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POSTER program

The European Society of Contact Lenses and Ocular Surface

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Tear MMP-9 Changes After Corneal Cross-Linking in Patients with Keratoconus

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Purpose

To evaluate tear matrix metalloproteinase-9 (MMP-9) levels in keratoconus (KC) patients after accelerated corneal cross-linking (A-CXL).

Methods

This prospective study included 21 eyes of 21 KC patients who underwent epi-off A-CXL with 9 mW/cm² UVA irradiation. Tear samples were collected preoperatively and at postoperative months 3 and 6 using Schirmer strips. MMP-9 was quantified by ELISA. Corneal tomography parameters (K1, K2, Kmean, Kmax, and thinnest corneal thickness [TCT]) were recorded at each visit. Ocular surface assessment included the Ocular Surface Disease Index (OSDI) and noninvasive tear break-up time (NI-BUT).

Results

The mean age was 23.7 ± 3.0 years; 7 patients were female (33.3%) and 14 were male (66.7%). KC stages were stage 1 in 4.8% (n=1) of eyes, stage 2 in 38.1% (n=8) of eyes, stage 3 in 9.5% (n=2) of eyes, and stage 4 in 47.6% (n=10) of eyes. The median tear MMP-9 levels, along with the mean OSDI scores and NI-BUT values, are presented in Table 1. MMP-9 did not differ at month 3 compared with preoperative values (p=0.161) but was significantly lower at month 6 (p=0.010). K2, Kmean, and Kmax decreased at month 6 compared to baseline. TCT decreased at month 3 but was similar to preoperative values at month 6. OSDI scores and NI-BUT values improved after A-CXL.

Table 1. Tear MMP-9 Levels, OSDI Scores, and NI-BUT Values Before and After Accelerated Corneal Cross-Linking

	Tear MMP-9 levels Median (IQR)	OSDI score Mean ± SD	NI-BUT values Mean ± SD
Preoperatively	21.84 ng/ml (IQR 11.95–68.91)	35.84 ± 22.79	9.71 ± 4.53
Post-op month 3	19.56 ng/ml (IQR 8.31–31.99)	17.52 ± 21.90	13.32 ± 3.79
Post-op month 6	14.52 ng/ml (IQR 3.39–27.04)	6.95 ± 7.20	13.40 ± 3.91
p values	0.011	<0.001	0.003

Conclusion

Tear MMP-9, an inflammatory biomarker, was reduced at 6 months after A-CXL. Additionally, there was an improvement in ocular surface symptoms, increased tear film stability, and corneal flattening.

Visual Function and Optical Quality During Scleral Lens Wear in Eyes with Keratoconus

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Purpose

To evaluate the impact of scleral lenses (SLs) on higher-order aberrations (HOAs), corrected distance visual acuity (CDVA), and contrast sensitivity (CS) in eyes with keratoconus.

Methods

Twenty-six keratoconic eyes were fitted with SLs.. CDVA (logMAR) and CS (Pelli–Robson) were measured prior to SL wear and after 30 minutes, 4 hours, and 8 hours of SL wear.

HOAs (the root mean square [RMS] of HOAs, coma, trefoil, and spherical aberration) and point spread function (PSF) metrics were recorded using Sirius corneal tomography with the SL on-eye at each time point.

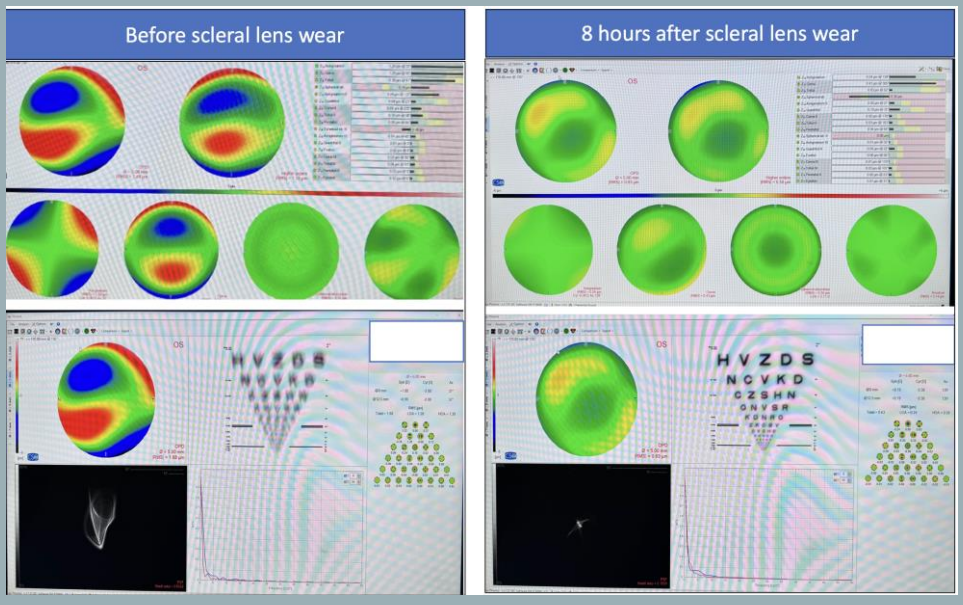

Figure 1. Representative case showing a reduction in higher-order aberrations and improvement in point spread function 8 hours after scleral lens wear .

Results

The mean age was 23.0 ± 6.6 years. Mean keratometry values were: K1; 48.39 ± 4.01 D, K2; 53.20 ± 4.83 D, Km; 50.59 ± 3.97 D, and Kmax; 58.23 ± 5.10 D.

Baseline CDVA was 0.44 ± 0.23 logMAR and baseline CS was 0.52 ± 0.21. CDVA and CS improved, and remained stable at all post-wear time points.

At 30 min, total HOA-RMS, coma, and trefoil decreased compared with baseline, PSF improved, and spherical aberration did not change. HOAs and PSF measurements at 4 and 8 hours were comparable to the 30-min values. (Figure 1)

Conclusion

SL wear improved visual performance in keratoconic eyes. Optical quality remained stable over 8 hours of SL wear, with reduced HOAs.

Clinical Outcomes of Sub400 Protocol and Contact Lens–Assisted Corneal Cross-Linking in Keratoconus with Thin Corneas

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Purpose:

To compare the clinical outcomes of the sub400 protocol and contact lens–assisted corneal cross-linking (CACXL) in keratoconus patients with thin corneas.

Methods:

This retrospective study included 41 keratoconic eyes with intraoperative pachymetry <400 µm: 18 treated with CACXL and 23 with the Sub400 protocol. Tomographic parameters and BCVA were assessed preoperatively and at the 2-year follow-up. Progression was defined as a ≥1.0 D increase in Kmax, regression as a ≥1.0 D decrease, and changes <1.0 D as stability.

CACXL[2]

A riboflavin-soaked soft contact lens was applied to increase intraoperative pachymetry above 400 µm, followed by accelerated UVA irradiation at 9 mW/cm² for 10 minutes.

Results:

Sub400 protocol was associated with significant reductions in K2, Kmean, and Kmax and improvement in BCVA, whereas CACXL showed significant reductions in K1, K2, Kmean, and Kmax with stable BCVA and TCT. The magnitude of Kmax change was comparable between groups.

In the Sub400 group;

52.2% of eyes showed regression and 47.8% remained stable.

In the CACXL group,

61.1% of eyes showed regression, 33.3% remained stable, and 5.6% progressed.

- No complications were observed in either group.

Sub400 protocol[1]

Minimum Stromal Required Thickness (mm)	UV Irradiation Duration (min)
200	1
210	01:20
220	01:40
230	2
240	02:30
250	3
260	03:30
270	4
280	5
290	6
300	7
310	9
320	10
330	12
340	14
350	16
360	18
370	20
380	23
390	26
400	29

Conclusion: In keratoconus eyes with thin corneas, both the Sub400 protocol and CACXL achieved comparable stabilization at 2-year follow-up, with no observed complications.

1- Hafezi F, Kling S, Gilardoni F et al. Individualized Corneal Cross-linking With Riboflavin and UV-A in Ultrathin Corneas: The Sub400 Protocol. Am J Ophthalmol. 2021 Apr;224:133-142.

2- Jacob S, Kumar DA, Agarwal A et al. Contact lens-assisted collagen cross-linking (CACXL): A new technique for cross-linking thin corneas. J Refract Surg. 2014 Jun;30(6):366-72.

Meibomian Gland Alterations in Keratoconus Patients After Corneal Cross-Linking

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Purpose

To evaluate the changes in the meibomian glands (MGs) and ocular surface parameters after corneal cross-linking (CXL) in keratoconus patients.

Methods

Forty-eight eyes of 48 keratoconus patients that underwent epi-off CXL were included in this prospective study. Upper and lower lid MGs were assessed with non-contact meibography at preoperatively, 1st, 3rd, 6th, and 12th month after CXL. Uncorrected distance visual acuity (UCVA), corrected distance visual acuity (BCVA), spherical equivalent (SE), and corneal tomography findings (K1, K2, Kmean, and Kmax) were recorded at each visit. Ocular surface staining score (Oxford grade), ocular surface disease index (OSDI) questionnaire, and non-invasive tear break-up time (NI-TBUT) were evaluated at preoperatively and 12 months after CXL.

Results

K1, K2, Kmean, and Kmax were decreased at post-operative 12th month compared to baseline UCVA, BCVA, and SE did not change between preoperatively and post- operative 12 months NI-TBUT showed similarity between pre-operative and 12 months values (p=0.180), while OSDI scores significantly decreased (p<0.001). MG loss in the upper and lower lids did not show significant difference compared to pre-operative values at any of the follow-up visits. (Table 1 and Figure 1)

Table 1. The meibomian gland morphological alterations at follow-ups

	Upper lid MG loss percentage	**Lower lid MG loss percentage**
Pre-operative	10.51±8.05	3.19±1.69
1st month	10.45±7.85	3.12±1.64
3rd month	10.80±8.10	3.08±1.56
6th month	10.84±8.17	3.14±1.65
12th month	10.53±7.96	3.11±1.58
p	0.121	0.117

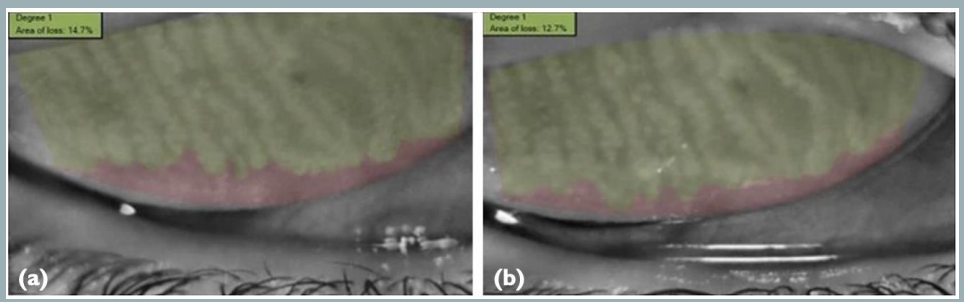

Figure 1. Representative images of meibomian glands in the upper lids of a patient obtained by meibography **(a)** before cross-linking and **(b)** 12 months after cross-linking.

Conclusion

CXL treatment did not significantly affect the NI-TBUT and MGs morphology, while improving ocular symptoms.

Ocular Surface–Oriented Management of Persistent Epithelial Defect After Penetrating Keratoplasty in Stevens–Johnson Syndrome

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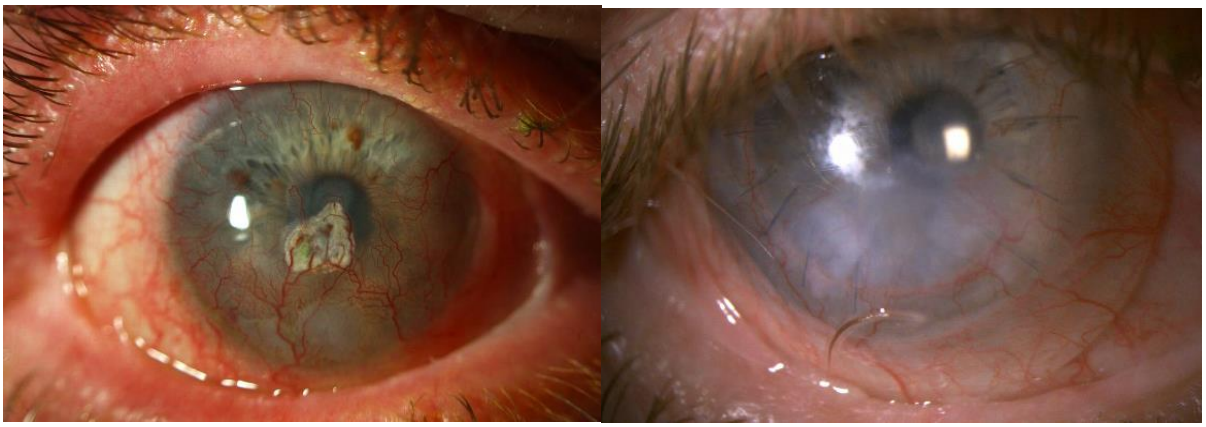
Aim: To describe the role of intensive ocular surface–oriented management in achieving epithelial healing after penetrating keratoplasty (PK) in a patient with Stevens–Johnson syndrome (SJS) and chronic cicatricial ocular surface disease.

Methods: A long-term case of indomethacin-induced SJS, followed since 2001, is presented. The patient developed severe bilateral cicatricial keratoconjunctivitis, recurrent epithelial defects, corneal thinning, and neovascularization despite extensive conservative therapy, including long-term bandage and piggyback contact lens use. Due to progressive visual loss and cataract formation, a combined PK and cataract extraction with intraocular lens implantation was performed in the right eye. Postoperatively, a descemetocele with impending perforation necessitated repeat PK. Following the second PK, a persistent inferior epithelial defect developed, refractory to conventional management including amniotic membrane transplantation and tarsorrhaphy. An intensive ocular surface–stabilizing strategy was initiated, consisting of temporary cessation of topical corticosteroids, hourly autologous serum drops, application of a properly fitted soft contact lens, tarsorrhaphy, and two sessions of botulinum toxin–induced ptosis.

Results: Complete epithelial closure was achieved after the second botulinum toxin injection. Initial epithelial irregularity persisted but showed gradual remodeling after cautious reintroduction of topical corticosteroids. Subsequent visual rehabilitation with a mini-scleral contact lens resulted in a best-corrected visual acuity of 0.8. The ocular surface remained stable without recurrence of epithelial breakdown during follow-up.



Conclusion: In patients with SJS undergoing PK, epithelial healing may represent the primary limiting factor for surgical success. This case highlights that individualized, ocular surface–oriented management—prioritizing epithelial stability over early immunosuppression—can facilitate epithelial closure and functional visual rehabilitation, even in eyes considered for keratoprosthesis.

Impact of Biologic Therapy on Mortality rate in Patients with Rheumatoid-Arthritis-Associated Corneal Ulceration (RACU)

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Introduction

Rheumatoid arthritis (RA) is the most **prevalent autoimmune disease** associated with destructive corneal involvement. RA-related ocular disease commonly manifests as peripheral ulcerative keratitis (PUK), which may progress to corneal melting, perforation, and irreversible visual loss. Importantly, patients with RA-associated corneal complications have a markedly increased mortality rate, with reported five-year mortality of up to **80%.**[1]

The introduction of biological therapies for RA, including TNF-α inhibitors, has significantly improved ocular and visual outcomes. However, the impact of these therapies on **overall mortality in** patients with RA-associated corneal disease remains unclear.

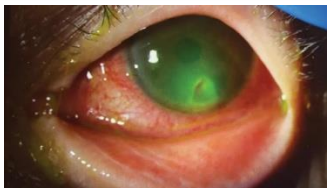

Figure 1[2]
Untreated seropositive erosive RA leading to PUK , reproduced from Cleveland Clinic Consult QD.

Methods

A retrospective cohort review of **17 patients** with RA-associated PUK (2005–2025 at Southampton General Hospital) with some having additional autoimmune comorbidities. Patients were stratified by systemic treatment (biologics ± DMARDs, DMARDs alone, steroids only, or none). Corneal perforation and mortality outcomes were compared descriptively between groups.

Results

Overall mortality was **41% (7/17)**, comparable to previously reported mortality **(~42%).**
Mortality was **33.3%** in the biologic group, **50%** in the DMARD-only group, and **100%** in untreated and steroid-only patients.
Corneal perforation occurred in **17.6% (3/17)** of patients.
All untreated patients died.

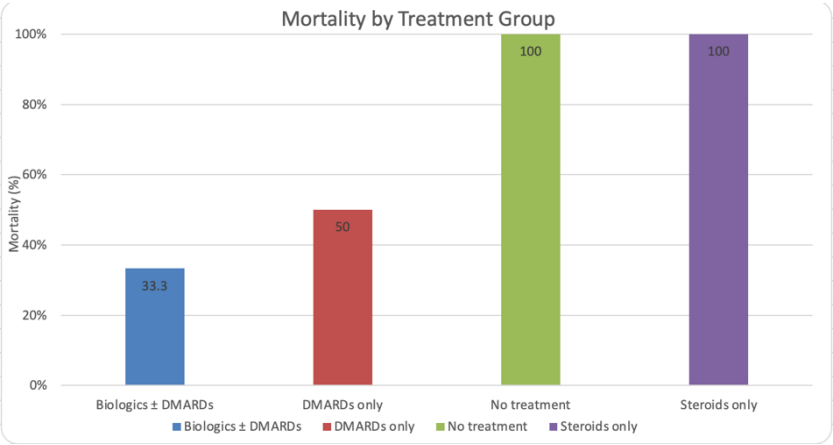

Figure 2
Bar chart showing mortality percentage

Treatment Group	Total (n)	Deaths (n)	Mortality (%)	Corneal Perforation (n)
Biologics with or without DMARDs	12	4	33%	1
DMARDs only	4	2	50%	1
No systemic treatment	2	2	100%	1
Steroid-only therapy	1	1	100%	0
Total	**17**	**7**	**41%**	**3**

Figure 3
Table illustrating mortality rate and corneal perforation

Discussion

Mortality rate in this cohort was high at **41%**, consistent **with previous 5-year mortality rate of 42%**[3] .

Biologic-treated patients had a lower mortality rate of **33%,** suggesting a potential benefit , although limited by **small sample** and **lack of follow-up data.** Interestingly, this was notably lower compared to patients receiving solely **DMARD therapy at 50%.**

Notably, untreated patients had **100% mortality**, highlighting severity of RA and importance of timely systemic treatment

Corneal perforation occurred across treatment groups, suggesting complication may reflect underlying disease severity rather than treatment effect.

Mortality in this cohort is likely **multifactorial,** with advanced rheumatoid arthritis, coexisting autoimmune disease and comorbidities such as malignancy, diabetes, and frailty contributing to **poor outcomes**

Conclusion

Rheumatoid arthritis–associated peripheral ulcerative keratitis remains a condition associated with **high mortality**. The overall mortality of 41% was comparable to reported 5-year mortality (~42%) [3].
Biologic therapy was associated with **lower observed mortality**, while untreated disease showed **poor outcomes**.
Mortality is likely **multifactorial**, reflecting advanced disease, coexisting autoimmune conditions, and comorbidities.

Larger studies with standardised longitudinal follow-up (≥5 years), incorporating **visual acuity outcomes, demographic data, treatment exposure, and autoimmune comorbidity profiles**, are required to better define the impact of biologic therapy on survival, with future **Kaplan–Meier analysis** to assess time-to-event outcomes.

References

1) Foster CS et al. 1984. *Ophthalmology.* 1984;91(10):1253–1263. **2)** Cleveland Clinic. Peripheral ulcerative keratitis in untreated rheumatoid arthritis. Consult QD, **3)** Mallem K et al. Clinical outcomes in peripheral ulcerative keratitis. *Am J Ophthalmol.* 2025.

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OCULAR SURFACE DISEASE INCIDENCE IN DIABETIC AND GLAUCOMA PATIENTS AS POTENTIAL CONTACT LENS USERS

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Objective: **Ocular Surface Disease** incidence analysis in diabetic and open angle glaucoma (OAG) patients on topical medical therapy **as potential contact lens users**

Introduction: **Ocular Surface Disease(OSD)(DEWS 2007)** is multifactorial disease of tears and ocular surface that results in symptoms of discomfort, visual disturbances, tear film instability and damage, increased tear film osmolarity and inflammation.

Classification:**hyposecretory** (SySjogren/non-Sjogren): **evaporative form** (extrinsic/intrinsic) **Delphi panel grade classification** in stages:

- I grade (TBUT>15s)
- II grade (IIa= 10-15s / IIb=5-10s)
- IIIgrade (TBUT < 5s)

OSD occurs due to multifactorial etiology: drugs, ***contact lenses,*** eye and systemic diseases, surgery, trauma. **Antiglaucoma drops** cause exacerbation or occurence of dry eye symptoms due to main substances or preservatives (benzalkonium, BAK) dose or time dependent. **Diabetes** cause reduce tear production and tear film instability

Methods: TBUT test of tear film stability and Delphi Panel grading scale

DEWS GRADE (TBUT- S)	OAG EYES DROPS WITH PRESERVATIVES No(%)	OAG EYES DROPS NO PRESERVATIVES	HEALTHY EYES	DIABETIC EYES
I (TBUT >15s)	15 (37,5%)	34 (85%)	32 (80%)	/
IIa (TBUT =10-15s)	10 (25%)	4 (10%)	3 (7,5%)	164 (30%)
IIb (TBUT = 5 - 10s)	15 (37,5%)	2 (5%)	5 (12,5%)	301 (55%)
III (TBUT <5s)	/	/	/	82 (15%)
IV (TBUT=0)	/	/	/	/
TOTAL (EYES)	40	40	40	547

Instable tear film was in diabetic patients(55%) and glaucoma eyes on antiglaucoma preservative drops(37,5%). Grade I in healthy 80% and without preservatives 85%.

Conclusion: **OSD impacts on contact lens fitting and visual acuity. To improve the quality of life and compliance it is necessary to correct OSD parameters apply artefitial tears, ask them for diseases. Higher prevalence:glaucoma (37,5%) and diabetes (55%).**

LEVELS OF INFLAMMATORY PROTEINS IN THE TEAR FILM IN PATIENTS WITH KERATOCONUS AND DRY EYE

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Architectural and histopathological alterations in the cornea of patients with keratoconus lead to increased tear film instability. Dry eye syndrome (DES) affects 81.5% of patients with keratoconus, and 70% of these patients exhibit hyperosmolarity and inflammation resulting from disrupted ocular homeostasis. Recent studies highlight the involvement of inflammatory factors and protein changes in the tear film in the progression of keratoconus.

Objectives: To determine the level of various proteins in the tear film and assess their correlation with dry eye syndrome parameters in patients diagnosed with keratoconus.

Material. Method. All patients underwent keratoconus screening program. History/presence of any systemic or ocular disorder, contact lens wear, current or recent use of topical or systemic medication represented **exclusion criteria.**

DES was established after analysis of the ocular surface disease index (OSDI), Schirmer test I and tear break-up time (TBUT).

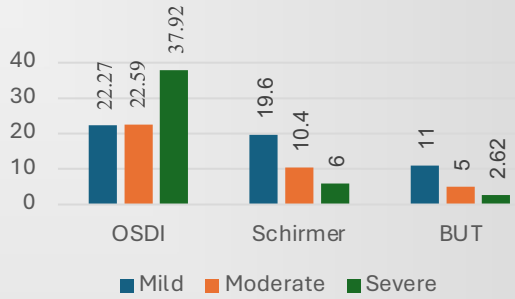
The levels of **albumin, lysozyme, lactoferrin, total protein (TP) and cytokines (IL 6, IL 10 and TNFα)** were measured using specific ELISAs and x Map array after basal tears were collected using a capillary tube.

Results.

Mean age of the 18 keratoconus cases (KC) analyzed was 25,94 ± 8,31 years old while that of the 18 cases in the control group was 31,84 ± 11.6 years. Of the keratoconus cases, three were classified as mild, eight as moderate, and seven as severe. Severe degree of DES was recorded in 8 cases, moderate in 5 cases and mild in 5 cases of KC

KC present a higher mean value of OSDI 29.32 ± 13.78 and lower mean value of TBUT 5.61 ± 3.92 than control group 15.77 ± 9.99, respectively 11.46 ± 2.36 and for Schirmer test the mean value was 11 ± 6.87 comparative with 16.15 ± 4.96.

Proteomic	KC group	Control group
Albumin (µg/ml)	6.81 ± 4.6	4.32 ± 2.53
Lysozyme (mg/ml)	2.58 ± 2.05	1.94 ± 0.6
Lactoferrin (mg/ml)	0.18 ± 0.2	1.29 ± 1.62
TP (mg/ml)	6.93 ± 1.5	6.81 ± 0.96
IL 10 (pg/ml)	177.28 ± 80.87	151 ± 57.99
IL 6 (pg/ml)	131.23 ± 29.33	118.61 ± 29.53
TNFα (pg/ml)	135.46 ± 30.01	113 ± 37.4



DES stage in KC group

Statistically significant negative correlations were recorded between TBUT and albumin (-0,394), lactoferrin (-0,28) and IL6 (-0,467) and positive correlation between IL10, IL6, TNF and albumin level (0,448, 0,397, 0,486) and negative with lactoferrin concentration (-0,533, -0,089, -0,335).

DES	Albumin	Lysozyme	Lactoferrin	TP	IL 10	IL 6	TNF α
Mild	4.86 ± 1.6	1.6 ± 0.51	0.25 ± 0.28	6.08 ± 1.08	198.22±69.88	127.02±17.67	136.32±26.75
Moderate	4.49 ± 1.4	2.81 ± 0.83	0.13 ± 0.14	7.07 ± 0.76	188 ±35.22	111.08±13.38	128.16±21.12
Severe	9.36 ± 5.9	3.29 ± 2.84	0.13 ± 0.04	7.37 ± 1.94	159.12±47.01	146.46± 35.2	139.48± 38.3

Conclusions. Quantitative analysis of the protein composition of the tear film is essential for establishing a proper correlation with ophthalmologic parameters. High levels of albumin and low levels of lactoferrin are correlated with inflammatory cytokines levels. Specific changes in the molecular markers can have diagnostic value, aiding in prognosis and the establishment of treatment.

This study was carried out within the project PN-III-P2-2.1-PED-2016-0187, financed by CNCS-UEFISCDI Romania.

Efficacy of Scleral Contact Lenses in Keratoconus: Clinical Parameters and Visual Outcomes

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INTRODUCTION

The aim was to analyze the clinical parameters and visual outcomes of scleral contact lenses applied to keratoconus patients.

SETTING

Patients who were followed up at the Izmir City Hospital Contact Lens Unit and who applied scleral lenses between October 2023 and December 2024 were included. Cases with a history of ocular surgery other than CXL, cases with different brands of scleral lenses (SL), and cases that would not benefit from scleral lenses were excluded.

METHODS

53 eyes of 36 keratoconus patients were examined. Corrected visual acuity (CVA), biomicroscopic examination, and corneal tomographic analysis were performed in the clinical evaluation. Misa scleral lens application was performed in all cases.

RESULTS

20 male and 16 female patients were evaluated as part of the study (mean age: 37.18 years; age range: 22-55 years).
In visual acuity measurements, the mean best CVA decreased to a minimum of 0.22 LogMAR (range: 0.0-0.22) after scleral lens application. A statistically significant improvement in best CVA was noted following scleral contact lens application ($p<0.05$).
Optimal lens parameters were determined as follows: 7.8 mm base curve value, 16.5 and 17.0 mm diameter values, and 325-450 micron vault range.
Of the 36 patients included in the treatment program, 12 (15 eyes) obtained scleral contact lenses.

Parameter 1	Parameter 2	Avg 1	Avg 2	Avg Difference	p-value
VA with SL	**Corrected VA**	0.1 ± 0.12	0.55 ± 0.32	0.44 ± 0.33	**<0.001**
		0.1 (0 - 0.7)	0.5 (0 - 1.8)	0.4 (0 - 1.8)	
VA with SL	**Uncorrected VA**	0.1 ± 0.12	0.89 ± 0.46	0.78 ± 0.48	**<0.001**
		0.1 (0 - 0.7)	0.7 (0 - 1.8)	0.7 (0 - 1.8)	
Corrected VA	**Uncorrected VA**	0.55 ± 0.32	0.89 ± 0.46	0.34 ± 0.36	**<0.001**
		0.5 (0 - 1.8)	0.7 (0 - 1.8)	0.3 (0 - 1.4)	
Stats: Mean ± SD / Paired T-Test					

Lens Acquisition	Not Acquired (n=38)	Acquired (n=15)	p-value
VA with SL	0.12 ± 0.13	0.07 ± 0.06	0.222(m)
	0.1 (0.03 - 0.1)	0.1 (0 - 0.1)	
Corrected VA	0.55 ± 0.32	0.55 ± 0.31	0.762(m)
	0.5 (0.3 - 0.7)	0.5 (0.3 - 0.6)	
Uncorrected VA	0.87 ± 0.49	0.92 ± 0.41	0.54(m)
	0.7 (0.52 - 1)	0.9 (0.7 - 1.1)	
Stats: Mean ± SD/Median (IQR), (m) Mann Whitney U Test			

DISCUSSION

Scleral contact lenses improve visual acuity and quality of life in keratoconus. They provide short-term improvement in topographic parameters. They are superior to rigid gas permeable (RGP) lenses in that they do not cause dryness, microtrauma, or suboptimal oxygenation.
Keratoconus is a common indication for penetrating keratoplasty.
Scleral lenses are currently an option for patients who do not benefit from soft or RGP contact lenses.
In our study, visual acuity improved with scleral contact lenses ($p<0.01$), however, most patients did not acquire scleral contact lenses despite improving their visual acuity (72.3%). There was no difference in visual acuity between those who acquired scleral contact lenses and those who did not ($p=0.222$).

CONCLUSION

Scleral contact lenses offer an effective treatment option for visual rehabilitation in keratoconus patients and can postpone the need for corneal transplantation in advanced cases.
However, the high cost of these lenses is considered a significant factor limiting access to treatment, particularly in developing countries.

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Exceptional Outcome with Scleral Lenses in a Challenging Refractive Keratotomy Case

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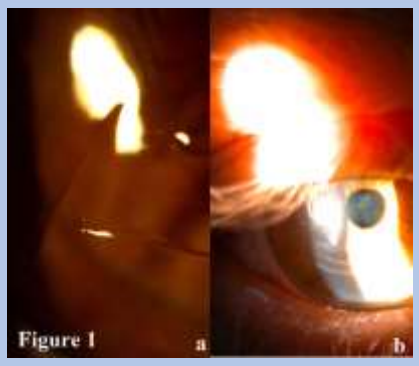
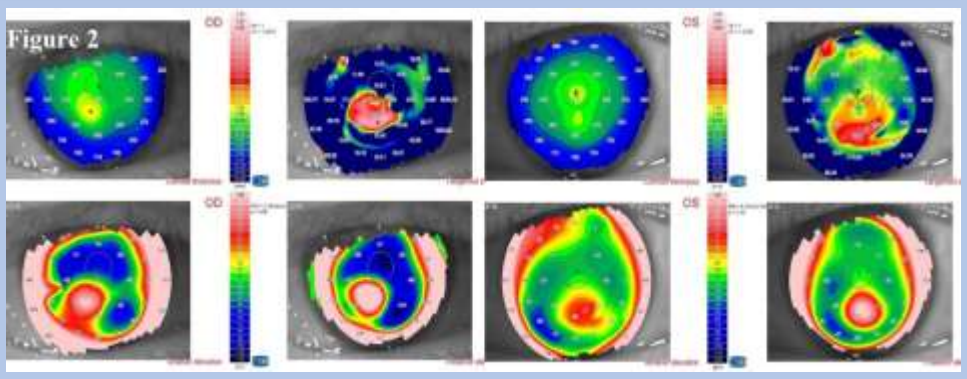
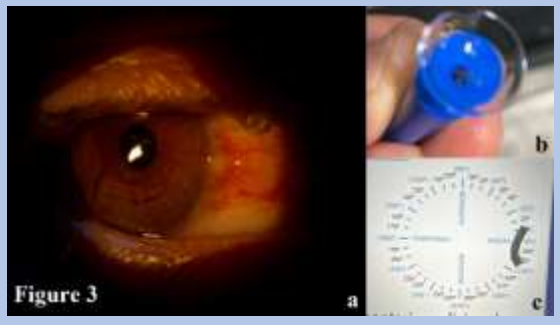
INTRODUCTION and PURPOSE: Refractive keratotomy (RK), which was widely performed as a refractive surgical procedure in the 1980s, has lost its popularity due to its association with significant postoperative complications, such as refractive instability and irregular astigmatism.[1] The aim of this case report is to demonstrate successful visual rehabilitation using a scleral lens in a patient with history of RK.

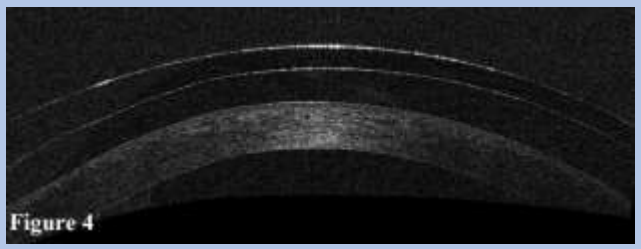
CASE PRESENTATION

A 51-year-old male patient with a history of radial and arcuate keratotomy for high myopia and astigmatism, who subsequently developed corneal ectasia with associated irregular astigmatism, presented to our clinic for visual rehabilitation. Visual acuity was 0.1 in both eyes, and anterior segment evaluation revealed bilateral radial and arcuate keratotomy scars (Fig 1). Sirius corneal tomography of both eyes demonstrated paracentral steepening and irregular astigmatism (Fig 2). As satisfactory visual improvement could not be achieved with spectacles or other contact lens modalities, an ICD Flexfit scleral lens with a diameter of 16.3 mm, base curve radius of 8.05 mm, power of −0.75 diopters, and a sagittal vault of 4200 µm was fitted in the right eye. For the left eye, an ICD Flexfit scleral lens with a diameter of 16.3 mm, base curve radius of 8.05 mm, power of +1.50 −2.00 × 180° diopters, and a sagittal vault of 4200 µm was prescribed. Because of a nasal pinguecula in the right eye, a notch was created in the 10–340° quadrant of the lens to achieve optimal ocular surface alignment (Fig 3). The optimal vault heights were verified by using anterior segment optical coherence tomography (AS-OCT) (Fig 4). After scleral lens application, best-corrected visual acuity increased to 0.9 in both eyes.









DISCUSSION and CONCLUSION: Scleral contact lenses represent an important option for visual rehabilitation for patients with irregular astigmatism. Especially in post-RK patients, corneal irregularities induced by radial incisions render contact lens fitting more challenging, particularly for cornea-supported lenses such as gas-permeable lenses.[2] Chu et al.[3], in a study involving 36 eyes, reported a scleral lens success rate of 64% in post-RK patients, and noted that decentration of the RK treatment zone and smaller central clear zones were associated with less optimal fitting.
In our patient unresponsive to alternative modalities, scleral lenses provided significant visual rehabilitation and restored functional daily life. With adequate chair time, and individualized lens modifications, scleral lens fitting can yield successful outcomes.

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POSTER #47

Therapeutic Scleral Lens for Severe Neurotrophic Keratopathy and Persistent Dry Eye Following Complicated Cataract Surgery

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BACKGROUND & OBJECTIVE

Complicated cataract surgery can cause severe corneal nerve damage leading to neurotrophic keratopathy.

When conventional treatments fail, scleral lenses provide continuous corneal hydration through a

pre-corneal fluid reservoir, consistent with TFOS DEWS management recommendations.

CASE 1 — Neurotrophic Keratopathy (Mackie Stage 2)

69-year-old female | Brunescent nucleus phacoemulsification

Preoperative course:

- Persistent epithelial defect with recurrent breakdown over 8 months
- Treatments failed: preservative-free tears, autologous serum 20%, bandage lens, amniotic membrane transplantation
- OSDI: 72 | Central corneal sensitivity: absent

Intervention: Mini-scleral lens with preservative-free saline reservoir

Outcome at 3 months:

- **Complete epithelial healing achieved**
- **OSDI: 72 → 16**
- **BCVA: 1.0 → 0.3 logMAR**
- **No epithelial breakdown over 9 months of wear**

CASE 2 — Bullous Keratopathy after Descemet Membrane Detachment

74-year-old diabetic male | Descemet membrane detachment + air injection

Preoperative course:

- Chronic epithelial edema with bullous keratopathy
- OSDI: 78 | TBUT: <1 second
- Unresponsive to: hypertonic saline, cyclosporine 0.1%, therapeutic soft lens

Intervention: Mini-scleral lens with preservative-free saline reservoir

Outcome at 3 months:

- **Complete epithelial healing achieved**
- **OSDI: 78 → 20**
- **BCVA: 0.8 → 0.4 logMAR**
- **No recurrence over 9 months of continuous wear**

MANAGEMENT APPROACH

- Both patients fitted with mini-scleral lenses (diameter: 16.5 mm)
- Preservative-free saline solution used as reservoir fluid
- OSDI, BCVA, and epithelial integrity assessed at 1, 3, 6, and 9 months
- Slit-lamp examination and corneal sensitivity testing performed at each visit
- No epithelial breakdown occurred over the entire follow-up period

KEY FINDINGS

OSDI
72→16 / 78→20
Dramatic improvement

BCVA
1.0→0.3 / 0.8→0.4
logMAR improvement

EPITHELIUM
Complete healing
by 3 months

RECURRENCE
Zero recurrence
9-month follow-up

OUTCOME COMPARISON

Parameter	Case 1 (Pre)	Case 1 (Post)	Case 2 (Pre)	Case 2 (Post)
OSDI Score	72	16 *	78	20 *
BCVA (logMAR)	1.0	0.3 *	0.8	0.4 *
Corneal integrity	Defect	Healed *	Bullous	Healed *
Lens tolerance	N/A	Excellent	N/A	Excellent
Follow-up (mo)	-	9	-	9

* Statistically significant improvement (p<0.05)

CONCLUSIONS

1. Therapeutic scleral lenses effectively manage severe neurotrophic keratopathy and bullous keratopathy after complicated cataract surgery, providing simultaneous corneal protection, hydration, and visual rehabilitation.
2. Complete epithelial healing was achieved in both cases within 3 months, with no recurrence over 9 months of lens wear.
3. Significant improvement in OSDI scores (72→16 and 78→20) demonstrates marked reduction in ocular surface disease burden.
4. BCVA improved substantially in both patients (1.0→0.3 and 0.8→0.4 logMAR), highlighting the optical benefit of the scleral lens.
5. Scleral lenses should be considered as a first-line intervention when conventional therapies fail in post-surgical neurotrophic keratopathy, consistent with TFOS DEWS II recommendations.

CLINICAL IMPLICATIONS

- Consider scleral lens early when conventional therapy fails
- Continuous corneal hydration prevents epithelial breakdown
- Suitable for diabetic patients with complex corneal disease
- Combines therapeutic and optical rehabilitation in one device

KEYWORDS

Scleral lens | Neurotrophic keratopathy | Dry eye disease | Cataract surgery | Corneal protection | TFOS DEWS II

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Beyond Traditional Methods

Solving Soft Contact Lens Intolerance through Orthokeratology & Precision Maintenance

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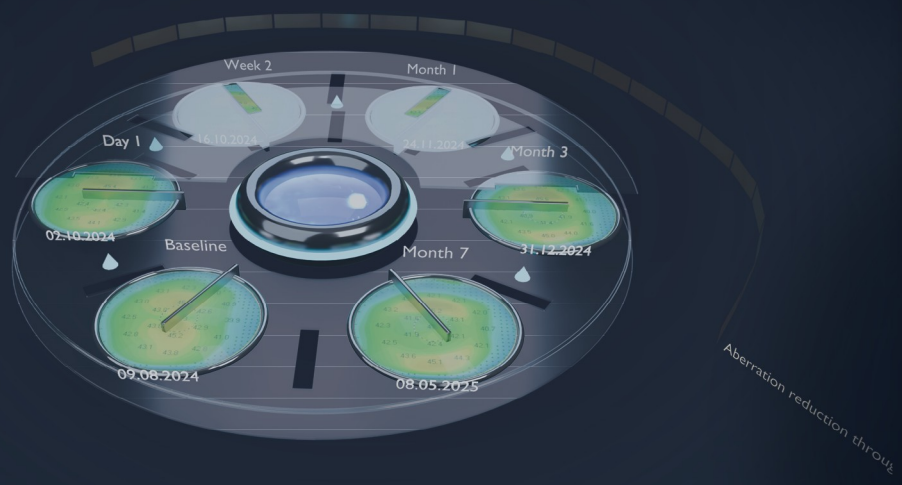
PURPOSE

This case demonstrates the successful management of severe soft contact lens (SCL) intolerance using orthokeratology (Ortho-K) combined with a novel 'Double-BSS Rinsing' maintenance protocol. The highly motivated physician patient, ineligible for refractive surgery, achieved sustained visual correction and comfort through this innovative non-surgical approach.



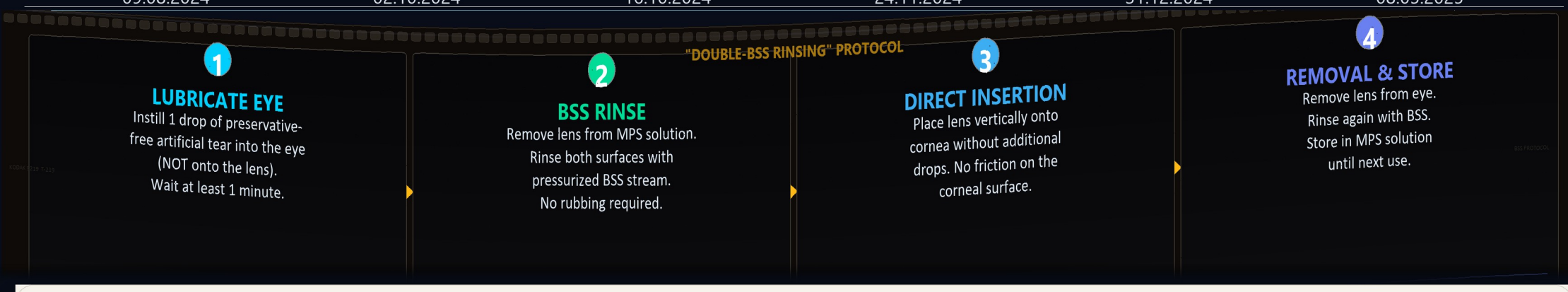
CASE

Demographics
- 28-year-old male physician
- Long-term spectacle wearer
- Refused refractive surgery

Ocular Examination
- CCT: 468/475 µm
- BCVA: 20/20 OU
- OD: -1.50 -1.75x10°
- OS: -2.50 -2.00x175°
- NBUT: 9/10 sec (reduced)
- Cornea: clear, no staining

Persistent intolerance to all soft contact lenses with immediate discomfort within minutes of insertion.

Baseline	Day 1	Week 2	Month 1	Month 3	Month 7
09.08.2024	02.10.2024	16.10.2024	24.11.2024	31.12.2024	08.05.2025



METHODS

Sequential SCL Trial (2 wks each)
- Lotrafilcon B (SiHy) - 33% H2O
- Senofilcon A (SiHy) - 38% H2O
- Comfilcon A (SiHy) - 48% H2O
- Samfilcon A (SiHy) - 46% H2O
- Senofilcon A DD - daily disposable

→ **ALL FAILED: intolerance < 2 hours**

Ocular Surface Optimization
- Topical steroid (2-week pulse)
- Cyclosporine A 0.05% (long-term)
- PF sodium hyaluronate 0.15% + dexpanthenol

After 12 months of treatment, NBUT improved from 9 to 17 seconds. Despite ocular surface recovery, SCL intolerance persisted unchanged, confirming material-sensitivity rather than dry eye etiology.

ORTHO-K FITTING

Lens Selection
- NightFlex (SwissLens, Switzerland)
- Reverse-geometry design
- Dk/t: 180 (high O2 transmissibility)

Wearing Schedule
- Nightly wear: 6-8 hours
- 1 lens-free day per week

Double-BSS Rinsing Protocol

Initiated from Day 1 to minimize deposit accumulation and maximize lens surface biocompatibility. This protocol replaces MPS as the final rinse step with preservative-free BSS, eliminating chemical preservative contact with the sensitive corneal surface.

RESULTS

Month 1 (October 2024)
- UCVA: OD 20/20, OS 20/25
- Corneal topography: central flattening
- Mild visual shadows initially

Month 3 (December 2024)
- UCVA: 20/20 OU
- Complete comfort achieved
- Visual shadows fully resolved
- Stable topographic response

Month 7 - Current (May 2025)

20/20	17s	24-30h
UCVA (OU)	NBUT (stable)	Effect duration

- No dry eye symptoms or discomfort
- No corneal staining or complications
- Patient satisfaction: excellent

CONCLUSIONS

1. Orthokeratology is a viable, reversible, non-surgical vision correction for patients with severe SCL intolerance who refuse or are ineligible for refractive surgery.
2. The 'Double-BSS Rinsing' protocol bridges the critical adaptation period and ensures long-term comfort by preventing preservative-related surface irritation and protein buildup.
3. Comprehensive ocular surface optimization prior to Ortho-K fitting, while not resolving SCL intolerance, provides a healthier baseline for overnight lens wear.
4. Careful patient selection and a systematic, stepwise clinical approach are essential for successful outcomes in complex CL cases.

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Impact of Dry Eye Disease on Keratometric Measurements and Intraocular Lens Power Calculations

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AIM: To evaluate the impact of dry eye disease on intraocular lens (IOL) power and toric axis calculations based on biometric measurements.

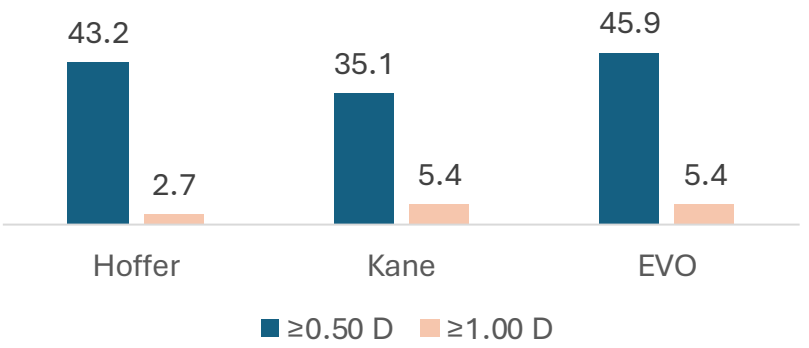
METHODS:

- ✓ Retrospective study, 37 eyes applying fro cataract surgery
- ✓ Biometry (IOLMaster 700) followed by ocular surface evaluation: TBUT, NIBUT, Schirmer, corneal staining, OSDI
- ✓ Dry eye disease diagnosis: TFOS DEWS III criteria
- ✓ Dry eye disease treated before surgery
- ✓ All measurements repeated after treatment (mean 17.4 days)
- ✓ IOL calculations using EVO, Kane, and Hoffer Q (ESCRS platform)

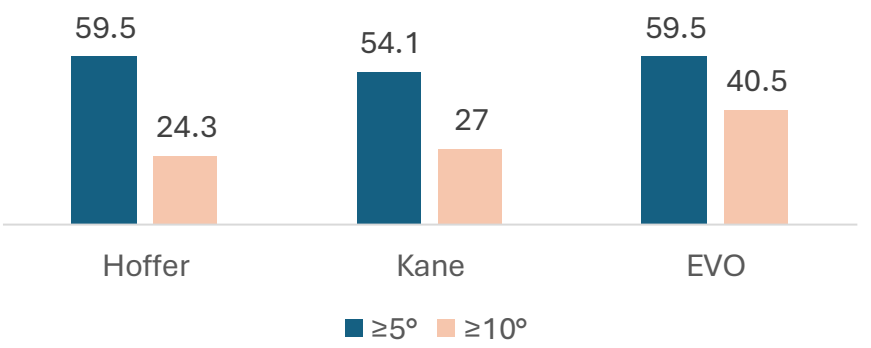
RESULTS:

- ✓ OSDI and corneal staining scores improved after treatment
- ✓ No statistically significant change in IOL power calculations before and after treatment, however
  - ✓ ≥0.50 D change observed in 35–45% of eyes depending on formula
  - ✓ Large deviations (≥1.00 D) were rare (2.7–5.4%)
- ✓ Toric IOL axis measurements showed substantial variability as well

Variability in IOL Power Calculations



Variability in Toric IOL Axis Calculations



DISCUSSION:

- Dry eye disease affects the reliability of preoperative biometric measurements
- Previous studies have shown that tear film instability impacts keratometry and IOL calculations
- In our study, toric axis measurements were more affected than IOL power
- These findings support the importance of ocular surface optimization before cataract surgery

CONCLUSION:

Dry eye disease appears to affect both toric IOL axis measurements and IOL power magnitude, with a more pronounced effect on axis variability. Optimization of the tear film and ocular surface prior to cataract surgery improves the accuracy of IOL power calculations and toric IOL axis alignment.

Dry eye disease significantly affects both toric IOL axis calculations and IOL power, with a markedly greater impact on axis measurements.

Epitropoulos AT et al. *J Cataract Refract Surg*. 2015 ; Trattler WB et al. *J Cataract Refract Surg*. 2017 ; Starr CE et al. *J Cataract Refract Surg*. 2019

Early Corneal Healing Responses Following Corneal Collagen Crosslinking in Keratoconic Eyes with Comorbidities

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Ulduz Adilova, MD
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Ankara University School of Medicine, Ankara, Türkiye

AIM: To evaluate the impact of preoperative ocular surface inflammatory comorbidities on epithelial healing following epithelium-off corneal collagen crosslinking (CXL) in keratoconus.

METHODS: This retrospective study included 147 eyes of 104 patients with progressive keratoconus undergoing epithelium-off corneal collagen crosslinking (CXL). Fifty-five eyes had ocular surface inflammatory disease, while 92 eyes without comorbidities served as controls. Eyes with ocular surface disease received appropriate preoperative treatment to optimize the ocular surface. Preoperative evaluation included BUT, NIBUT, Schirmer test, corneal staining, OSDI, and meibography. Postoperative epithelial closure time and corneal haze were assessed. Group comparisons were performed using nonparametric and chi-square tests.

RESULTS: Ocular inflammatory disease was present in 37.4% Among eyes with ocular surface disease, allergic conjunctivitis was present in 41.8%, vernal keratoconjunctivitis in 30.9%, meibomian gland disease in 14.5%, and atopic conjunctivitis in 12.7%. Postoperatively, corneal haze gradings did not significantly differ between groups. However, delayed epithelial healing (>3 days) was significantly more common in eyes with ocular surface disease (p=0.011). This difference was primarily driven by the VKC subgroup (41.2% vs 9.8% in controls, p=0.021), while other subgroups showed no significant differences coompared to controls.

Table. Delayed Epithelial Healing (>3 days) After CXL Across Ocular Surface Subgroups

Group	Eyes (n)	Delayed epithelial closure n (%)
Control	92	9 (9.8%)
Ocular surface disease	55	14 (25.4%)
○ Allergic conjunctivitis	23	5 (21.7%)
○ ***Vernal keratoconjunctivitis***	***17***	***7 (41.2%)***
○ Atopic conjunctivitis	7	1 (14.3%)
○ Meibomian gland disease	8	1 (12.5%)

DISCUSSION: Epithelial healing after CXL is generally rapid and complete in a few days (Caporossi et al., 2010). In our study, epithelial closure was statistically significantly delayed in VKC, compared to controls, apparently due to the chronic inflammatory process and corneal epithelial alterations characteristic of this condition (Bruschi et al., 2023; Albadawi et al., 2023).

CONCLUSION: Preoperative ocular surface inflammation, particularly vernal keratoconjunctivitis, is associated with longer epithelial recovery after corneal collagen cross-linking despite pre-operative ocular surface optimization. Careful assessment and management of any ocular surface before CXL improves postoperative outcomes.

In keratoconus patients, among co-existing ocular surface diseases, only VKC is associated with delayed epithelial healing after CXL despite pre-operative treatment, while corneal haze remains unaffected.

Effect Of Orthokeratology Contact Lens On Myopia Control In Children With Anisometropia

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YONSEI PLUS EYE CENTER

Background

There are many unanswered questions about relationship between myopia control and reverse geometric contact lens. We report the clinical features of myopic patients under overnight orthokeratology with steep or flat keratometry in KOREA.

Purpose

To investigate the effect of orthokeratology (OK) lens on axial length (AL) elongation in unilateral myopia and bilateral myopia with anisometropia children. The effectiveness of orthokeratology in retarding anisometropic progression has been investigated in several small-sample studies. This quantitative analysis aimed to elucidate the efficacy of orthokeratology for anisometropia control.

Methods

Yonsei plus eye center in KOREA.
Total 13 patients (7 male, 6 female).
Age 8-13 years old. Mean 11ys old.
Period From 2021. Feb to 2025.Feb

Results

Figure 1. Visual Acuity Change After Orthokeratoloy with Reverse Geometric Contact Lens.

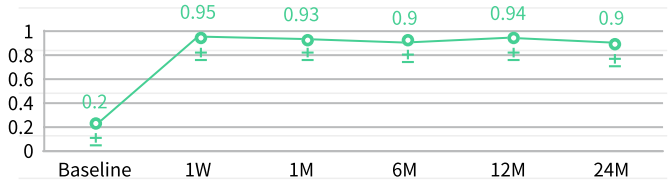


Figure 2. Topography in Orthokeratology

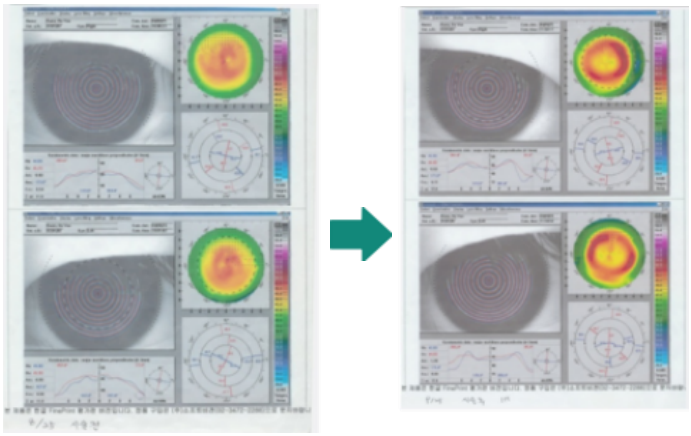
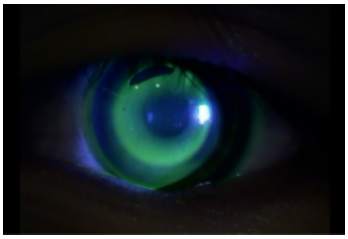


Figure 3. Contact Lens fitting pattern in patients with orthokeratology



Conslusions

Monocular OK lens is effective on suppression AL elongation of the myopic eyes and reduce anisometropia value in unilateral myopic children.
The OK lens can control the AL elongation in both eyes at the same rate, but it cannot reduce anisometropia value in bilateral myopia with
anisometropia children after 2-year follow-up. Safe use of Overnight Orthokeratology Contact Lens is predicted on the emphasis of clear patient
direction on how to wear and take care of the lens followed by regular examination by eye care specialist.

Six-Month Safety and Clinical Performance of Abiliti Myopia Control Soft Contact Lenses in Children: A Real-World Study

51st ECLSO Congress
24-25 April 2026 | Vienna

Sevil Karaman Erdur, Goktug Demirci

Department of Ophthalmology, Istanbul Medipol University, Istanbul, Turkey

MAIN TAKEAWAY

In 32 children aged 8-14 years, Abiliti lenses showed +0.07 mm axial length change and -0.11 D refractive change over 6 months, with stable distance visual acuity and no serious ocular adverse events.

PURPOSE

To evaluate the 6-month safety and clinical performance of Abiliti myopia control soft contact lenses in children in a prospective, single-arm real-world study.

STUDY DESIGN AND ASSESSMENTS

Prospective, single-center study
32 children, age 8-14 years
Medipol Mega Hospital
Visits: baseline, 1 week, 1 month, 6 months

Axial length: Myopia Master

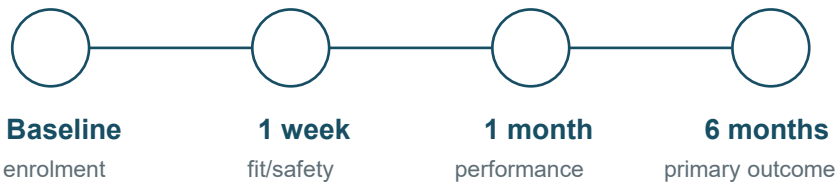
Refraction: cycloplegic autorefraction

Distance VA: logMAR

Safety: ocular adverse events

FOLLOW-UP SCHEDULE

Distance VA and ocular safety were monitored throughout follow-up.



KEY OUTCOMES AT 6 MONTHS

+0.07 mm

Axial length change

mean +/- SD: 0.07 +/- 0.12 mm

-0.11 D

Cycloplegic SE change

mean +/- SD: -0.11 +/- 0.25 D

Stable

Distance visual acuity

logMAR distance VA remained stable

No serious AEs

Ocular safety

no clinically significant ocular adverse events

CONCLUSION

In this 6-month real-world study of children aged 8-14 years, Abiliti myopia control soft contact lenses demonstrated good safety and stable visual performance, with low axial elongation and minimal refractive progression.

These findings support the short-term clinical performance of Abiliti lenses for pediatric myopia control.

Prepared from the submitted ECLSO 2026 abstract. Poster format: portrait e-poster for PDF upload.

Submission deadline: 13 April 2026

Acute Ocular Surface and Blink Behavior Effects of a Non-Coaxial Ring-Focus Myopia Control Soft Contact Lens in Children

ECLSO 2026

Simla Şahin · Sevil Karaman Erdur · Göktuğ Demirci

Istanbul Medipol University, Department of Ophthalmology, Istanbul, Türkiye

Take-home message

Short-term wear of a non-coaxial ring-focus myopia control soft lens did not significantly alter blink dynamics, tear film stability, or ocular surface protection in myopic children.

Background

- Myopia control soft lenses must balance optical efficacy with ocular surface comfort.
- Acute changes in blinking or tear stability may influence early tolerance in children.
- Objective, non-invasive assessment helps quantify the short-term ocular surface response.

Aim

To evaluate the acute effects of a non-coaxial ring-focus soft myopia control lens on blink behavior, tear film stability, and ocular surface protection in myopic children.

Participants and Design

n = 28 children

8–13 years

10.5 ± 1.5 mean age

−2.55 ± 0.85 mean spherical equivalent (D)

Prospective within-subject study

Right eye analyzed in each participant

Study workflow

28 myopic children
8–13 years

↓

Lens-free baseline
MYAH assessment

↓

Short-term lens wear
non-coaxial ring-focus soft lens

↓

Lens-on assessment
same MYAH protocol

↓

Right eye analyzed
within-subject comparison

All measurements were non-invasive.

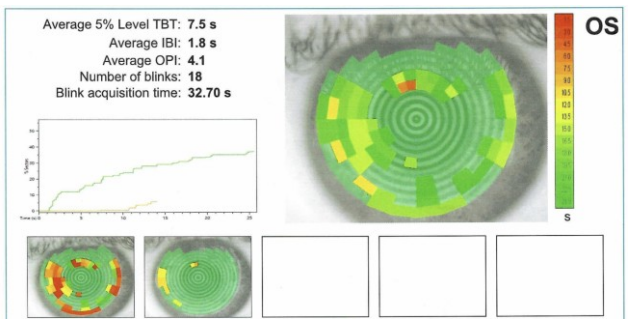
Methods

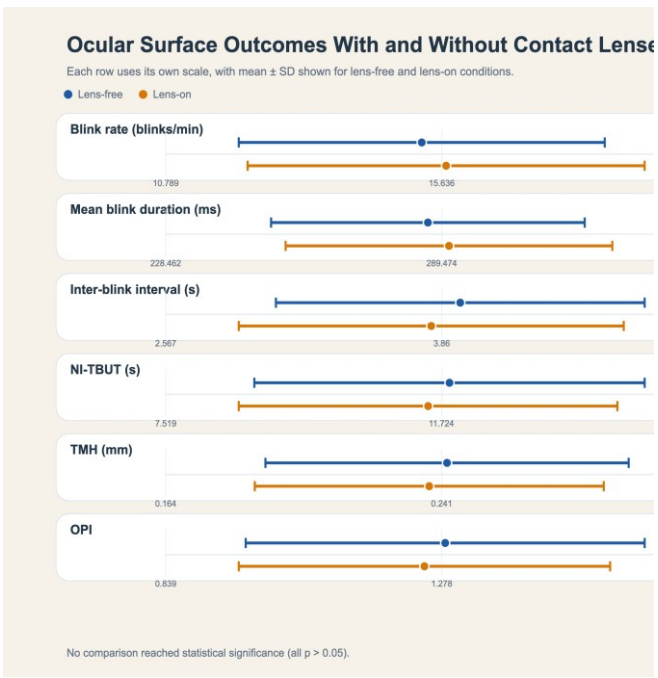
- • Lens-free baseline was followed by short-term wear of a non-coaxial ring-focus soft contact lens.
- All measurements were obtained with the MYAH non-invasive ocular surface analysis system.
- Lens-free and lens-on conditions were compared within the same participant.

Outcome Measures

- Blink rate
- Mean blink duration
- Inter-blink interval
- Non-invasive tear break-up time (NI-TBUT)
- Tear meniscus height (TMH)
- Ocular protection index (OPI)

Lens comparison (MYAH system)





Results

- Blink rate, mean blink duration, and inter-blink interval did not differ significantly between lens-free and lens-on conditions (all p > 0.05).
- NI-TBUT and TMH remained unchanged after short-term lens wear.
- OPI showed no significant difference between conditions (p = 0.58).
- Mean OPI values remained above the threshold for adequate ocular surface protection.

Conclusion

Short-term wear of this non-coaxial ring-focus myopia control lens did not induce clinically meaningful changes in blink dynamics, tear film stability, or ocular surface protection in myopic children.

Clinical relevance

Acute wear appears well tolerated from an ocular surface and blink behavior perspective.

Outcome summary

Outcome	Lens-free, mean ± SD	Lens-on, mean ± SD	p value
Blink rate (blinks/min)	15.286 ± 3.214	15.714 ± 3.487	0.412
Mean blink duration (ms)	286.421 ± 34.672	291.083 ± 36.115	0.338
Inter-blink interval (s)	3.947 ± 0.864	3.811 ± 0.902	0.295
NI-TBUT (s)	11.842 ± 2.973	11.516 ± 2.884	0.441
TMH (mm)	0.243 ± 0.051	0.238 ± 0.049	0.367
OPI	1.284 ± 0.318	1.251 ± 0.296	0.580

Comparative evaluation of corneal stromal demarcation line following accelerated corneal collagen crosslinking protocols using different riboflavin formulations and soaking durations

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[2] Department of Ophthalmology, Ankara University School of Medicine, Ankara, Turkey

INTRODUCTION AND AIM

- Corneal crosslinking (CXL) is the only treatment in halting the progression of keratoconus.
- The optimal riboflavin formulation and soaking duration for accelerated CXL (ACXL) protocols remain unknown.
- Riboflavin solution with hydroxypropyl methylcellulose (HMPC) as a carrier, is one of the alternative formulations which has been documented to accelerate stromal penetration of riboflavin, and increase stromal ultraviolet-A (UVA) absorption and stromal hydration compared to dextran.[1]
- Our purpose in this study was to compare the structural features of the crosslinked cornea and depth of stromal demarcation line (DL) following ACXL using riboflavin solutions with different carrier agents (HPMC or dextran) and soaking durations. We also sought to investigate these features with ACXL efficacy at postoperative year-1.

METHODS

- Prospective, comparative study
- Consecutive progressive keratoconus patients who were scheduled for CXL
- Exclusion criteriae : severe axial corneal scarring, previous refractive or other corneal surgery, a history of herpetic keratitis, any corneal/ocular disease or any autoimmune condition.

Group 1	HPMC-based RF, 10 min.	UVA (9 mW/cm²) and HPMC-based RF, 10 min.
Group 2	HPMC-based RF, 20 min.	UVA (9 mW/cm²) and HPMC-based RF, 10 min.
Group 3	Dextran-based RF, 30 min.	UVA (9 mW/cm²) and HPMC-based RF, 10 min.
Group 4	Dextran-based RF, 30 min.	UVA (3 mW/cm²) and Dextran-based RF, 30 min.

RF: riboflavin; UVA: ultraviolet-A; HPMC: hydroxypropyl methylcellulose; Riboflavin 0.1% in 1.1% HPMC solution (Vibex Rapid, Avedro Inc, Waltham, MS, USA); Riboflavin 0.1% in 20% dextran T500 solution (MedioCross, Kiel, Germany); UVA light (Avedro, Waltham, MS, USA)

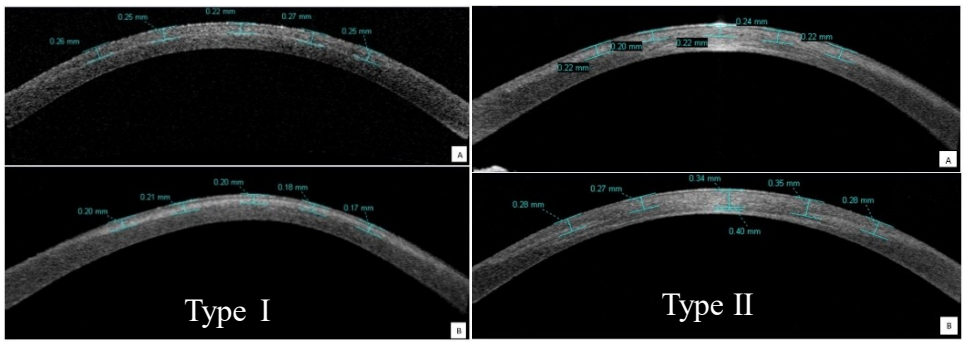
Preoperative, Postoperative Month-1 and Month-12

- Uncorrected and corrected distance visual acuity (UDVA and CDVA)
- Manifest refraction (MR),
- Corneal tomography, pachymetry and aberrometry (Pentacam, Oculus GmbH, Wetzlar, Germany),
- In vivo confocal microscopy (IVCM) (HRT II, Rostock Cornea Module,Heidelberg, Germany)
- Anterior segment optical coherence tomography (AS-OCT) (Visante, Carl Zeiss Meditec, Dublin, CA, USA).

Demarcation Line Depth and Morphology

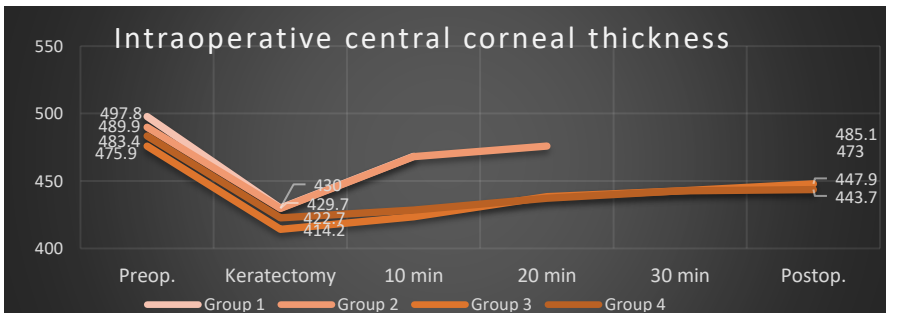
Table 1. Morphological classification of crosslinked cornea and demarcation line as measured using the anterior segment optic coherence tomography

Type	Definition
I	Homogenous, hyper-reflective crosslinked cornea with, linear, uninterrupted hyper-reflective demarcation line that is easily detectable
II	Heterogenous, patchy crosslinked cornea with, barely detectable demarcation line that is deeper at the central 3 mm corneal zone.



RESULTS

- 104 eyes of 104 patients (26 patients in each group), mean age: 24.1±5.1 (15-33) years



Demarcation Line and Structural Features of the Crosslinked Area

Table 2: The mean central demarcation line depth and its percentage relative to total corneal thickness in the study groups

	Group 1	Group 2	Group 3	Group 4	p
DL depth (µm)	358.8±95.6	341.5±84.1	261.2±62.3*	310.3±82.3	<0.001
DL %	68.03±16.90	65.67±16.36	49.41%±11.15*	60.45±11.52	<0.001

*: significantly lower in group 3, compared to other groups

- **Type I** morphology was statistically significantly more common in eyes that had undergone CXL using **dextran-based riboflavin** (83.9% vs 35.9 %), whereas **Type II** morphology was more common in **HPMC-based riboflavin** group (64.2% vs 16.1%).

At postoperative month-12, we documented;

- No statistically significant between-group differences in the improvements in UDVA, CDVA, or spherical/cylindrical MR measurements (p>0.05).
- **Stable** mean Kmax in **group 1** (p=0.324), statistically significant **flattening** of Kmax in **groups 2, 3 and 4** (p=0.001, 0.031, 0.001, respectively). Positive correlation between % of crosslinked cornea and Kmax improvement (p<0.001, r=0.382).
- Statistically significant **improvement** of 5/7 tomographic indices in **group 2 and 4** (p<0.05).
- No significant between-group differences in regards to improvement of Kmax, tomographic indices, vertical coma, and spherical aberration at 12 month follow-up (p>0.05).
- No endothelial cell loss, prolonged corneal haze or any other clinically significant adverse at 12 month follow-up.

DISCUSSION

- **In our study,** demarcation line depth (DLD) reached 60–68% in groups 1, 2, and 4, while it was significantly shallower in the dextran-based group (group 3). HPMC-based groups showed more heterogenous and patchy crosslinked tissue and yielded comparable visual, refractive, and tomographic outcomes to conventional CXL, with no significant endothelial cell loss or adverse events at 12 months.
- **Previous studies** using 10 minutes of HPMC-based riboflavin soaking have reported DLD of 203-355 µm postoperatively,[2-5] whereas 20 minutes of HPMC-based riboflavin soaking with similar protocols revealed 160-273 µm of depth.[6,7] Since UVA intensities and durations in these studies were also variable, comparative evaluation between outcomes is hard to achieve.
- Due to its low surface tension and contact angle,[1] HPMC enables rapid and widespread corneal distribution, which may explain the more heterogeneous, patchy appearance observed after ACXL with HPMC-based riboflavin.
- The DL should be sufficiently deep for efficacy without compromising endothelial safety. It was hypothesized that transient accommodation of excess HPMC in the posterior stroma allows safe UVA exposure, with postoperative de-swelling bringing the DL closer to the endothelium;[8] accordingly, in our study no endothelial cell loss was observed at 12 months, even in eyes with a deep DL.
- **In conclusion,** ACXL (9 mW/cm², 10 min) with HPMC-based riboflavin soaking (10–20 min) provides a crosslinked corneal volume comparable to conventional CXL, whereas dextran-based soaking results in shallower DLD. Despite early stromal differences, 1-year efficacy was similar across all groups. Further large-scale, long-term studies are needed to clarify the relationship between AS-OCT findings and CXL outcomes.

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Resistant *Pseudomonas aeruginosa* Keratitis in a Contact Lens Wearer: A Case Report

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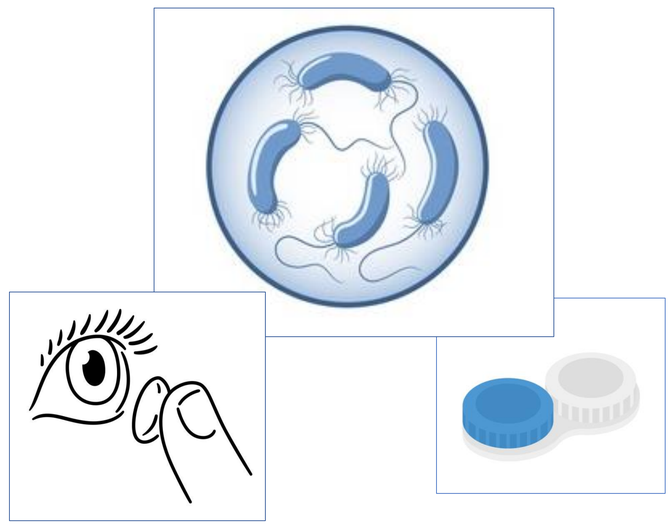
Objective: To present a case of keratitis caused by a multidrug-resistant strain of *Pseudomonas aeruginosa* in a contact lens wearer.

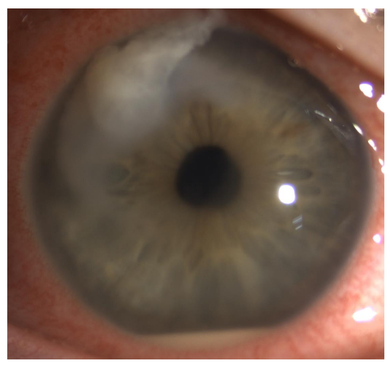


Introduction: Keratitis is one of the most serious complications associated with contact lens use. Risk factors include prolonged lens wear, poor hygiene, exposure to water, sleeping with contact lenses, and unsupervised use of topical corticosteroids, which may worsen infection and delay appropriate treatment.

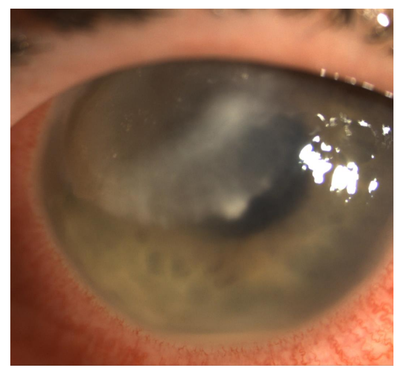
Methods: This is a case report of a 21-year-old female contact lens wearer who presented with acute keratitis. Clinical examination, corneal scraping, and microbiological analysis were performed. The patient was treated with intensive topical and systemic antimicrobial therapy, adjusted according to clinical response and microbiological results.

Results: The patient presented with eyelid edema, conjunctival hyperemia, and severe pain in the right eye. BCVA in the affected eye was 0.1 at presentation. Microbiological analysis revealed a resistant strain of *Pseudomonas aeruginosa*. Despite initial empirical therapy, clinical deterioration occurred, requiring multiple modifications of antimicrobial treatment. After several weeks of intensive topical and systemic antimicrobial therapy, topical corticosteroid treatment was initiated. The patient was hospitalized for seven weeks and discharged with improved visual acuity of 0.3, with continued scheduled follow-up visits.

1st day

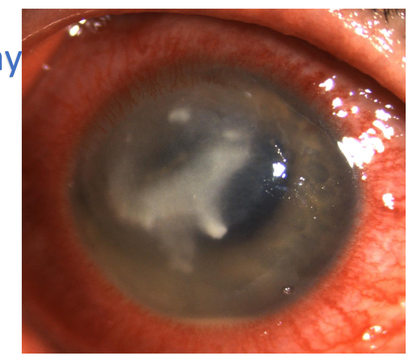


Vigamox (fluoroquinolone) and **gentamicin (aminoglycoside)** **Meropenem** added (suspected *Pseudomonas*) + **Amikacin (aminoglycoside)**

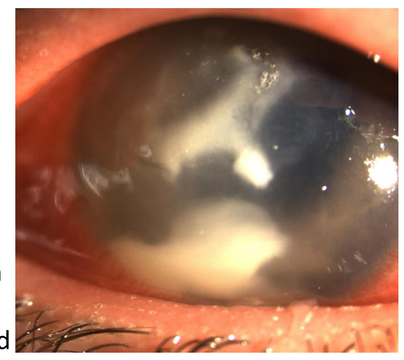


3rd day

17th day

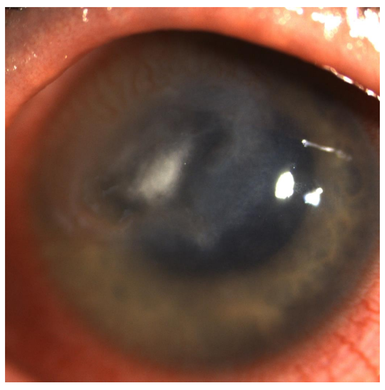


Systemic therapy added **Doxycycline (tetracycline)** and **Citeral (ciprofloxacin)** + probiotic
After scraping results: **Colistin (polymyxin)** added according to antibiogram **Zavicefta (ceftazidime + avibactam)** and **vancomycin (glycopeptide)** added **Diflucan (fluconazole)** added

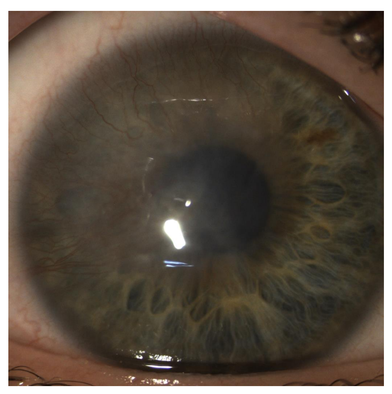


22nd day

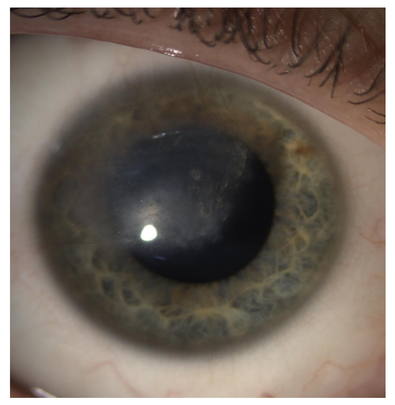
37th day



0.125% prednisolone introduced

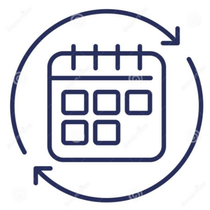


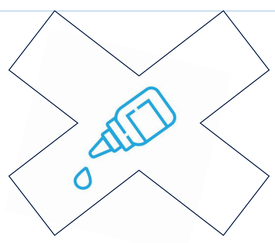
check-up after 3 months



check-up after 8 months

Conclusion: Keratitis caused by multidrug-resistant *Pseudomonas aeruginosa* represents a major therapeutic challenge in contact lens wearers and may result in significant visual impairment. Strict adherence to contact lens hygiene and avoidance of unsupervised corticosteroid use are essential for prevention.





40TH CONGRESS HSIOIRS · ATHENS, GREECE · MARCH 12-14, 2026

Primary Mucinous Carcinoma of the Eyelid Mimicking Recurrent Chalazion

A Diagnostic Challenge — Case Report

Yaren Guven, MD · Fatma Sumer, MD · Cigdem Ozturk, MD
Department of Ophthalmology, Recep Tayyip Erdogan University, Rize, Turkey

POSTER #60

⚠ **Recurrent eyelid lesion after 2+ failed I&C procedures = excisional biopsy, not repeat curettage**

BACKGROUND

PRIMARY MUCINOUS CARCINOMA (PMC)
<150 cases worldwide
Low-grade eccrine sweat gland malignancy · Indolent growth · Strong eyelid predilection

⚠ DIAGNOSTIC PITFALL
Mimics chalazion, epidermal cyst, sebaceous cyst
Must distinguish from **metastatic** mucinous adenocarcinoma (breast, GI) — treatment implications differ fundamentally

CASE PRESENTATION

PATIENT
68-year-old female
Left lower eyelid nodule · 18-month history

PRIOR TREATMENT — DIAGNOSTIC DELAY
2× Incision & Curettage
Recurrence within 3–6 months each time

EXAMINATION (OUR CENTRE)
12 × 8 mm gelatinous nodule
Well-circumscribed · Pinkish-tan · Medial lower eyelid · No ulceration

HISTOPATHOLOGY

"Floating island" pattern: *Epithelial cell islands floating in abundant extracellular mucin pools — pathognomonic for primary mucinous carcinoma.*

SURGICAL MARGINS
✓ Clear — 5 mm margins
Wide local excision · Permanent section histopathology

IMMUNOHISTOCHEMISTRY PANEL

✓ POSITIVE
- ✓ **CK7**
- ✓ **GCDFP-15**
- ✓ **ER / PR**
- ✓ **p63**

✗ NEGATIVE
- ✗ **CK20**
- ✗ **CDX2**

GI origin excluded

→ *Supports primary cutaneous origin. ER/PR positivity = eccrine differentiation, not breast metastasis.*

METASTATIC WORKUP

✓ **Whole-body PET-CT** — No occult primary identified

✓ **Mammography** — Normal, breast primary excluded

→ PRIMARY cutaneous origin confirmed

18-MONTH FOLLOW-UP

✓
No local recurrence

✓
No regional metastasis

✓

Disease-free

👁

Full lid closure

Tenzel flap

😊

Excellent cosmesis

⌨

Follow-up

3-mo × 2yr then 6-mo

💡 **The key lesson:** Any eyelid lesion recurring after 2+ I&C procedures warrants **excisional biopsy with histopathology** — not another curettage. This patient had **18 months of diagnostic delay** from repeated treatment of presumed benign disease. The gelatinous appearance and medial location should have prompted earlier suspicion.

TAKE-HOME MESSAGES

1. PMC can **masquerade as recurrent chalazion** — maintain suspicion for any gelatinous, well-circumscribed eyelid lesion, especially in patients over 60
2. **2+ failed I&C procedures = excisional biopsy** with histopathological examination as standard of care — never repeat I&C
3. **Comprehensive IHC panel** (CK7, CK20, CDX2, GCDFP-15, ER/PR, p63) is essential to confirm primary cutaneous origin and exclude metastatic breast or GI adenocarcinoma
4. **Complete excision with clear margins is curative.** Systemic workup (PET-CT + mammography) mandatory. Long-term follow-up ≥5 years — late recurrences up to 10 years reported

40TH CONGRESS HSIOIRS · ATHENS, GREECE · MARCH 12-14, 2026

Endocrine Mucin-Producing Sweat Gland Carcinoma of the Eyelid with Progression to Invasive Mucinous Adenocarcinoma

A Rare Entity with Breast Carcinoma Analogy — Case Report

Yaren Guven, MD · Fatma Sumer, MD · Cigdem Ozturk, MD
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POSTER #61

EMPSGC = cutaneous equivalent of endocrine ductal carcinoma in situ of the breast — neuroendocrine differentiation, ER/PR positivity, potential for invasive progression

BACKGROUND — EMPSGC

WHAT IS EMPSGC?

<100 cases worldwide

Low-grade neuroendocrine cutaneous neoplasm · Strong eyelid predilection · Dual IHC phenotype

SKIN
EMPSGC
(in situ)
→
BREAST ANALOGY
Endocrine DCIS
→ Type B Invasive Mucinous

Key question: True progression or de novo invasive carcinoma?

CASE PRESENTATION

PATIENT

72-year-old male

Left upper eyelid · Slowly enlarging × 8 months · Firm, non-tender

INITIAL IMPRESSION

Epidermal inclusion cyst

Classic misdiagnosis — progressive enlargement in elderly should prompt excision

MANAGEMENT

Wide excision — 4 mm margins

Advancement flap · Full IHC panel · PET-CT systemic staging

HISTOPATHOLOGY — BIPHASIC PROGRESSION PATTERN

SUPERFICIAL — EMPSGC (IN SITU)

Solid nests + papillary structures of **low-grade epithelial cells** with intracytoplasmic mucin · Characteristic neuroendocrine architecture

↓
TRANSITION

DEEP — INVASIVE MUCINOUS ADENOCARCINOMA

Extracellular mucin pools with floating tumour cell clusters · Transition zone clearly identifiable — supports progression model

✓ **Surgical margins: CLEAR on permanent section histopathology**

IMMUNOHISTOCHEMISTRY

NEUROENDOCRINE
- ✓ **Chromogranin**
- ✓ **Synaptophysin**

HORMONE
- ✓ **ER (+)**
- ✓ **PR (+)**
- ✓ **CK7 (+)**

NEGATIVE
- ✗ **CK20**
- ✗ **CDX2**

Chromogranin/synaptophysin positivity distinguishes EMPSGC from metastatic breast mucinous carcinoma — even with ER/PR positivity.

SYSTEMIC WORKUP & OUTCOME

✓ **PET-CT** — No breast, GI or distant primary

✓ **Male breast** — No uptake (mandatory even in males)

→ **PRIMARY cutaneous origin confirmed**

✓

No recurrence
24 months

✓

No metastasis

👁

Full lid function

🔬 This case documents **in situ EMPSGC progressing to invasive mucinous adenocarcinoma** — the rarest progression in an already rare tumour. The **visible transition zone** and neuroendocrine marker positivity in both components support a progression model paralleling breast carcinoma biology. **Clonality studies** (NGS, LOH) would confirm shared origin in future cases.

TAKE-HOME MESSAGES

1. EMPSGC is a **rare neuroendocrine eyelid carcinoma** — any firm, slowly enlarging upper eyelid nodule in an elderly patient should be excised and submitted for histopathology with full IHC panel including neuroendocrine markers
2. EMPSGC **can progress to invasive mucinous adenocarcinoma**, directly paralleling endocrine DCIS in breast cancer — a unique progression with biphasic histopathological pattern
3. **Dual IHC phenotype** is the diagnostic key: neuroendocrine markers (chromogranin + synaptophysin) PLUS hormone receptors (ER/PR) — neuroendocrine positivity is absent in metastatic breast mucinous carcinoma
4. **Complete excision with clear margins is curative.** Invasive component warrants enhanced surveillance. Systemic workup mandatory even in male patients when ER/PR positive mucinous carcinoma identified

ECLSO 2026

The European Society of Contact Lenses and Ocular Surface

24-25 April 2026 | Vienna, Austria

POSTER #62

Microbial Keratitis in Contact Lens Wearers: Three Different Etiologies and Strategies for Safe Return to Lens Wear

Yaren Guven, Fatma Sumer

Department of Ophthalmology, Recep Tayyip Erdogan University Faculty of Medicine, Rize, Turkey

BACKGROUND & OBJECTIVE

Microbial keratitis is a sight-threatening complication of contact lens wear. Evidence-based guidelines on timing and modality for safe return to lens use post-infection remain limited. We present three cases with organism-specific management.

CASE 1

24-year-old male | Monthly silicone hydrogel wearer

Organism: Pseudomonas aeruginosa (3 mm central infiltrate)

- 6 weeks fortified antibiotic therapy required
- Central corneal scar persisted (BCVA: 0.3 logMAR at completion)

Treatment: Fortified topical antibiotics x 6 weeks

Return to lens wear:

- **Return modality:** Daily disposable lenses at 4 months
- **Final BCVA:** 0.15 logMAR
- **Follow-up (12 mo):** Infection-free

Minimum interval before return: 4 months | Strict hygiene counseling provided

CASE 2

29-year-old female | Biweekly lens wearer

Organism: Staphylococcus aureus (paracentral)

- Resolution within 3 weeks with fluoroquinolone monotherapy
- Minimal paracentral scarring (BCVA: 0.0 logMAR)

Treatment: Fluoroquinolone monotherapy x 3 weeks

Return to lens wear:

- **Return modality:** Daily disposable lenses at 3 months
- **Final BCVA:** 0.0 logMAR
- **Follow-up (12 mo):** Infection-free

Minimum interval before return: 3 months | Daily disposables recommended

CASE 3

35-year-old male | Monthly lens wearer

Organism: Fusarium (fungal keratitis)

- 8 weeks natamycin + voriconazole therapy
- Dense paracentral scar (spectacle BCVA: 0.5 logMAR)

Treatment: Natamycin + voriconazole x 8 weeks

Return to lens wear:

- **Return modality:** Scleral lens at 6 months
- **Final BCVA:** 0.2 logMAR
- **Follow-up (12 mo):** Infection-free

Minimum interval before return: 6 months | Scleral lens for irregular surface

RETURN-TO-LENS PROTOCOL

- Bacterial keratitis: minimum 3 months before lens resumption
- Fungal keratitis: minimum 6 months before lens resumption
- Preferred modality: daily disposable lenses for bacterial cases
- Scleral lenses preferred for residual scarring or irregular corneal surface
- Strict hygiene counseling mandatory at all stages of rehabilitation

KEY FINDINGS

Case 1	Case 2	Case 3	All Cases
Pseudomonas	**Staph aureus**	**Fusarium**	**12 mo**
Return at 4 mo	Return at 3 mo	Return at 6 mo	Zero
BCVA: 0.15	BCVA: 0.0	BCVA: 0.2	recurrence

CASE COMPARISON

Parameter	Case 1 Pseudomonas	Case 2 Staph aureus	Case 3 Fusarium
Age / Sex	24 M	29 F	35 M
Lens type	Monthly	Biweekly	Monthly
Tx duration	6 wks	3 wks	8 wks
Scar	Central	Minimal	Dense paracentral
BCVA pre-return	0.3	0.0	0.5
Return interval	4 mo	3 mo	6 mo
Return modality	Daily disp.	Daily disp.	Scleral lens
Final BCVA	0.15	0.0	0.2
12-mo outcome	Infection-free	Infection-free	Infection-free

CONCLUSIONS

1. Safe return to contact lens wear after microbial keratitis is feasible with organism-specific timing: 3 months for bacterial and 6 months for fungal keratitis.
2. Daily disposable lenses are the safest post-keratitis rehabilitation option for bacterial cases, eliminating lens storage contamination risk.
3. Scleral lenses provide superior visual rehabilitation for cases with residual corneal scarring or irregular astigmatism following fungal keratitis.
4. All three patients remained infection-free at 12-month follow-up, confirming the safety of a structured return-to-lens protocol.
5. Strict hygiene counseling and regular follow-up are essential components of any contact lens rehabilitation program post-infection.

CLINICAL IMPLICATIONS

- 3-month rule for bacterial, 6-month rule for fungal keratitis
- Daily disposables preferred over reusable lenses post-infection
- Scleral lenses for irregular corneas after dense scarring
- Hygiene re-education mandatory before any lens resumption

KEYWORDS

Microbial keratitis | Contact lens | Pseudomonas | Fusarium | Scleral lens | Daily disposable

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Predictors of Postoperative Dry Eye Disease in Refractive Surgery Patients

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Background

Dry eye disease (DED) is a common concern after corneal refractive surgery, but whether it is driven by surgical factors or preexisting ocular surface dysfunction remains unclear

Aim

To evaluate preoperative DED prevalence, identify longitudinal ocular surface changes and predictors of postoperative DED, following photorefractive keratectomy (PRK).

Methods

- Retrospective cohort study of consecutive PRK patients with or without preoperative DED.
- Ocular surface evaluation was performed at the initial examination, on preoperative day-1, and at postoperative months 1, 3, and 6.
- Assessed parameters at all visits included DEWS III-defined DED, ocular surface disease index (OSDI), non-invasive tear breakup time (NIBUT), tear breakup time (TBUT), Schirmer test, meibomian gland dropout and fluorescein staining
- Preoperative ocular surface comorbidities, artificial tear use, contact lens wear, and key surgical parameters (ablation depth, residual stromal thickness, central corneal thickness, mitomycin-C exposure time, and bandage contact lens duration) were recorded.
- Eyes with DED at initial examination were treated before surgery.
- Intergroup comparisons were performed according to preoperative DED status at each time point. Univariable analyses were conducted to identify for predictors of postoperative DED.
- Longitudinal outcomes were assessed using linear mixed-effects models including time, preoperative DED status, and time-by-group interaction; Bonferroni correction was applied for pairwise comparisons.

Results

- 179 eyes of 91 PRK patients were included.
- Figure 1 shows the prevalence of DED in the whole cohort.
- Of 179 eyes, 74 (41.3%) were with DED and 105 (58.7%) without DED.
- At initial visit, eyes with DED had significantly higher median OSDI and lower median TBUT compared to controls (31.25 vs 7.50, $p < 0.001$; 8.00 vs 12.00, $p < 0.001$, respectively). In this group, the median TBUT improved before surgery; however, OSDI remained significantly higher compared to controls until postoperative month 6.
- Postoperative DED predictors were female sex (p=0.009) and DED at initial examination (p=0.029). No surgical parameter was associated with postoperative DED.
- OSDI changed significantly over time and differed between groups ($p = 0.027$ and $p < 0.001$, respectively), with a significant time-by-group interaction ($p = 0.001$), whereas NIBUT, TBUT, and meibomian gland dropout remained stable (all $p > 0.05$); Schirmer values decreased significantly over time ($p < 0.001$), particularly at 6 months. Figure 2 and figure 3 illustrate the significant longitudinal change in OSDI and the relative stability of NIBUT over time.

Figure 1. Prevalence of preoperative DED in the study cohort.

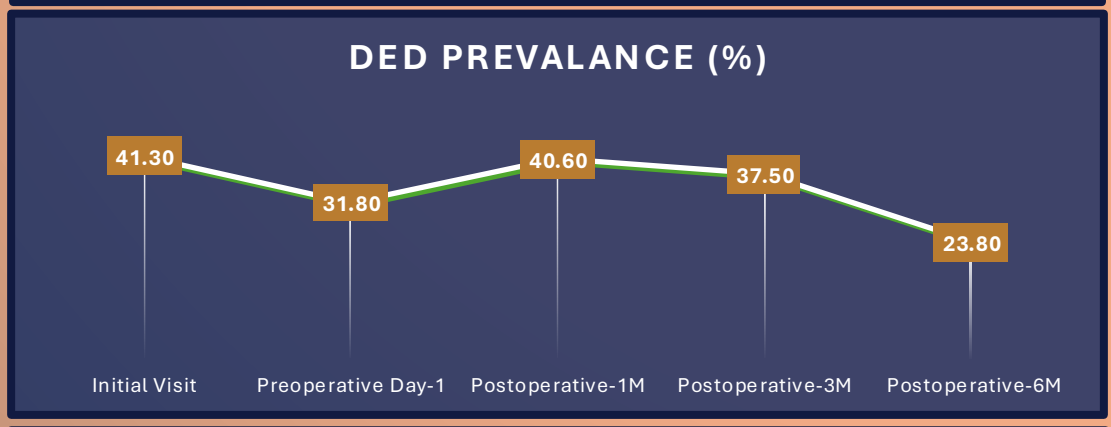


Figure 2. Longitudinal change in OSDI in eyes with and without preoperative DED.

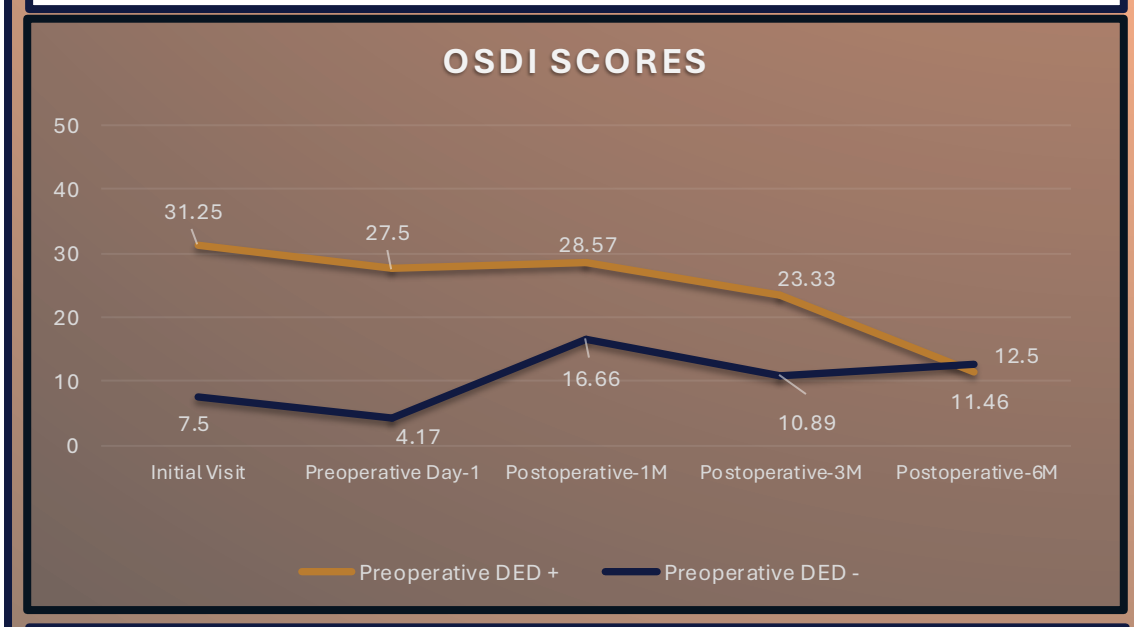
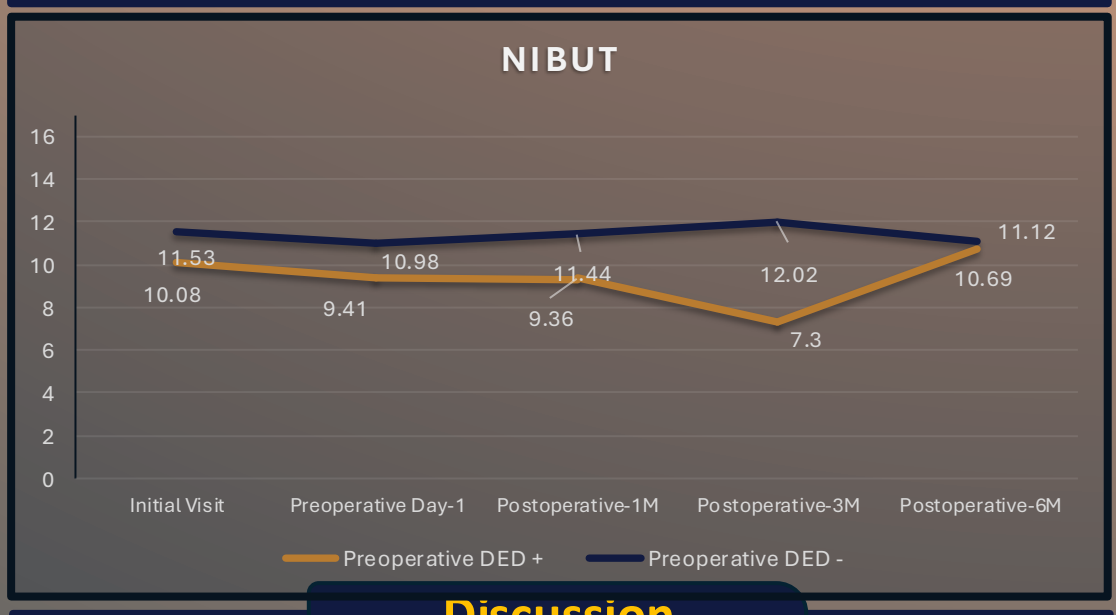


Figure 3. Longitudinal change in NIBUT in eyes with and without preoperative DED.



Discussion

Previous studies have identified pre-existing DED as a major risk factor for postoperative DED after refractive surgery, while the contribution of surgical factors has been less consistent across reports (1,2). Consistent with these results, in our cohort, preoperative DED was the main predictor of postoperative DED.

Conclusion

In refractive surgery candidates preoperative tear film and ocular surface evaluation and optimization are essential prior to surgery to optimize surgical outcomes.

In patients undergoing PRK, postoperative DED was primarily associated with preexisting ocular surface dysfunction, rather than surgical factors.

References

1. Nair, A. A., et al. *Refractive surgery and dry eye: An update*. 2023.
2. Dossari SK, et al. Post-refractive surgery dry eye: a systematic review. Cureus. 2024

Contact lens pra
adolescents

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Private practice

Izmir Turkey

INTRODUCTION

Children who require vision correction may benefit from contact lens wear, and all options for correction should be considered and be part of the discussion process with the child and their parent(s)[1]

Contact lenses provide advantages of increased magnification for myopes, unobstructed field of view and the absence of prismatic peripheral field distortion

Contact lens wear was shown to improve how children and teens felt about their appearance and participation in activities

Adolescent years are all about appearance and acceptance issues.

In this study we aimed to discuss our soft lens fitting results in adolescents

Walline J, Gaume A, Jones L, Rahm M, Manny R, Berntsen D, Chitkara M, Kim A, Quinn N. Benefits of contact lens wear for children and teens. Eye Contact Lens 2007;33:317–21.
Paquette L, Jones DA, Sears M, Nandakumar K, Woods CA. Contact lens fitting and training in a child and youth population Contact Lens & Anterior Eye 38 (2015) 419–423

MATERIALS AND METHODS

Single-center, retrospective cross sectional study

Adolecents who underwent soft spheric and toric lens fitting between September 2024 and January 2026

All were given informed consent after a complete ophthalmological exam
Two different brands were fit for the right and left eyes

CLvisual acuity (CLVA) and overrefraction was checked after 30 min

Lens fit and push-up test were evaluated
If the fit and visual acuity were optimal brand choice was up to the patient
In myopic astigmatism rotation and stability affected the decision

Insertion and removal was instructed by ZO and written information was given to all.

All of the youngsters practiced insertion and removal both on the trial day and the control visit within 2 weeks.

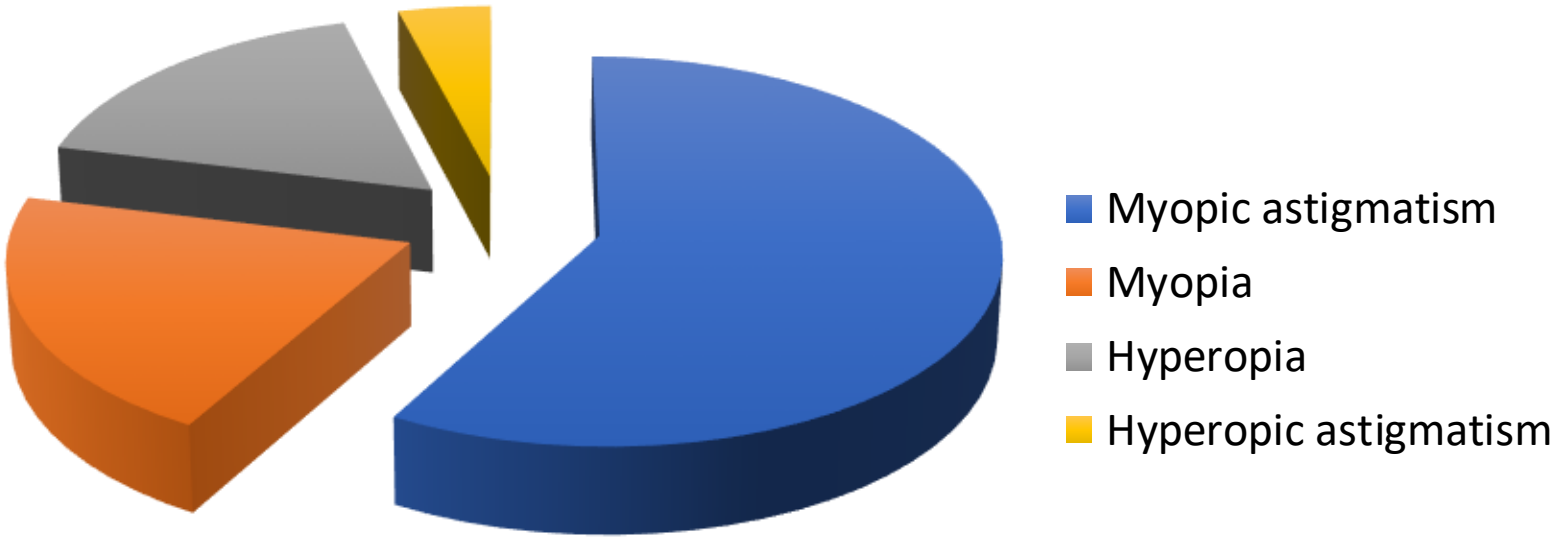
CLVA was superior or equivalent to spectacle-corrected VA for all.

Lens fit, adherence to lens hygiene and patient reported comfort were noted

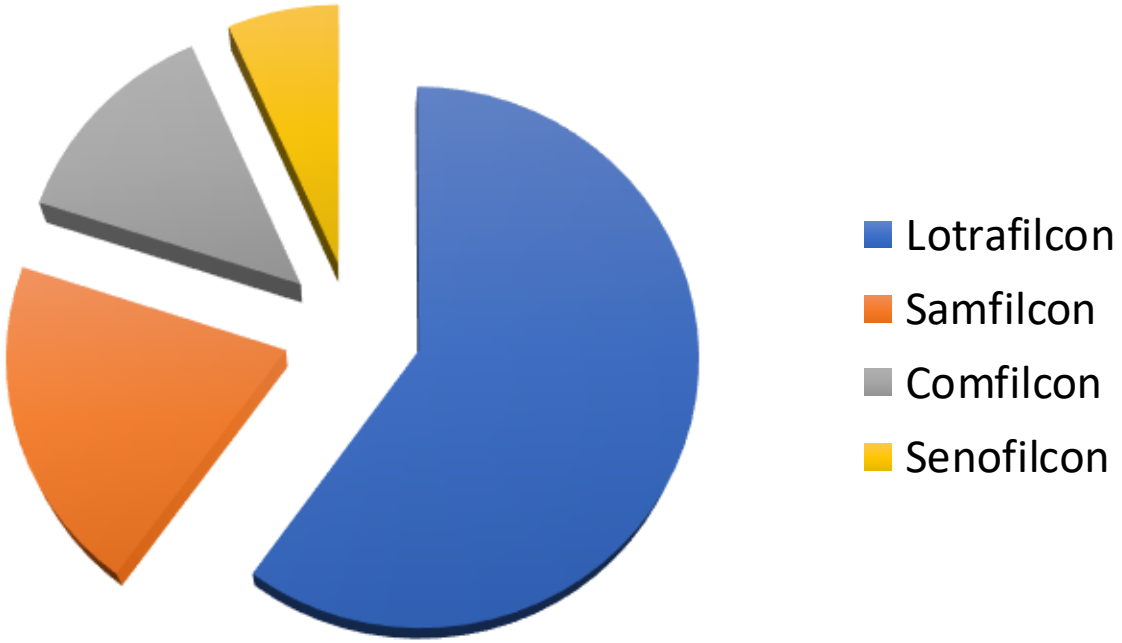
RESULTS: 30 patients, 58 eyes

Gender	Male 14 (%46,7) Female 16 (%53,3)
Age (years)	15.03 ± 2,8 (range= 12-17)
Indication	**Myopic astigmatism** 17 patients (%56,6) Myopia 6 (%20) Hyperopia 5 %16.6) Hyperopic astigmatism 2 (%6.6)
Failure	3 patients (%10)

Indications



Prescribed material



Mean follow-up: 10.4± 3.6 months (range:6-16)
All reported stable and comfortable vision throughout the day and adhered to hygiene.
No serious complications were noted

DISCUSSION

Contact lenses are a good alternative in vision correction when attention paid to lens hygiene Recently there has been an increasing interest in the use of contact lenses in the control of myopia, which will likely lead to an increasing interest in fitting children with contact lenses.

Initial motivation of the child was reported to be a major factor in determining success with contact lens training as well as future wear. Our study also confirmed this motivation factor

One interesting result was myopic astigmatic fits were more than total spheric fits

Lam CSY, Tang WC, Tse DYY, Tang YY, To CH. Defocus incorporated soft contact(DISC) lens slows myopia progression in Hong Kong Chinese school children: a 2-year randomized clinical trial. Br J Opthalmol 2014;98:40–5
Cheng X, Xu J, Brennan NA. Randomized trial of soft contact lenses with novel ring focus for controlling myopia progression Ophthalmol Sci 2022;18
Paquette L, Jones DA, Sears M, Nandakumar K, Woods CA. Contact lens fitting and training in a child and youth population Contact Lens & Anterior Eye 38 (2015) 419–423

To conclude..

Adolescents may demand contact lens wear for physical appearance and sports activities.

After taking a detailed medical and social history, the child and the family should be informed about every step emphasizing hygiene

Lens trial chance should be given since fitting is similar to adults and chair time is not that long when motive is high

Due the increasing prevelance of astigmatism, we believe this issue should be considered for myopia control soft contact lenses

Kam KW et al. Prevalence and severity of astigmatism in children after Covid 19.Jama Ophthalmol 2025;143:383