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From Vision to Ocular Surface Rehabilitation: A Paradigm Shift in Scleral Lens Prescribing

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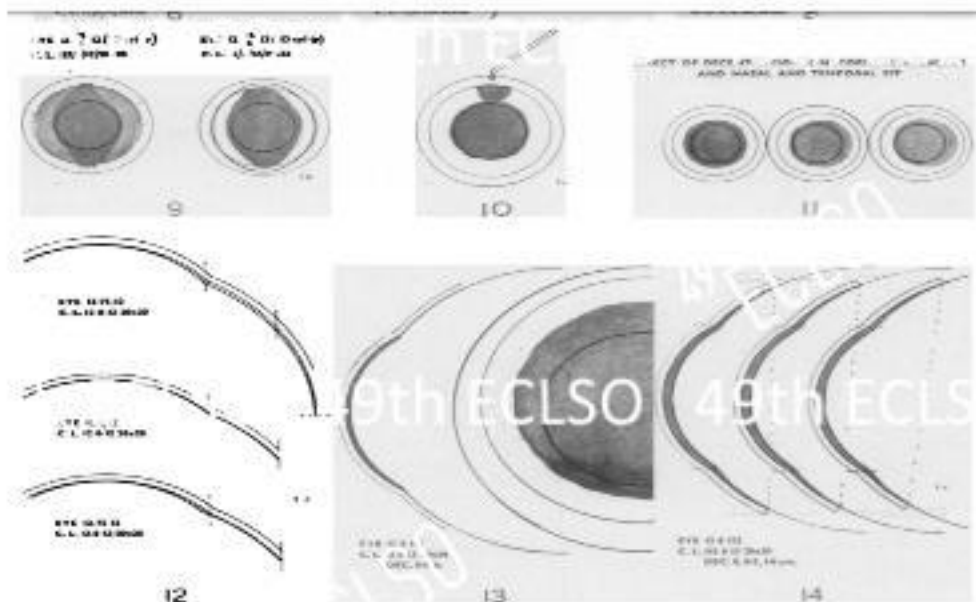
No financial disclosures

“The Role of Contact Lenses and Shells”

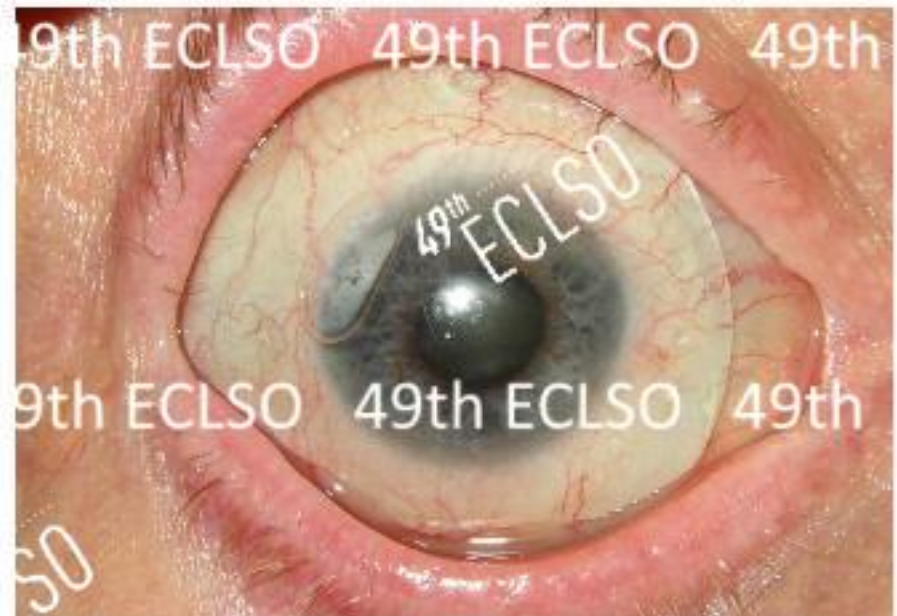
“To protect the eye from drying; to separate the conjunctival surfaces and to afford a mechanical barrier to irritation of the globe and cornea by ingrowing lashes, or rough tarsal plates”

“To secure comfort for the patient leading to a steady clearing of the cornea”

Frederick Ridley 1946



FREDERICK RIDLEY. Recent Developments in the Manufacture, Fitting and Prescription of Contact Lenses of Regular Shape.



Sccleral Lenses Status: From Optical to Therapeutic

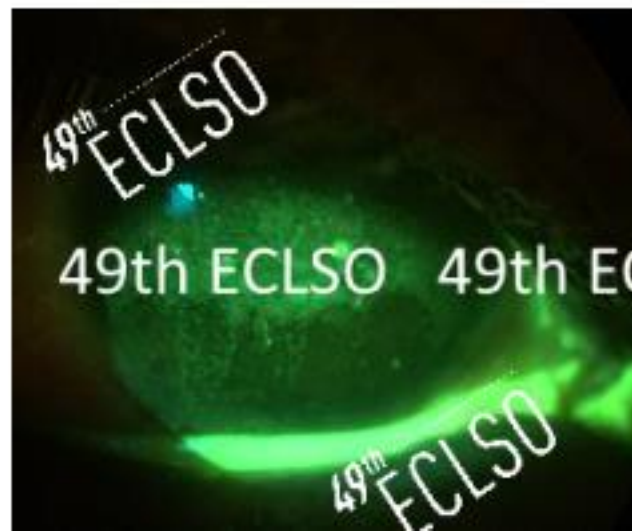
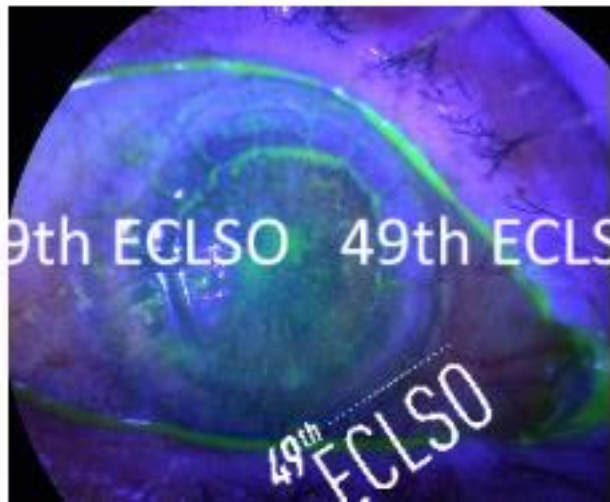
Do we see an increase in therapeutic applications???

The status of scleral lenses for ocular surface disease (OSD)

- Tan, Pullum and Buckley, 1995 – OSD 6.4%
- Pullum and Buckley, 1997 - ocular surface disorders 8.2%
- Segal et al, 2003- dry eye and exposure 9.2%
- Nau et al, 2018 – OSD 16%

Methods

- Retrospective records review: Emory University Department of Ophthalmology, Specialty Lens Service, March 2018 to April 2019
- 183 patients (281 eyes) fitted with scleral contact lenses (SCL)
- Indications: Visual Rehabilitation and Therapeutic use in OSD
- Success rates among various OSD conditions investigated



Results

- 94 eyes (**33.5 %**)!!! were fitted for OSD management
- Remaining 187 eyes – Irregular Cornea (IC): KC, post RK, K scarring, etc.
- OSD group 51 patients (**32F/19M**) mean age **56±19.8** years, range (5-89)
- Irregular cornea group (**68F/64M**) mean age **45±17.5** years
- Wearing times and removal/reinsertion breaks:
 - OSD 10 h/day with 1.7 breaks
 - IC group >12 h/day , 0.6 removal breaks



Results - Indications

- **Severe Dry Eye/ K-Sicca** of autoimmune etiology:
38 eyes (12 eyes with confirmed Sjogren's, RA, etc.)
- **Graft-Versus-Host Disease (GVHD)** 18 eyes
- **Neurotrophic Keratitis (NK)** 15 eyes
- **Ocular Cicatricial Pemphigoid (OCP)** 11 eyes
- **Stevens-Johnson syndrome (SJS)** 6 eyes

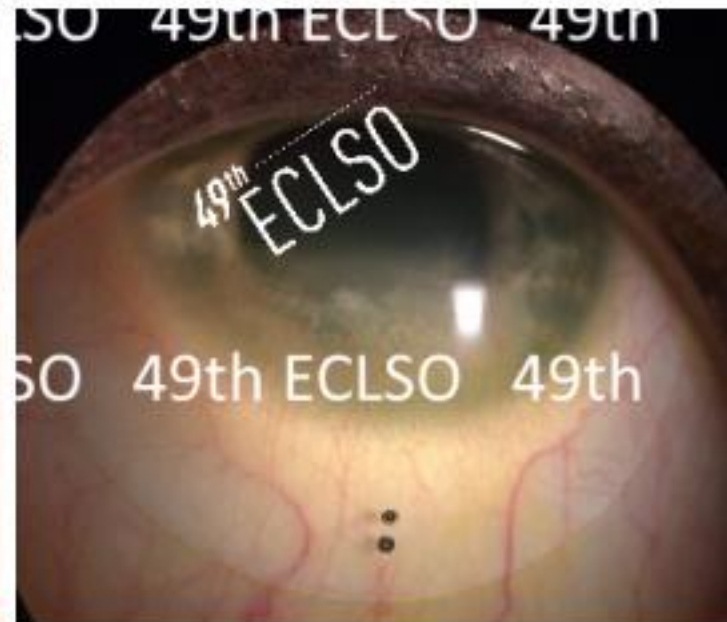


Results – Success Rates

- 88% of eyes fitted for ocular surface indications responded well to therapy and continued scleral lens wear
- Highest success rates were recorded in OCP (98%), GVHD (86%), and NK (80%) groups
- Visual acuity among OSD patients improved from 20/80 to 20/30 SCL corrected (range, 20/400 to 20/20)
- **In 3 patients with OCP temporal Tarsorrhaphy was removed**
- 20 % of referrals were from non-ophthalmology providers (oncology, rheumatology, dermatology, etc.)

Exposure Keratitis

- Multifactorial: CN palsies, post blepharoplasty, muscle atrophies...
- Inferior exposure with Epithelial compromise, KNV, Scarring
- Desiccation contributes to irregular surface → decreased VA
- **Scleral lens to rescue = surface protection + VA improvement**



Incomplete Closure – Corneal Exposure

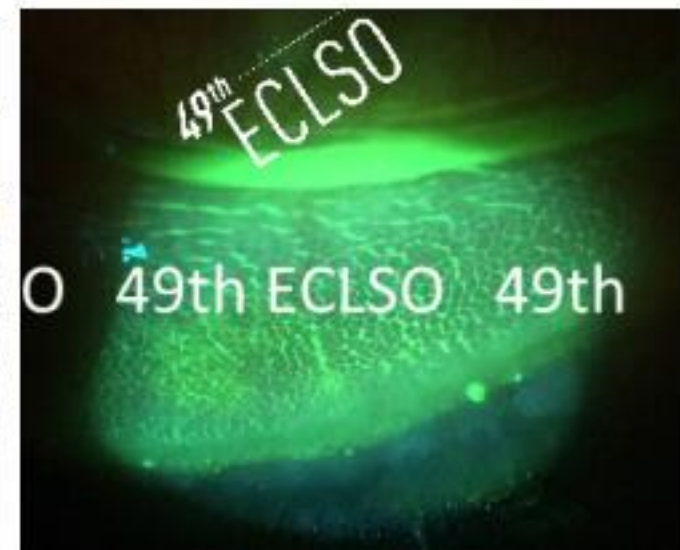
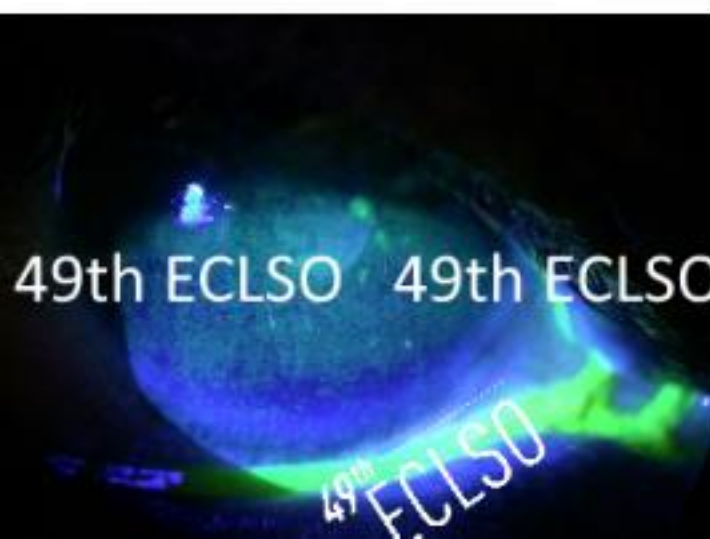
- 61 yof, s/p Rt. Acoustic Neuroma removal, hearing loss, OS Deep Amblyopia (high myopia)
- Incomplete closure → gold weight implantation → constricted VF → gold weight removal → Severe Exposure Keratopathy
- Options → Tarsorrhaphy vs Scleral Lens

2 MONTHS AFTER STARTING SCLERALS



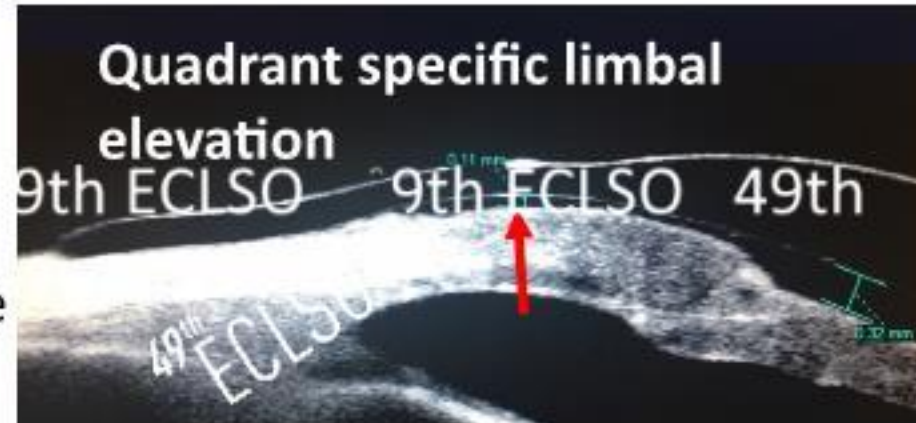
Keratoconjunctivitis Sicca

- Keratoconjunctivitis of autoimmune origin vs Sicca Syndrome (Sjogren's)
- First line therapy: Anti-inflammatory/Immunosuppressants
- Ancillary therapy: Scleral Lenses, MGD/Eyelid therapy (Lipiflow, IPL)
- SCL should be started after the acute phase is under control
- Lack of physiological fit may complicate the condition



Neurotrophic Keratitis

- 71 yof, s/p Accoustic Neuroma removal
- NK → MK → central scarring
- Underwent PK in 2016, exposure K, graft failure
- Repeated PK 2017, Tarsorrhaphy, VA FC5 ft
- Compromised surface, severe PEK
- Complex graft geometry (oblate) → Started Scleral lenses, clear graft, 20/25!
- 03/2019 tarsorrhaphy removed → Happy with vision and cosmetics



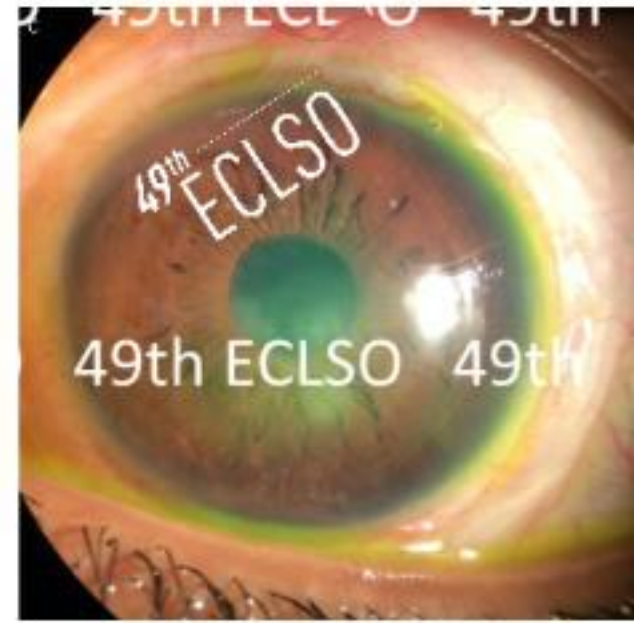
Corneal Melt

- GVHD/RA related corneal melt
- Restasis, Serum tears, prophylactic Ab, tear substitutes)
- Surface protection therapies (Scleral Lenses, AMT, tarsorrhaphy)
- Progressive thinning → Corneal gluing
- Resumed Scleral lenses, good corneal coverage and fit, VA 20/30+



Corneal Neurotization for NK

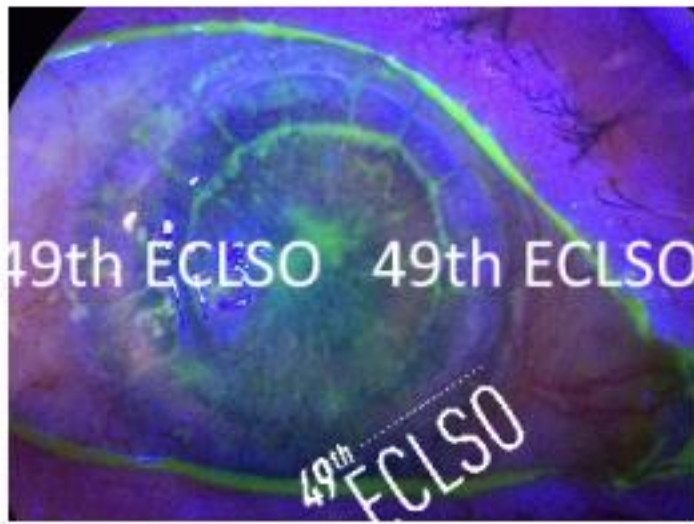
- 35 yof, NK s/p intracranial tumor removal
- Complete absence of corneal sensation, impaired blink reflex, exposure K
- 6 mo after K neurotization sensitivity restored to 20% → needs SCL
- Complex scleral architecture → elevated nerve transplant contour
- Insufficient limbal gutter may compromise preformed SCL fitting
- Custom 13.80 mini-scleral, full corneal coverage, BCVA 20/30



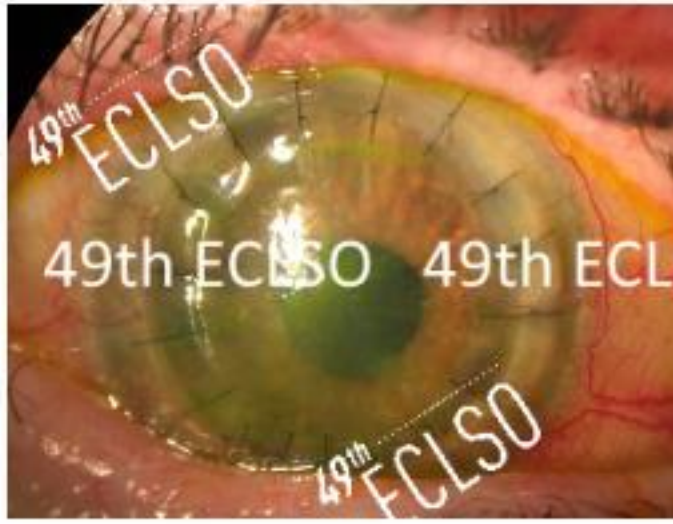
Persistent Epithelial Defect

- 78 yof, RA, Neurotrophic cornea, PK for perforated corneal ulcer
- Failed graft, Persistent ED for >4mo
- Failed BCL and serum tears. Refuses tarsorrhaphy, VA FC 3 FT
- Re-graft in setting of NK vs Scleral Lenses ???

1 week with SCL , closing ED



3 w, healed ED, hypertrophic epi



5 weeks, BCVA 20/100



Conclusions

- Higher penetration rates of SCL for OSD management (33.5% this study)
- Patients with severe inflammatory conditions (GVHD/OCP) are most appreciative of SCL benefits
- Increased awareness of therapeutic SCL benefits among other specialties: Dermatology, Oncology, Rheumatology
- This knowledge allows timely referrals and might save sight in many cases

Thank You for Your Attention!

Ocular Cicatricial Pemphigoid (OCP)

- Chronic, progressive, systemic autoimmune condition → Blinding disease
- Incidence 1 :8000, ages 50-60, females ↑
- Severe ocular surface inflammation, conjunctival fibrosis and keratinization, symblepharon and intractable trichiasis
- PED → Infectious Keratitis → Scarring or Perforation → Vision loss
- **Compromised scleral alignment**

