

Current management of thyroid eye disease

Richard C. Allen MD PhD FACS
 Texas Oculoplastics Consultants
 Professor, Department of Ophthalmology
 Dell Medical School, The University of Texas at Austin
 Austin, TX USA
 Editor-in-Chief, *Orbit*
 President-elect, IJCAHPO
 Immediate-past-president, ASOPRS

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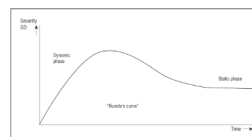
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Once the diagnosis is made

- What am I trying to figure out on the first visit?
 - Where they are in their clinical course?
 - What is the tempo of the disease?
 - Are they mild, moderate, or severe?

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- Where are they on the curve?
 - When did the symptoms first start?
 - How inflamed do they look?



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- What is the tempo?
 - I'm a little dependent on history.
 - If I'm not sure, I will have them come back in two months to reevaluate or have them call.
 - Patient should call sooner if significant progression




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- Clinical activity score (CAS)
 - Helps determine inflammatory vs chronic phase
 1. Spontaneous orbital pain
 2. Gaze evoked orbital pain
 3. Eyelid swelling
 4. Eyelid erythema
 5. Conjunctival redness
 6. Chemosis
 7. Inflammation of the caruncle or plica


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- Mild
 - Inflammation/congestion
 - Dry eye
 - No motility deficit
 - No compressive optic neuropathy
- Treatment will be conservative




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- Proser child
 - Mild to moderate disease
 - Females
 - 40s
 - Symmetrical




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- Moderate
 - Motility deficit, but no diplopia in primary gaze
 - Pressure pain
 - Significant congestion/inflammation
 - No CON
- Treatment will be with medications



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- Severe
 - Significant motility deficit
 - Proptosis/lid retraction that is causing significant dryness
 - Any compressive optic neuropathy
- Treatment will be with surgery, radiation, or medications with potentially significant side effects.



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- Who are the patients who progress?
 - Males
 - Asymmetrical disease
 - Smokers
 - Older (8th-9th decade)

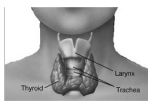
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- Goal
 - Get patients through the inflammatory phase with the fewest long term sequelae.
 - Try not to do surgery on patients while they are in the inflammatory phase unless you are pushed
 - Things that will cause permanent visual decline that are not responding to medical treatment.

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- First and foremost

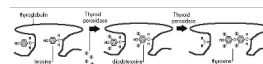
- Get thyroid under control
 - Course of TED affected by level of thyroid dysfunction
 - Kautbally S, et al. Eur Thyroid J 2012;1:122-128
 - De Bellis A, et al. Endocrine 2012;41:320-326
- Get other systemic disease under control
 - Type 1 DM – more common
 - Other autoimmune disease
 - Type 2 DM – more severe course of disease
 - Le Moli R et al. Nutr Metab Cardiovasc Dis 2015;25:452-7
- Medical vs radioactive iodine ablation vs thyroidectomy
 - Discuss with the endocrinologist!



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- Medical treatments for hyperthyroidism

- Methimazole
 - Carbimazole
 - Propylthiouracil
- Inhibit thyroid peroxidase, blocking thyroid hormone synthesis



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- Radioactive iodine for thyroid ablation

- Evidence that it provokes or worsens orbitopathy
 - Bartalene L, Tanda ML. N Engl J Med 2009;360:994-1001
 - Watanabe N et al. J Clin Endocrinol Metab 2015;100:2700-8
- Treat with prednisone prophylaxis (0.3-0.5 mg prednisone/kg q day for 6 weeks in patients with active TED or high risk [smokers]).
- Treat hypothyroidism immediately
 - Exacerbates TED
 - Marocci and Marino, 2012
 - Taleb D et al. Eur J Endocrinol 2016;174:491-502
 - Prophylactically treat with LT4



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- Rationale for thyroidectomy

- Complete removal of thyroid antigens and thyroid infiltrating lymphocytes
 - May result in attenuation of immune reaction against orbital antigens
- Near total thyroidectomy followed by I131
 - Menconi F et al. J Endocrinol Invest 2015;38:809-15



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- Stein JD et al. JAMA Ophthalmol 2015;133:290-6

- Big data, 8404 patients with Graves disease in nationwide US managed healthcare network
- 8.8% developed ophthalmopathy
- Surgical thyroidectomy alone or in combination with medical therapy associated with 74% decreased hazard for ophthalmopathy compared to I131 alone

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- What should you recommend?

- Thyroid levels usually under control of the primary care physician or endocrinologist
- If significant/worsening disease, would recommend thyroidectomy
 - General surgeon vs. Head and Neck surgeon
- If evidence of orbitopathy or high risk patient for progression, could consider I131 but would treat with steroids perioperatively
- Don't let patients become hypothyroid

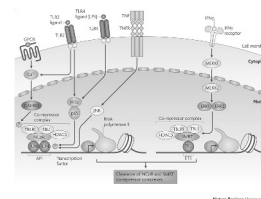
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- Smoking cessation
 - Poorer response to intravenous steroid therapy in smokers as well as ex-smokers
 - Xing L et al. Br J Ophthalmol 2015;99:1686-91
 - Increase in orbital venous congestion
 - Sadeghi-Tari A, et al. Eye (Lond) 2016;30:1573-78.



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- Controlling inflammation
 - Steroid (IV vs oral)
 - Radiation
 - Anti-metabolites
 - Biologics



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- Treating the inflammatory phase of the disease
 - Clinical activity score (CAS)
 - Spontaneous retrobulbar pain
 - Pain on attempted upward or downward gaze
 - Redness of eyelids
 - Redness of the conjunctiva
 - Swelling of caruncle or plica
 - Swelling of eyelids
 - Swelling of conjunctiva (chemosis)
 - Inactive: CAS < 3
 - Active: CAS ≥ 3

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- Severity (EUGOGO)
 - Mild
 - Minor impact on daily life insufficient to justify immunosuppressive or surgical treatment
 - Minor lid retraction (< 2mm), mild soft-tissue involvement, exophthalmos < 3mm above normal for race and gender, no or intermittent diplopia, corneal exposure responsive to lubricants
 - Moderate to severe
 - Without sight-threatening orbitopathy, sufficient impact on daily life to justify the risks of immunosuppression (if active) or surgical intervention (if inactive).
 - Lid retraction ≥ 2 mm, moderate or severe soft-tissue involvement, exophthalmos ≥ 3 mm above normal for race and gender, inconstant or constant diplopia
 - Sight threatening (very severe)
 - Patients with optic neuropathy and/or corneal breakdown

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- Selenium
 - Some controversy, but most would supplement
 - Marcocci C et al. N Engl J Med 2011;364:1920-31.
 - Se significantly improved the quality of life, reduced ocular involvement, and slowed progression of orbitopathy for mild disease
 - Dehina N et al. Eur Thyroid J 2016;5:57-64.
 - Results neither support nor discourage adjuvant Se supplementation
 - Safety concerns
 - Increase risk of type 2 diabetes
 - Peripheral vascular disease
 - 100 micrograms BID for 6 months



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- Doxycycline
 - 50 mg per day
 - Improvement in TED symptoms at 12 weeks when compared to placebo

Pan et al. JAMA Ophthalmol. 2022;140:1076-1083.

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- IV glucocorticoids
 - Wiersinga WM. Lancet Diabetes Endocrinol 2016
 - Significant advantage in terms of efficacy over oral
 - 77% vs 51% clinical response (Kahaly)
 - Cushingoid features, weight gain, myalgia higher in oral
 - Hypertension, depression, hyperglycemia similar between the two
 - Fatal adverse events associated with IV
 - Acute liver disease (ALD) and cardiovascular accidents
 - ALD
 - 1%, higher with a single dose >0.5 g and a cumulative dose >6.5 gram
 - Recommendation (Sisti E et al. Eur J Endocrinol 2015;172:269-76)
 - Liver enzymes, viral hepatitis markers, autoantibodies associated with AIH
 - Exclude patients with cirrhosis, chronic HBV or HCV, or severe steatosis
 - Monitor liver function during (q 2 weeks) and up to 3 months after the end of treatment, then once monthly to 6 months.
 - Oral taper after IV

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- Typical dose for moderate to severe (EUGOGO)
 - 0.5 q week for 6 weeks, then 0.25 q week for 6 weeks (4.5 cumulative dose)
 - For more severe cases, consider 0.75 and 0.5 (7.5 cumulative dose)



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- Other immunosuppressive agents
 - Cyclosporine, azathioprine, methotrexate, diclofenac, mycophenolate mofetil
 - Have the advantage of well-described side effect profiles and cost efficacy
 - Often used in combination with IV corticosteroids
- Methotrexate
 - Rivera-Grana E, et al. J Clin Exp Ophthalmol 2015 6:422
 - 9/14 patients on long term oral steroids were able to stop the steroids an average of 7.5 months after starting methotrexate

rheumatologist

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- Diclofenac
 - Lantz M et al.
 - 61 patients
 - 11% treated with diclofenac and 21% of controls developed orbitopathy (p=0.273)
 - Reduces anti-TPO concentrations and seems to be safe.
 - No significant influence on development of orbitopathy

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- Radiotherapy in thyroid eye disease
 - Farach A, Carpenter LS. Int Ophthalmol Clin 2016;56:81-93.
 - Based on sensitivity of lymphocytes to ionizing radiation
 - Moderate to severe TED with diplopia or restricted motility.
 - Grassi P et al. Ir J Med Sci 2017
 - Evaluation of radiation as first-line therapy in 35 patients with active TED.
 - 20 Gy
 - Significantly improved 7-CAS and ocular motility disturbances.
 - No improvement in proptosis or eyelid retraction

Lower doses have support

Atenas M, et al. Rep Pract Oncol Radiother 2016;21:313-8

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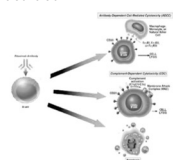
- Disadvantages/contraindications to radiotherapy
 - Pregnancy
 - Diabetes
 - Collagen vascular disease (e.g. scleroderma)
 - Delayed in patients with the use of radioiodine within the past 3 months
 - Possible secondary malignancy
 - Gillis CC et al. Rep Pract Oncol Radiother
 - Describe a secondary meningioma
 - Calculate a risk of 0.17%
 - Recommendation to not use in patients under 35 years of age

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- Corticosteroids vs. corticosteroids plus radiation
 - Shams PN et al. Am J Ophthalmol 2014;157:1299-305.
 - Rate of compressive optic neuropathy was significantly lower and improvement in ocular motility greater in those patients receiving radiotherapy in addition to corticosteroids
 - Tand ML, Bartalena L. J Clin Endocrinol Metab 2012;97:3857-065
 - Combination of radiotherapy and oral glucocorticosteroids is more effective than either treatment alone.
 - No available evidence that the addition of OR to IV glucocorticosteroids provide an advantage over IV GCs alone

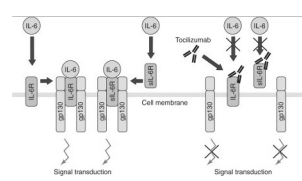
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- **Biologics**
 - Rituximab
 - Monoclonal antibody to CD20
 - CD20 is expressed on B cells
 - Salvi M, et al. J Clin Endocrinol Metab 2015;100:422-431
 - Rituximab vs IV methylprednisolone
 - Better therapeutic outcome in moderate-to-severe TED
 - Younger patients, lower TRAb, and shorter duration of disease; more smokers
 - Stan MN et al. J Clin Endocrinol Metab 2015;100:432-441
 - 25 patients, randomized, double-masked
 - Rituximab vs placebo
 - No additional benefit observed
 - Significant adverse events
 - Role in corticosteroid resistant cases



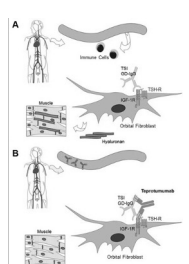
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- **Tocilizumab**
 - Interleukin-6 receptor antagonist
 - IL-6 involved in T-cell activation
 - Success described with TED
 - First line
 - Pacual-Camps I et al. Orbit 2018
 - Corticosteroid resistant
 - Perez-Moreiras JV et al. Am J Ophthalmol 2018



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- **Teprotumumab**
 - IGF-1 receptor antibody
 - Human insulin-like growth factor-1 receptor inhibitor
 - Inhibits TSH-mediated TNF alpha production in human fibrocytes
 - The only FDA-approved biologic for TED



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- **Rationale for the use of teprotumumab**
 - Orbital fibroblasts recruit fibrocytes and lymphocytes that infiltrate the orbit
 - T and B cells activate orbital fibroblasts
 - Once activated, orbital fibroblasts proliferate which enlarges orbital tissue volume
 - IGF-1R is a receptor involved in the stimulation of orbital fibroblasts

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- NEJM 2017;376(18):1748-61
 - Multi-center, double-masked, randomized, placebo-controlled study
 - 45 patients placebo, 42 teprotumumab
 - Active, moderate to severe TED
 - Infusion every 3 weeks for 24 weeks
 - Response: 2 or more points in the CAS or reduction of 2 mm or more in proptosis
 - Rapid effects evident by 6 weeks: 43% vs. 4% (p<0.001)
 - At 24 weeks, 71% vs. 20% (p<0.001)
 - Hyperglycemia in patients with diabetes
 - Smoking status greater in the placebo group

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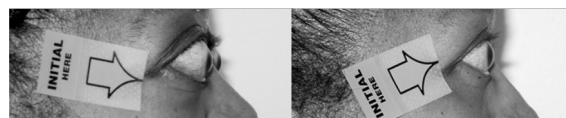
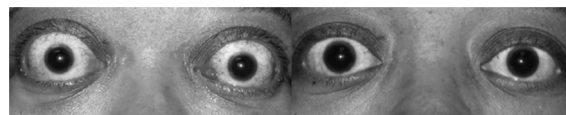
- **Diplopia**
 - 53% of teprotumumab-treated patients vs. 25% of placebo-treated patients were diplopia responders

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- Durability

- 53% of patients who were proptosis responders at week 24 maintained proptosis response 51 weeks after last teprotumumab infusion
- 67% of patients who were diplopia responders at week 24 maintained diplopia response 51 weeks after last teprotumumab infusion

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- Side effects

- Muscle spasm
- Nausea
- Hair loss
- Diarrhea
- Fatigue
- Elevated blood sugar
- Dry skin
- Hearing loss

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- Cost

- \$14,900 per vial
- Depending on weight, 16-24 vials over the 24 week period

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- Use of teprotumumab in mild active disease and chronic disease

- Case series
- No published randomized studies
- Risk and cost of the drug is likely not justified at this point

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- January 2020

- FDA approval of teprotumumab for “thyroid eye disease”
 - No declaration of stage or severity of the disease

- Terrible timing

- COVID-19 pandemic starts in January of 2020



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- Manufacturing shortages

- Increase demand for products used to diagnose and treat COVID-19
- Production of teprotumumab was halted for vaccine production in December 2020
 - US government mandated vaccine production
 - Resumed in April 2021



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- The company had a lot of catching up to do

- Initial early excitement faded with decreased clinic volume and lack of available product



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- How did Horizon "catch up"?

- Colleagues
- Advertising
- Research

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- Colleagues

- Consultants
- Speakers' bureau
- Sunshine Act data
 - <https://openpaymentsdata.cms.gov/>

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- A lot of money floating around

- Peak sales estimated to be \$3.9 billion
- Open payments data 2020-2022
 - \$935K (RD)
 - \$857K (TS)
 - \$129K (KC)
 - \$68K (BK)
 - \$67K (RD)
 - \$44K (DK)
 - \$35K (AK)

53

- Why does this matter?

- Study after study has shown that even a small token from a pharmaceutical company influences prescribing patterns
- Mitchell AP et al. Are financial payments from the pharmaceutical industry associate with physician prescribing? A systematic review. *Ann Intern Med* 2021
- Fickweiler F et al. Interactions between physician and the pharmaceutical industry generally and sales representatives specifically and their association with physicians' attitudes and prescribing habits: a systematic review. *BMJ Open* 2017

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- Aggressive advertising
 - Advertising to physicians
 - Meeting support
 - 2021 AAO meeting
 - Direct to consumer advertising on television
 - Strawbridge JC et al. JAMA Ophthalmol 2022
 - Google search for TED (Google Trends)
 - Steady from Jan 1 2004 to June 2019
 - After FDA approval, increase of 25%
 - After first national television commercial in Dec 2020, 525% increase
 - After second series in May 2021, 640% increase

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- Research
 - Industry sponsored
 - Horizon employees as authors in studies
 - Many studies are funded by the company
 - Always look at the fine print at the end of the manuscript

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- How has affected my practice?
 - I have patients ask for teprotumumab
 - I have Horizon reps frequent my office



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- The company has made it easy to prescribe the medication
 - Preprinted forms
 - Help in finding an infusion center



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- Infusion centers owned by physicians
 - This has been encouraged by Horizon
 - Financial incentive for physicians to prescribe the medication

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- Has this jaded me?
 - I feel many of my colleagues have been corrupted
 - I don't believe many of my colleagues who receive money from the company
 - Is the reputation that you have worked to develop over the last 20-30 years worth the money that is received?

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- My patients arrive with information provided by the company
 - Believe that it is a miracle drug
 - Ask to be given the drug for indications that are not proven

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- Cost-effective medicine has been ignored
 - Approximately \$350K for the standard 24 week course
 - I can somewhat justify it for active moderate-to-severe disease
 - Not sure if I would ever consider using it in chronic disease
 - I have a proven, durable, less expensive treatment with potentially fewer side effects
 - Would never consider using it in mild active disease



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- What is my simplified, typical protocol for the TED patient?
 - Ensure patient is euthyroid
 - Mild active disease: observation/conservative measures
 - Moderate-to-severe:
 - Discuss IV steroids, teprotumumab, possibly radiation, possible thyroidectomy

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- Compressive optic neuropathy
 - Surgical decompression
- Chronic disease
 - Elective surgery

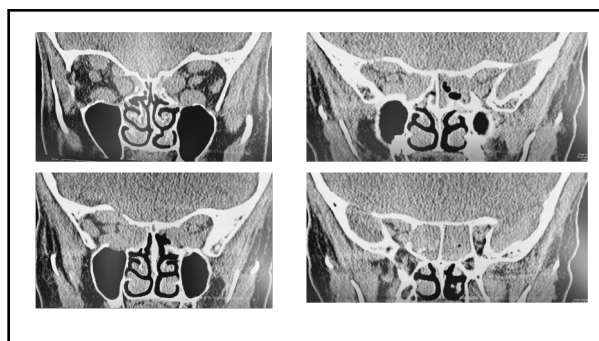
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- However, it has saved me in the rare case when all else fails

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- How is my relationship with the company?
 - Actually very friendly
 - They are doing their job to push the boundaries
 - I am doing my job in trying to reign them in
 - I believe we understand each other
- Very similar to my children

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- What do we need?
 - Randomized, prospective, case-controlled studies directly comparing
 - IV steroids
 - Radiation
 - Steroid sparing agents
 - Rituximab
 - Tocilizumab
 - Teprotumumab

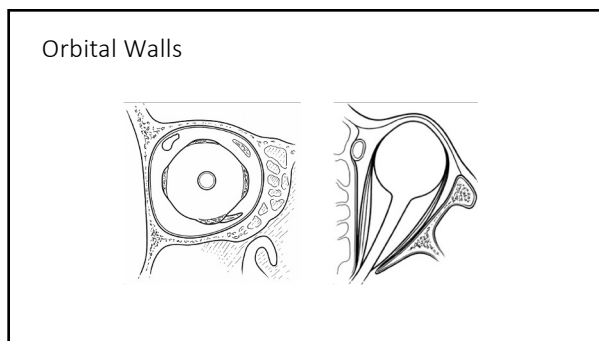
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- Surgical intervention
 - Decompression
 - Strabismus
 - Eyelid

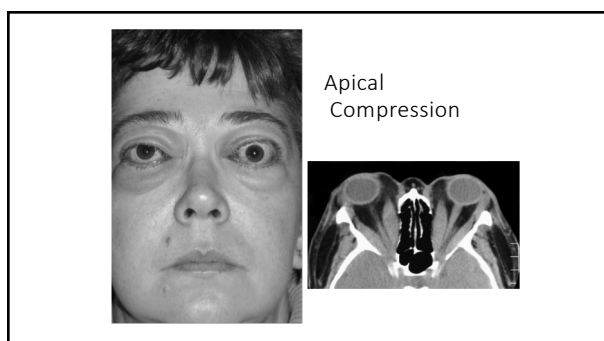
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- Differences in practices
 - Oculoplastics
 - Lateral wall always
 - Fat if possible
 - Medial wall probably
 - Floor less likely
 - Head and Neck Surgery
 - Medial +/- inferior
 - Inferomedial achieves more proptosis reduction than medial alone
 - Thapa S et al. JAMA Otolaryngol head Neck Surg 2015;141:329-34

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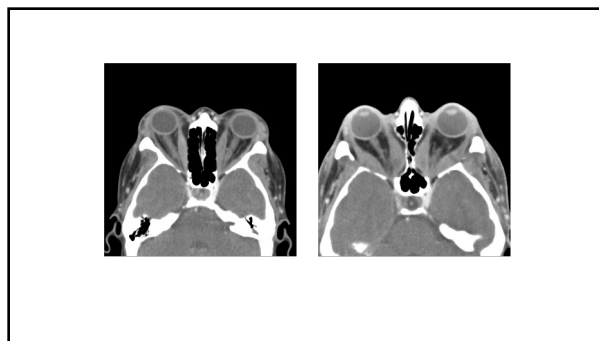
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- Treatment:
 - "cool" the patient down with steroids
 - Proceed with orbital decompression

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- Proptosis
 - May endanger the cornea in the acute or chronic phase
 - Usually will treat medically
 - If unable to stabilize, then decompress
- Most commonly treated in the chronic phase of the disease for functional or cosmetic reasons

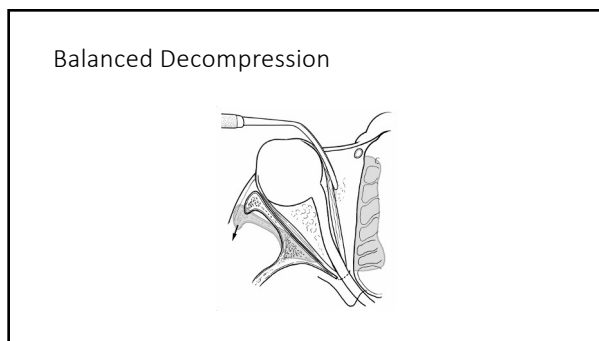
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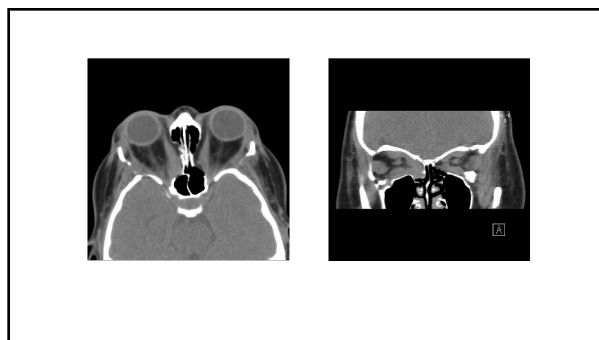
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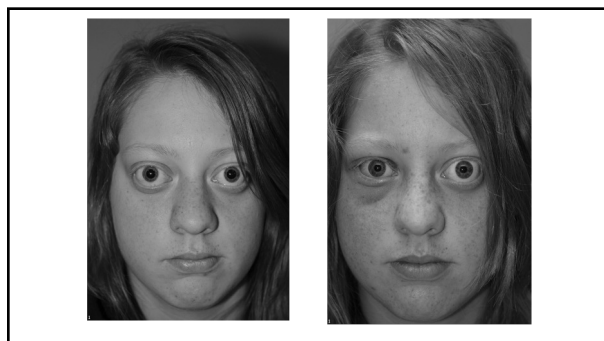
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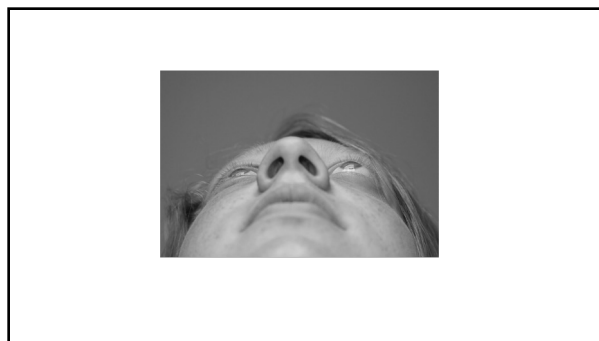
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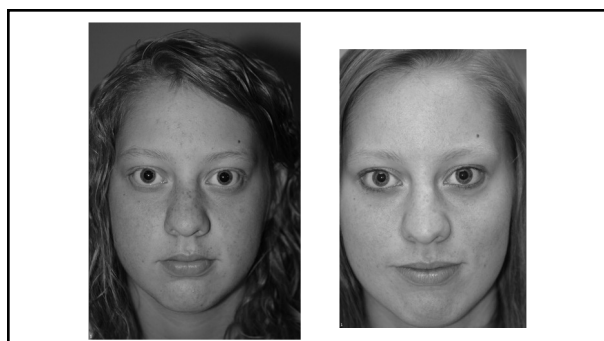
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- Long-term results of endoscopic decompression
 - Gulati S et al. Acta Ophthalmol 2015;93:178-83
 - 19% new-onset diplopia
 - 22% worsening diplopia
- Endoscopic medial fat decompression
 - Wu W et al. Am J Ophthalmol 2015;159:277-84
 - 206 orbits, type I disease
 - 8 mm reduction in proptosis
 - Low incidence of diplopia

87


- Endoscopic vs external
 - Ference EH et al. Am J Rhinol Allergy 2016;30:360-6.
 - 1009 patients (93% underwent medial wall only)
 - 22.9% endoscopic, 74.5% open, 2.6% combined
 - 80% had TED
 - Charges
 - \$13,119 endoscopic
 - \$11,291 open
 - $p=0.04$
 - OR time
 - 132 minutes endoscopic
 - 98 minutes open
 - $p=0.08$

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- Transcranial decompression
 - Bingham CM et al. Ophthal Plast Reconstr Surg 2014;30:215-8
 - 8 orbits in 4 patients
 - Progressive compressive optic neuropathy despite 3-wall decompression
 - Previously treated with steroids and orbital radiation

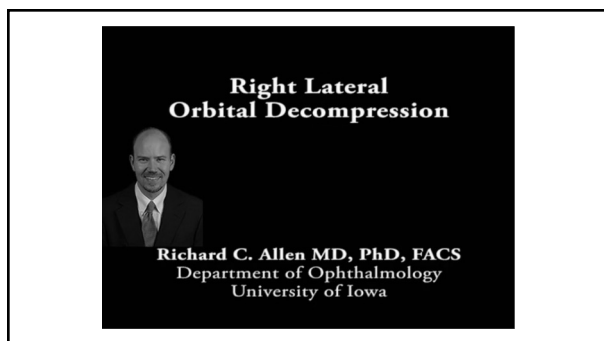
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Left Lateral Orbital Decompression

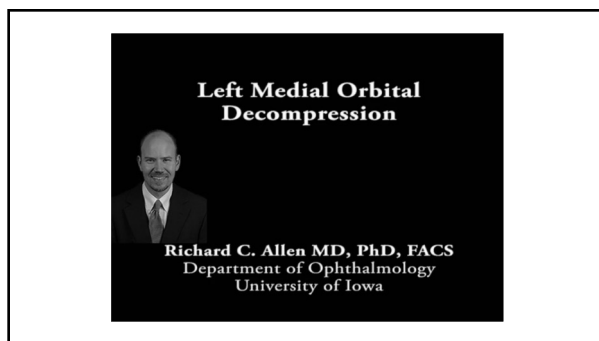


Richard C. Allen MD, PhD, FACS
 Department of Ophthalmology
 University of Iowa

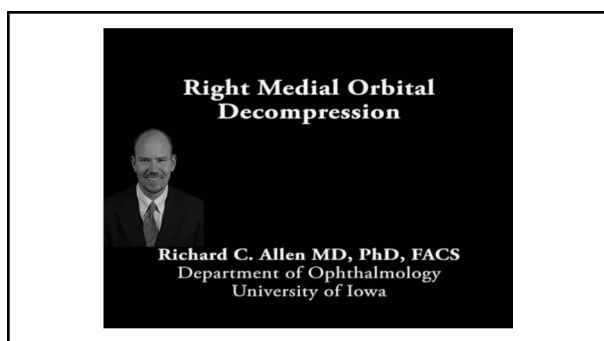
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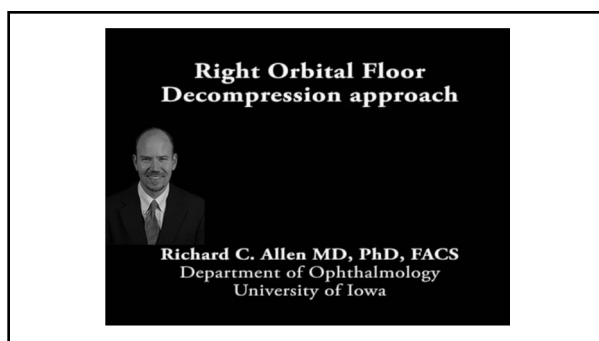
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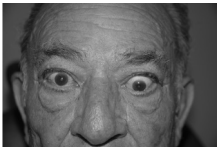


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- Strabismus
 - Misalignment of the eyes is due to imbalance of the muscles of the eyes
 - In TED, the enlarged muscles may not contract or relax normally
 - Also caused by orbital decompression



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Eyelid Surgery

- Corneal exposure
- Subluxation
- Recession of aponeurosis
- Extirpation of lower eyelid retractors
- Spacers



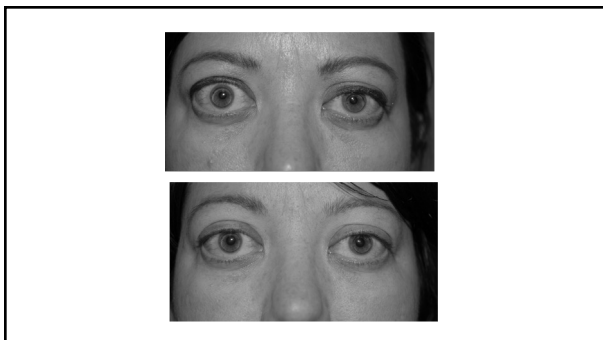
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- Etiology of upper lid retraction in thyroid eye disease
 - Sympathetic stimulation
 - Fixation duress
 - Fibrosis of the levator muscle
 - Mechanical (exophthalmos)
- Evidence of full-thickness lid changes

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- Goals of surgery to correct upper lid retraction
 - Lower the eyelid appropriately
 - Attain an acceptable contour
 - Prevent elevation of the lid crease

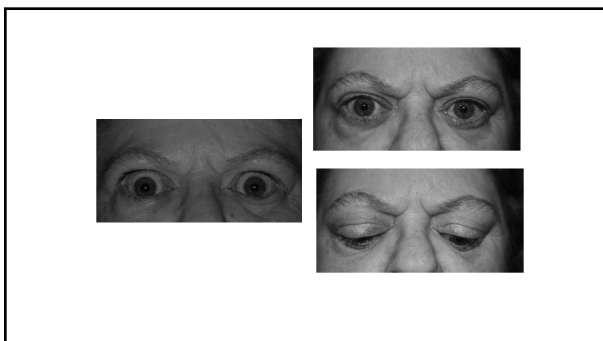
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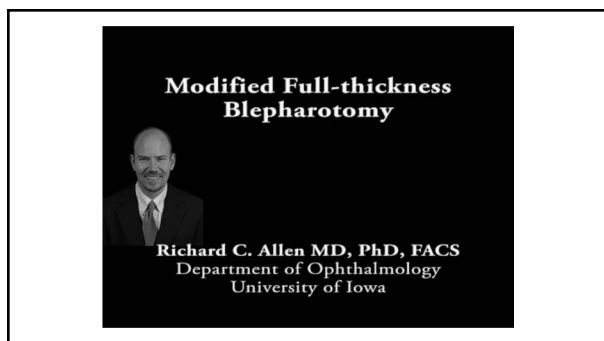
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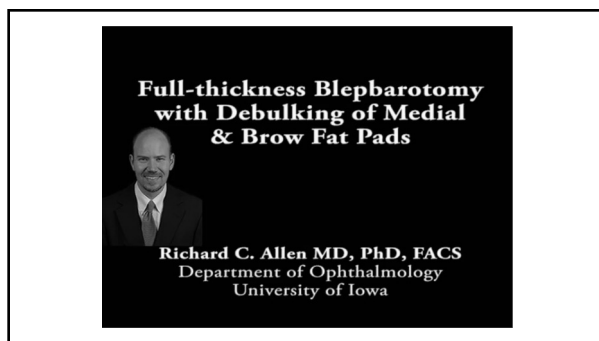
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- Full-thickness blepharotomy
 - Developed by Koornneef (1999)
 - Results reported
 - Elner et al. (2004)
 - Hirschich and Haritoglou (2005)

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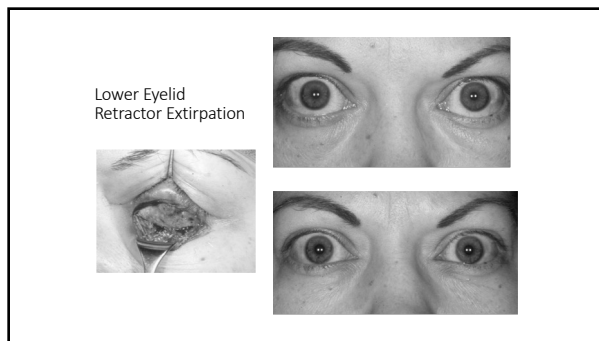
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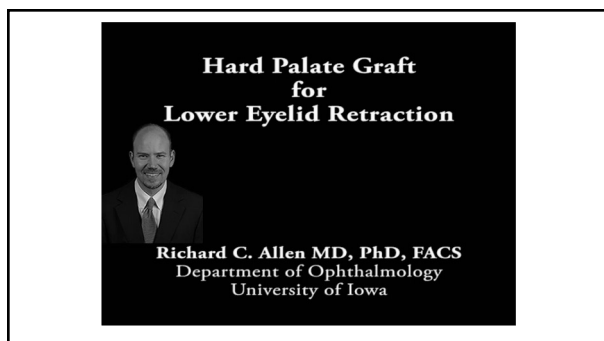
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- Lower lid retraction
 - Mechanical
 - proptosis
 - Tight inferior rectus
 - After strabismus surgery
 - inferior rectus recession

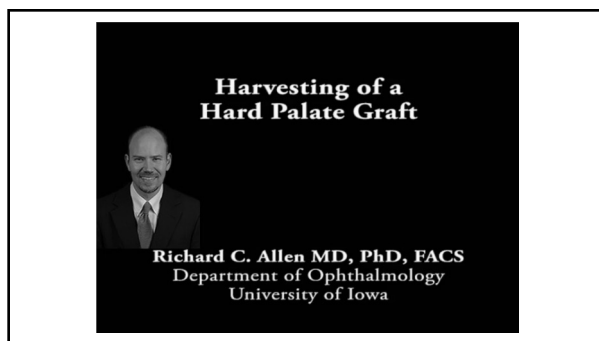
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108



109



110



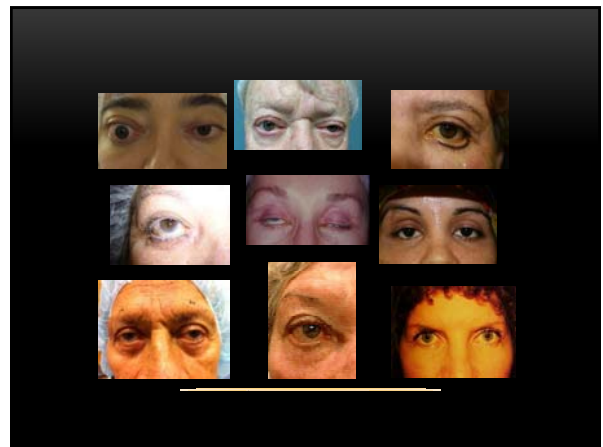
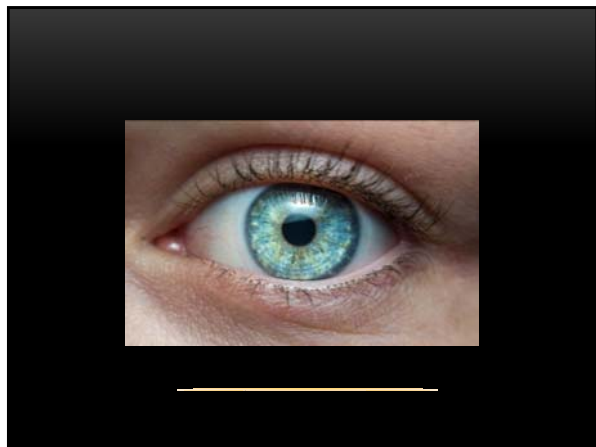
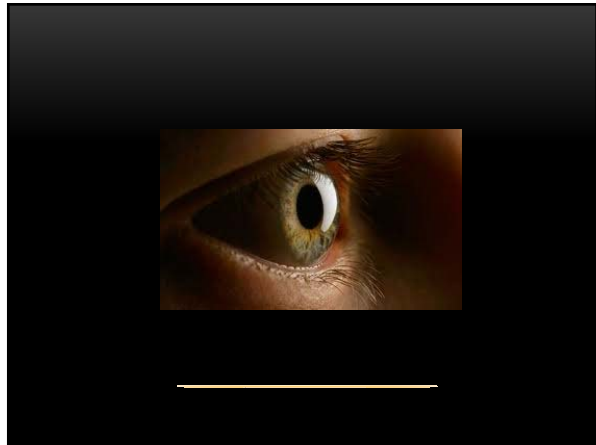
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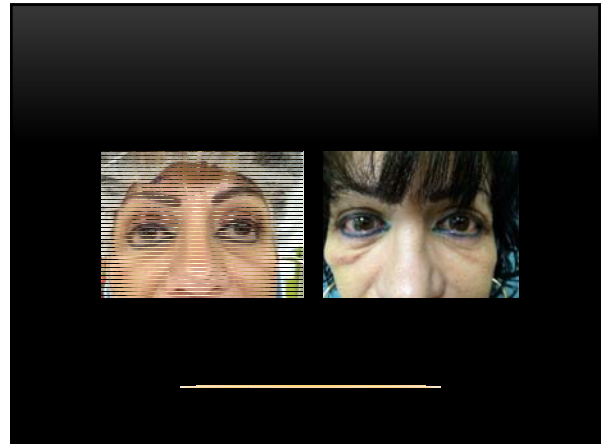
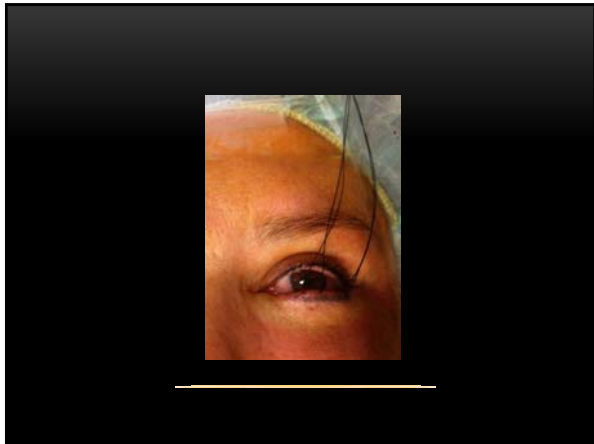
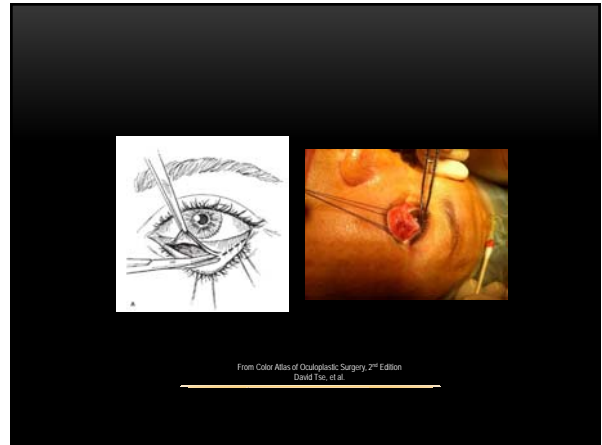
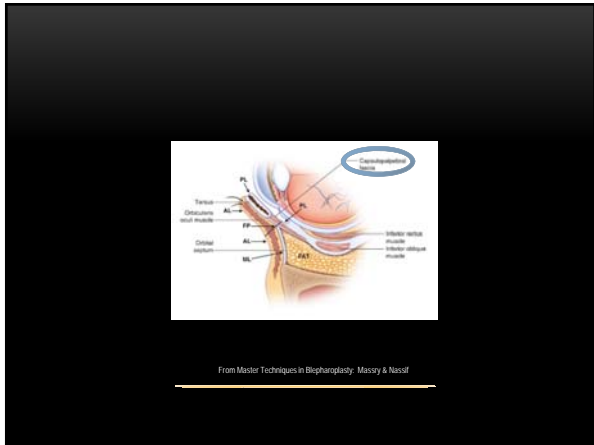
PROTECTING THE CORNEAL REALM: EYELID MALPOSITIONS AND THE CORNEA

Wendy W. Lee, MD
Professor of Clinical Ophthalmology & Dermatology
Oculofacial Plastic & Reconstructive Surgery
Bascom Palmer Eye Institute
University of Miami Miller School of Medicine

FINANCIAL DISCLOSURES

- Consultant
 - Allergan
 - Galderma
 - Revance
 - Evolus
 - RVL
 - Horizon
 - Tarsus
 - RoC
 - Novabay
-





MODERATE TO SEVERE EYELID RETRACTION


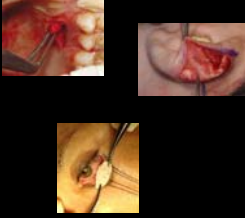


Greater than 2mm

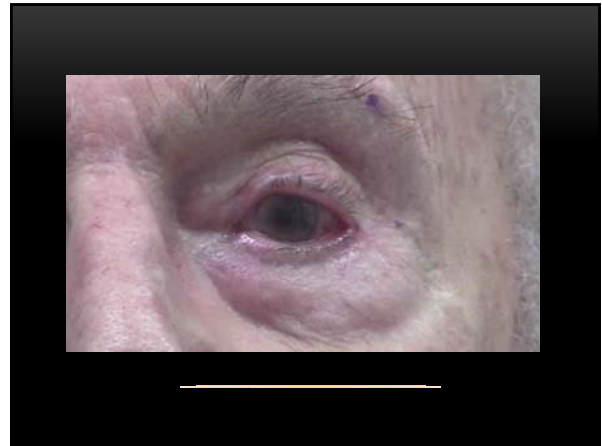
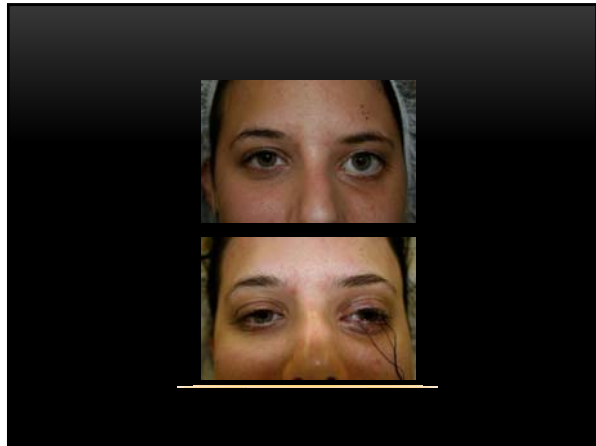
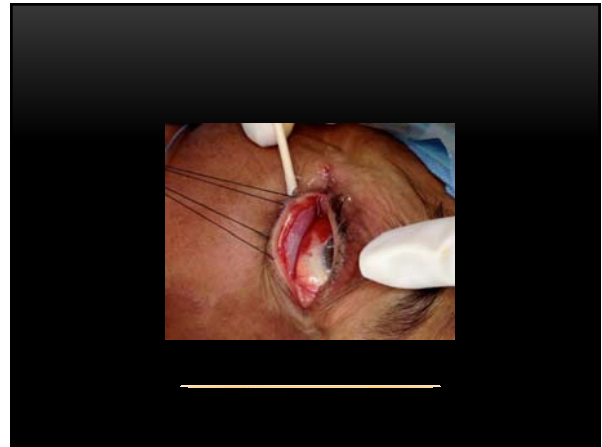
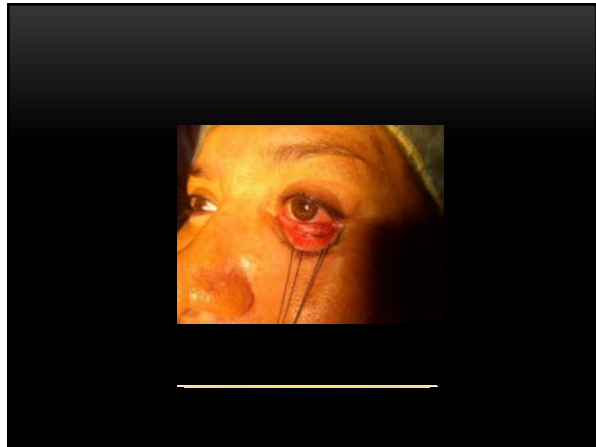
The diagram shows a vertical stack of horizontal lines representing the eyelid margin. A horizontal line is drawn below the stack, with the text 'Greater than 2mm' underneath it, indicating the measurement of the retraction.

VERTICAL SPACER GRAFT

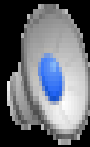
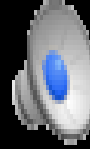
- Autograft
 - Hard Palate
 - Ear Cartilage
 - Nasal septum
- Allograft
 - Cadaveric
- Xenograft
 - Porcine collagen



The top row of images shows the harvest of autografts from the hard palate and ear cartilage. The bottom image shows the placement of a graft into the eyelid. The UHealth logo is in the bottom right corner.



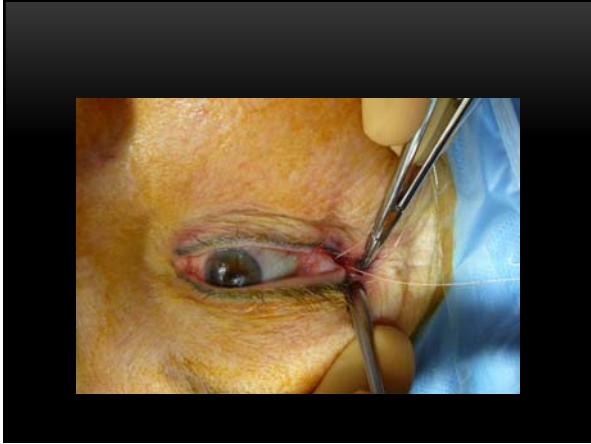
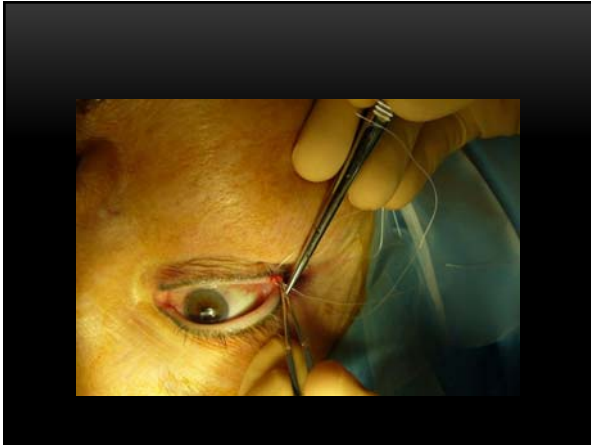
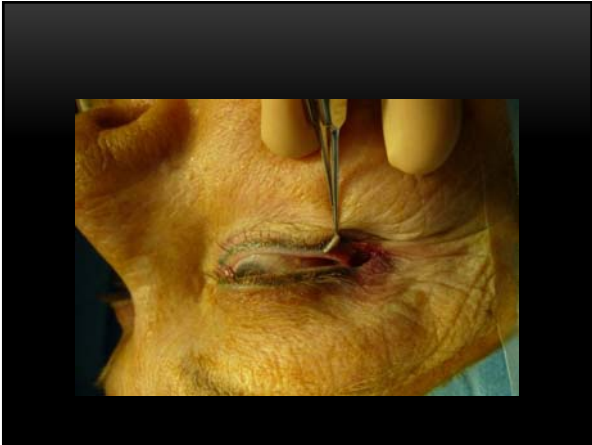
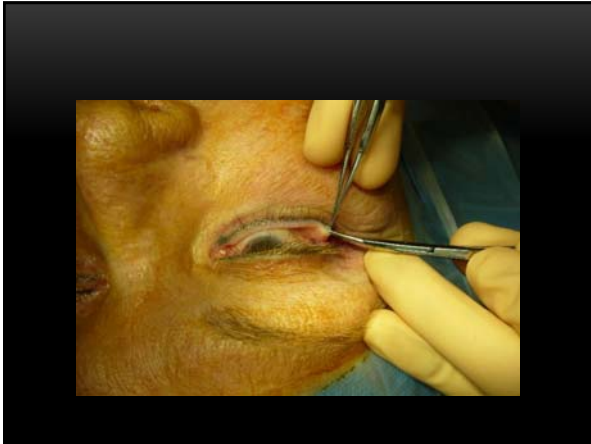
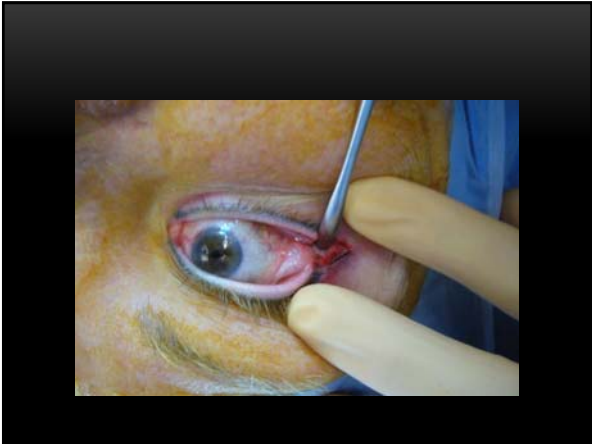
PSEUDO LID RETRACTION AND INCOMPLETE BLINK
CONFIRMATION: THUMB TEST

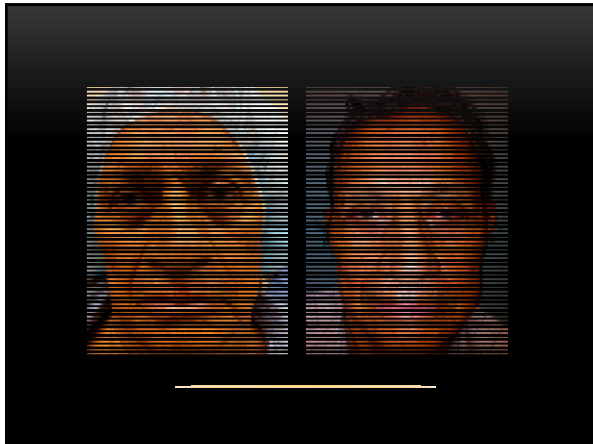
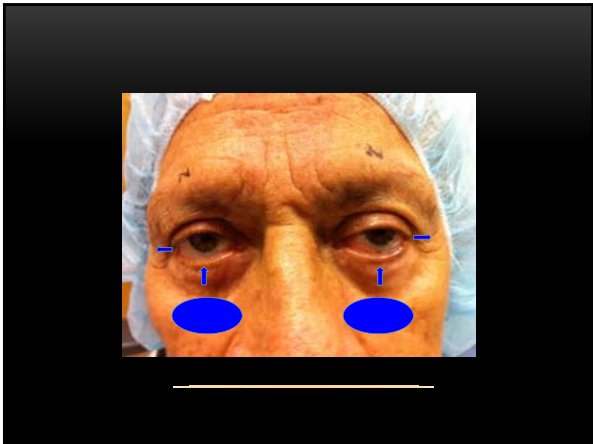
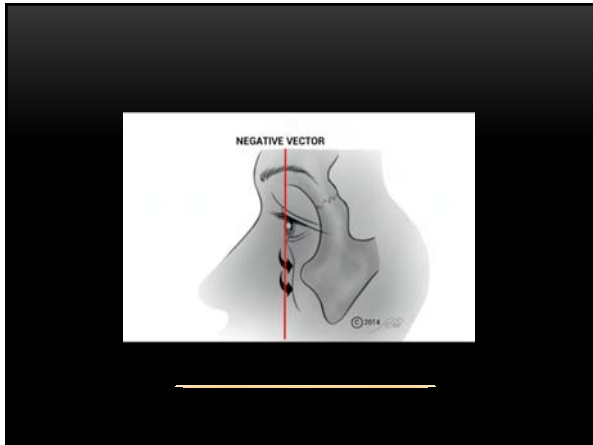
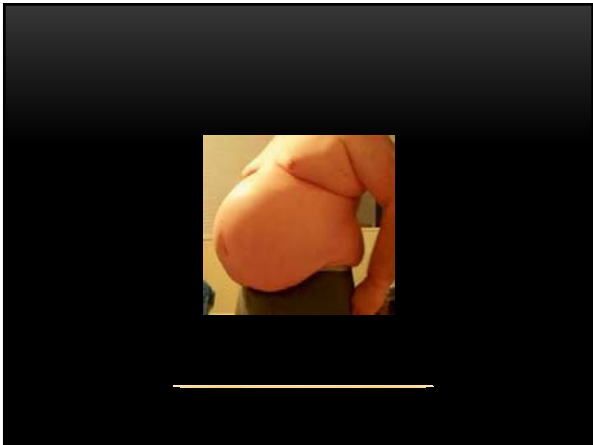
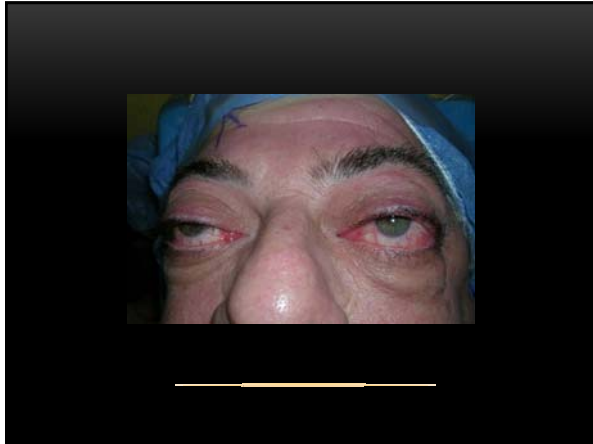
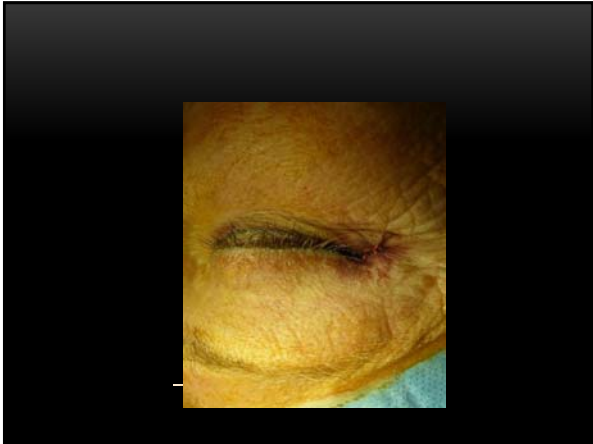


LATERAL TARSAL STRIP

LATERAL CANTHOTOMY

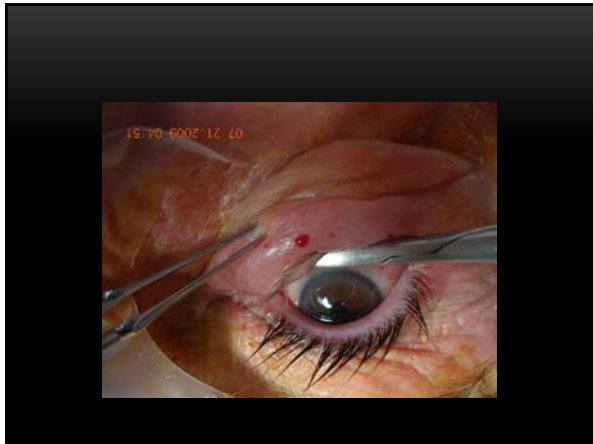
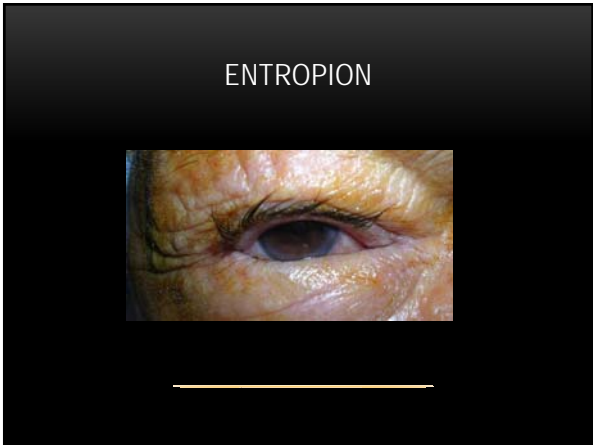
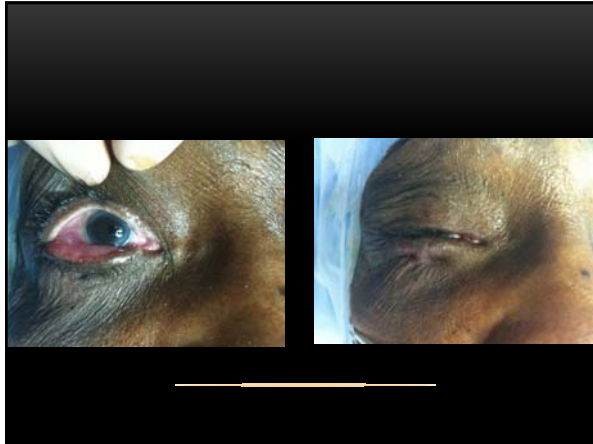
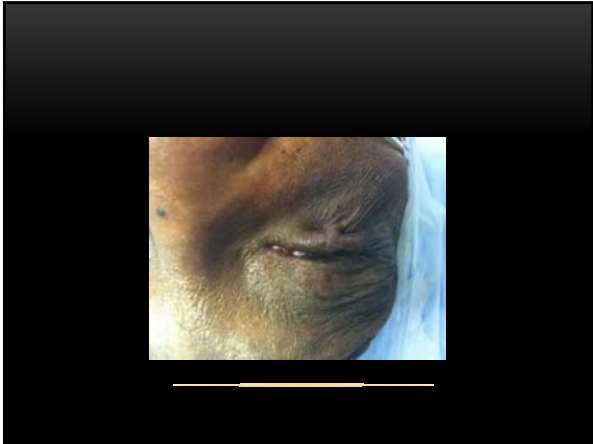


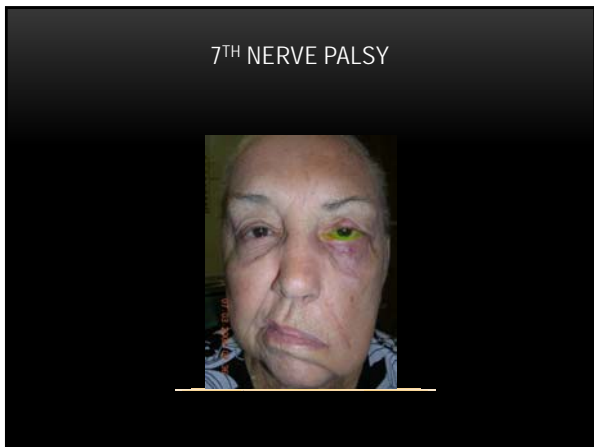
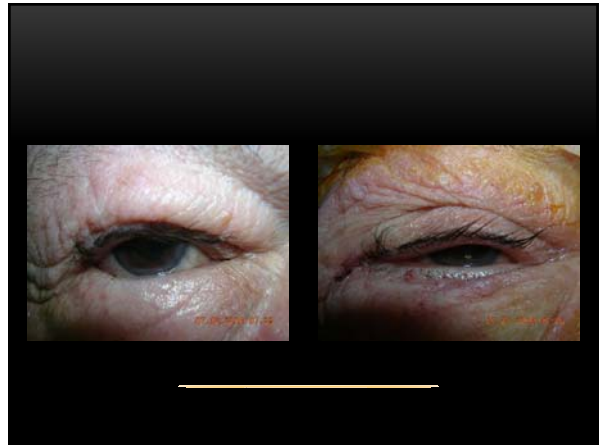
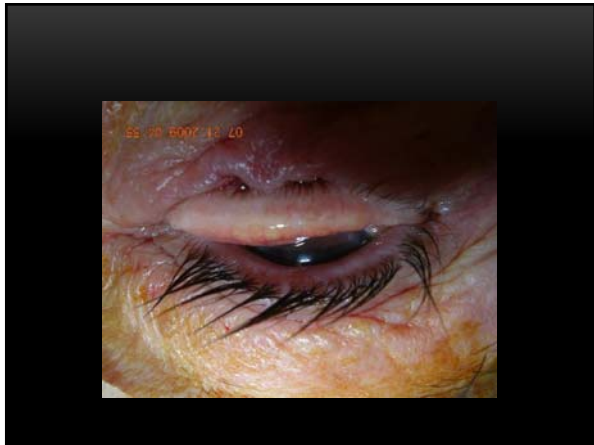
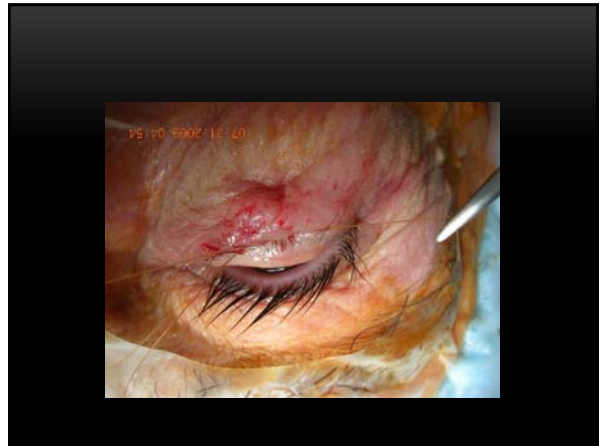
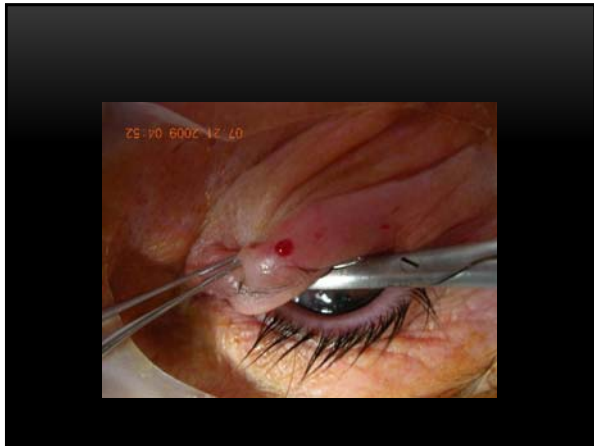




RETRACTOR DISINSERTION







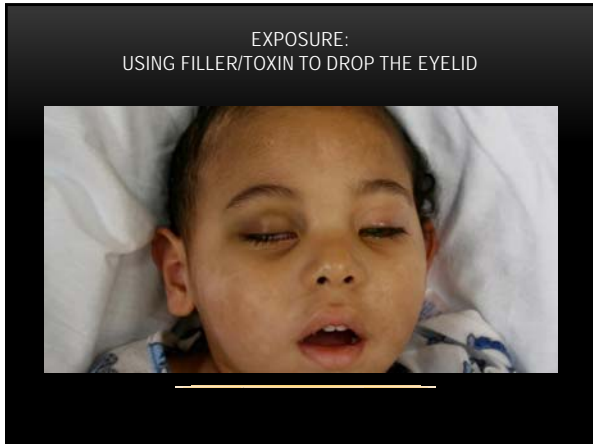
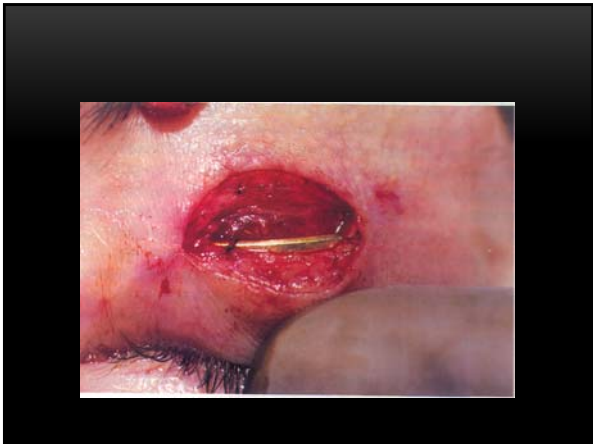
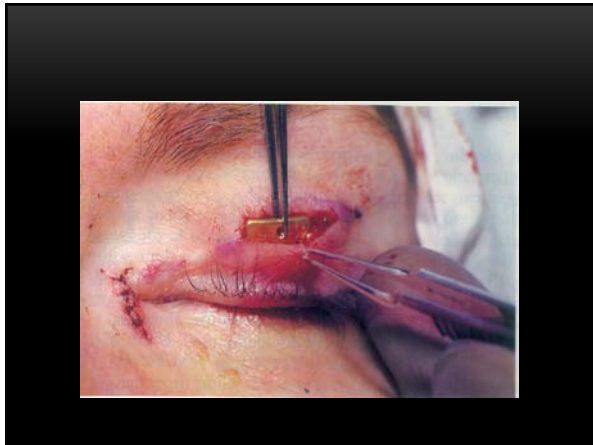
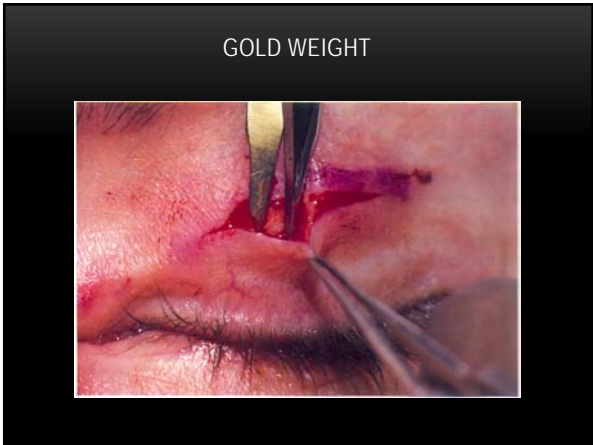
- SURGICAL MANAGEMENT OPTIONS
- Tarsorrhaphy
 - Palpebral spring
 - Muscle transfers
 - 7th nerve grafting
 - Lateral Tarsal Strip
 - Gold Weight
-

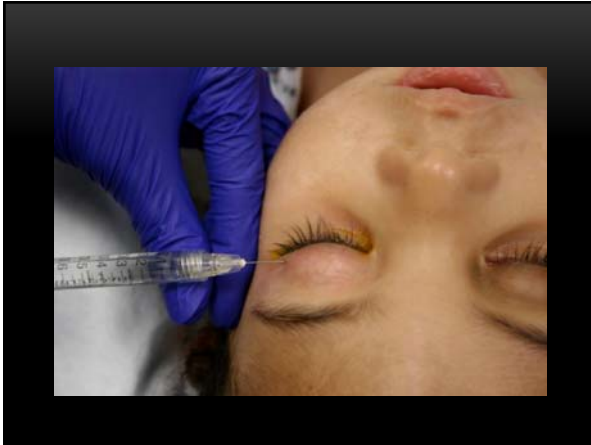
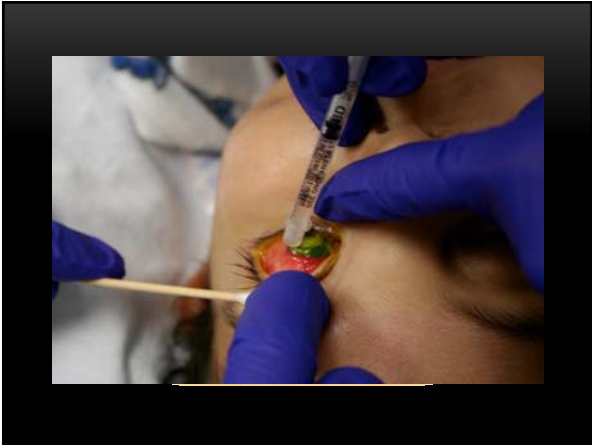
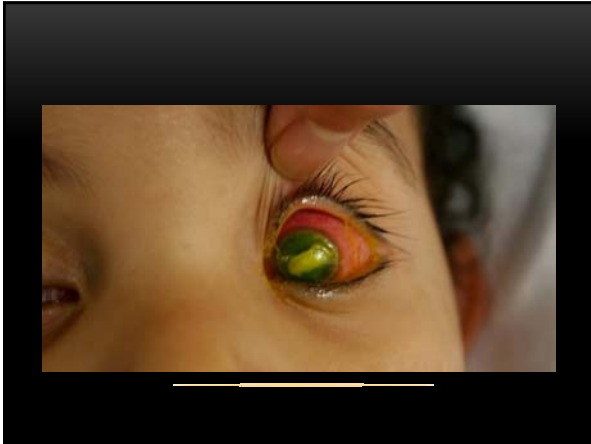
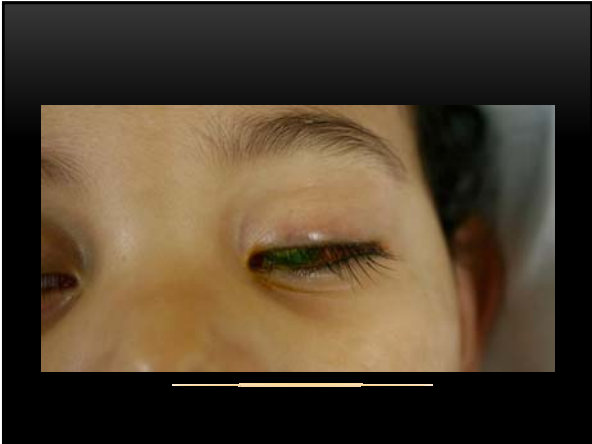
SURGICAL MANAGEMENT OPTIONS

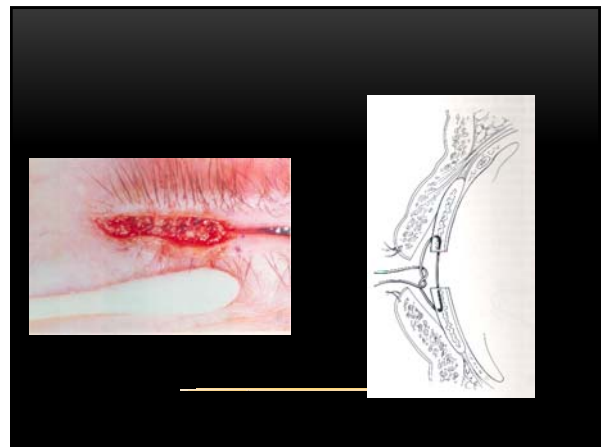
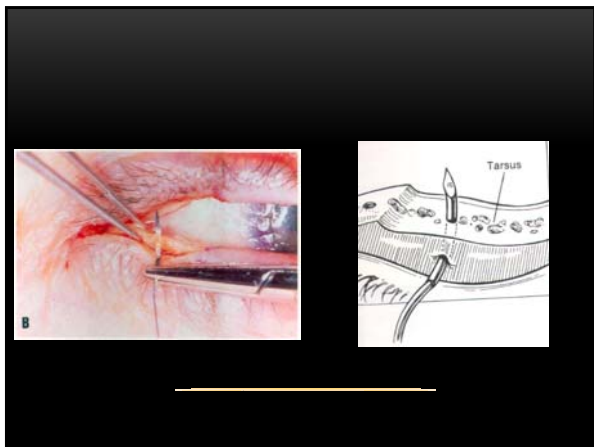
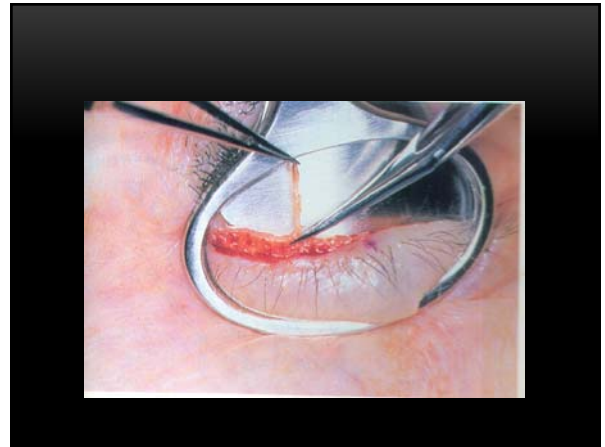
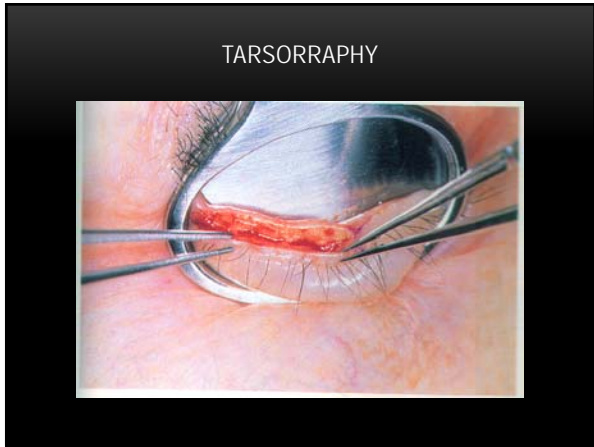
- Tarsorrhaphy
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SURGICAL MANAGEMENT OPTIONS

- Tarsorrhaphy
- Palpebral spring
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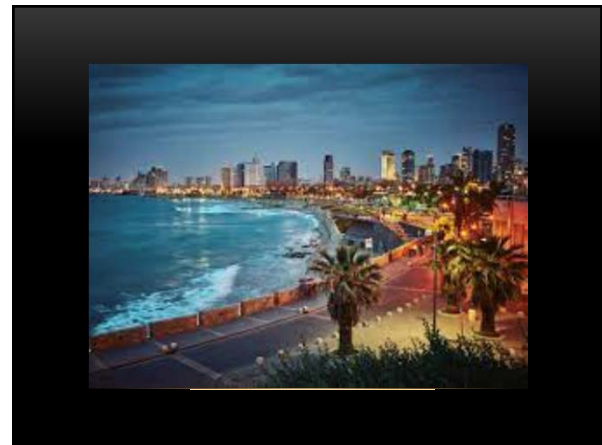








- ### SUMMARY
- Eyelid Retraction
 - Release of retractors +/- vertical spacer
 - Lateral Canthal Tendon Disinsertion
 - LCT plication
 - Ectropion/Entropion Repair
 - Lateral Tarsal Strip
 - Retractor Reinsertion
 - Fornix Sutures
 - 7th Nerve Palsy
 - Gold Weight + Lateral Tarsal Strip
 - Exposure Keratopathy from Proptosis
 - Tarsorrhaphy
 - Toxin
-



UCLA Stein Eye Institute

Evaluation and Management of the Tearing Patient

Kelsey A Roelofs MD FRCS
 Oculofacial Plastic Surgeon
 Assistant Professor
 Departments of Ophthalmology & Neurosurgery
 University of California, Los Angeles

UCLA Stein Eye Institute

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No financial disclosures or conflicts of interest

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Objectives

To review eyelid, ocular surface and lacrimal drainage etiologies of tearing

To discuss a step-wise approach to management of the tearing patient

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eyelid ocular surface lacrimal management of the tearing patient

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Bring out subtle lid malposition with forceful closure and/or supine positioning

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Tearing due to: Irritation of the ocular surface

Bring out subtle lid malposition with forceful closure and/or supine positioning

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Skin
Orbicularis
Eyelashes
Levator
Meibomian glands
Tarsus
Conjunctiva

Tearing due to:

Temporal and Zygomatic
Buccal

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Skin
Orbicularis
Eyelashes
Levator
Meibomian glands
Tarsus
Conjunctiva

Tearing due to:

Exposure

Poor lid globe apposition
Lagophthalmos & incomplete blink

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Skin
Orbicularis
Eyelashes
Levator
Meibomian glands
Tarsus
Conjunctiva

Tearing due to:

Exposure
Puncta not in tear lake

Poor lid globe apposition
Lagophthalmos & incomplete blink

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Skin
Orbicularis
Eyelashes
Levator
Meibomian glands
Tarsus
Conjunctiva

Tearing due to:

Exposure
Puncta not in tear lake

Sometimes punctual malposition is subtle

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Skin
Orbicularis
Eyelashes
Levator
Meibomian glands
Tarsus
Conjunctiva

Tearing due to:

Exposure
Puncta not in tear lake
Ineffective tear pump

Fishmouthing
Eyelid imbrication

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Skin
Orbicularis
Eyelashes
Levator
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Tearing due to:

Exposure
Puncta not in tear lake
Ineffective tear pump

Exposure
Puncta not in tear lake
Ineffective tear pump

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Normal Trichiasis Distichiasis

Tearing due to: Irritation of the ocular surface

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Tearing due to: Increased evaporation

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Tearing due to: Accumulation of inflammatory debris, Demodex in approx 60%

MGD results in unstable tear film and rapid evaporation

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Tearing due to: Upregulated inflammatory cascade

MGD results in rapid

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Tearing due to: Upregulated inflammatory cascade
Rapid TBUT and ocular surface desiccation

MGD results in unstable tear film and rapid evaporation

Low Level Light Therapy Versus Intense Pulsed Light for the Treatment of Meibomian Gland Dysfunction: Preliminary Results From a Prospective Randomized Comparative Study

Parameter	Group	Before Treatment	After Treatment	p
TBUT (sec)	LLLT	4.27 ± 4.23	5.37 ± 3.26	0.002
	ILPT	4.26 ± 4.11	4.23 ± 4.49	0.988
MMP-10 (µg)	LLLT	3.9 ± 3.6	3.4 ± 3.4	0.002
	ILPT	4.3 ± 4.4	4.4 ± 3.7	0.807
MMP-10 (µg)	LLLT	3.2 ± 3.0	3.0 ± 3.4	0.763
	ILPT	3.2 ± 3.4	3.4 ± 3.4	0.807
D (mm)	LLLT	1.4 ± 0.7	1.4 ± 0.4	0.002
	ILPT	1.4 ± 0.7	1.2 ± 0.7	0.102
MGD (mm)	LLLT	7.0 ± 1.0	7.0 ± 1.1	0.807
	ILPT	7.0 ± 1.0	7.0 ± 1.0	0.807
MGD (mm)	LLLT	7.0 ± 1.0	7.0 ± 1.0	0.807
	ILPT	7.0 ± 1.0	7.0 ± 1.0	0.807

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Tearing due to: Upregulated inflammatory cascade
Rapid TBUT and ocular surface desiccation

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	ILPT	7.0 ± 1.0	7.0 ± 1.0	0.807
MGD (mm)	LLLT	7.0 ± 1.0	7.0 ± 1.0	0.807
	ILPT	7.0 ± 1.0	7.0 ± 1.0	0.807

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Tearing due to:

Lash ptosis

Spontaneous eversion with upward traction

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Tearing due to:

Inflammation

Mechanical trauma when lid is everted during sleep

Giant papillae

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Tearing due to:

Inflammation

Irregular surface

Mechanical trauma when lid is everted during sleep

NEEDS EVALUATION FOR OSA

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Tearing due to:

Inflammation

Allergic conjunctivitis

Itch is a key feature

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Surface irregularities

Toxic effects

Dry Eye

Tear Osmolarity and Tear Film Parameters in Patients With Unilateral Pterygium

Munshi, Ghanta, MD, Rama Anand, MD, Sevil K. Entezar, MD, Golden Galibelli, MD, Sallie M. Koozekan, MD, and Abhinav Mehta, MD

Parameter	Eye With Pterygium	Other Eye	Mean Difference	P*
Tear osmolality (mOsm/L)				
Mean ± SD	307 ± 12	294 ± 12	15 ± 14	<0.001
Range	281-330	270-326		
Median	308	292		
Schirmer test (mm)				
Mean ± SD	14.8 ± 9.2	16.2 ± 7.2	1.2 ± 5.2	>0.05
Range	2-35	3-30		
Median	13	15		
Central staining				
Mean ± SD	1.2 ± 1.1	0.4 ± 0.8	0.9 ± 0.9	<0.001
Range	0-4	0-4		
Median	1	0		
Conjunctiva/robness				
Mean ± SD	0.9 ± 0.9	0.4 ± 0.7	0.8 ± 1.8	<0.001
Range	0-3	0-3		
Median	1	0		
TBUT (s)				
Mean ± SD	10.3 ± 3.4	12.3 ± 4.4	2.2 ± 4.4	<0.001
Range	2-22	3-33		
Median	10	12		

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Surface irregularities

Toxic effects

Dry Eye

Topical glaucoma drops

Toxic effects on corneal epithelium can stimulate tear production

Active ingredient	U.S. brand name	Preservative free
Glaucoma medications		
Bimatoprost 0.03%	Lumigan	0.1% Purite
Travoprost 0.004%	Travatan Z	0.01% Purite
Timolol 0.5%	Timoptic	Timoptic XE, timolol gel, or generic timolol
Timolol 0.5%	Timoptic	0.0125% timolol gel
Timolol 0.5%	Timoptic	Individual ampules of timolol solution
Timolol 0.5%	Timoptic	Individual ampules of timolol solution with benzalkonium bromide preservative
Dry eye medications		
Lipid-based emulsion of Omega-3 fatty acids	Preservative free	
Cyclosporine 0.05%	Preservative free	
Polyvinyl alcohol 1.4%	Preservative free	

management of the tearing patient

UCLA Stein Eye Institute


eyelid ocular surface **lacrima**l

Punctal stenosis
Canalicular disease
Nasolacrimal duct

Etiopathogenesis of primary acquired nasolacrimal duct obstruction (PANDO)
 Mohammad Javed Ali¹
Assistant Professor, Department of Ophthalmology, UCLA Medical Center, Los Angeles, California

ABSTRACT

Primary acquired nasolacrimal duct obstruction, or PANDO, is a common adult lacrimal drainage disorder. The current treatment modality of dacryocystorhinostomy to bypass the obstructed nasolacrimal duct has excellent outcomes. However, the understanding of the disease etiology remains to be clarified. There are not many studies that specifically assessed any hypothesis or even that consistently put forth the proposed or confirmed interpretations regarding the PANDO pathogenesis or the mechanisms of primary acquired disease. Some pathological evidence points to recurrent inflammation of the nasolacrimal duct, subsequent fibrosis, and the resulting obstruction. The disease etiology is considered multifactorial. Several implicated aspects include anatomical narrowing of the bony nasolacrimal duct, vascular factors, local hormonal imbalance, an orbital influence, nasal abnormalities, autoimmune dysregulation, infections, hormonal dysfunction, genetic susceptibility, tear protein, and damaged local host defenses. The present work reviewed the literature on the etiopathogenesis of primary acquired nasolacrimal duct obstruction (PANDO) to gain insight into the disease and state of the understanding and the high-value translational implications of precisely decoding the disease etiology.



management of the tearing patient

UCLA Stein Eye Institute

eyelid ocular surface lacrima

Skin Surface irregularities Punctal stenosis

Orbicularis Toxic effects Canalicular disease

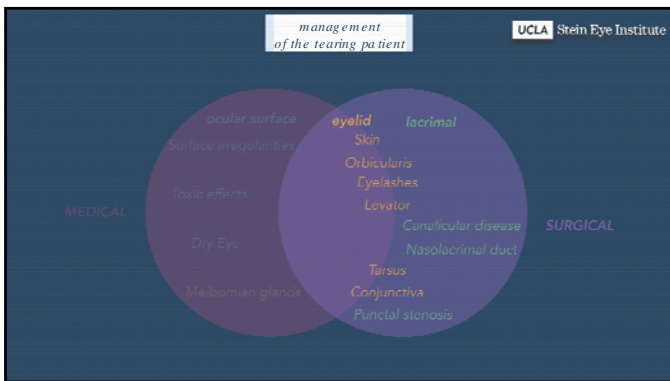
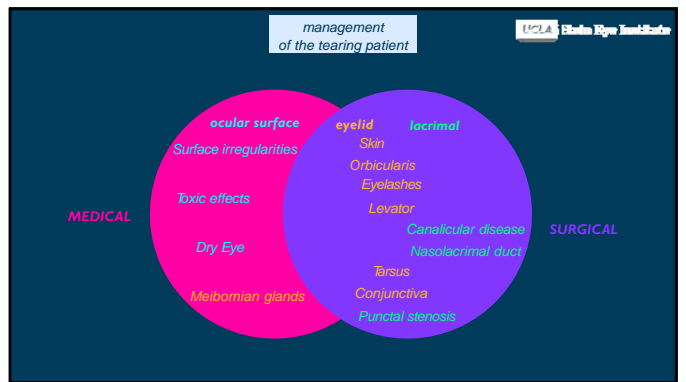
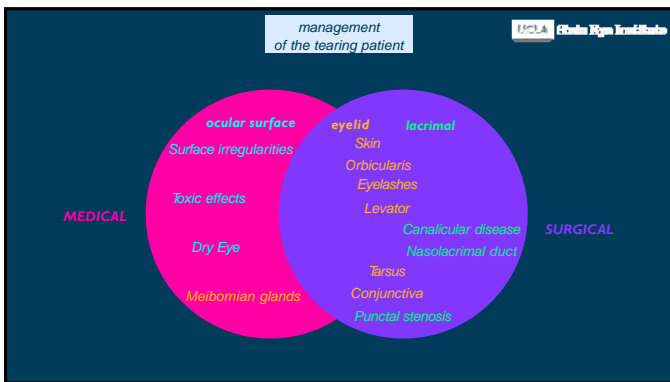
Eyelashes Dry Eye Nasolacrimal duct

Levator

Meibomian glands

Tarsus

Conjunctiva



management of the tearing patient

UCLA Stein Eye Institute

SURGICAL

eyelid correction of lid malposition ectropion entropion retraction

Skin
Orbicularis
Eyelashes
Levator
Tarsus
Conjunctiva

lacrima
Canalicular disease
Nasolacrimal duct
Punctal stenosis



Midface lift + lateral tarsal strip

management of the tearing patient

UCLA Stein Eye Institute

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eyelid correction of lid malposition

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management of the tearing patient

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TED with right upper eyelid retraction post retraction surgery

management of the tearing patient

UCLA Stein Eye Institute

SURGICAL

eyelid correction of lid malposition

- Skin
- Orbicularis
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- lacrimal
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TED with right upper eyelid retraction post retraction surgery

Right CN VII palsy post mid-face lift and lower lid fascia sling

management of the tearing patient

UCLA Stein Eye Institute

SURGICAL

eyelid correction of mid-directed lashes

- Skin
- Orbicularis
- Eyelashes
- Levator
- Tarsus
- Conjunctiva

- lacrimal
- Canalicular disease
- Nasolacrimal duct
- Punctal stenosis

A B C

management of the tearing patient

UCLA Stein Eye Institute

SURGICAL

eyelid correction of significant lid laxity

- Skin
- Orbicularis
- Eyelashes
- Levator
- Tarsus
- Conjunctiva

- lacrimal
- Canalicular disease
- Nasolacrimal duct
- Punctal stenosis

management of the tearing patient

UCLA Stein Eye Institute

SURGICAL

eyelid

lacrimal canalicular incision and curettage

- Skin
- Orbicularis
- Eyelashes
- Levator
- Tarsus
- Conjunctiva

- Canalicular disease
- Nasolacrimal duct
- Punctal stenosis

management of the tearing patient


UCLA Stein Eye Institute

SURGICAL

eyelid
Skin
Orbicularis
Eyelashes
Levator
Tarsus
Conjunctiva

lacrimal

dacryocystorhinostomy



Canalicular disease
Nasolacrimal duct
Punctal stenosis

management of the tearing patient

UCLA Stein Eye Institute

SURGICAL

eyelid
Skin
Orbicularis
Eyelashes
Levator
Tarsus
Conjunctiva

lacrimal

punctoplasty

Kelly punch punctoplasty vs. simple punctal dilation, both with mini-monoka silicone stent intubation, for punctal stenosis related epiphora

Hila Goldberg¹, Ayellet Priel¹, Ofra Zlotse¹, Tali Koval¹, Lipaz Verker¹, Guy J. Ben Simon¹

Characteristic	Dilation and MM	KP-assisted punctoplasty and MM	P
N	36	24	
Gender			
Male	6	10	NS ^a
Female	20	14	
Age (±SD) years	60 (±11)	61 (±13)	NS ^b
VA	20/25	20/25	NS
ROP (±SD) mmHg	15 (±3)	14 (±2)	NS
Munk score			
Munk pre Tx.	4.9	4.3	0.01
Munk 3 months post Tx.	1.7	1.0	NS
Munk 1 year post Tx.	1.9	1.2	NS
Delta at 1 year post Tx.	3.0	3.1	NS
P value (twotail)	<0.005	<0.005	

Canalicular disease
Nasolacrimal duct
Punctal stenosis

management of the tearing patient

UCLA Stein Eye Institute

ocular surface

eyelid

lacrimal

Surface irregularities

Toxic effects

Dry eye

Meibomian glands

Orbicularis

Conjunctiva

Canalicular disease

Eyelashes

Nasolacrimal duct

Levator

Tarsus

Punctal stenosis

Etiology AND approach to management are OFTEN multifactorial

management of the tearing patient

UCLA Stein Eye Institute

ocular surface

eyelid

lacrimal

Surface irregularities

Toxic effects

Dry eye

Meibomian glands

Orbicularis

Conjunctiva

Canalicular disease

Eyelashes

Nasolacrimal duct

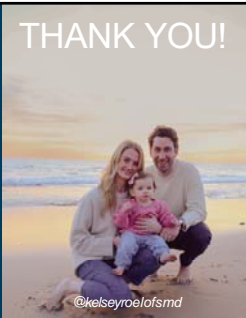
Levator

Tarsus

Punctal stenosis

In many instances, stepwise approach is reasonable

THANK YOU!



@kelseyrolofsmid

Email: kelseyrolofsmid@gmail.com

Cell: 424-299-0885

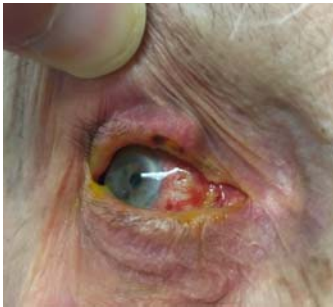
UCLA Center for Eye Health

Ocular Surface Tumors and the Adnexa: A Combined Approach

WENDY W. LEE, MD
 PROFESSOR OF CLINICAL OPHTHALMOLOGY & DERMATOLOGY
 OCULO-FACIAL PLASTIC & RECONSTRUCTIVE SURGERY
 BASCOM PALMER EYE INSTITUTE
 UNIVERSITY OF MIAMI MILLER SCHOOL OF MEDICINE

Financial Disclosures

- ▶ Consultant:
 - ▶ Allergan
 - ▶ Galderma
 - ▶ Revance
 - ▶ Evolus
 - ▶ RVL
 - ▶ Horizon
 - ▶ Tarsus
 - ▶ Viridian
 - ▶ RoC
 - ▶ Novabay



Treatment of Ocular Surface Tumors

- ▶ Gold Standard:
 - ▶ No touch surgical excision with 2 - 4mm margins
 - ▶ Rapid resolution
 - ▶ Provides a diagnosis
 - ▶ Risk of scarring, symblepharon, limbal stem cell deficiency
 - ▶ Cryotherapy to edges of conjunctiva
 - ▶ *and* skin if involved
 - ▶ High recurrence rate on the conjunctiva
 - ▶ 31% with positive margins
 - ▶ 14% with negative margins
 - ▶ Decreased by chemotherapy and cryotherapy

Treatment of Ocular Surface Tumors

- ▶ Chemoreduction preoperatively with topical or injectable
 - ▶ 5 fluorouracil
 - ▶ Interferon α 2b
 - ▶ Mitomycin C

Topical Chemotherapy

- ▶ Treats the entire ocular surface
 - ▶ Subclinical disease
 - ▶ May defer the need for surgery
 - ▶ Less stressful
 - ▶ More time
 - ▶ Out of pocket expenses

Topical Chemotherapy

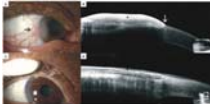
- ▶ Tumor extension into sclera or Bowman's layer
 - ▶ Surgical excision
 - ▶ Can us topical as neoadjuvant or chemo-reduction before surgery
- ▶ May not adequately treat the adnexa
 - ▶ Depending on involvement of anterior vs posterior eyelid
 - ▶ Surgical treatment often needed for the adnexal component regardless of topical chemotherapy

5- Fluorouracil

- ▶ Interrupts DNA replication and cell growth
- ▶ 1% eye drops compounded and stored at RT
- ▶ CID x 1 week
- ▶ 3-week break
- ▶ Repeat until resolution (about 4 cycles)
- ▶ High resolution rates: 82 – 100%
- ▶ Low recurrence rates: 10 – 11%
- ▶ Can be injected subconjunctival or perilesional but more studies need to be done
- ▶ Relatively low cost: \$50/cycle
 - ▶ Less in other countries
 - ▶ Not often covered by insurance because compounded

5-Fluorouracil

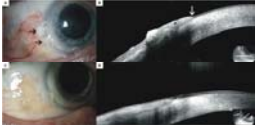
- ▶ Well tolerated with minimal side effects
 - ▶ Pain, tearing, redness, eyelid edema and keratopathy
- ▶ Minimize side effects:
 - ▶ Copious lubrication with preservative-free artificial tears
 - ▶ Short term topical steroids prn
 - ▶ Occlude punctum after application to decrease risk of punctal stenosis
 - ▶ Lubricate lower eyelid skin



Medical treatment for ocular surface squamous neoplasia
Morrey D, Semano A, Galar A, Karp CJ. Eye 37: 885-893 (2023).

Interferon alpha-2b

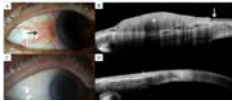
- ▶ Naturally occurring protein produced by immune cells
- ▶ Antiviral, antimicrobial and anti-neoplastic properties
- ▶ Can be used as topical eye drops or subconjunctival / perilesional injections
- ▶ High resolution rates for topical: 81 – 100%
- ▶ Low recurrence rates for topical: 0 – 4%
- ▶ Topical eye drops:
 - ▶ 1 million IU/mL solution
 - ▶ CID until resolution (about 12 weeks)
 - ▶ Another treatment 1 – 3 mos after resolution
 - ▶ Recommend refrigeration
- ▶ Well tolerated – ‘Angel Drops’
- ▶ Must be compounded so usually not covered by insurance
- ▶ \$800/month in US



Medical treatment for ocular surface squamous neoplasia
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Interferon alpha-2b - Injections

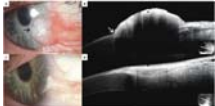
- ▶ High resolution rates for injections: 87 – 100%
- ▶ 3 million IU/mL in a 0.5 mL solution
- ▶ Once weekly
- ▶ Or 10 million IU/mL in 0.5 mL given monthly



- ▶ Well tolerated
- ▶ Can have mild flu-like symptoms for 24 hours after injection
 - ▶ 1 gram acetaminophen at time of injection and q 4 hours x 1 day
- ▶ Injections usually covered by insurance
 - ▶ Not compounded

Mitomycin C

- ▶ Antimetabolite isolated from *Strep caesepitosus*
- ▶ Antineoplastic and antibiotic properties
- ▶ 0.02 – 0.04% strengths
 - ▶ Found no difference in time to resolution or recurrence between both concentrations
- ▶ Resolutions rates 79 – 100%
- ▶ Low recurrence rates 0 – 15%
- ▶ 4 week cycles of 0.04% qid x 1 week, 3 week vacation
- ▶ Compounded
- ▶ Generally not covered by insurance
- ▶ \$100 - \$190 in US



Medical treatment for ocular surface squamous neoplasia
Morrey D, Semano A, Galar A, Karp CJ. Eye 37: 885-893 (2023).

Mitomycin C

- ▶ Intense side effects – ‘gota del diablo’
 - ▶ Redness, itching, tearing, pain, corneal erosion, hyperemia, punctate staining, punctal stenosis, limbal stem cell deficiency
 - ▶ Use of steroids and AT help alleviate
 - ▶ Punctal plugs to prevent stenosis
 - ▶ Petroleum jelly to skin

Alternative Topical Treatments

- ▶ Programmed cell death-inhibitors
 - ▶ Anti-PD1 and anti-PDL-1
 - ▶ Programmed death-1 suppresses anti-neoplastic activities of T cells
 - ▶ Checkpoint inhibitors have shown potential in SCCA of the head, neck, esophagus and anal canal, some BCCA
 - ▶ Has been studied in conjunctival SCCA with orbital extension
 - ▶ Very expensive

Alternative Topical Treatments

- ▶ Retinoic Acid
 - ▶ Anti-neoplastic
 - ▶ Used in conjunction with interferon alfa-2b
 - ▶ 0.01% qod
 - ▶ \$75/5mL
 - ▶ Well-tolerated

Alternative Topical Treatments

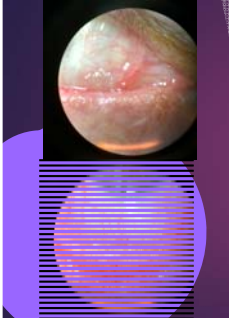
- ▶ Anti-vascular endothelial growth factor
 - ▶ Blocks angiogenic factor that is upregulated by neoplastic cells
 - ▶ Topical 5mg/mL bevacizumab qid x 8 weeks
 - ▶ Subconjunctival 0.05mg/mL ranibizumab 1 – 2 x per month
 - ▶ Some successes, some no to minimal response
 - ▶ Well-tolerated but may have delayed corneal healing in epithelial defects

Alternative Topical Treatments

- ▶ Aloe Vera
 - ▶ Immunomodulatory, anti-inflammatory, antiparasitic, UV protective, antioxidant, antiviral, antidiabetic and anti-neoplastic
 - ▶ \$25
 - ▶ Only 1 case report of complete resolution of OSSN after 3 mos of applying concentrated topical aloe vera eye drops

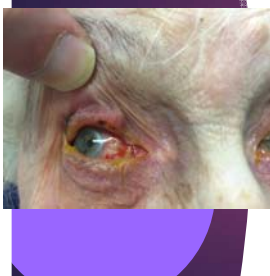
Anterior Segment High Resolution OCT

- ▶ Identifies OSSN as thickened, hyper-reflective epithelium with an abrupt transition from normal to abnormal tissue
- ▶ Can detect subclinical OSSN in 17% of cases that were determined to be resolved clinically
 - ▶ Especially useful for monitoring progression of OSSN treatment with topical chemotherapy
 - ▶ Can be considered during surgery to detect surgical margins




- ▶ 70 yo male from Costa Rica who reported having a biopsy of the right conjunctiva and right lower eyelid
 - ▶ Path slides reviewed → OSSN od and SCCA RLL
 - ▶ Had already been treated with IFN x 2 mos
 - ▶ At presentation, no evidence of obvious lesion RLL
- ▶ Finished 4-month course of IFN without evidence of recurrence
- ▶ Map biopsies performed x 17 → metaplasia and inflammation

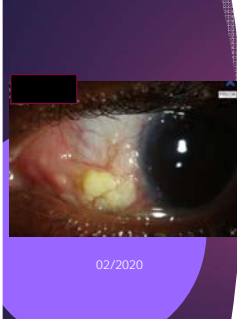
- ▶ 4 years later he comes back from Costa Rica with a RLL chalazion
- ▶ Biopsy
 - ▶ SCCA
 - ▶ s/p Mohs with Hughes doing well
- ▶ Ocular surface managed medically
- ▶ Adnexa required surgical excision



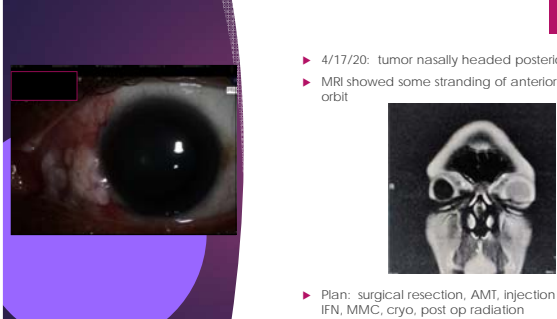
- ▶ 102 yo WF with sebaceous cell carcinoma
 - ▶ Right upper eyelid
 - ▶ 3 o'clock, semilunar fold OD from pagetoid spread
- ▶ Would need an orbital exenteration as a life-saving procedure, but patient did not want surgery
- ▶ Plan:
 - ▶ Radiation + topical chemo
 - ▶ Consider checkpoint inhibitors



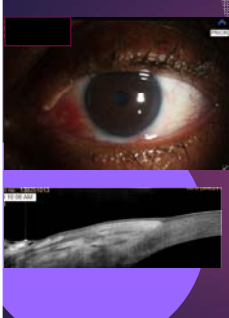
- ▶ 54 yo AA male
- ▶ Double lung transplant for COPD, asthma and pulmonary hypertension
- ▶ HIV+
- ▶ Enucleation OD 4/08/11 secondary to ruptured globe from rock hitting eye in 2010
- ▶ November 2019 presented with redness OS



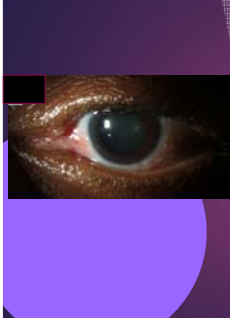
- ▶ 1/28/20 started 5FU x 2 cycles
 - ▶ Increase in size
- ▶ 2/25/20 started MMC x 4



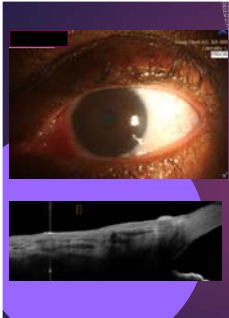
- ▶ 4/17/20: tumor nasally headed posteriorly
- ▶ MRI showed some stranding of anterior orbit
- ▶ Plan: surgical resection, AMT, injection of IFN, MMC, cryo, post op radiation



- ▶ 4/2020 s/p surgical resection, multi-layered AMT
- ▶ MMC x 2
- ▶ 9/2020 much improvement




- ▶ 1/2021
- ▶ MMC x 3 cycles: 1 week on and 2 weeks off




- ▶ 3/2021
- ▶ Returned with small mass nasally
- ▶ Refused treatment



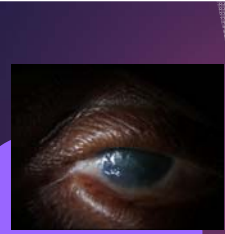
- ▶ 8/2021
- ▶ Returned with hard mass nasally
- ▶ Refused treatment



- ▶ MRI September 2021 confirmed orbital involvement
- ▶ 10/12/21: Presented to Tumor Board to recommend Next Generation Gene Sequencing
- ▶ 10/20/21: Cisplatin 40 mg/m2 started
- ▶ 10/25/21: Recommended pembrolizumab, (-) PD-L1



- ▶ 11/15/21: Started XRT to left orbit of 66.15 Gy in 35 fractions
- ▶ 11/22/21: Cycle #2 cisplatin
- ▶ 12/16/21: d/c cisplatin due to elevated creatinine
- ▶ 12/30/21: started Carboplatin
- ▶ Held Carboplatin #2 with surgery of lower abdominal pain, fatigue and weakness



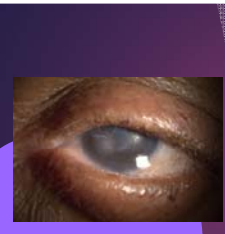
07/2022

- ▶ Biopsy of conjunctiva NEGATIVE!!
- ▶ PET Scan → no uptake in orbit
- ▶ Plan
 - ▶ Re-biopsy if growth
- ▶ 08/2022
 - ▶ Corneal lesion improved
 - ▶ Biopsy deferred because of lung infection



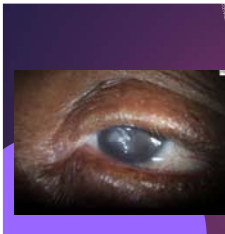
06/2023

- ▶ 06/2023
 - ▶ Va decreased with KED
 - ▶ Inferonasal epithelial thickening
 - ▶ Cannot treat until KED healed
 - ▶ Plan for biopsy
- ▶ 07/2023
 - ▶ Biopsy of conjunctival lesion



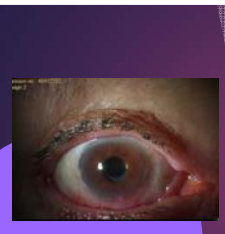
08/2023

- ▶ 08/2023
 - ▶ Positive for CIN
 - ▶ Restart MMC



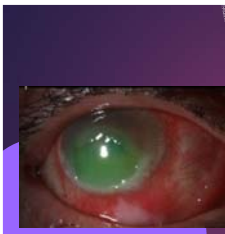
10/2023

- ▶ 10/2023
 - ▶ Improvement in appearance of lesion
 - ▶ Refused ocular imaging
 - ▶ Plan for map biopsies but lost to f/u



90 yo WF with OSSN OD

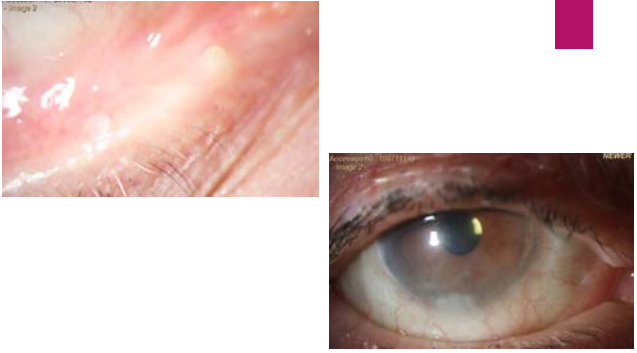
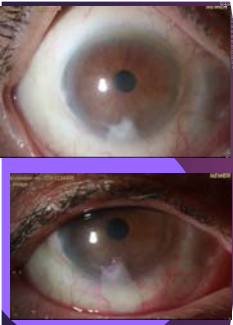
- ▶ Extension to RLL tarsal conj and margin
- ▶ Plan:
 - ▶ Pre-op 5FU
 - ▶ En bloc resection of RLL with bulbar conj
 - ▶ Reconstruct with Hughes and AMT for ocular surface and fornix



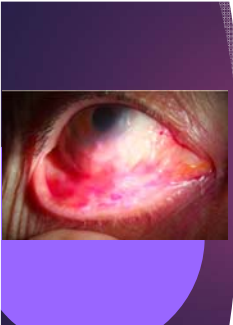
- ▶ Completed 2 cycles of 5FU
- ▶ During 3-week med vacation she was using a topical CBD oil on the eye and skin
- ▶ Presents with tumor resolution, but large KED so needs to stop 5FU until resolved
- ▶ Treatment dilemma: great response with 5FU but corneal toxicity



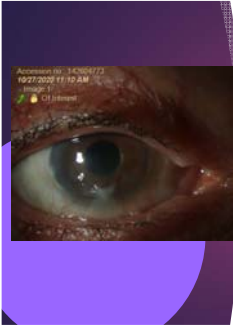
- ▶ 5FU injection 25 mg x 4 inferiorly to tongue of remaining tumor
- ▶ Great response but still with tumor at 6 o'clock


- ▶ PDT
 - ▶ Rose Bengal x 30 min followed by green light (10 mW/cm²) for 9 min over cornea and another 9 min over tarsal conj and eyelid margin, PDT
- ▶ No improvement but stable




- ▶ Discussed IFN injection, but unlikely to address eyelid lesions
- ▶ Plan for surgical resection
- ▶ Postponed due to COVID



- ▶ Worsening lesion
- ▶ Surgical excision:
 - ▶ Resection of conjunctival lesion and RL, cryo to all edges, reconstruction with AMT and Hughes with adjacent tissue transfer
- ▶ 12/2020
 - ▶ Second stage Hughes with injection of IFN into inferior fornix

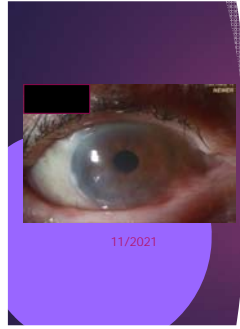


- ▶ 5/2021
 - ▶ Symblepharon progressing
 - ▶ Excision, cryo, limbal stem cell transplant, conjunctival autograft and MMG



07/2021

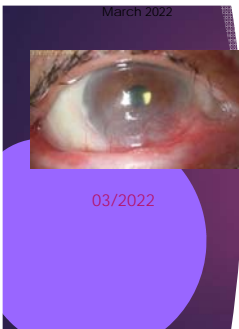
- ▶ 8/18/21
 - ▶ Biopsy of suspicious lesion
 - ▶ CIN
- ▶ Subconjunctival injection of IFN x 4



11/2021

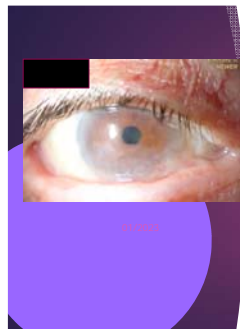
- ▶ Map biopsies 1 month later
 - ▶ CIN sup/nasal, inferior tarsus and fomix
- ▶ Opted for IFN injections
 - ▶ 3 million units/0.5cc x 2 Jan 2022

March 2022




03/2022

- ▶ Map biopsies 3/30/22
 - ▶ CIN nasal and central tarsus
 - ▶ 5FU injection 25mg x 4 subconj
 - ▶ Will continue until 6 injections then rebiopsy
 - ▶ Finished injections 07/2022
- ▶ Biopsy 08/2022
 - ▶ Dysplasia



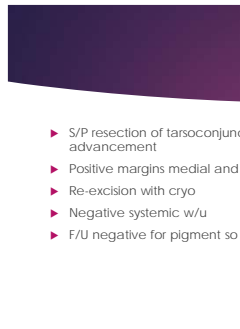
08/2022

- ▶ Plan for residual CIN
 - ▶ Full excision with conj autograft & SLET from OS
 - ▶ MMG for forniceal reconstruction
- ▶ Lost to f/u



08/2022

- ▶ 64 yo WF present with pigment RLL
 - ▶ Previous biopsy 4 years prior reportedly PAM without atypia
- ▶ Rebiopsy confirmed melanosis



08/2022

- ▶ S/P resection of tarsoconjunctiva, cryo to edges, conjunctival advancement
- ▶ Positive margins medial and lateral
- ▶ Re-excision with cryo
- ▶ Negative systemic w/u
- ▶ F/U negative for pigment so far

Ocular Surface + Adnexal Tumors

Summary

- ▶ Often require topical chemotherapy **and** surgical excision with reconstruction
 - ▶ Pre-operative chemoreduction
- ▶ Tend to be much more aggressive and can progress to orbit
- ▶ If orbital involvement, may need post-operative radiation treatment and/or systemic chemotherapy
- ▶ Surgical Excision
 - ▶ Globe-sparing if appropriate
 - ▶ Orbital exenteration if life-saving
- ▶ Long term follow up to check for recurrence

