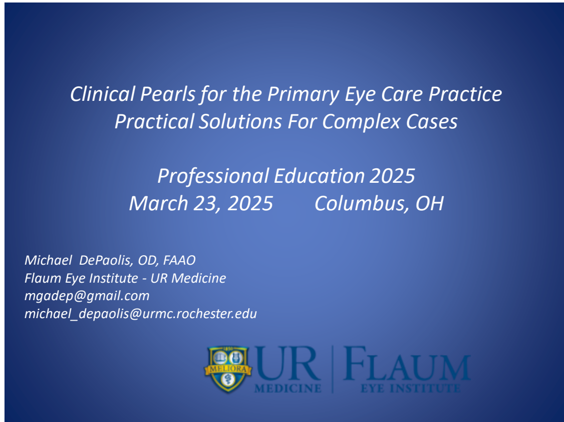

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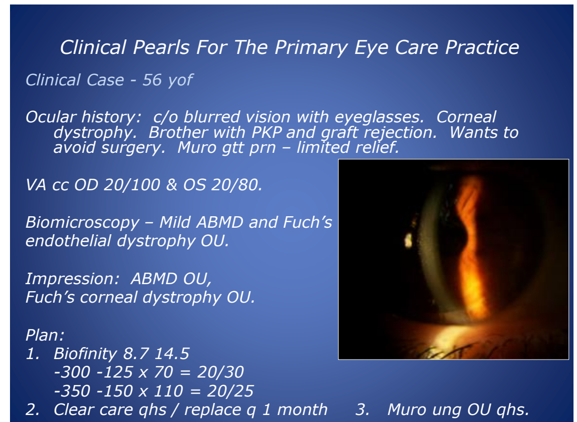
Clinical Pearls for the Primary Eye Care Practice

Clinical pearls are best defined as small bits of free standing, clinically relevant information based on experience or observation. They are part of the vast domain of experience-based medicine, and can be helpful in dealing with clinical problems for which controlled data do not exist.

Lorin, etal Med Teach 2008.

3



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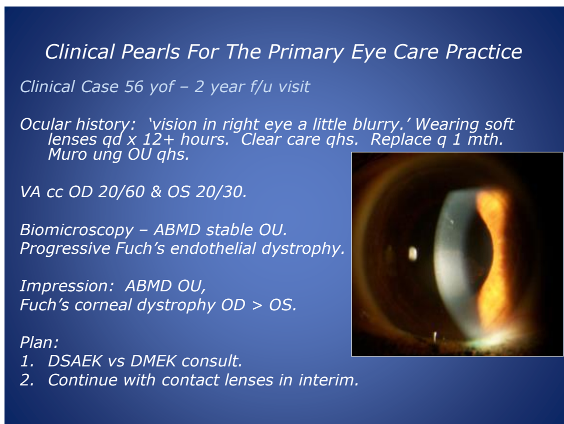

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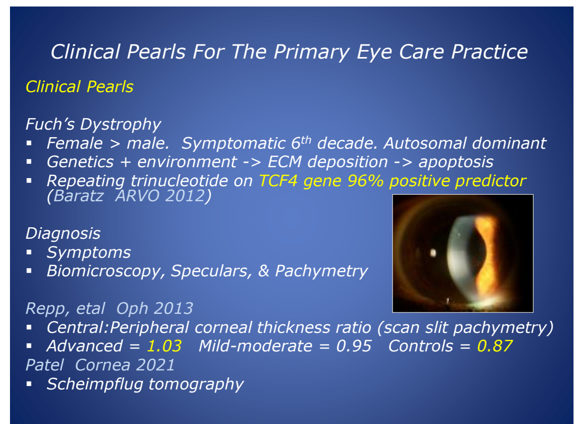

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Clinical Pearls For The Primary Eye Care Practice

Clinical Pearls

Muro 5% ung vs FreshKote qhs?
- Muro 128 – 5% NaCl hyperosmotic
- FreshKote – PVA:Povidone creating high osmotic gradient

DSAEK vs DMEK?
- Majmudar Oc Surg News 2014
- DMEK quicker recovery, less rejection, better BCVA, & less + Rx shift
- Weisenthal, etal Am J Oph 2022
- N = 128 eyes DMEK vs DSAEK with 2 yr follow-up
- DMEK faster recovery, but vision similar @ 2 yr

DMEK vs UT-DSAEK?
- Dunker, etal Ophth 2020
- N = 54 pseudophakes with Fuch's randomized to DMEK vs UT-DSAEK
- BCVA 20/25+ DMEK 66% vs UT-DSAEK 33%. Less + Rx shift in DMEK.

Do we even need donor tissue … DSO?

Garcerant, etal Curr Op Oph 2019
- Clearing in 63-100% cases with DSO across all series
- Rho-kinase inhibitor (ripasudil) adjunct critical

Din, etal Cornea 2022
- Ovid, Embase, & Cochrane database search
- DSO success … 4 mm rhexis, good peripheral ECD, thinner central pachymetry, and adjunct Rho- kinase inhibitor

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Clinical Pearls For The Primary Eye Care Practice

Clinical Case - 63 yof

Ocular History: Successful monovision soft CL wear.
C/O dryness, blurred vision, and contact lens intolerance.
"I think my dryness is due to my medications"

Contact Lens History: Biofinity Toric SCL. ReNu qhs. Rep q2 mth .

Systemic History: HTN, hypo-T, Non-smoker small cell lung CA.

Medications: Amlodipine, levothroxyine, & Tarceva. NKDA.

Exam:
- VA OD cc 20/60 & OS cc 20/50
- Pupils, motilities, & CVF's normal OU
- IOP's 14 OU
- DFE: Normal disc, macula, vessels, periphery OU

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Clinical Pearls For The Primary Eye Care Practice

Clinical Case - 63 yof

Refraction:
- OD - 1.25-0.75x180 / +2.25 = 20/25
- OS - 2.00-0.50x170 / +2.25 = 20/40

Biomicroscopy: Mild MGD, mild conjunctival injection, coalesced SPK, & TBUT 3-5 sec. Grade 1 NS OU.

Tear Osmolarity 308 mOsm/L OD & 319 mOsm/L

Impression: Tear deficient & evaporative dry eye (likely iatrogenic)

Plan:
- Environment, hydration, & omega 3's
- Hot compress qd x 5 minutes
- Systane Hydration PF qid,
- Lotemax gel bid,
- Precision 1 toric OD / no lens OS

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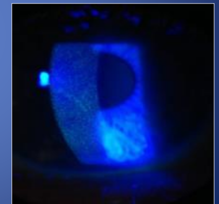
Clinical Pearls For The Primary Eye Care Practice

Clinical Case - 63 yof

2 week follow-up:

Ocular History: Compliant with all treatments. Right eye feels much better and is much clearer. Left eye still symptomatic.

VA: OD scl 20/25 (D) & OS sc J3 (N)



Biomicroscopy: Mild MGD OU,
trace injection OS > OD,
trace SPK OD & coalesced SPK OS,
AC d&q, iris normal, grade 1 NS

Plan:
- Hydration and omega 3s
- Hot compress qd x 5 minutes
- Systane Hydration PF qid
- Precision 1 toric OD & Precision 1 +050 OS

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Clinical Pearls For The Primary Eye Care Practice

Clinical Pearls

Just what is Tarceva?
- Erlotonib is an EGFR inhibitor approved for pancreatic cancer and metastatic non-smoker small cell lung cancer

Tyrosine Kinase Inhibitors
- Erlotonib (Tarceva)
- Gefitinib (Iressa)
- Afitinib (Gilotrif)
- Osimertinib (Tagrisso)

Monoclonal Antibodies
- Cetuximab (Erbitux)
- Panitumimab (Vectibix)
- Necitumumab (Portrazza)

EGFR Side Effects
- Common – Xerosis, alopecia, paronychia, mucositis
- Serious – SJS-TEN, Hepatotoxicity, Interstitial Lung Disease

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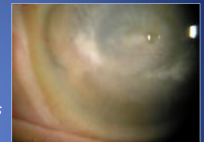
Clinical Pearls For The Primary Eye Care Practice

Clinical Pearls

Ocular Sequelae of Tarceva



- Borkar, etal Sup Care Cancer 2013
- Dry Eye
  - Blepharitis and trichiasis
  - Corneal abrasions and sterile melts
- Sun, etal J Clin Pharm (2018)
  - Ocular side effects dose dependent
  - Erlotinib > 150mg per day

What are reasonable adjunct treatments?
- Punctal plugs
- Cyclosporin, Lifitigrast, Loteprednol, Varenicline, Perfluorohexyloctane
- Amniotic membrane
- Bandage Contact Lenses (Inamoto, etal Biol Blood Marrow Transplant 2015)

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Clinical Pearls For The Primary Eye Care Practice

Clinical Case - 35 yof

Ocular History: Dx of 'forme fruste' keratoconus 3 months prior. Intolerant to GPCL. Resumed SCL wear. C/O blurry and cloudy VA. Eyes burn & tear after lens removal.

Contact Lens History: Acuvue Oasys OU. OptiFree Replenish qhs. No rub, no rinse. Replaces q 2-3 mths.

Systemic History: Excellent. No medications. NKDA.

Exam: VA OD cc 20/30 & OS cc 20/70 (spectacles)
Pupils, motilities, and CVF's normal OU
IOP's: 12mm Hg OU
DFE: Normal disc, macula, vasculature, periphery OU

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Clinical Pearls For The Primary Eye Care Practice

Clinical Case - 35 yof

Refraction: OD -4.25-0.75 x 100 = 20/20-
OS -5.00-0.50 x 50 = 20/25

Simulated Keratometry: OD 43.78 x 44.35 @ 48
OS 43.70 x 44.48 @ 7

Keratoconus Indices:

Negative OD
Negative OS

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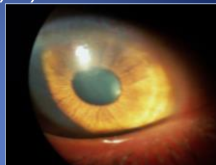
Clinical Pearls For The Primary Eye Care Practice

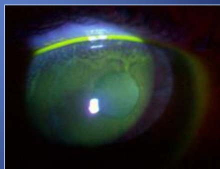
Clinical Case - 35 yof

Biomicroscopy:

Moderate MGD OU
Mild conjunctival injection OU
Superior limbal haze OU
Negative wetting whorl epitheliopathy
AC d&q OU
Iris normal OU
Lens clear OU

Pachymetry:
545u OD
538u OS





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Clinical Pearls For The Primary Eye Care Practice

Clinical Case - 35 yof

Impression: MGD evaporative dry eye OU
CL related limbal stem cell deficiency OU

Plan:
- Discontinue contact lenses
- Lotemax gel OU qid x2 wk, bid x2 wk
- Bruder Mask OU qd
- Blink PF OU qid
- 1000 mg fish oil qd (EPA/DHA)
- 500 mg Vitamin C bid
- F/U 1 mth

1 month f/u
CC: eyes feel much better. VA stable. No burning or tearing.

VA OD cc 20/20 OS cc 20/25
Biomicroscopy: Fading stromal haze OU. Improved ocular wetting OU.

Plan:
- Continue Bruder mask qhs, omega 3s, and Blink PF qid
- Eventual refit Alcon Dailies Total 1 8.5 -4.50 OD & -4.75 OS

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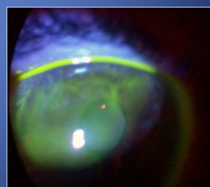
Clinical Pearls For The Primary Care Practice

What is Limbal Stem Cell Deficiency (LSCD) ?

- Corneal epithelial stem cells are within the Palisades of Vogt
- Stem cells progressively differentiate and migrate centrally (transiently amplifying-> migratory basal -> wing -> surface)
- Corneal "homeostasis" Landage , etal Inv Oph & Vis Sci 2003.
- Limbal stem cell function is modulated by developmental, hormonal, neuronal, vascular and inflammatory factors

LSCD caused by ….
Congenital Diseases
Infection
Inflammation
Immune disorders
Trauma (contact lens)
Chemical, thermal, radiation burns



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Clinical Pearls For The Primary Care Practice

Clinical Pearls

Contact Lens induced LSCD
- 2.5% of all contact lens wearers (Martin Clin Exp Optom 2007)
- Bilateral - most often superior limbus with whorl epitheliopathy
- Conjunctival goblet cells on cornea via impression cytology

Termote, etal Can J Oph 2017
N = 27 eyes with CL related LSCD
- All soft lenses / 75% Si-Hy lenses
- Mean wear time 18.1 years
- PF topical steroids & PF AT gtt

Kim, etal Ophth 2014
- N = 22 eyes with CL related LSCD
- 18% resolved with CL discontinuation and PF OTC AT's
- 82% required topical steroids, topical cyclosporin, topical vitamin A, oral doxycycline, punctal plugs

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Clinical Pearls For The Primary Eye Care Practice

How is LSCD best managed ?

Partial LSCD
- Lubrication
- Anti-inflammatory agents (corticosteroid, cyclosporin, lifitigrast)
- Vitamin A ung – Optase HyloNight PF (250 IU/g Retinol Palmitate)
- Amniotic Membrane
  - Cryopreserved vs Dehydrated
- Autologous serum or Platelet Rich Plasma
  - Hussain, etal Cornea (2014) "Reasonable in severe disease"
- Topical Interferon a-2b and ATRA
  - Tan, etal B J Opth 2016

Total LSCD Fernandez, etal BMJ Open Ophth 2018
- direct autologous limbal (AULT) – risk to contralateral eye ?
- direct allogenic limbal (ALLT) – donor and immunosuppressive ?
- oral mucosal epithelial transplantation – 50-70% successful
- cultured AULT and ALLT – 75-84% successful

Lee, etal JAMA 2020
- Meta-analysis of 40 studies – 2202 eyes
- Improved ocular surface: AULT = cAULT > cALLT > ALLT
- Improved vision: AULT > cAULT = ALLT > cALLT

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Clinical Pearls For The Primary Eye Care Practice

Clinical Case - 44 yof

Ocular History:
Referred by corneal specialist
Previously wore soft contact lenses, but d/c due to dryness
Previous OTC: Refresh, Systane, & TheraTears
Previous Rx: Pred Forte & Alrex
Current eye gtt: Pataday ou bid, Restasis ou bid, fish oil daily

Cc: 'I get eye hemorrhages monthly.' I'd like to get back into wearing contact lenses if possible'.

Systemic History: +Anxiety. (-) Thyroid. (-) Rheumatology. (-) hematology work-up.
Medications: Fluoxetine qd, Fish oil qd.

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Clinical Pearls For The Primary Eye Care Practice

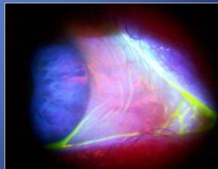
Clinical Case - 44 yof

VA: OD Rx 20/20- & OS Rx 20/20.

Externals: (+) malar flush

Biomicroscopy:
Grade 3 MGD OU
Grade 2 conjunctivochalsis OU
Grade 1 conjunctival LG stain OU
Cornea clear with TBUT 8-10 sec OU
Tear prism <0.5mm OU

Impression:
- MGD
- Combined DED
- Rosacea (ocular)
- Subconjunctival hemorrhage (Menstrual related ?)



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Clinical Pearls For The Primary Eye Care Practice

Clinical Case - 44 yof

Plan:
- Spoke with ob-gyn – r/o causes for menorrhagia
- Doxycycline 50 mg bid
- Bruder Mask OU bid
- Nordic Naturals ProOmega – 2 softgels po qd
- Lotemax gel OU bid
- Pataday OU qam
- Restasis OU bid

1-month follow-up
Doing much better symptomatically
Biomicroscopy: improved MGD, LG staining, & TBUT.
Conjunctivochalasis persists.

Plan:
- Discontinue Lotemax gel
- Continue all other treatments
- 1-month follow-up

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Clinical Pearls For The Primary Eye Care Practice

Clinical Case - 44 yof

2 month follow-up
CC: 'doing great, no hemorrhages.'
VA: OD Rx 20/20 & OS Rx 20/20.

Biomicroscopy:
Gr 1 MGD OU
Gr 1 conjunctivochalasis w/o lissamine green staining OU
Cornea clear with TBUT ~ 10 seconds OU

Plan:
- Continue hot compress OU qd
- Continue Restasis OU bid & Pataday OU prn
- Continue ProOmega qd
- Doxycycline 50 mg qd x 1 mth, then discontinue
- BioTrue Daily Disposable

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Clinical Pearls For The Primary Eye Care Practice

Clinical Pearls

Is conjunctivochalasis the "demon in the closet?"

Acera, etal Invest Ophth Vis Sci 2013
- N = 12 eyes conjunctival resection conjunctivochalasis
- Less epithelial defects, epiphora, and symptoms
- Improved matrix metalloproteinase 9 levels

Yamamoto, etal Eye Cont Len 2015 epub
- N = 362 pts with subconjunctival hemorrhage (SCH)
  - Conjunctivochalasis + visual demands = 3+ SCH
- N = 38 pts conjunctivochalasis (CCh) surgery for SCH
  - 80+% no SCH recurrence after surgery

Is low dose corticosteroid a reasonable adjunct?
- Lotemax SM (0.38% loteprednol)
  Pflugfelder AJO 2004 – loteprednol safe & effective for inflammatory DE
- Dextenza (0.4mg dexamethasone punctal plug)
  FDA approval for post-op adjunct time release over 30 days
- Flarex (0.1% fluorometholone acetate, Harrow)
  Pinto-Fraga AJO 2016 – FML improves dry eye and buffers flares
- Eysuvis (0.25% loteprednol)
  Korenfeld, etal Cornea 2021 – Safety / efficacy in managing dry eye

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Clinical Pearls For The Primary Eye Care Practice
Clinical Pearls

Is a low dose oral contraceptive acceptable in recurrent menstrual cycle subconjunctival hemorrhage?

Dua, etal Ophth Plast Reconstr Surg 2014
- Case of 'vicarious orbital menstruation' responded favorably to oral contraceptives

What else to keep in mind?
- Anti-coagulative medications
- Clotting conditions
  - Hemophilia
  - von Willebrand disease
- Platelet disorders
  - Thrombocytopenia purpura
- Blood malignancies
  - Leukemia

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Clinical Pearls For The Primary Eye Care Practice
Clinical Pearls
- Meibomian Gland Thermal Therapy
  - LipiFlow (J&J) Thermal Pulse Tx (J&J LipiFlow)
    Blackie, etal Clin Oph 2016
    LipiFlow superior to HC - 86% maintain up to 1 year
  - I-Lux (Alcon) – comparable to LipiFlow @ 1mth Merchea AAO 2019
  - Tear Care (Sight Sciences) – Olympia Trial clinicaltrials.gov
    Badawi Clin Ther 2019 – TearCare superior to HC. Retx @ 6mth
  - IPL + MGX – effective in refractory MGD Arita, etal Oc Surf 2019
- Immunomodulation
  - IMPACT Study Stonecipher, etal Clin Oph 2016
    Restasis bid x 6 month - OSDI, staining, TBUT, & visual scores
  - OPUS-1 Sheppard, etal Oph 2014
    Xiidra bid – improved SPK & LG stain (day 14) & symptoms (day 84)
  - OTX-1 Study Tauber, etal Clin Oph 2018
    Cequa - improvements in corneal & conjunctival stain, & Schirmer's
  - ESSENCE-2 Study Wirta, etal Cornea 2024
    Vevye – improvements in corneal staining, Schirmer's, & symptoms

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Clinical Pearls For The Primary Eye Care Practice

Clinical Case – 62 yof

Ocular History: Reis-Buckler's corneal dystrophy.
PTK OD 2006 and OS 2007 with repeat OU in 2014.
c/o intermittent irritation, photophobia, and blurred VA.
Systemic History: Excellent. No medications. NKDA.
Family History: Mother and Daughter with Reis-Buckler's.

VA OD cc 20/70 & OS cc 20/80 (spectacles)
Pupils, motilities, and CVF normal OU
IOP's: 12mm Hg OU
DFE: Normal disc, macula, vasculature, periphery OU

OD +1.00-1.00 x 25 = 20/70
OS +1.00-1.00 x 165 = 20/80-

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Clinical Pearls For The Primary Eye Care Practice
Clinical Case – 62 yof

Biomicroscopy: Recurrent Reis-Buckler's Corneal Dystrophy OU

Contact Lens Tx:

Biofinity Toric 8.6
OD +1.25-0.75x40 = 20/40
OS +0.50-0.75x140 = 20/50-

Clear Care qhs
Monthly replacement
Polysporin ung OU qhs prn

Pachymetry 653u OD and 743u OS.

Next step??

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Clinical Pearls For The Primary Eye Care Practice
Clinical Case – 62 yof

Biomicroscopy: Recurrent Reis-Buckler's Corneal Dystrophy OU

PTK OU 2023

BCVA OD 20/50 & OS 20/50+

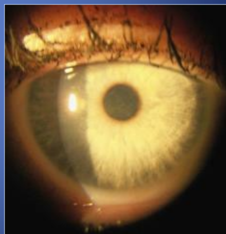
Biomicroscopy:

Reis-Buckler's Corneal Dystrophy with improved corneal clarity OU.

2+ Nuclear Sclerotic Cataract OU.

Next step??

Phaco + IOL OU vs PKP followed by CE



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Clinical Pearls For The Primary Eye Care Practice
Clinical Pearls

What is Reis-Buckler's Dystrophy and prognosis?
- Autosomal Dominant with symptoms onset 2nd decade of life
- Early symptoms of RCE and foreign body
- Later symptoms of photophobia and blur
- Changes primarily at Bowman's and anterior stroma ??

Qui, etal BMC Ophth 2016
- RBCD linked to mutation of TGFBI gene
- TGFBI-protein greatest in stroma
- Confocal microscopy, AS-OCT, and histology – deep stroma!

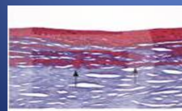

image courtesy of aao.org

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Clinical Pearls For The Primary Eye Care Practice

Clinical Pearls …. PTK or DALK or PKP?

Vinciguerra, etal J Ref Surg 2018
- N = 14 RBCD eyes treated with sequential customized PTK
- m BCVA improved from 20/50 to 20/25
- N = 2 eyes required repeat surgery over 5 yr follow-up

Qui, etal BMC Ophth 2016
- N = 4 RBCD eyes treated with DALK w/o recurrence to date

Reddy, etal Cornea 2015
- N = 109 PKP eyes and 21 DALK eyes over 1 year
- DALK less endothelial graft rejection & glaucoma

Chan, etal Can J Oph 2018
- N = 1104 consecutive corneal transplants @ KEI over 3 years
- 80% lamellar surgeries
- DALK increasing and PKP decreasing

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Clinical Pearls For The Primary Eye Care Practice

Case study – 40 yof

Ocular History
- c/o dryness OU and foreign body sensation OS x 3 years.
- chalazion removal LUL 3 years ago with symptoms ever since.
- LUL swells and droops. Recent neuro-eye consult negative.
- Xiidra bid. TheraTears prn. Hot compress. Omega 3's daily.
- Systemic History: Negative. No meds.

Exam:
UCVA: 20/20- OD & 20/20 OS.
Externals: Pupils, motilities, and CVF normal OU.
IOP 19 OD and 19 OS.

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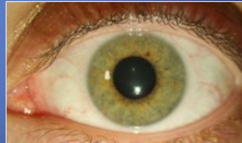
Clinical Pearls For The Primary Eye Care Practice

Case study – 40 yof

Biomicroscopy:
- Trace MG inspissation OU.
- No tarsal foreign body on LUL eversion.
- Conjunctiva clear with weak tear prism.
- Trace inferior SPK OU. TBUT 3-5 seconds OU. No ABMD.

Diagnosis: Bilateral Dry Eyes

Plan:
- Continue Xiidra OU bid.
- Continue TheraTears OU bid.
- Bruder Mask daily x 5 minutes.
- GNC TS Fish Oil Mini bid.
- Lotemax gel OS qhs
- 1-month follow-up



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Clinical Pearls For The Primary Eye Care Practice

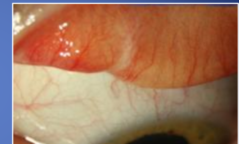
Case study – 40 yof

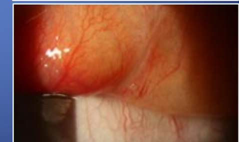
1- month follow-up:
- Symptoms improved with Lotemax gel, but now worse again.
- Compliant with all other tx.

Biomicroscopy:
- Unchanged.
- Tarsal fissure LUL.
- No staining or fb track

Impression: Bilateral Dry eyes
Tarsal Fissure LUL

Plan:
- Continue all dry eye tx
- Totals Dailies 1 8.5 -0.25 OS.
- Schedule oculoplastics consult.





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Clinical Pearls For The Primary Eye Care Practice

Clinical Pearls

- Tarsal conjunctival keloids rare
  - D'Hermies, etal J Fr Oph 2003
  - Lim & Son SpringerPlus 2016
- Management
  - Bandage Contact Lens
    - Ung qhs
  - Triamcinolone injection
  - Surgical Revision
    - amniotic membrane graft
    - mitomycin C
- Other sources of tarsal fibrosis
  - Papillary conjunctivitis
  - Vernal conjunctivitis
  - Conjunctival lithiasis
  - Pyogenic granuloma
  - Cicatricial Ocular Pemphigoid

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Clinical Pearls For The Primary Eye Care Practice

Thank you for attending!

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