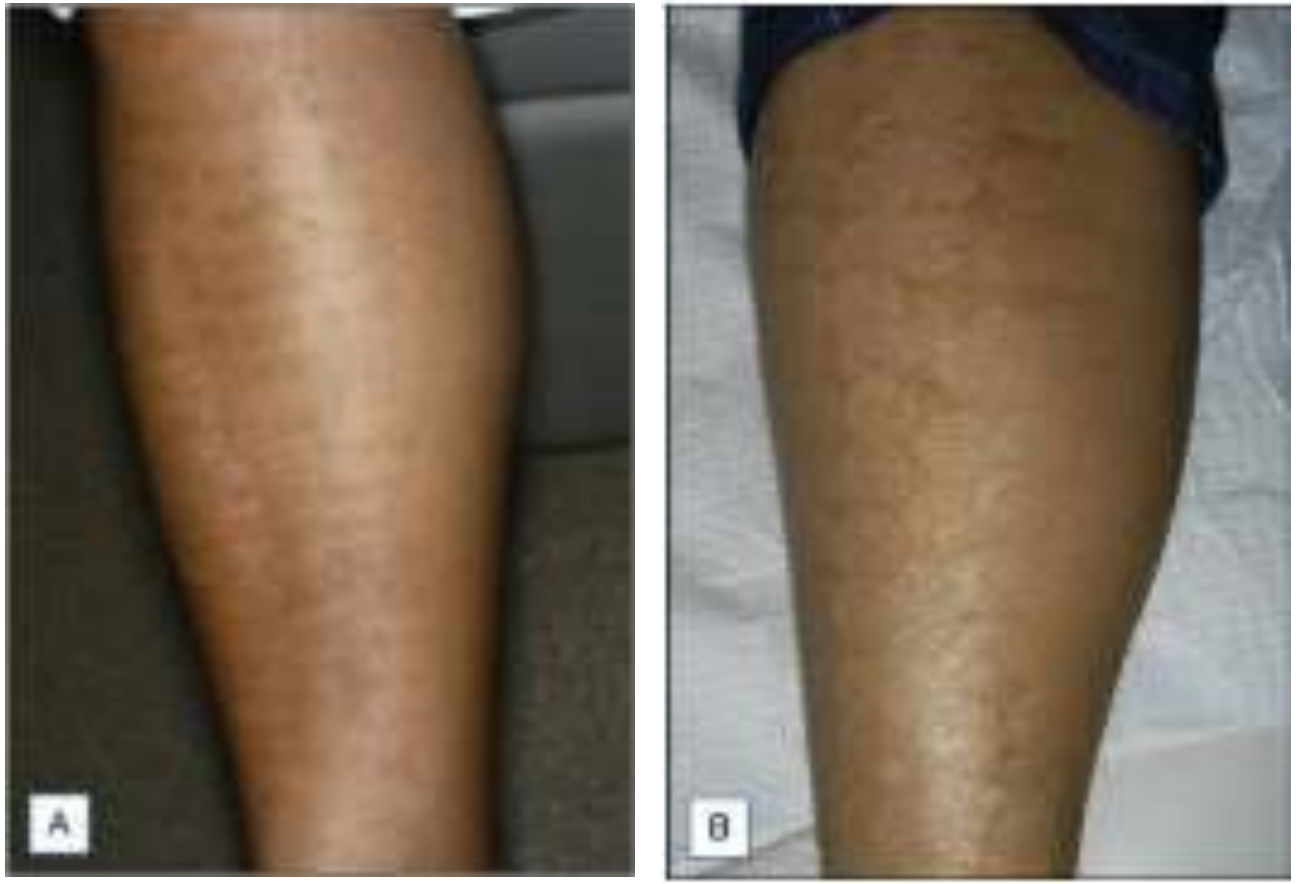
Irritation, itching,and/or a mild burning sensation or pain similar to sunburn may occur within 48 hours of treatment.

Pigmentary changes such as hyper pigmentation and hypo pigmentation of the skin in the treated areas can occasionally occur.

Other known complications of this procedure include blisters, redness, pinpoint pitted scars, bruising, superficial crusting, burns, pain, and infections. These side effects are usually temporary, lasting from five to ten days but can be permanent as well.

PSEUDO-HYPOPIGMENTATION

HYPERPIGMENTATION/HYPOPIGMENTATION



FAQ'S

Can I treat if patient is on doxy?

- If low dose doxy yes, photosensitivity occurs with UV light, IPL has no UV light

Can I use topical numbing agents?

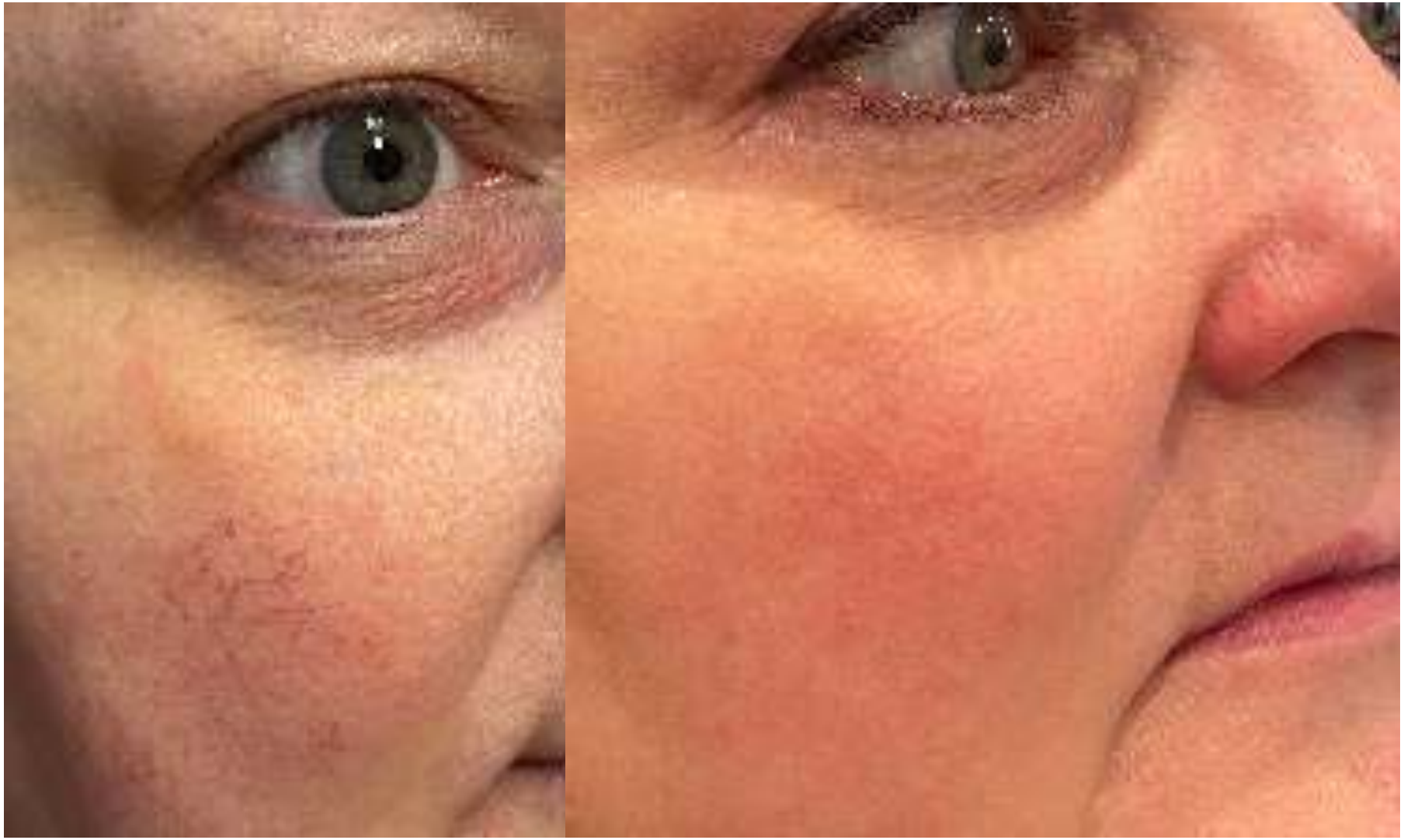
- **No!** Due to the vasoconstrictive properties this will diminish your target rendering your treatment less effective. You also need the patient to give you proper feedback

Do I need to treat lids and do expression?

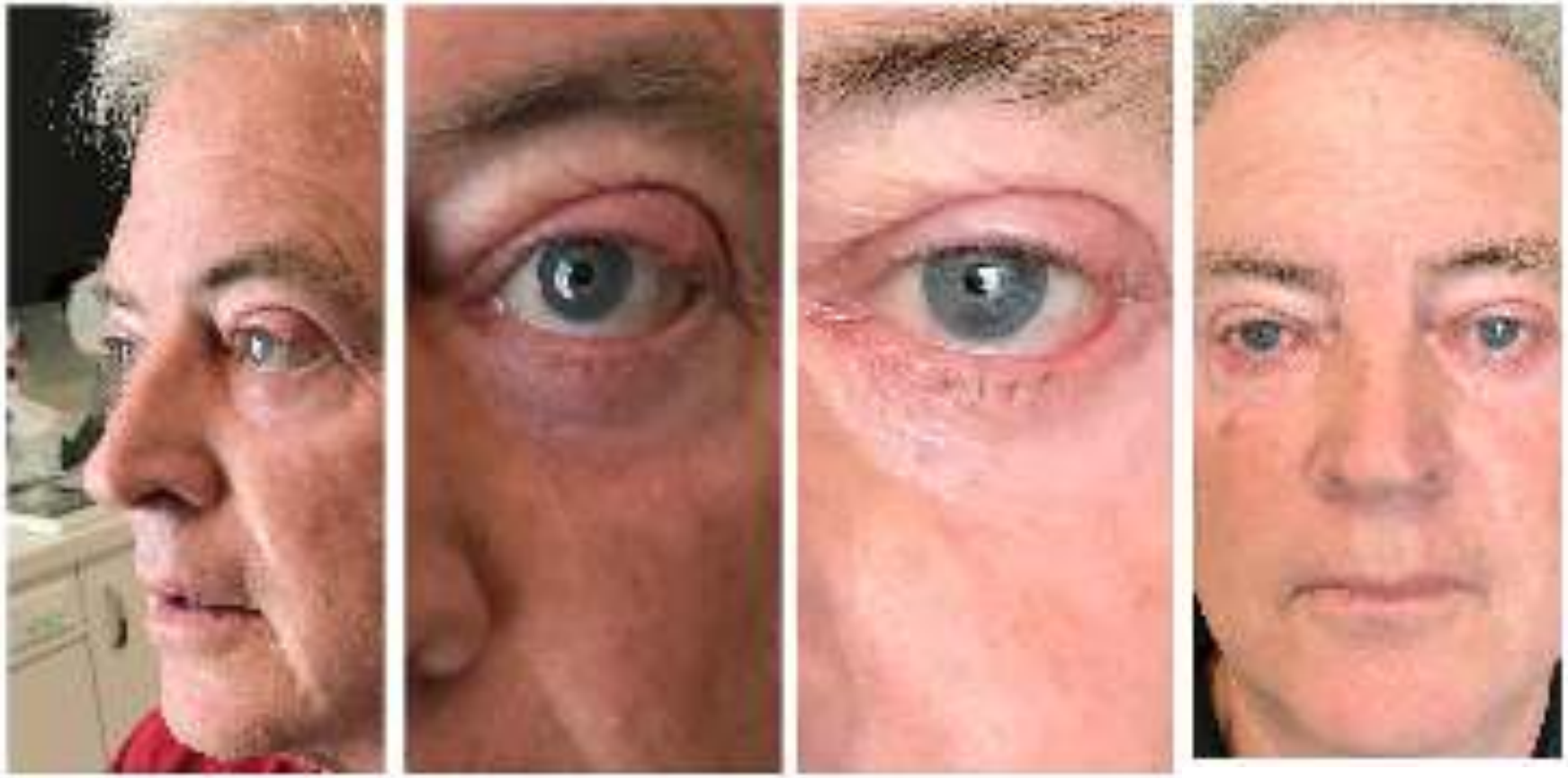
- Periman Protocol=Yes/No. Richard Adler Protocol=Yes/No. Toyos=No/Yes
- McGee=Depends on the patient/No-All patients improve!!

Do I do with this before or after Thermal Pulsation (LipiFlow, Tear Care, iLux, etc)

- Prior to, most patients won't need thermal pulsation in my experience, some still will but wait until 3-4 treatment of IPL before performing, Dr. Ed Jaccoma is doing some very interesting work with RF in conjunction with IPL-stay tuned!
- No harm in doing more treatments



CHALAZIA TREATMENT-INCISION FREE, INJECTION FREE, SCAR FREE MANAGEMENT-



1 TX WITH IPL-NEXT DAY

HOW DOES IPL ACTUALLY WORK? WHAT IS IT DOING TO THE TISSUES? THINK BEISTO

Photocoagulation

Photoimmunomodulation

Photomodulation

Photothermolysis

Photosanitization

EPIONCE KITS

PATIENT ASSESSMENT

SKIN ASSESSMENT

PHOTOGRAPHY

Take at least 3 pictures before at rest and in motion

- Straight on
- Right side
- Left side

Utilize the same background

Blue or Black backdrop

Photography Consent

RADIOFREQUENCY

Can be done with and without micro needling

Key Aesthetic Trends

Key Trends:

- 74% patients are most bothered by lines and wrinkles around their eyes*
- Radiofrequency treatments among top 5 treatments consumers are considering*

These issues are on the rise:

- Younger age due to increase in US screen time (6-10 hours a day)
- Zoom Boom Aesthetic trend (wrinkles around the eyes)
- Millennial age group interested in preventative treatments

*ASDS 2019 Consumer Survey

Market Demand for Radiofrequency

70% OF CONSUMERS CONSIDER UNDERGOING NON-INVASIVE TREATMENTS[3]

RADIOFREQUENCY TREATMENTS ARE THE **TOP 5 PROCEDURES CONSUMERS ARE CONSIDERING**[3]

74% OF PATIENTS ARE MOST BOTHERED BY LINES AND WRINKLES AROUND THE UNDER EYES[3]

[3]*American Society for Dermatology*

What is Radiofrequency?

- **Radiofrequency** (RF) is part of the **electromagnetic spectrum** characterized by a **specific frequency** measurable in Hertz (Hz).

- RF energy produces a **change in the electrical charges** of the treated skin creating an **electron movement.** The **resistance** (impedance) of the tissue to that electron movement **generates heat.**

- The amount of heat generated depends on these factors:
  - **Impedance** of the treated skin
  - **Intensity** of the current applied
  - Length of time of **exposure** to the RF energy

NON SURGICAL TREATMENT OF OCULAR ADNEXA

Prolongs Blepharoptosis Surgery

Treats Periorbital Fine Lines

Lateral Hooding

Dermatochalasis

Ectropion: tendon check technique, LLPP

MGD-off label

RADIO-FREQUENCY REJUVENATION

Periocular Indications

- Skin tightening with modest reduction in fine lines & wrinkles

How it works

- Elevation of dermal layer temperature (of at least 42°C) leads to a transient denaturation of structural collagen fibrils → followed by contraction / tightening of the skin 42°C → Dermal fibroblasts to elicit a heat shock response → net increase in collagen production in upon cooling 2-3 treatments 4 weeks apart are generally needed to see a clinically measurable response.

Narins, D.J. and Narins, R.S. (2003) Non-surgical radiofrequency facelift. J. Drugs Dermatol. 2:495–500.

HOW RF REMODELS COLLAGEN AND IMPROVES ELASTIN

The Wound Healing Response

- Heat is applied to the epidermis creating an Inflammatory Phase (1-3 days)
  - a. Early contraction of blood vessels (5-10 minutes)
  - b. Vasodilation in order to increase blood supply (multiple hours to 1-3 days)
  - c. Cells (macrophages, neutrophils,etc) infiltrate the damaged area to remove dead/damaged tissue and destroy bacteria

Proliferative Phase – 3 weeks

- Ongoing Process to repair tissue
  - Day 2-3 – Fibroblast activity is induced in damaged tissue. Fibroblasts multiply, sending mediators to stimulate repair, combining with damaged tissue
  - Day 5-7 – Fibroblasts begin synthesis of collagen (Day 7-21)
  - Day 7-21 – Old collagen is removed by collagenase

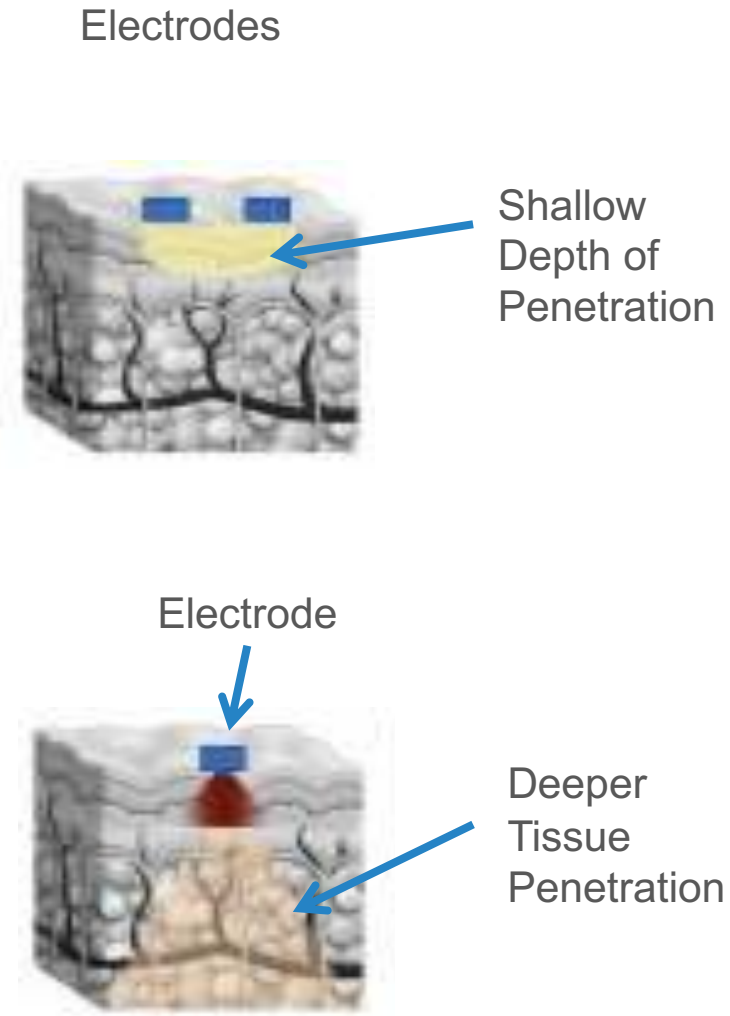
Maturation Phase – 3 weeks to 6 months and beyond

- New collagen is generated
- Elastin becomes more uniform and its quality is improved

Types of RF

- **Bipolar RF**
  - Current passes between 2 electrodes
  - Limits current to area between electrodes
  - Depth of penetration equals half the distance between electrodes
  - Shallow tissue heating

- **Monopolar RF**
  - Current between active treatment electrode and passive grounding electrode (Neutral Pad)
  - Lower energies - no pain, minimal adverse events
  - High penetration of the emitted current



TREATMENTS

- 3 – 5 treatments
- 2 – 4 weeks apart
- Patients may notice improvement after 2nd or 3rd treatment
- Skin will continue to improve over the next 6 -12 months post treatment
- Results will vary from patient to patient
- It is advised to photo document each treatment session

RECOMMENDED HANDPIECE ENERGY RANGE

Handpiece Size	Treatment Type	Recommended Energy Range*
Small 10mm	Envi Facial & eyeEnvi treatments	15-30

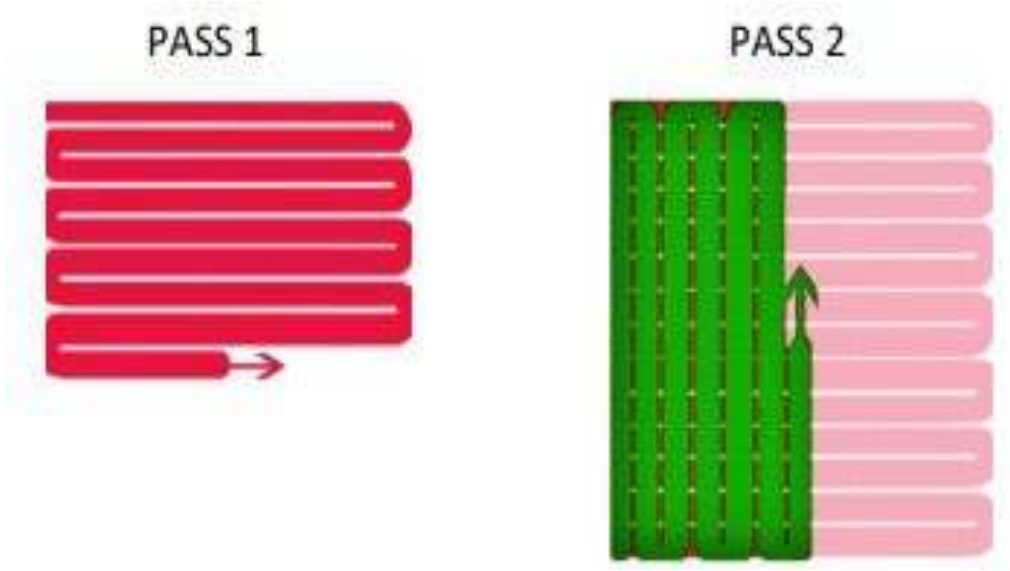
- Once treatment area has reached target temperature (up to 44°C), use of higher settings does not correlate to better treatment outcome and may result in undesired heating of the neutral pad.

FACIAL TREATMENT TECHNIQUE & TIPS

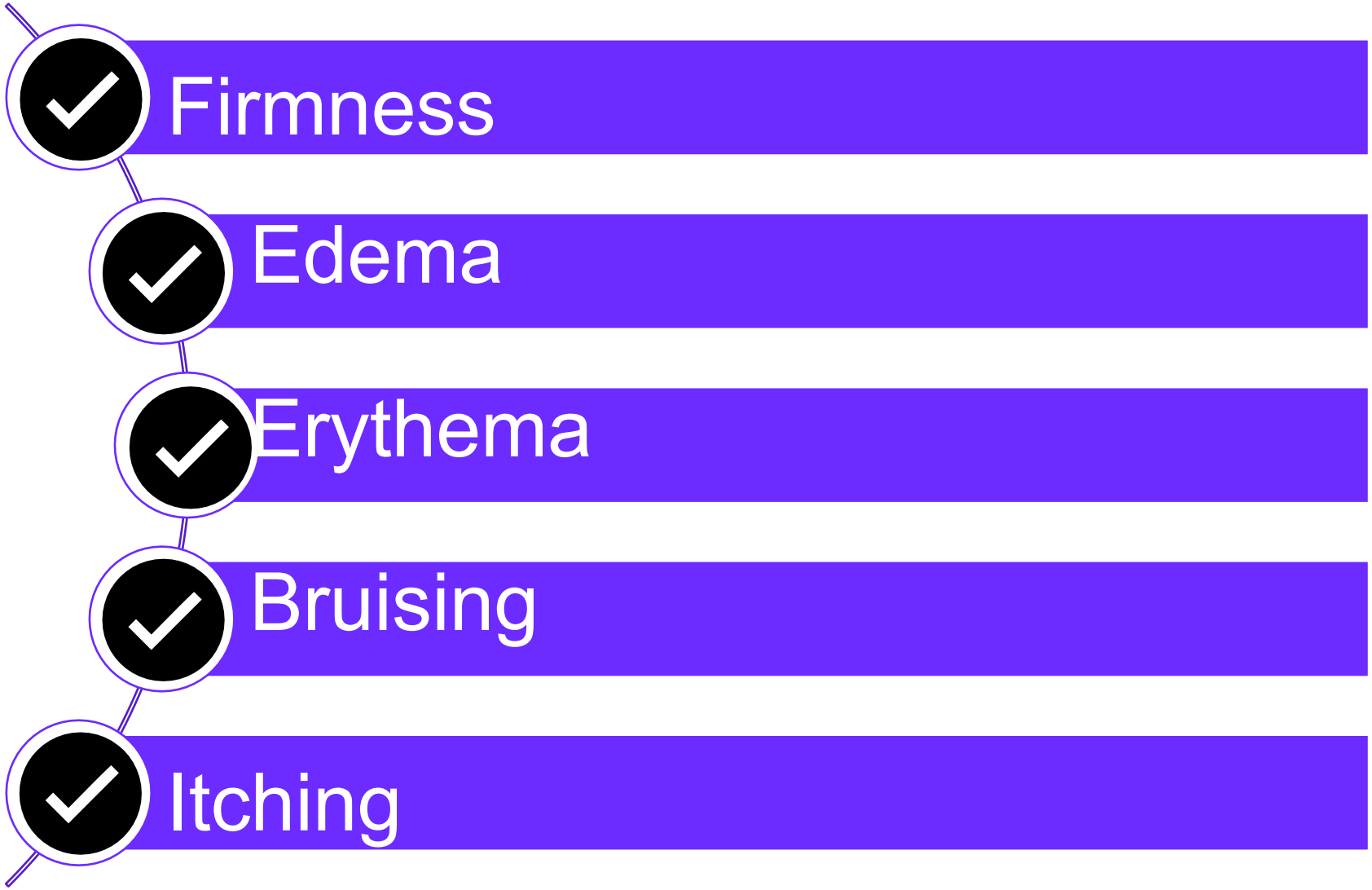
- When using the Small 10mm handpiece, treat in a tight circular motion to cover all the tissue within the zone.
- Warm the zone to 39˚C. Once 39˚C is reached, incrementally increase the temperature to 40°, 41° and 42°C, based upon the patient's tolerance. Treat vertically and horizontally using even, consecutive small circular motions. If the client feels too hot, speed up the motion, or stop and turn the energy level down by 1-2 levels.
- If treating smaller areas such as the upper lip, the 10mm handpiece or Small 10mm handpiece may be appropriate. Also, if the temperature of the tissue is not rising, consider using the Small 10mm handpiece at an energy range of approximately 25-30 to bring the tissue to 39°C and then switch to the 20mm handpiece and continue the treatment.
- The handpiece must be continuously moving to activate the energy. If the small 10mm handpiece is held stationary on the tissue the handpiece will not activate until movement is initiated by the user.

10MM SMALL TISSUE HEATING TREATMENT TECHNIQUE

- For tissue heating treatments, apply pressure when using the Small 10mm. Treatment areas may be as large as approximately 2.5" x 2.5" (6cm x 6cm) when using the Small 10mm for the purpose of tissue heating.
- Use a crosshatch pattern and apply pressure to the tissue while moving any sized handpiece, using wide, linear, non-overlapping strokes in a tight “U” shaped pattern. See Pass 1 and Pass 2 at right.
- Initiate energy setting at 20 and increase if needed
- Warm and treat the tissue
- Set the target temperature to 39°C and when reached, increase the temperature to 40°C, then incrementally increasing up to 42°C
- If the patient reports discomfort, speed up the motion or decrease the energy by 1 or 2 levels
- Non-overlapping “U” shaped strokes that follow a crosshatch pattern should be used for treatment



ANTICIPATED CLINICAL ENDPOINT



STANDARD NEUTRAL PADS

Standard Neutral Pad P/N IEC-NPD

For use with the following THPs only:

- **Small 10mm**
- **10mm**
- **15mm**
- **18mm**
- **20mm**

***Not compatible with the 25, 30, or 60mm THP's or FlexSure Applicators**

- The closer the Neutral Pad is to the treatment site, the less power required from the unit
- Consistency in location of the neutral pad will help maintain more consistent energy delivery
- The Single-Use neutral pad requires direct skin contact
- Make sure there are no wrinkles and that all skin is good contact with the adhesive backing

ANTICIPATED CLINICAL ENDPOINT

Dr. Selina McGee

Post eyeEnvi

Post eyeEnvi

RF

Selina R. McGee, OD, FAAO

Post EyeEnvi

Post EyeEnvi

CLINICAL ENDPOINT

Before TempSure Envi

3 months after 4th treatment (Courtesy of B. DiBernardo, MD)

EYE BEAUTY COMBINATION B&A

Dr. Raminder Saluja

Before

After 2 TempSure eyeEnvi / 1 Icon Max G

EYE BEAUTY COMBINATION B&A

Dr. Raminder Saluja

Before

After 4 TempSure eyeEnvi / 2 Icon Max G

EYE BEAUTY COMBINATION B&A

Westford Clinic

Before

After 4 TempSure eyeEnvi / 2 Icon Max G

ELECTRODE SIZE

Assortment of sizes, shapes and lengths

Depends on tissue to be incised

Size proportional to power required

Smaller electrode
- Higher current concentration
- Lower Power
- Decreased lateral heat

Larger electrode, loop or triangular
- More power
- More scar tissue
- More lateral heat

VERRUCA

LASER RESURFACING

WHAT ABOUT THESE DARK CIRCLES-CAN YOU HELP?

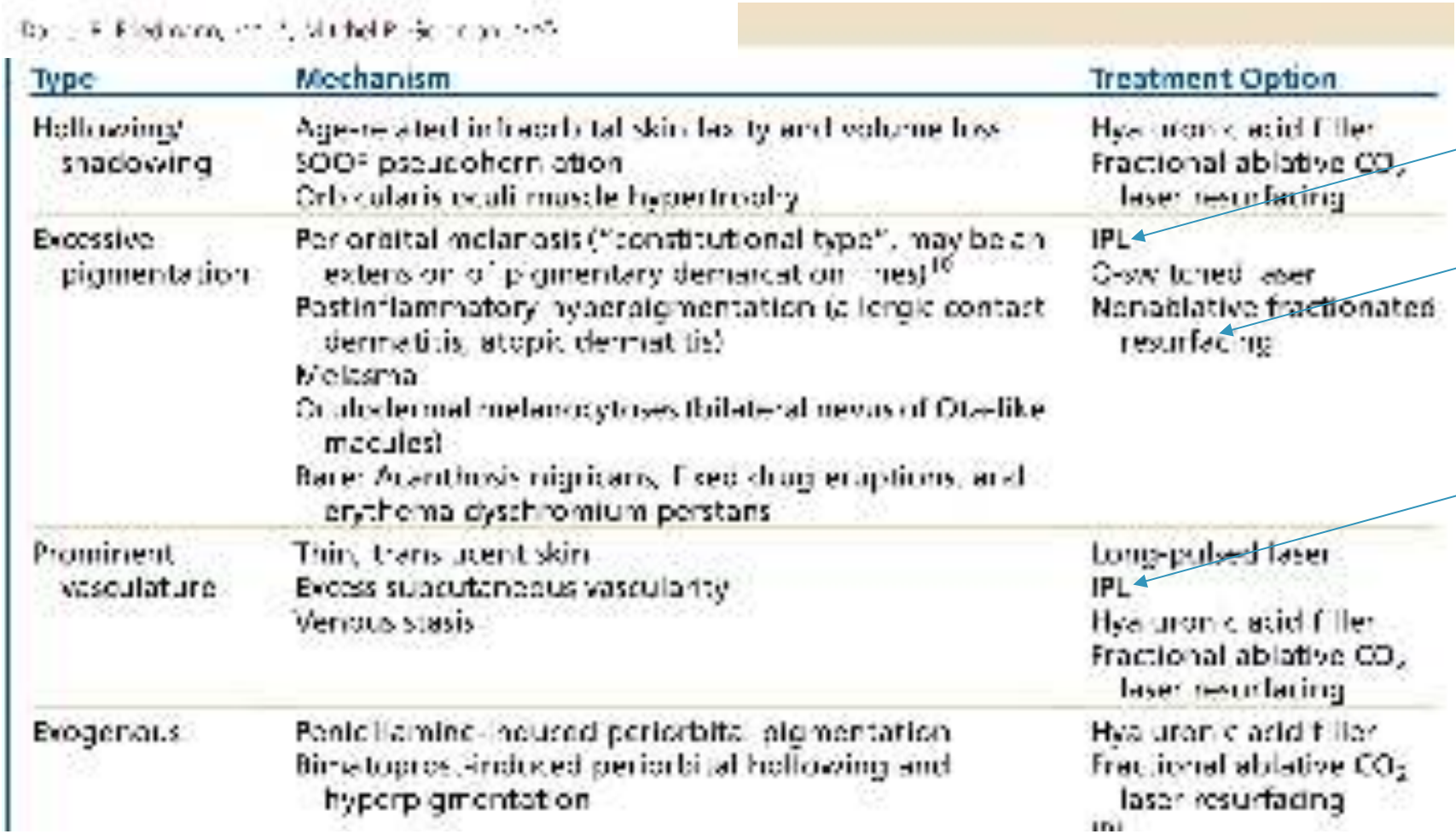

Pre-Treatment
Post IPL #1
Post 1540 #1
Post IPL #2
Post 1540 #2
Post Tx's-3 months

Pre-Treatment

Post Treatments-3 months

WHAT ABOUT THESE CIRCLES?

Dark Circles
Etiology and Management Options



Type	Mechanism	Treatment Option
Hollowing/ shadowing	Age-related inferior orbital skin laxity and volume loss SOOF pseudoherniation Orbicularis oculi muscle hypertrophy	Hyaluronic acid filler Fractional ablative CO_2 laser resurfacing
Excessive pigmentation	Periorbital melanosis ("constitutional type", may be an extension of pigmentary demarcation lines)[16] Postinflammatory hyperpigmentation (allergic contact dermatitis, atopic dermatitis) Melasma Dermal melanocytoses (bilateral nevus of Ota–like macules) Rare: Acanthosis nigricans, fixed drug eruptions, and erythema dyschromicum perstans	IPL Q-switched laser Nonablative fractionated resurfacing
Prominent vasculature	Thin, translucent skin Excess subcutaneous vascularity Venous stasis	Long-pulsed laser IPL Hyaluronic acid filler Fractional ablative CO_2 laser resurfacing
Exogenous	Panic/amine-induced periorbital pigmentation Bimatoprost-induced periorbital hollowing and hyperpigmentation	Hyaluronic acid filler Fractional ablative CO_2 laser resurfacing

PATHOGENESIS, EVALUATION AND TREATMENT

IVAN VRCEK, OMAR OZGUR,[1] AND TANUJ NAKRA

ENERGY BLENDS TO TREAT CHROMOPHORES

IPL safely and effectively targets oxyhemoglobin while leaving skin intact

MOST POPULAR COSMETIC SKIN PROCEDURES PERFORMED

Photofacial

- #1 Cosmetic procedure performed in the United States
- 80 million Americans have some kind of venous disorder (80% of those are cosmetic)
  - Rosacea represents 16 million alone
- Hyperpigmentation is the 2nd largest skin disorder in the US (Acne #1)

- Chang AL, Bitter PH Jr, Qu K, Lin M, Rapicavoli NA, Chang HY. Rejuvenation of gene expression pattern of aged human skin by broadband light treatment: a pilot study [published correction appears in J Invest Dermatol. 2013 Jun;133(6):1691]. *J Invest Dermatol*. 2013;133(2):394–402. doi:10.1038/jid.2012.287

American Academy of Dermatology

IPL AND "THE LITERATURE"

- Lei Y, Peng J, Liu J, Zhong J. Intense pulsed light (IPL) therapy for meibomian gland dysfunction (MGD)-related dry eye disease (DED): a systematic review and meta-analysis. Lasers Med Sci. 2022 Dec 19;38(1):1. doi: 10.1007/s10103-022-03690-1. PMID: 36534219.

ORIGINAL ARTICLE

Intense pulsed light (IPL) therapy for meibomian gland dysfunction (MGD)–related dry eye disease (DED): a systematic review and meta-analysis

Yahui Lei[1] · Jing Peng[2] · Jiayan Liu[1] · Jingxiang Zhong[1,3]

Received: 29 August 2022 / Accepted: 3 December 2022

HOW DOES IPL ACTUALLY WORK? WHAT IS IT DOING TO THE TISSUES? THINK BEISTO

- Photocoagulation
- Photoimmunomodulation
- Photomodulation
- Photothermolysis
- Photosanitization

SKIN ASSESSMENT

Fitzpatrick Skin Type

Amounts of Target Chromophore and Competing Chromophore

- What's a Chromophore?
  - Water, Pigment, Oxyhemaglobin

Any active sun or lamp exposure

Ethnicity

Thickness of skin

Overall skin health

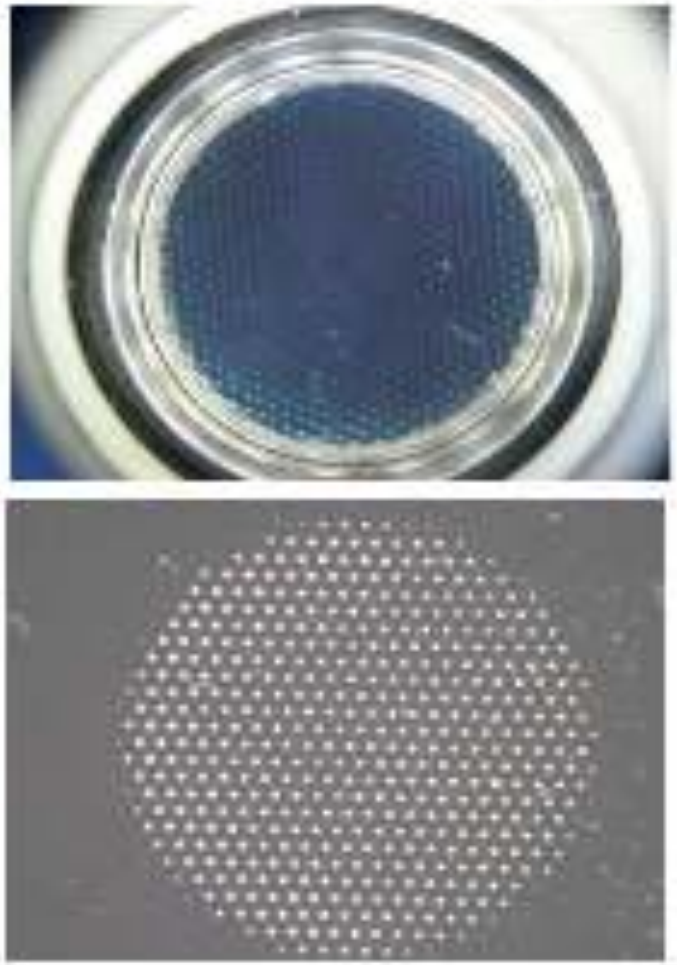
Medical history

Medication Review

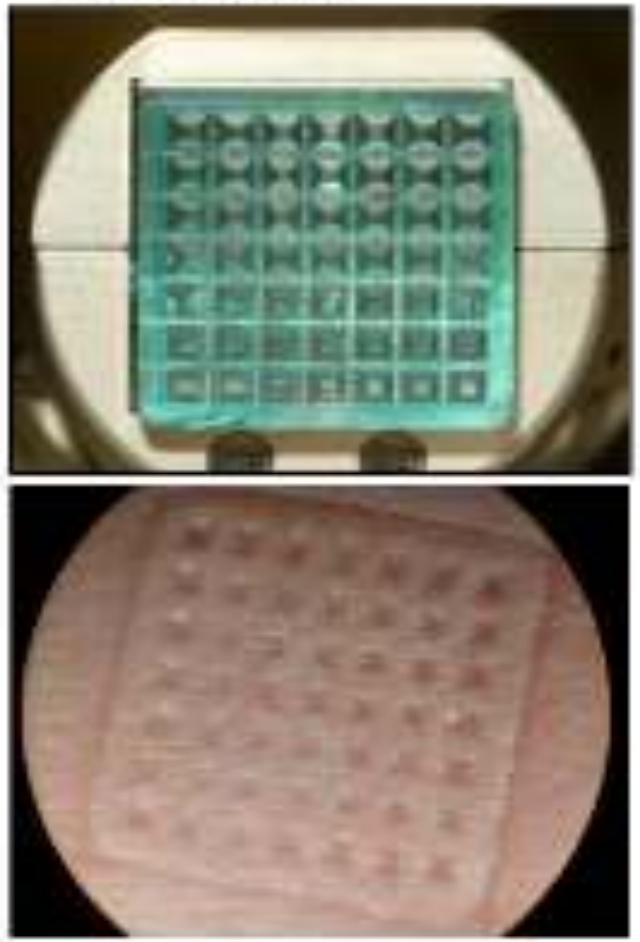
THIS NEEDS TO BE DONE BEFORE EVERY TREATMENT

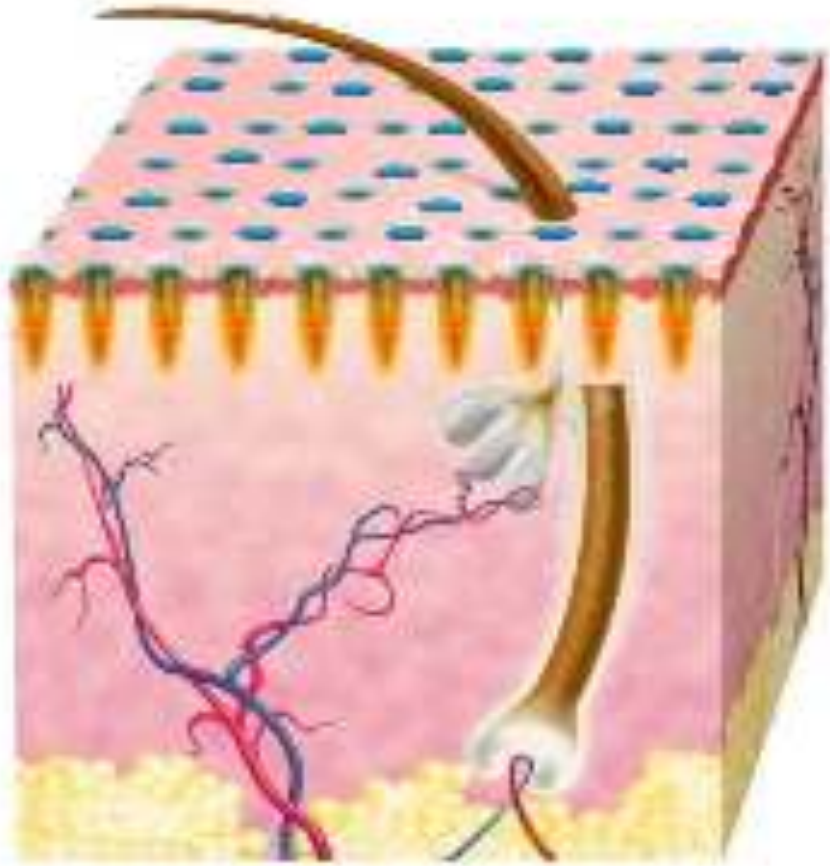
FITZPATRICK SCALE

15mm. 320 mB/cm² &
XΓ Microlens 115mB/cm²

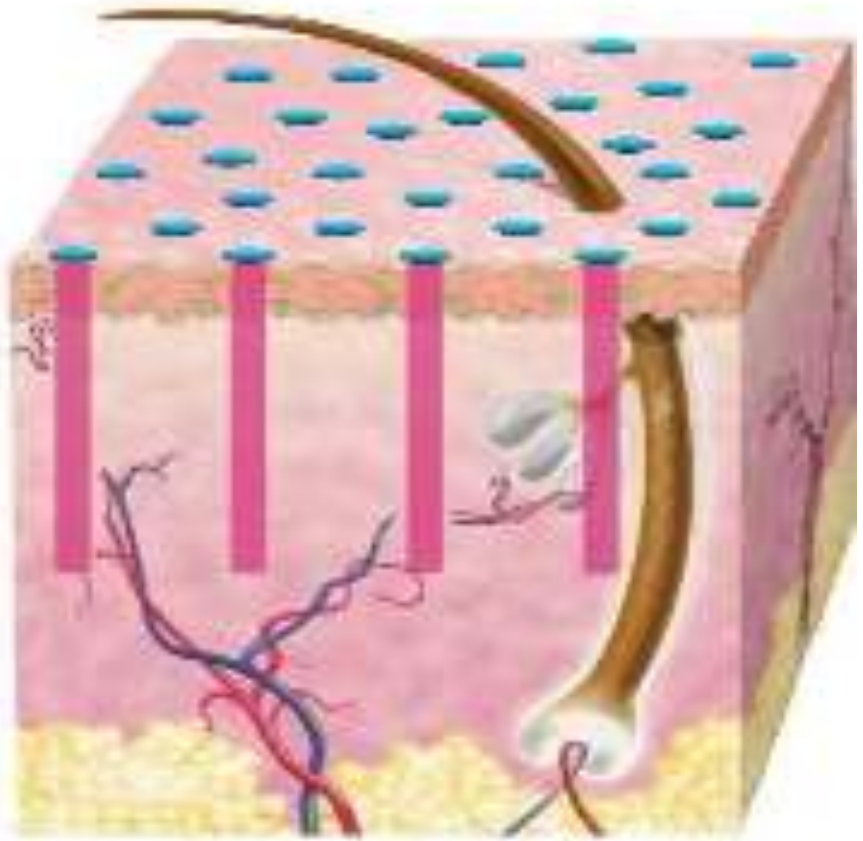


12mm x 12mm XD
25mB/cm²

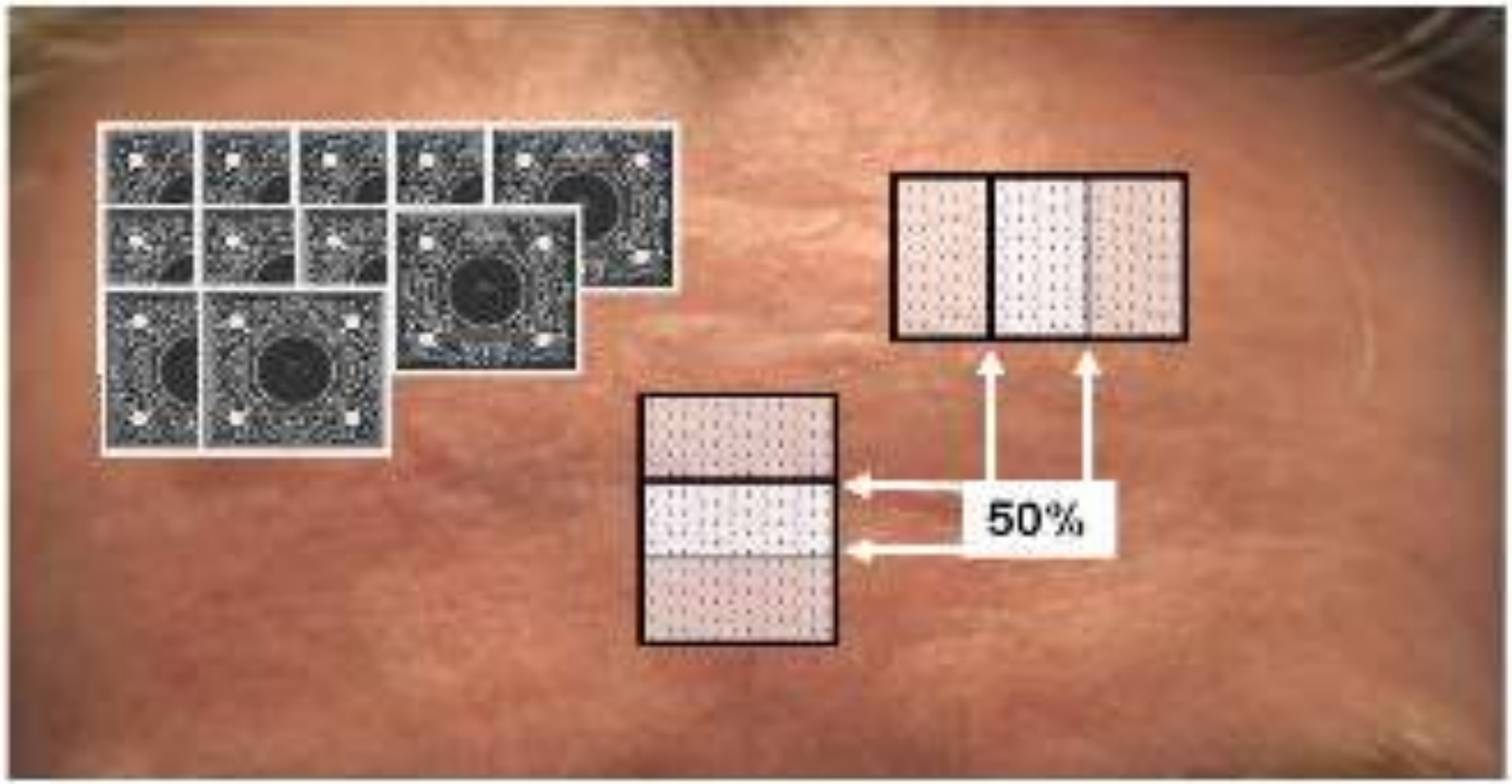




XF / 115mB/cm²

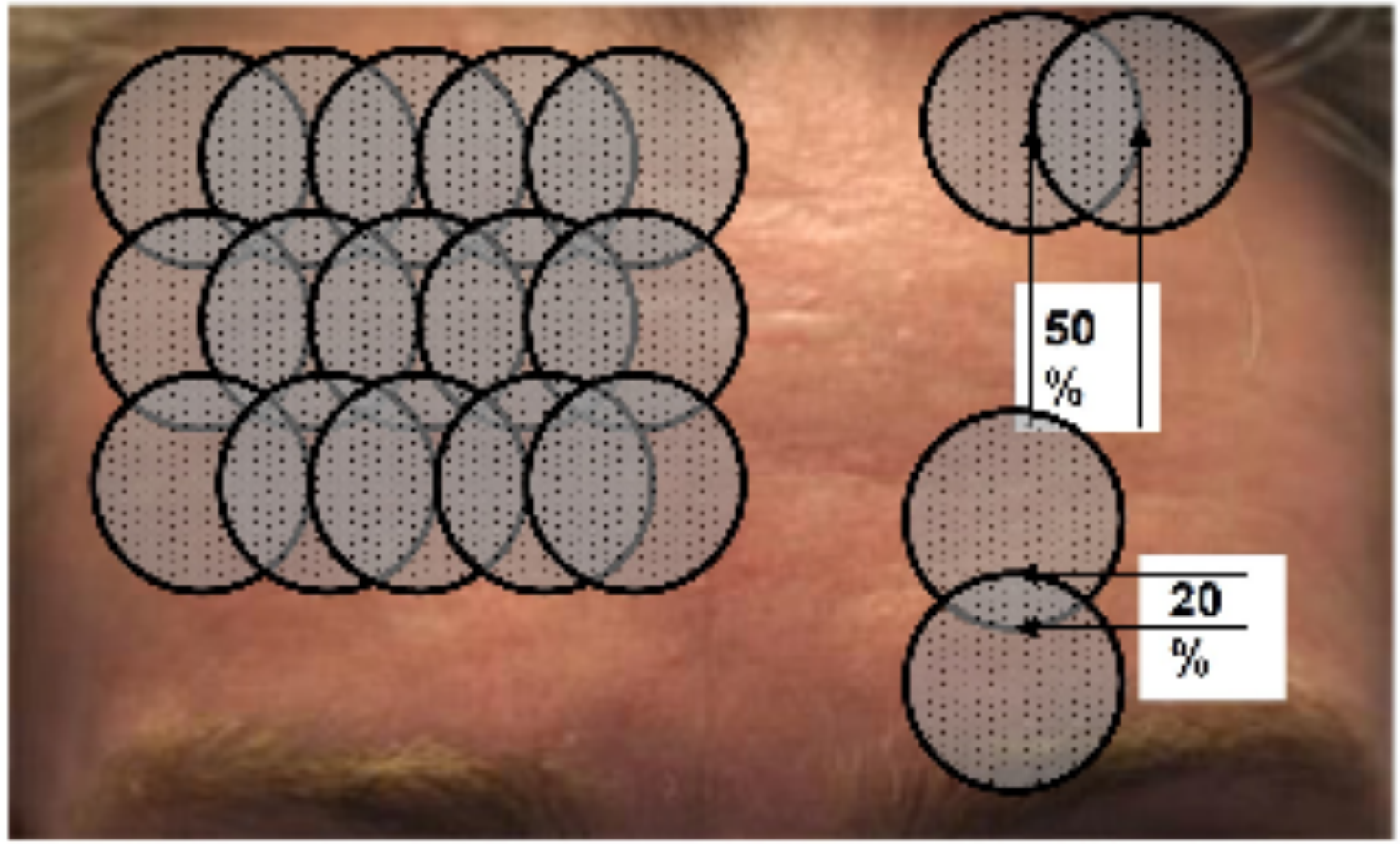


XD / 25mB/cm²



Overlap in both directions

- *50% / 50% overlap for XD*


50
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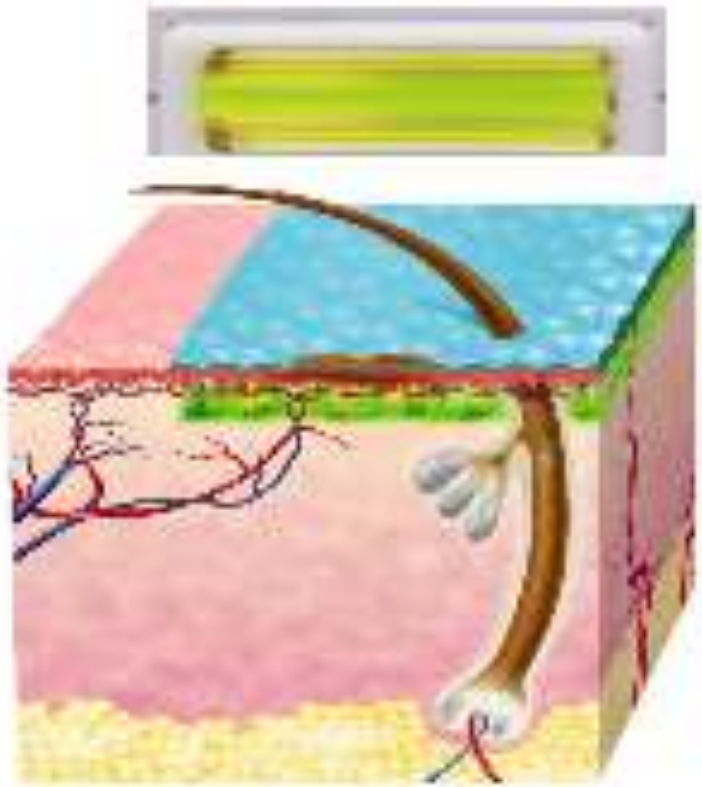
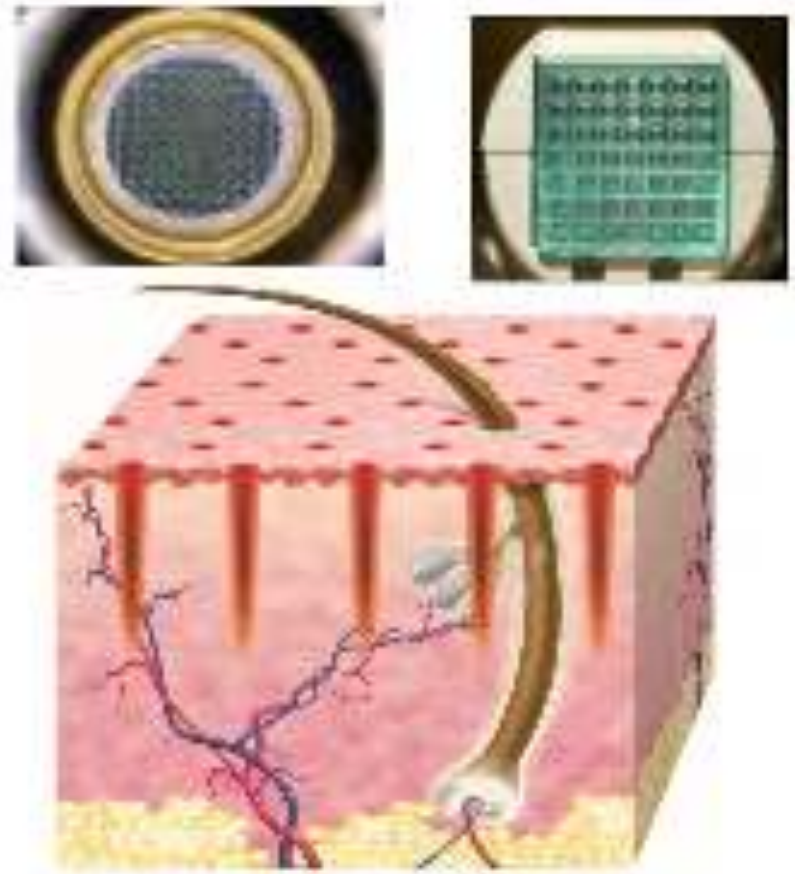


MaxG



1540nm

ENERGY BLENDS-THINK OUTSIDE THE BOX

YAG CAPSOLOTOMY


TelScreen
NSU Oklahoma College of Optometry

PI


TelScreen
NSU Oklahoma College of Optometry

SLT

SLT A

Selective laser trabeculoplasty versus eye drops for first-line treatment of ocular hypertension and glaucoma (LiGHT): a multicentre randomised controlled trial

Gus Gazzard, Evgenia Konstantakopoulou, David Garway-Heath, Anurag Garg, Victoria Vickerstaff, Rachael Hunter, Gareth Ambler, Catey Bunce, Richard Wormald, Neil Nathwani, Keith Barton, Gary Rubin, Marta Buszewicz, on behalf of the LiGHT Trial Study Group

Summary

Background Primary open angle glaucoma and ocular hypertension are habitually treated with eye drops that lower intraocular pressure. Selective laser trabeculoplasty is a safe alternative but is rarely used as first-line treatment. We compared the two.

Methods In this observer-masked, randomised controlled trial treatment-naive patients with open angle glaucoma or ocular hypertension and no ocular comorbidities were recruited between 2012 and 2014 at six UK hospitals. They were randomly allocated (web-based randomisation) to initial selective laser trabeculoplasty or to eye drops. An objective target intraocular pressure was set according to glaucoma severity. The primary outcome was health-related quality of life (HRQoL) at 3 years (assessed by EQ-5D). Secondary outcomes were cost and cost-effectiveness, disease-specific HRQoL, clinical effectiveness, and safety. Analysis was by intention to treat. This study is registered at controlled-trials.com (ISRCTN32038223).

Findings Of 718 patients enrolled, 356 were randomised to the selective laser trabeculoplasty and 362 to the eye drops group. 652 (91%) returned the primary outcome questionnaire at 36 months. Average EQ-5D score was 0·89 (SD 0·18) in the selective laser trabeculoplasty group versus 0·90 (SD 0·16) in the eye drops group, with no significant difference (difference 0·01, 95% CI −0·01 to 0·03; p=0·23). At 36 months, 74·2% (95% CI 69·3–78·6) of patients in the selective laser trabeculoplasty group required no drops to maintain intraocular pressure at target. Eyes of patients in the selective laser trabeculoplasty group were within target intraocular pressure at more visits (93·0%) than in the eye drops group (91·3%), with glaucoma surgery to lower intraocular pressure required in none versus 11 patients. Over 36 months, from an ophthalmology cost perspective, there was a 97% probability of selective laser trabeculoplasty as first treatment being more cost-effective than eye drops first at a willingness to pay of £20 000 per quality-adjusted life-year gained.

Interpretation Selective laser trabeculoplasty should be offered as a first-line treatment for open angle glaucoma and ocular hypertension, supporting a change in clinical practice.

Funding National Institute for Health Research, Health and Technology Assessment Programme.

SLT

Recent Ground Breaking 3-Year LiGHT Clinical Trial

SLT vs Eye Drops

CLINICAL CONCLUSION

"Selective Laser Trabeculoplasty (SLT) should be offered as first-line treatment for open angle glaucoma and ocular hypertension, supporting a change in clinical practice."

3 Years	n=652	5x LESS	78.2%	
MULTI-CENTER RANDOMIZED	SLT 329 DROPS 323	Adverse Events SLT 30 DROPS 150	SLT DROP FREE @ 3 YEARS	Surgical Intervention SLT 0 DROPS 11

*Data available in reference article below

QUALITY OF LIFE

The trial supports a longer drop-free period for patients when treated with SLT, which may confer significant benefits to your patient's quality of life.

LIGHT TRIAL 6 YEAR DATA

Released Sept 2022

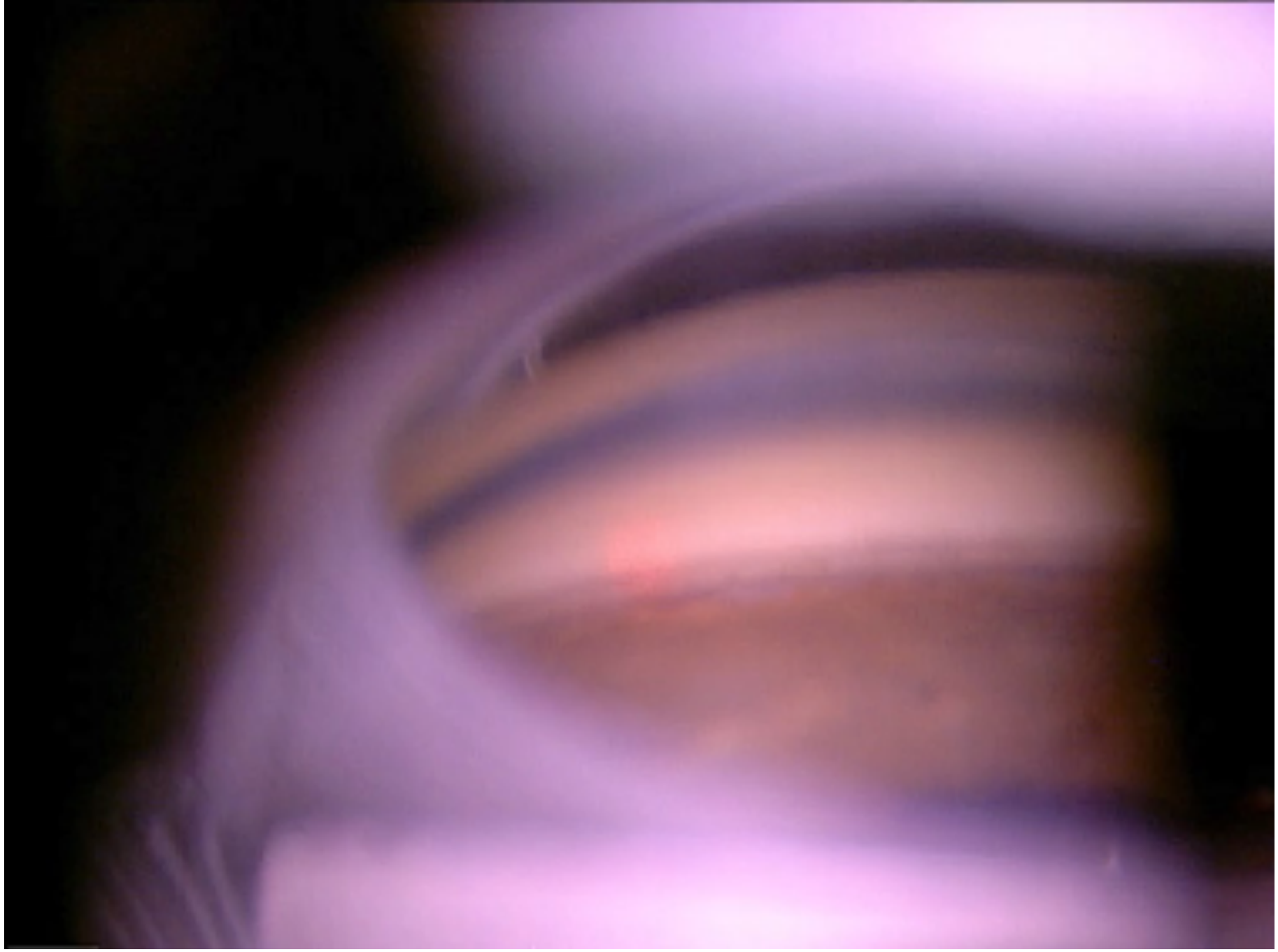
At 6 years:

- No significant difference in health related quality of life (HRQL) in 3 of the 4 questionnaires
- SLT had better scores in the GSS (glaucoma symptoms scores) quality of life measurement
- 69.8% of SLT patients remained at or below target without other intervention
- More eyes in the drop arm exhibited disease progression (26.8% vs 19.6%)***
- Trabeculectomy required in 32 eyes in drop arm, 13 eyes in SLT arm
- More cataract surgeries in the drop arm (95 compared to 57) – statistically significant
- No serious laser related adverse events

Conclusion

- SLT is a safe treatment for OAG and OHT, providing better long-term disease control than initial drop therapy, with reduced need for incisional glaucoma and cataract surgery over 6 years.


TelScreen
NSU Oklahoma College of Optometry

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