ECOS-G

EDUCATIONAL CLUB
OF OCULAR SURFACE
& GLAUCOMA

CLINICAL CASES
BROCHURE

2017-2018 COLLECTION

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Dear Friends,

After the great success of the ECOS-G meeting in 2018, and especially its Clinical Case session, we have decided to print a brochure with all the Clinical Cases collected these past two years.

I want to sincerely thank the authors for their priceless contribution on Glaucoma and Ocular Surface Disease. All the clinicians involved are here sharing with us real-life cases: different diagnostic techniques, various management, new medical approaches and most recent surgical procedures are presented. For each case I have included some comments and suggestions.

I also want to thank Professors Baudouin and Thygesen, that make co-chairing this event with them easy, and of course Laboratoires Thea for their constant help and selfless engagement.

I hope you will enjoy this initiative,

Kind regards,

Professor José Manuel Benítez-del-Castillo Sánchez

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CLINICAL CASE

Steroid-induced protracted severe ocular hypertension in a 14-year-old girl

Prof. Luís Abegão Pinto

Head of the Glaucoma Clinic, Department of Ophthalmology, Hospital Santa Maria, Lisbon, Portugal
Assistant Professor of Ophthalmology, Faculty of Medicine, Lisbon University, Portugal

> PATIENT'S PRESENTATION

14-year-old girl with a diagnosis of an idiopathic bilateral anterior and intermediate uveitis with macular oedema was referred from another institution with a protracted, refractory Steroid-Induced Ocular Hypertension (SIOH).

> BACKGROUND

4 months earlier

- OD: intravitreal triamcinolone injection
- OS: subconjunctival triamcinolone delivery
- While the steroid proved effective in resolving the uveitic macular oedema and restoring both the normal foveal contour and a near normal visual acuity, IOP significantly increased despite medical therapy.

→ Resolution of the uveitic macular oedema
→ Restoration of the normal foveal contour
→ Restoration of a near normal visual acuity,
→ IOP significantly increased despite medical therapy.

> AT PRESENTATION

Investigation for infectious and non-infectious causes of uveitis > oral ciclosporin A 100 mg twice daily.

- Visual acuity: 20/25 OU
- No signs of active inflammation in neither eye
- No posterior or anterior synechiae
- Open-angle OU (Schaffer IV 360°) on gonioscopy
- IOP: 40 mmHg OD, 34 mmHg OS
- Corneal central thickness: 546 µm OD, 543 µm OS
- Treatment: topical prostaglandin analogue, betablocker, alpha agonists and oral acetazolamide.

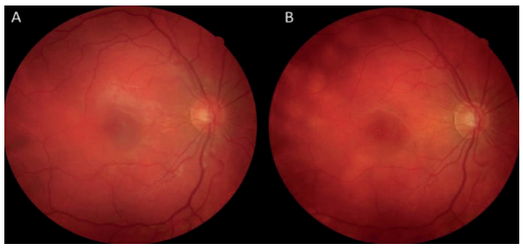
> INVESTIGATIONS

Funduscopic examination

- Bilaterally enlarged cupping with the triamcinolone crystals still floating on the posterior segment OD

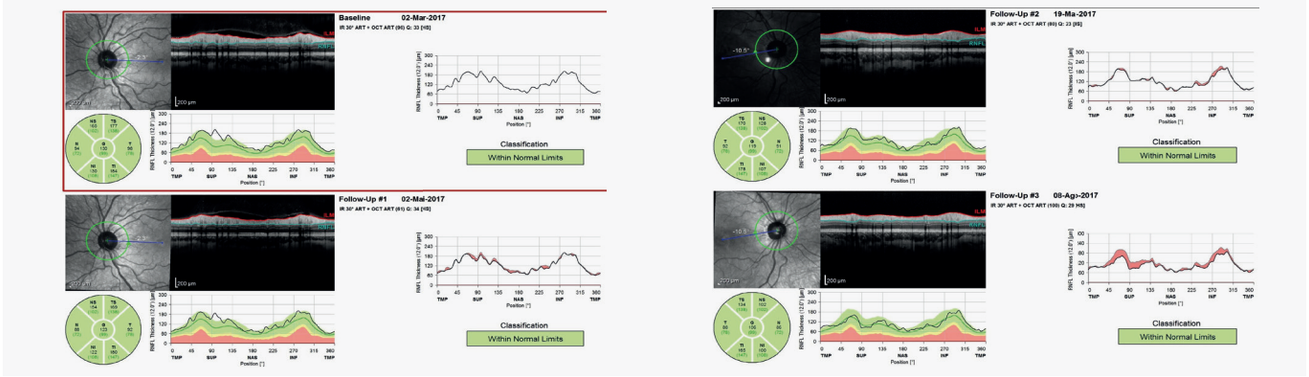
OCT and visual field :

- Normal thickness of the peripapillaryretinal nerve fibrelayer and no abnormal retinal sensitivity in both eyes, respectively.



> TREATMENT/MANAGEMENT

- Initial 'wait-and-see' conservative approach preferred (young patient age & SIOH transient in most case).
- Close follow-up scheme in clinic including a monthly OCT



- After 4 months, since progressive structural changes (higher than 5%) were documented in 3 consecutive OCT examinations under maximal medical therapy, we considered proceeding to a surgical approach.

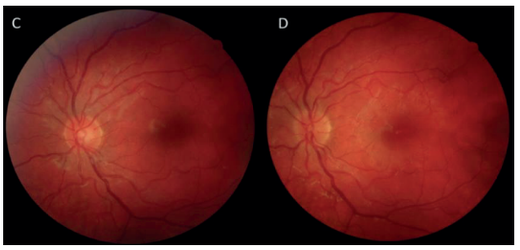
- Bilateral sequential MIGS (XEN® gel stent implant): implant inserted ab interno as usual, keeping about 3 mm of it in the subconjunctival space, 2 mm intrasclerally, and 1 mm in the anterior chamber

- Anti-inflammatory therapy during the peri-operative period (protocol follows the one from cataract (Suresh PS, Jones NP Phacoemulsification with intraocular lens implantation in patients with uveitis. Eye 2001;15:621-628) as per the Manchester Eye Hospital Protocols:
  - One week before surgery: topical prednisolone 6x/day + oral prednisolone 20 mg
  - After surgery: the preoperative oral prednisolone dose is maintained until at least day 5 postoperatively + topical prednisolone each hour. Following day 5, doses are titrated downwards slowly according to response. The average time taken to baseline treatment is 9 weeks.

> OUTCOME AND FOLLOW-UP

DURING FOLLOW-UP

- Ocular inflammation under control with no flare-ups under systemic conventional immunosuppression (subcutaneous methotrexate 20 mg weekly), with no need for topical or systemic steroids.



AFTER 6 MONTHS

- IOP was well controlled (OD: 14–16 mm Hg; OS: 13–14 mm Hg, with no topical therapy),
- the optic cup was noted to reverse, most strikingly in the left eye.

> DISCUSSION

- In our case, an initial 'wait-and-see' conservative approach was preferred, but a MIGS procedure was considered due to documented anatomical progression. As a note, and since SIOH is a presumed diagnosis, one may not underestimate the importance of ruling out all the potential infectious etiologies for the intraocular inflammation, before performing invasive procedures, especially in uveitic eyes.
- This option allowed to effectively decrease IOP, while avoiding the complications associated with filtering surgery or other more invasive procedure in a teenage patient with SIOH.
- Given the patient's long life expectancy, the decrease in dependence on glaucoma medications and the good safety profile of MIGS surgery, this option is certainly associated with better quality of life among other surgical possibilities.
- This brief case raises awareness for the concept of primum non nocere, when considering the use of steroids in the paediatricage group. Conventional systemic immunosuppression (with an antimetabolite, for example) would have been a preferred initial approach to control bilateral ocular inflammation even with macular oedema, instead of bilateral local steroid treatment in the first place.

KEY MESSAGES

- **Steroid-induced ocular hypertension (SIOH) in the paediatric age is uncommon but usually more severe than in adults, with almost 20% requiring glaucoma surgery.**
- **A minimally invasive glaucoma surgery (MIGS) may effectively decrease the IOP, while avoiding the complications associated with a more invasive filtering surgery in a teenage patient with SIOH.**
- **Given the patient's age, the decrease in dependence on glaucoma medications and the good safety profile of MIGS, this option also allows for better quality of life among other surgical options.**
- ***A primum non nocere* attitude should be in our minds when considering the use of steroids in the paediatric age group.**

> *Metothrexate is the first choice immunosuppressant in this type of uveitis in children. Second line is adalimumab.*
>
> *Prof. José M. Benítez-del-Castillo Sánchez*

CLINICAL CASE

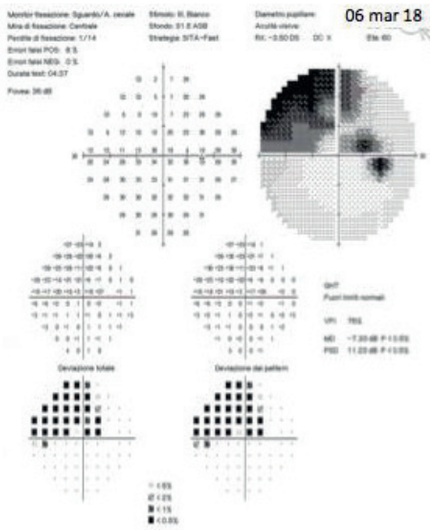
MIGS & pharmaceutical treatment associated

Prof. Michele Iester

Medical Head of Ophthalmology Clinic, Hospital San Marino, University of Genoa, Italy
Professor of Ophthalmology, University of Genoa, Italy

> PATIENT'S PRESENTATION

60-year-old man already on treatment, coming for a second opinion, and suffering from high blood pression, glaucoma since 2010 & max IOP 28 mmHg (without treatment).



- ODV: -6 sf -0.50X90= 10/10
- OSV: -5 sf -0.50X100= 10/10
- OS CV normal
- OO LAF (Both eyes, Lens Thickness/Axial Length Factor) :
  - Open angle,
  - Suffering corneal epitelium,
  - Fluo and lissamine green staining +++
- ODF C/D 0.9 notch h 6 with hemorrhage
- OSF C/D 0.8
- OOF (Fundus in both eyes) myopic fundus with tilted ONH
- OOT (Tonometry in both eyes) 16 mmHg APL
- Paki: OD 522 - OS 527
- Treatment: bimatoprost 0.1 and brimonidine and timolol

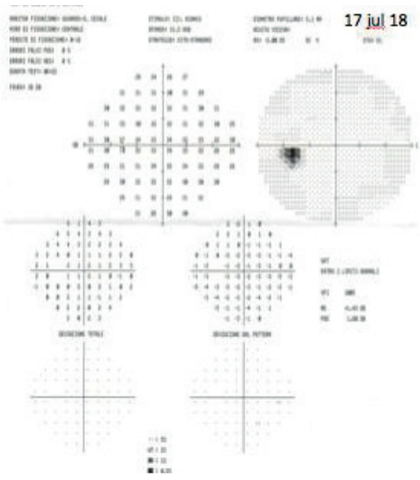
> TREATMENT/MANAGEMENT & RESULTS

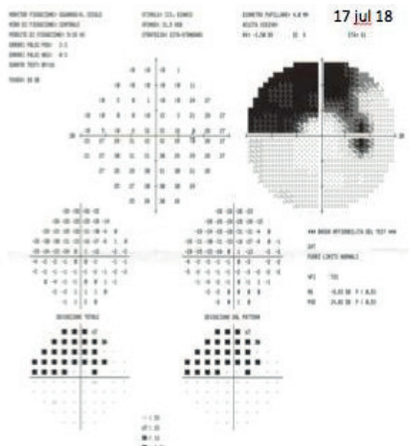
- Glaucoma: To determine rate of progression and target IOP
- Ocular surface: Artificial substitute - HA + Trehalose, 1 drop x 4
- Treatment: bimatoprost 0.1 and brimonidine and timolol

	After 2 months	After 4 months
OOT	16 mmHg APL	16 mmHg APL
OO (Both eyes)	Improvement of corneal epithelium but not enough	Mild corneal staining

> *Change to combinations (to decrease the number of preserved eye drops) or use preservative-free medications if available.*
>
> *Prof. José M. Benítez-del-Castillo Sánchez*

NB: In dry eye disease, Visual Field Testing is not reliable.





> FOLLOW UP

- Progression (3 VF getting worse) or fluctuation (consider old exams)
- Diurnal tension curve
- Target IOP below 14 mmHg
- Maximum treatment (actually on 3 medications)
  - Acetalozamide ?
  - Surgery?
  - Neuroprotection?

Hour 8,30	TOD: 15 mmHg	TOS: 15 mmHg
Hour 12,00	TOD: 15 mmHg	TOS: 16 mmHg
Hour 16,00	TOD: 16 mmHg	TOS: 15 mmHg
Hour 19,00	TOD: 17 mmHg	TOS: 17 mmHg

> SURGERY & POST OP TREATMENT



OD: Xen® implant surgery
- Injection in CA of air or viscoelastic
- Tobramycin + Dexamethasone, 1 drop x 5
- Atropine 1% 1 drop x 2

OS: bimatoprost 0.1 and brimonidine and timolol

> INFORMATION

… Among glaucoma patients, older age and lower postoperative IOP are risk factors for choroidal detachment after trabeculectomy with mitomycin C.

Haga et al., Clinical Ophthalmology 2013:7 1417–1421

> POST-OP FOLLOW UP

After 1 week :
- Choroidal detachment
- Prednisolone cpr1 mg/Kg

After 2 weeks :
- ODT 10 mmHg without treatment,
- Choroidal detachment improved
- Decrease Steroid
- OST 16 mmHg with local treatment

After 3 weeks :
- ODT 9 mmHg without treatment,
- No choroidal detachment
- Stop steroids
- OST 16 mmHg with Local treatment
- In OD Tobramycin + Dexamethasone for months, needling if the IOP increases

KEY MESSAGES

- **Improve patient's compliance to improve efficacy**
- **Fluctuation or progression related to the ocular surface status**
- **No surgery is complication free**
- **In MIGS complications are mild, but present**

CLINICAL CASE

Epitheliopathy of the bleb (EoB)-identifying attrition: A new model for failure of glaucoma surgery/cases

Prof. Gysbert van Setten

Department of Clinical Neuroscience, Karolinska Institutet and St Eriks Eye Hospital, Sweden
Assistant Professor of Clinical Ophthalmology

> PATIENT'S PRESENTATION

73-year-old man having undergone filtration surgery

> FLUORESCEIN STAINING & PHOTOGRAPHY

- Fluorescein staining was performed directly after surgery as well as during the months following surgery.
- Slit lamp photography was conducted using a cobalt blue filter and a yellow filter within 30 seconds after application of a standardized amount of fluorescein.

> POST-SURGERY FOLLOW UP

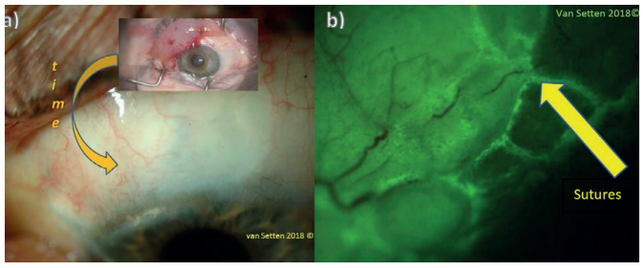


Figure 1. a) Decrease of the elevation of the bleb after deep sclerectomy within a few weeks after surgery, b) Localized staining at the site of sutures after glaucoma surgery.

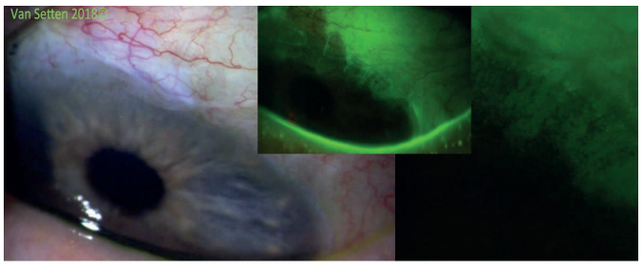


Figure 2. Staining at the limbal side of the bleb, extending over the corneal periphery

- In the weeks following surgery, the initially visible fluorescein staining close to the sutures and wound edge rapidly decreased.
- With the stabilization of the bleb, however, specific staining for fluorescein did not entirely disappear even weeks after surgery.

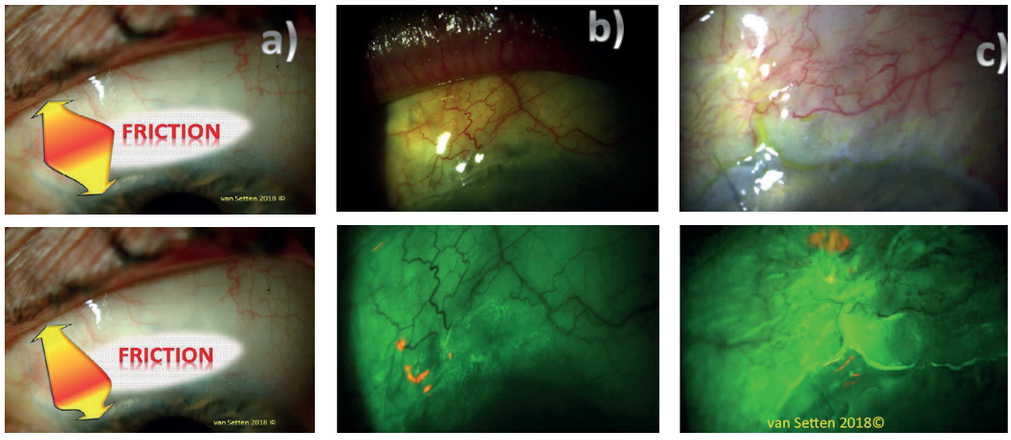
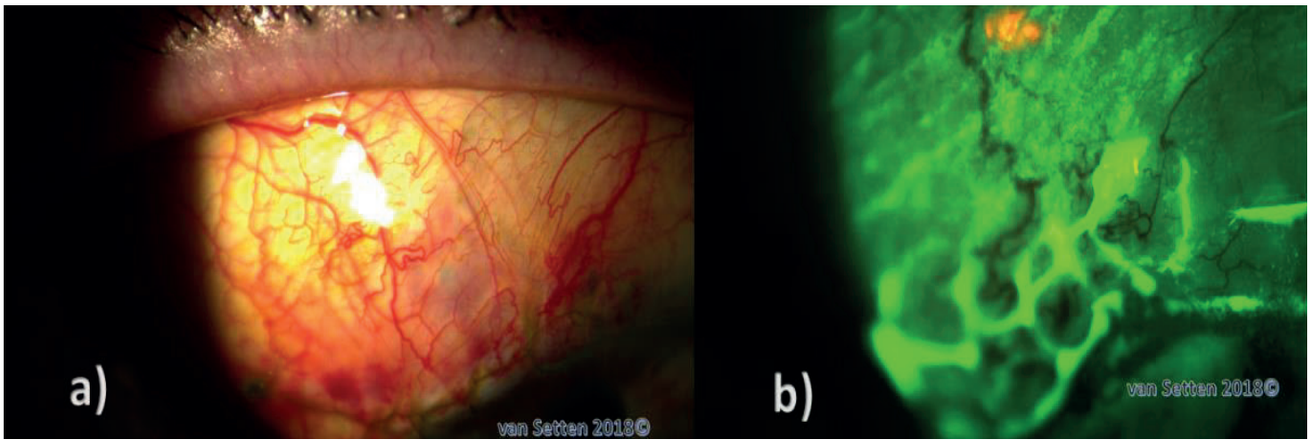


Figure 3a. Location of main friction areas in the area of the bleb (schematic);

3b. Localized punctate staining at the downhill side of the bleb towards the limbus;

3c. Localized staining over a cystic area of the bleb

Fig 4:
a) Slit lamp appearance of a well functioning bleb 1 month after successful deep sclerectomy
b) Same site inspected with yellow filter after fluorescein addition.



The results of Attrition: Fibrosis

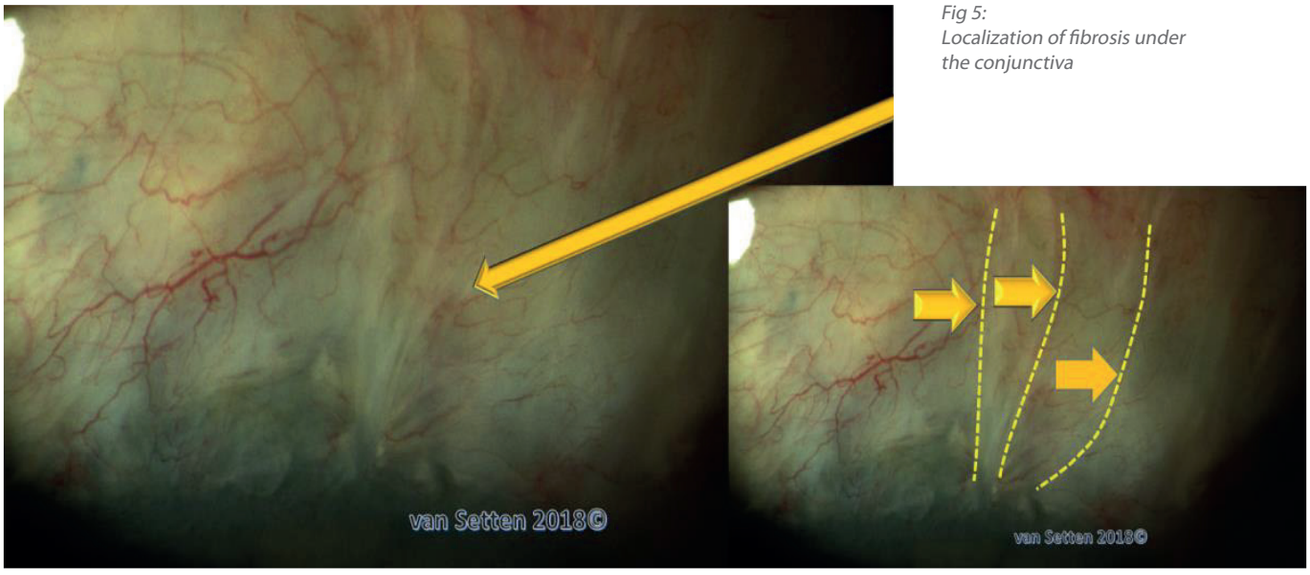


Fig 5:
Localization of fibrosis under the conjunctiva

- Once the bleb, visible sign of functionality of filtration efficacy, had stabilized, specific staining was still observed on the surface of the bleb months after the surgery.
- This characteristically localized and mostly punctate staining, hereinafter defined as epitheliopathy of the bleb (EoB), occurred towards the limbal side of the bleb. This may be followed by scar formation under the conjunctiva, leading to contraction and constriction of the anterior surface of the bleb towards the limbus. On the side of the bleb towards the fornixes, the staining was less and had a sandbank epitheliopathy-like appearance of low intensity. Such staining occurred when tear fluid insufficiency was simultaneously present.

> DISCUSSION - CONCLUSION

- Visible staining of the epithelium at or over the filtration site, however, does reflect localized injury, stress and ongoing healing processes, indicating secondary activity in the subconjunctival space. This could trigger stimulation of fibrosis leading to failure of filtration.

- Epitheliopathy of the bleb (EoB) should be actively looked after following any glaucoma filtration surgery because it is a key indicator of localized imbalance of epithelial homeostasis and attrition, identifying areas of enhanced mechanical stress, threatening to activate and maintain continuous wound healing of the bleb and therefore emphasizing the need for lubricating agents able to cope with the local rheological demands.

- Here, high molecular weight hyaluronic acid formulations appear to be particularly suitable.

KEY MESSAGES

- **Epitheliopathy of the bleb (EoB) should be actively looked after following any glaucoma filtration surgery.**
- **Visible EoB could hence be a key indicator for the need of lubricating agents able to cope with the local enhanced rheological demands. Amongst the available agents, not unexpectedly, non-preserved gels and compositions containing high molecular weight hyaluronic acid formulations have been shown to be particularly suitable.**

> *The use of artificial tears should be continued after surgery for uncontrolled glaucoma and OSD related with anti-glaucoma therapy.*
>
> *Prof. José M. Benítez-del-Castillo Sánchez*

CLINICAL CASE

Keratograph evolution after glaucoma surgery

Prof. Francisco José Muñoz-Negrete

Professor of Ophthalmology, Universidad de Alcalá, Spain
Head of Clinical Ophthalmology, Hospital Universitario Ramón y Cajal, Madrid, Spain

> PATIENT'S PRESENTATION

- 76 year-old woman
- Primary Open-Angle Glaucoma (POAG)
- IOP: 22mmHg
- Glaucoma treatment:
  - Presevative-free latanoprost
  - Fixed combination: Brinzolamide-Timolol

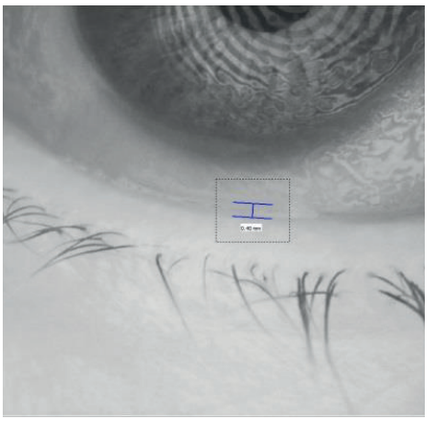
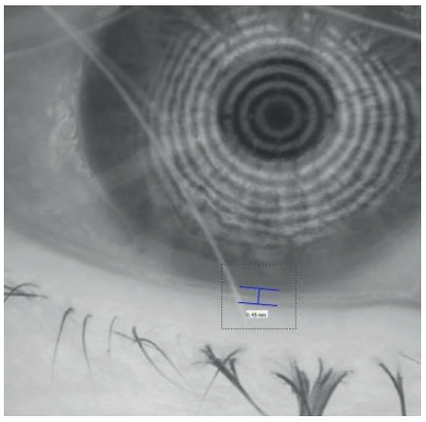
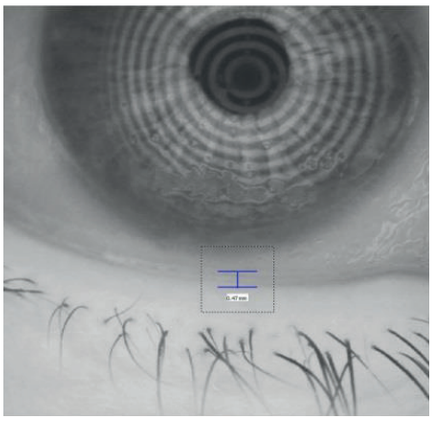
> TREATMENT

- Non perforating deep sclerectomy
- Postoperative treatment:
  - Fixed combination Tobramycin-Dexametasone multidose 1,5 month
- Postoperative IOP without glaucoma medication:
  - 1 week: 5 mmHg
  - 1 month: 14 mmHg

> EXAMINATIONS & MANAGEMENT

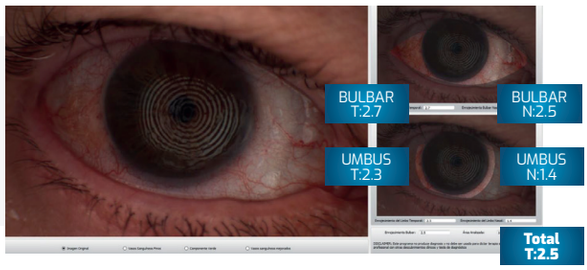
KERATOGRAPH: LACRIMAL MENISCUS

PREOPERATIVE: **0.4**
POSTOPERATIVE:
- 1 Week: **0.45**
- 1 Month: **0.47**

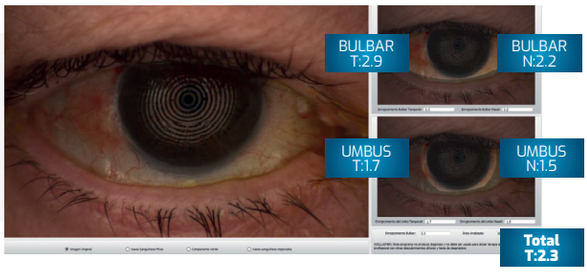




KERATOGRAPH: HYPEREMIA

PREOPERATIVE

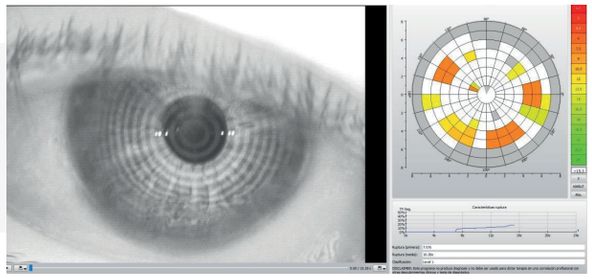


1 MONTH POSTOPERATIVE



KERATOGRAPH: BUT

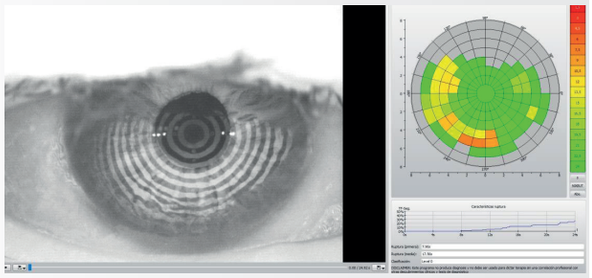
PREOPERATIVE



1 MONTH POSTOPERATIVE

Supression of glaucoma medication:

- Increase in MENISCUS LACRIMAL
- Reduction of hyperemia
- Increase BUT



After 1 month patient is still under preservative-free anti-inflammatory drugs:

- Possible improvement after complete treatment withdrawal

> CONCLUSION

There are new instruments to assess OSD, that are also useful for follow-up. In my opinion fixed preservative-free combinations of steroids and antibiotics should be used, but after one week only steroids are desirable (antibiotics can be toxic for the ocular surface).

Prof. José M. Benítez-del-Castillo Sánchez

After glaucoma filtering surgery

- Preservative-free anti-inflammatory antibiotic treatment desirable
- OSD partially reverted
  - Long-term
  - Little impact on caliciform cells
- Keratograph useful tool

CLINICAL CASE

Management of OSD in Open-Angle Glaucoma

Dr Martin Emesz

Department of Ophthlamology and Optometry, Tauerklinikum, Zell am See, Austria

> PATIENT'S PRESENTATION

75-year-old female, referred for Selective Laser Trabeculoplasty (SLT) because of severe primary open-angle glaucoma, IOP poorly controlled, poor compliance, distinct OSD.

- Fourfold (quadruple) preserved glaucomatous therapy
- Progressive vision loss
- Presenting with periocular eczema and painful eyes
- Epiphora
- Poor compliance because "drops sting"

> TREATMENT ALREADY USED

- Beta blocker - prostaglandin combination alpha blocker preserved
- Carboanhydrase inhibitor (all containing BAK)
- Lubricants (Cellulose - gel)
- Dexamethasone (ointment for periocular eczema)

> EXAMINATIONS

- Skin edema, focal redness, scales (figure 1)
- Slitlamp: compromised ocular surface conjunctival inflammation, corneal staining (figure 2 & 3)
- IOP: 20/21 (target <15mmHg)
- Gonioscopy: open angle, normally pigmented
- Pachymetry: 520/543 µm
- Vision: 10/20 o.u. due to corneal epithelium damage and cataract
- Visual Field Defect (figure 4)



Figure 1: eczema
© ophthalmology Zell am See

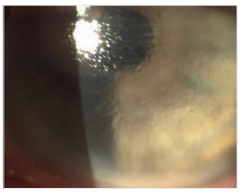


Figure 2
epithelial damage © ophthalmology Zell am See

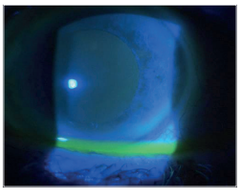


Figure 3
fluoresceinepositive area © ophthalmology Zell am See

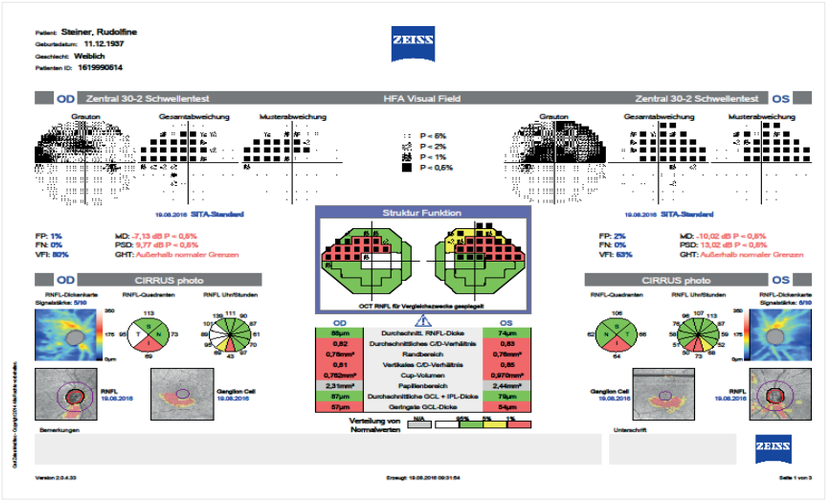


Figure 4
Visual fields © ophthalmology Zell am See

> NEW TREATMENT:

- Preservative-free antiglaucomatous regimen: dorzolamide/timolol combination and latanoprost
- Low-dose steroid treatment of periocular eczema for 1 week
- Treatment for OSD with preservative-free hyaluronic acid-trehalose drops, first 5 x daily for 4 weeks, then 4 x daily
- Cataract surgery to improve visual acuity and lower IOP

> RESULTS

- IOP 14 mmHg
- Ocular surface (figure 5 & 6)

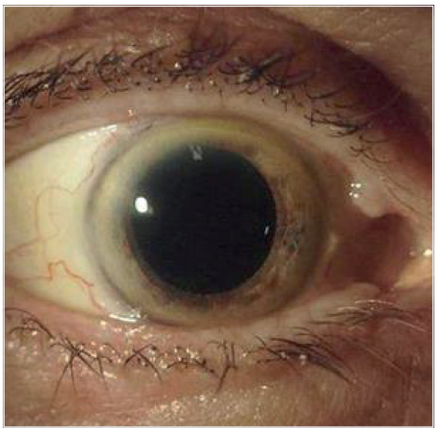


Figure 5 after Treatment
© ophthalmology Zell am See

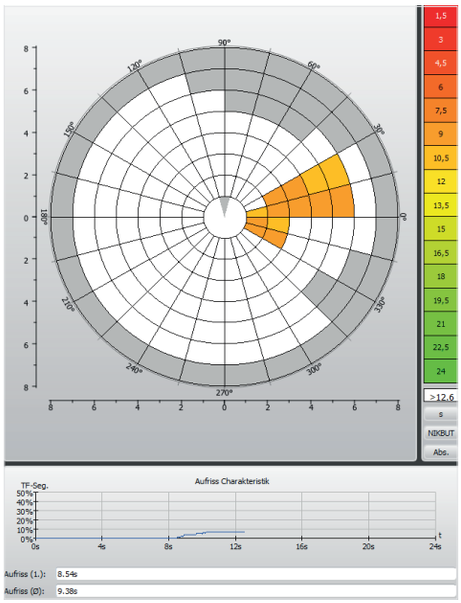


Figure 6 NIK-BUT
© ophthalmology Zell am See

> CONCLUSION

- Massive improvement of OSD (figure 5)
- Reduced amount of medication, switch to preservative-free treatment of glaucoma improves OSD
- Sufficiently lowered IOP with less drop (11-15 mmHg)
- Better visual acuity-stable visual filed/NFA OCT (figure 6)

KEY MESSAGES

- **Improvement of ocular surface conditions leads to a better quality of life and a better adherence in glaucoma therapy. Decrease in surface inflammation improves resorption of antiglaucomatous and enhances the success in surgical treatments as SLT, trabeculectomy or stent-implementation if still necessary.**

> *Think of OSD when glaucomatous patients are treated with preserved drugs. Toxicity is related with poor adherence and glaucoma progression.*
>
> *Prof. José M. Benítez-del-Castillo Sánchez*

REFERENCES

Jaenen, N. et al. : Ocular Symptoms and signs with preserved and preservative free glaucoma medications; EURJOphthalmol. 2007: 341-9

Pisella PJ. et al : Prevalence of ocular symptoms and signs with preserved and preservative free glaucoma medications BrJOphthalmol. 2002: 418-23

Servat JJ. et al : Effects of common topical antiglaucoma medications on the ocular surface, eyelids and periorbital tissue. Drugs Aging 2011: 28(4): 267-82

Ken Hayashi MD et al.Effect of cataract surgery on intraocular pressure control in glaucoma patients. Journal of Cataract & Refractive Surgery. 2001: 1779-1786

Takamura Etsuko et al.: a randomized, double masked comparison study of diquafosol versus sodium hyaluronate ophthalmic solutions in dry eye patients. BrJOphthalmol.2012: 1310-5

Baudouin C. et al: Preservatives in eyedrops: the good, the bad and the ugly. ProgRetinEyeRes2010: 312-34

TFOS DEWS II iatrogenic report.OculSurf.2017; 15,(3): 511-538

CLINICAL CASE

Ocular surface treatment and improvement of IOP

Dr Hannel Maldonado González

Glaucoma Specialist Ophthalmologist, Institute of Ophthalmology Conde de Valencia, Mexico City, Mexico
Graduate in evaluation of anterior segment, Harvard Medical School
Former president of the Mexican College of Glaucoma

> INTRODUCTION

- The term glaucoma corresponds to a group of progressive optical neuropathies characterized by degeneration of the ganglion cells of the retina and the consequent changes in the optical nerve. The loss of ganglion cells is related to the level of IOP, however other factors play an important role.
- The reduction of IOP is the only proven method to treat the disease. Treatment usually begins with hypotensive ocular drops[1], nevertheless it´s not free from side effects[2], including those that affect the ocular surface, putting at risk the treatment adherence.
- Side effects of the ocular surface occur due to chronic long-term use of antiglaucoma medications. It has been found that the instillation of topical drops during a period of three months or more, causes a significant subclinical inflammation, which has been detected as an increase in the expression of HLA-DR in the conjunctival epithelial cells[3] . It has been observed that the secretion of proinflammatory cytokines by conjunctival cells occurs as a result of the instillation of antiglaucoma eye drops[4]. OSD related to topical medication produces annoying symptoms that result in a decrease in compliance with the treatment, poor surgical results therefore decrease the quality of life in glaucoma patients[5], hence the importance of prevention and/or treatment to prevent progression in the deterioration of their visual field.

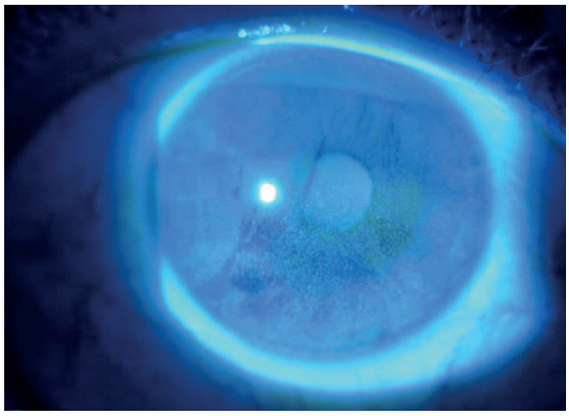
> PATIENT'S PRESENTATION

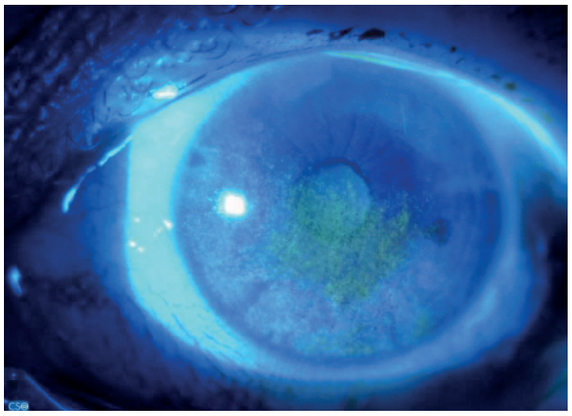
- Female patient 61 years old, public accountant, mother with primary angle-closure glaucoma, history of ovarian cancer in remission treated with surgical resection.
- Occasional migraine treated with flunarizine, diagnosis of primary angle closure glaucoma for 6 years.
- Under treatment with bimatoprost and brinzolamide a topical lubricant.
- Systemic medication: hormonal supplement (estrogen), ferranin.
- Iridotomies with YAG laser were performed in both eyes without complications. Brimonidine was added at that time to reduce the risk of a hypertensive peak due the procedure.
- She came two days after the Iridotomies with laser YAG laser iridotomies procedure due to:
  - Ocular pain in Left Eye (LE),
  - Photophobia,
  - Foreign body sensation and blurred vision of predominance in LE, that does not improve with refraction,
  - Difficulty reading and headache.

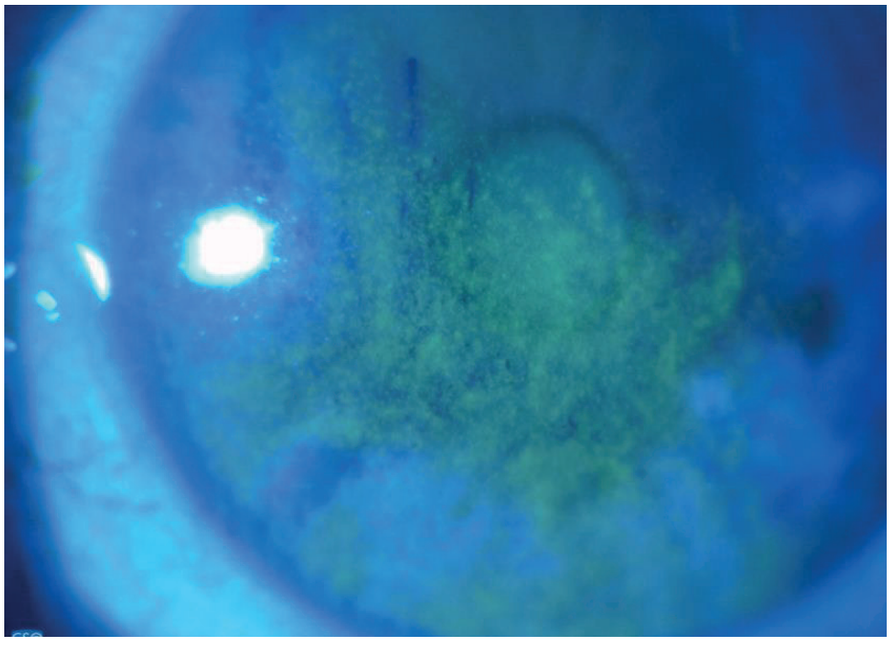
> EXAMS THAT HAVE BEEN DONE

- Visual acuity exploration in Right Eye (RE): 20/40 that corrects to 20/30 with refraction+1.00 sph, LE 20/60 that does not correct with refraction (+1.00=-0.50 x 90°).
- Biomicroscopically, scales are found at the base of the eyelashes, hypertrophy of the meibomian gland ducts.
- BUT 3 seconds in both eyes, superficial punctate keratitis of lower predominance with greater involvement of the LE that includes visual axis.
- Iridocorneal angle grade II-III in both eyes, permeable iridotomies in each eye, IOP 14 and 15 mmHg respectively.
- In the funduscopy, we observed degenerative changes in the optic nerve and thinning in the retinal fibers with moderate glaucoma.
- The OCT and Visual Fields were compatible with this diagnosis.

OD DAY 0





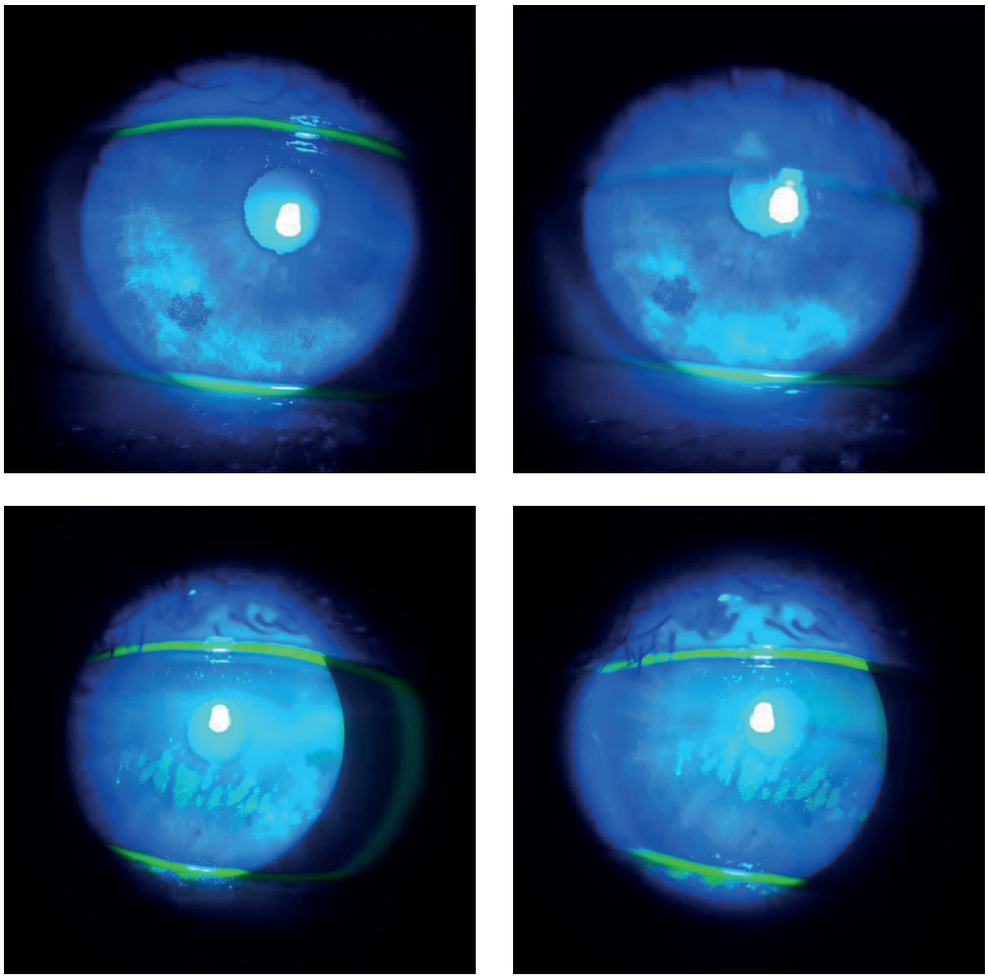


> NEW TREATMENT/MANAGEMENT DONE

- It was decided that the antiglaucomatous treatment had to be discontinued and was replaced with sodium hyaluronate with no added preservatives, four times a day, eyelash cleaning, oral hydration increase, oral omegas supplements. Trehalose drops three times a day.

> RESULTS

OD DAY 10



Three weeks later:

- photophobia resolved by 90%,
- foreign body sensation by 90%,
- blurred vision by 85% and eye pain by 75%,
- clinical observation shows almost complete resolution of superficial punctate keratitis,
- IOP 17 and 18 mmHg
- improvement in blepharitis.
- it was decided to restart a fixed combination of dorzolamide and timolol, add a drop with triglycerides in its formula and continue cleaning and intake of omegas.

> DISCUSSION

- Patients with chronic use of antiglaucomatous drugs frequently present alterations in the ocular surface, which put at risk adherence to treatment.
- 59% of patients under treatment with glaucoma manifest discomfort due to dry eye in at least one patient eye[6].
- 70.3% of the population with antiglaucomatous treatment, showed OSD, unlike 33% of the general population without glaucoma[7].
- Trehalose has also been shown to protect corneal cells against oxidative damage induced by ultraviolet (UV) rays by accelerating corneal repair[8], reducing inflammatory conjunctival cytokines[9] and restoring osmotic balance to the ocular surface, preventing denaturation of the cells, lipid membrane layers and proteins to maintain homeostasis of the corneal cells.

> CONCLUSION

- Regarding the corneal surface of the patient with chronic use of antiglaucomatous drugs is highly relevant in the adherence to treatment and in the impact on their quality of life.
- Trehalose has demonstrated an important role as an osmoprotector in this group of patients, largely resolving the signs and symptoms of the OSD, so it should be considered a great tool in the management of these cases. Use of anti-glaucomatous without preservatives and surface repair drops without preservatives (such as sodium hyaluronate) is also to be considered. They not only maintain good adherence to the treatment but also diminish its impact on conjunctiva (part of the ocular surface in patients) and future filtering surgery prognosis, and impact the quality of life.

> *OSD related to preserved antiglaucomatous drugs affect not only the cornea and conjunctiva but also the lid margin and meibomian glands. Meibomian gland dysfunction is the most frequent cause of dry eye disease.*
>
> *Prof. José M. Benítez-del-Castillo Sánchez*

REFERENCES

1. Weinreb, M Robert MD, Aug Tim MD, et al ¨The pathophsiologyand treatment of Glaucoma¨JAMA 2014 May 14;311(18):1901-1911
2. Boland MV, Ervin AM, Friedman DS, et al. Comparative effectiveness of treatments for open-angle glaucoma: a systematic review for the US Preventive Services Task Force. Ann Intern Med. 2013;158(4):271–279. [PubMed]
3. AriciMK, AriciDS, TopalkaraA, GulerC. Adverse effects of topical antiglaucomadrugs on the ocular surface. ClinExpOphthalmol. 2000;28(2):113–117. [PubMed]
4. MalvittelL, MontangeT, VejuxA, BaudouinC, BronAM, Creuzot-GarcherC, Lizard G. Measurement of inflammatory cytokines by multicytokineassay in tears of patients with glaucoma topically treated with chronic drugs. Br J Ophthalmol. 2007;91(1):29–32
5. PisellaPJ, PouliquenP, BaudouinC. Prevalence of ocular symptoms and signs with preserved and preservative-free glaucoma medication. Br J Ophthalmol. 2002;86(4):418–423.
6. Leung EW, Medeiros FA, WeinrebRN Prevalence of ocular surface disease in glaucoma patients J Glaucoma 2008;17:350
7. Ohare. F ClinExperiment Ophthalmol2012
8. Cejkov_aJ, CejkaC, LuyckxJ. Trehalosetreatment accelerates the healing of UVB-irradiated corneas.

CLINICAL CASE

Ocular Surface Treatment and Improvement of IOP Visual Fields and Ocular Surface

Prof. Iryna Shargorodska

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Associate professor of the department of ophthalmology at National Medical Academy of Postgraduate Education Training, Kyiv, Ukraine

Prof. Sergiy Rykov

Professor, Chief of the Chair of Ophthalmology
National Medical Academy of Postgraduate Education Training, ESA/AAPOS member
President of Association of Children's Ophthalmologists and Optometrists of Ukraine, Kyiv, Ukraine

> INTRODUCTION

- The present case describes the result of long-term one-eye treatment of patient with allergic conjunctivitis.
- The patient had received prolonged multi-drug therapy preserved.
- Uncontrolled use of steroids led to the development of secondary steroid glaucoma and inflammation of the ocular surface.
- Patient with Secondary Open-Angle Glaucoma (SOAG) since 2016.

	OD	OS
Visual Acuity	20/30	20/62
Slit lamp examination	Normal, mild hyperemia	Severe hyperemia, inferior superficial punctate keratopathy (SPK)
Gonioscopy	Shaffer grade I	Shaffer grade 0
Goldmann tonometry	14 mmHg	29 mmHg
Papillary excavation	3/10	9/10
Ultrasound pachymetry	500	490

> ETIOLOGY

- 65-year-old woman with severe obstructive meibomian blepharitis referred for surgery because of severe glaucoma, poorly controlled IOP, OSD..
- Family history of glaucoma on the motherside.
- Patient with SOAG controlled with multiple drugs frequently changed due to repeated local intolerance.
- Complaints: discomfort and annoyance in both eyes, pain and severity in the left eye.

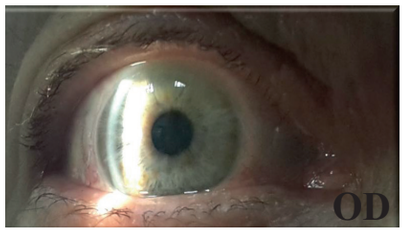
> CURRENT TREATMENTS

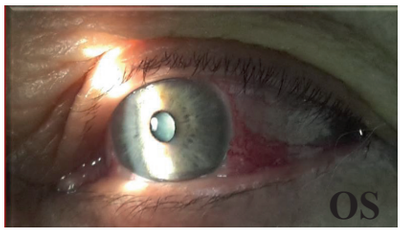
- Steroid therapy
- Antiallergic eyedrops
- IOP-lowering eye-drops: alpha-agonist (all preserved)
- Stimulant for the regeneration of the epithelium of the cornea and conjunctiva eye-drops

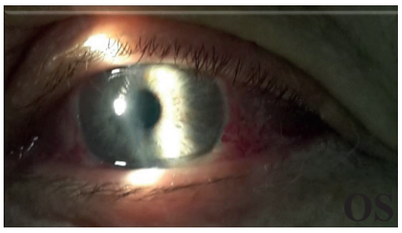
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> EXAMINATIONS

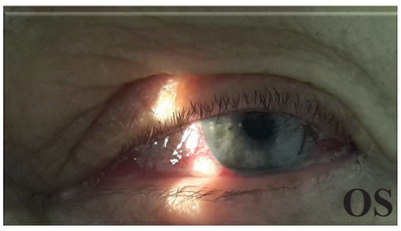
SLIT LAMP EXAMINATION OF THE RE AND LE



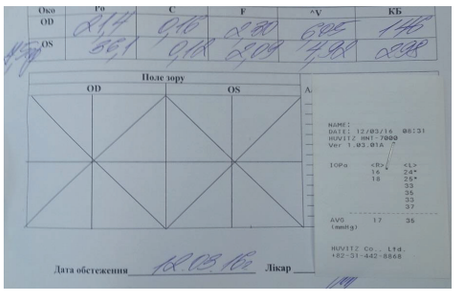




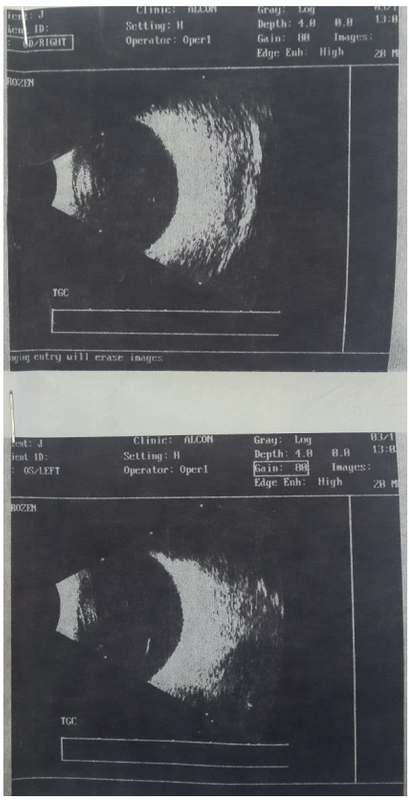




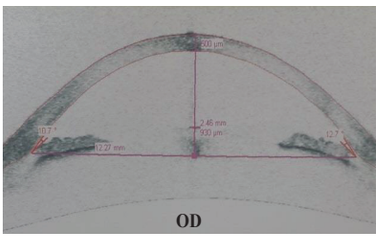
ULTRASOUND BIOMETRY EXAMINATION (ACD, LENS), REFRACTOMETRY EXAMINATION, TONOMETRY EXAMINATION OF THE RE AND LE

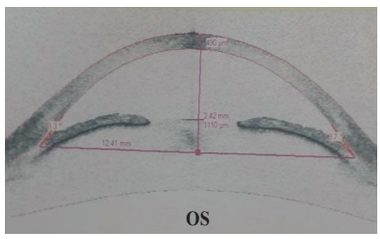






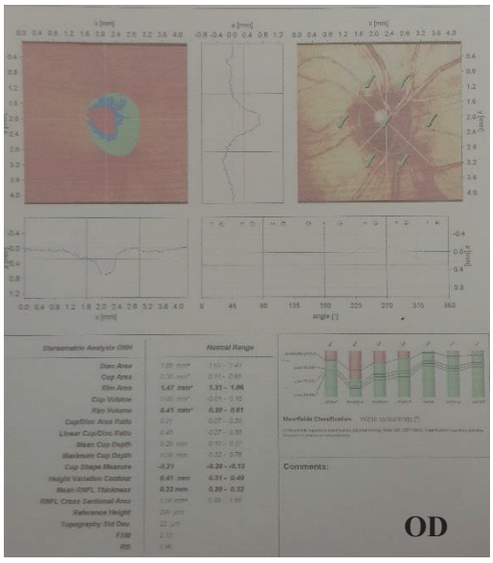
OCT VIZANTE OF THE RE AND LE

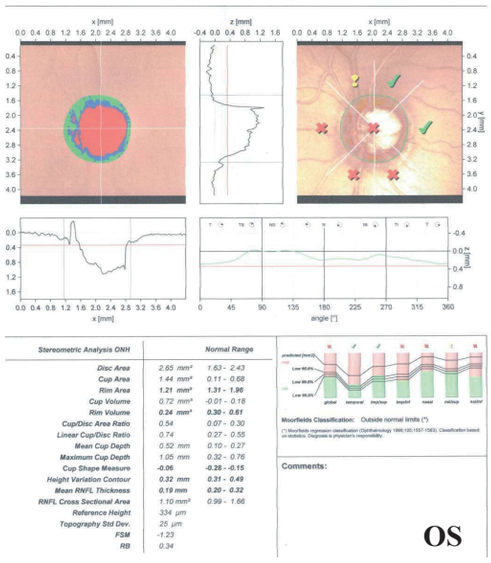




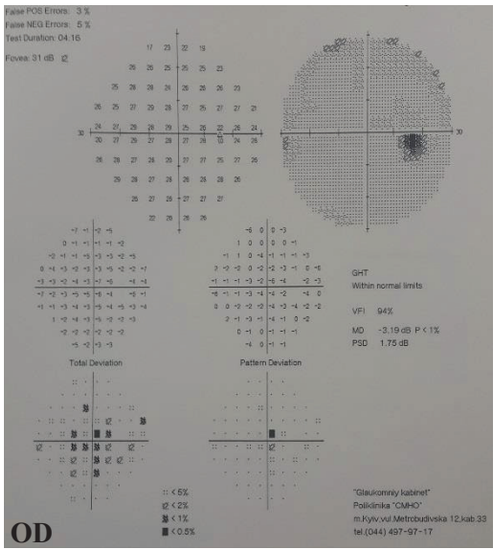
	OD	OS
Schirmer test	11.7 mm	8.6 mm
Tear Film BUT Test	11 sec	6 sec

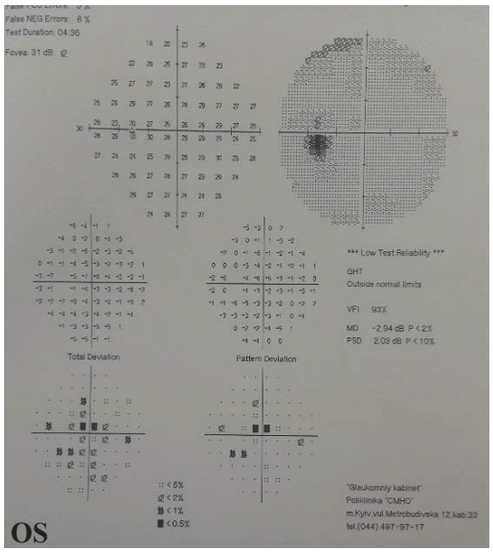
HRT OF THE RE AND LE





WHITE-ON-WHITE PERIMETRY OF THE RE AND LE





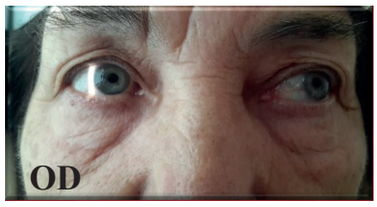
New treatment (during 6 months):

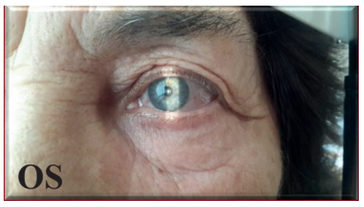
- Palpebral hygiene
- Artificial tears (trehalose, 3% and hyaluronic acid, 0.15%)
- IOP-lowering eye-drops: carbonic anhydrase inhibitor (Brinzolamide) + beta-blocker
- Anti-inflammatory eye-drops (NSAIDs)
- Oral supplementation: omega-3 fatty acids, lutein and zeaxanthin, resveratrol plus key vitamins and minerals

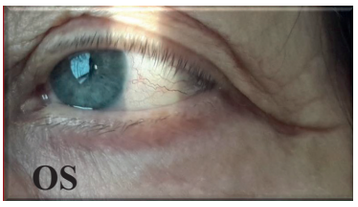
> RESULTS

OCT VIZANTE OF THE RE AND LE

	OD	OS
Visual Acuity	20/25	20/50
Goldmann tonometry	13 mmHg	18 mmHg

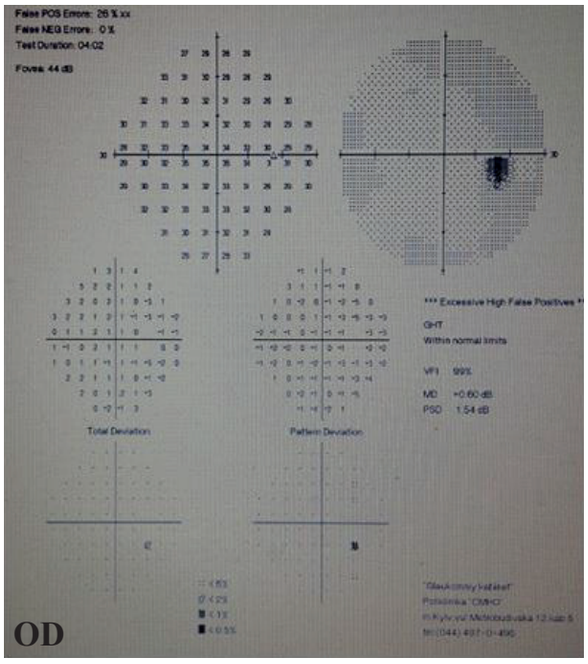


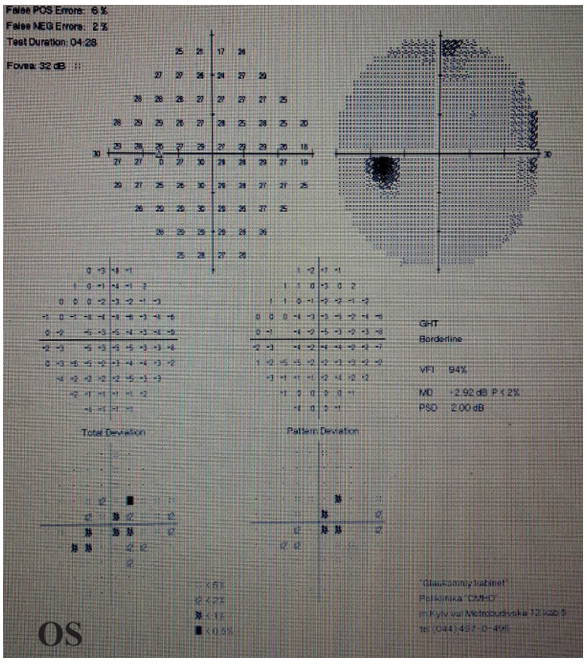




	OD	OS
Schirmer test	12.8 mm	10.4 mm
Tear film BUT test	13 sec	11 sec

WHITE-ON-WHITE PERIMETRY OF THE RE AND LE





- The ocular surface was improved
- The patient was more satisfied
- The efficacy was better
- The IOP dropped down to 18 mmHg
- The White-on-white perimetry was better

> CONCLUSION

After treating the ocular surface and removing steroids and all useless medications and reducing the treatment, IOP decreased, which suggests:

- that medications had lost their efficacy
- that trabecular meshwork inflammation was associated to the OSD, resulting in further outflow reduction

KEY MESSAGES

- **The ocular surface is important for glaucoma care**
- **An inflammatory surface is a major risk factor for glaucoma surgery failure**
- **Surface inflammation may disturb work of trabecular meshwork.**

> *Preserved topical antiglaucoma medications are toxic for: tear film, corneal and conjunctival epithelium, conjunctival stroma, trabecular meshwork, lens and macula.*
>
> *Prof. José M. Benítez-del-Castillo Sánchez*

REFERENCES

ShargorodskaI, RykovS, GurskaD, LyemyenyevaA, YakovetsA. Dry eye syndrome. Unresolved issues // Bulletin of the problems of biology and medicine. 2016; Vol.2 (132): C.63-69.

ShargorodskaI, GurskaD, LyemyenyevaA, SymchukI. Modern problems of drug treatment of glaucoma // International Scientific and Practical Journal Ophthalmology. Eastern Europe. 2014; Vol.4 (23):10-20.

ErbC. German registers for glaucoma patients with dry eye. I. Basic outcome with respect to dry eye / ErbC., GastU., SchremmerD. // Graefe'sArch ClinExpOphthalmol. 2008; Vol.246 (11): 1593-1601.

BCSC Glaucoma// 2012: 38-42.

BaudouinC, DenoyerA, DesbenoitN, Hamm G, GriseA. In vitro and in vivo experimental studies on trabecular meshwork degeneration induced by benzalkoniumchloride (an American Ophthalmological Society thesis); Trans Am OphthalmolSoc. 2012;110:40-63.

BatraR, Tailor R, Shabbir. Ocular Surface Disease Exacerbated Glaucoma: Optimizing the Ocular Surface ImproveslntraocularPressure Control; J Glaucoma. 2014 Jan;23(1):56-60. Doi:10.1097/IJG.ObO13e318264cd68.

Brignole-Baudouin F, L. Riancho, D. Ismail, M. Deniaud, M. Amrane, Ch. Baudouin. Correlation Between the Inflammatory Marker HLA-DR and Signs and Symptoms in Moderate to Severe Dry Eye Disease // Investigative Ophthalmology & Visual Science April 2017, Vol.58, 2438-2448. doi:10.1167/iovs.15-16555.

CLINICAL CASE

Impact of Preservatives on Treatment Efficacy and Glaucoma Follow-up

Prof. Nathalie Collignon

Head of the Glaucoma Unit, CHU Liège
University of Liège, Belgium

> PATIENT'S PRESENTATION

- 58-year-old man
- suffering from Primary Open-Angle Glaucoma (POAG) since 2005
- untreated IOP: **OD** 40 mmHg **OS** 35 mmHg

	OD	OS
Visual Acuity	10/10	10/10
Biomicroscopy	Normal, hyperemia, SPK	Normal, hyperemia, SPK
IOP (Gonioscopy-assisted transluminal trabeculotomy (GATT))	16 0.75	16 0.75
Fundoscopy	0.75	0.8
Pachymetry	524	519

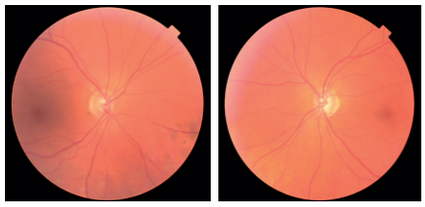
> TREATMENT/MANAGEMENT ALREADY USED

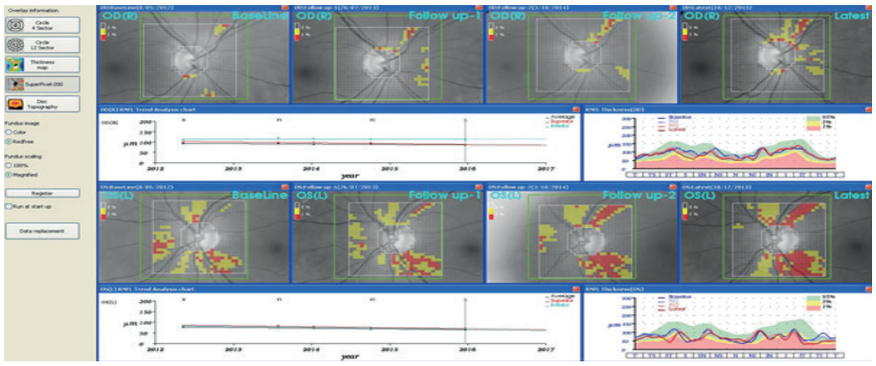
Current treatment:
Maximum medical treatment with 11 preserved drops/day

- Fixed carbonic anhydrase inhibitor/beta-blocker 2x/day
- Alpha-agonist 2x/day
- Prostaglandin 1x/day
- Anti-inflammatory drops 2x/day
- Artificial tears 4x/day

- **Total: 11 preserved drops/day**

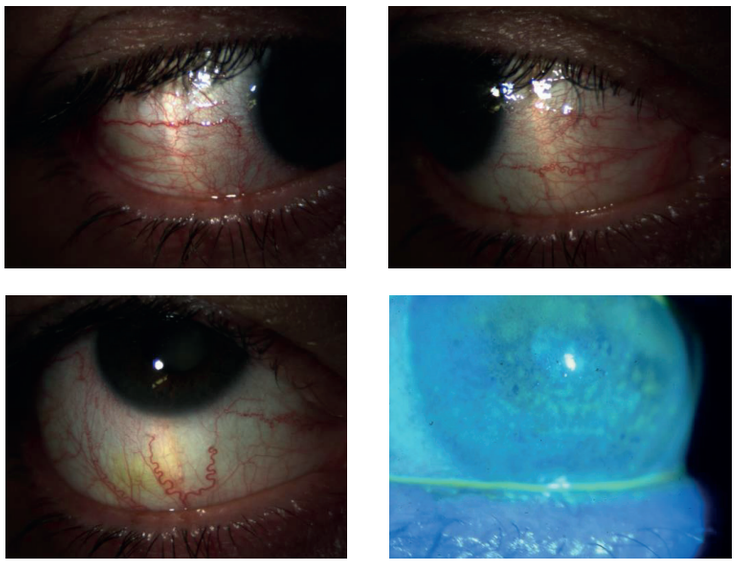
> CLINICAL EXAM





Progression of the left optic nerve excavation>> loss of RNFL

> SLIT LAMP EXAM



IOP 16-17 mmHg WITH DIURNAL CURVE VARIABILITY OF +/- 3 mmHg

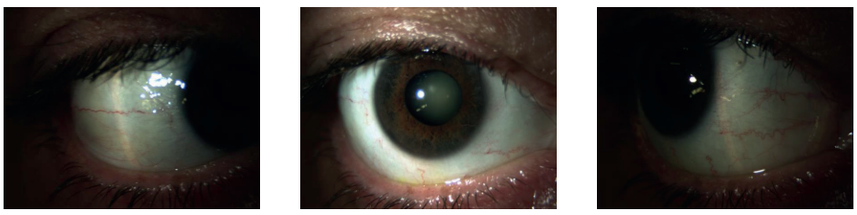
> TREATMENT/MANAGEMENT DONE

- Preservative-free prostaglandin 1x/day
- Preservative-free fixed carbonic anhydrase inhibitor/beta-blocker 2x/day
- Preservative-free artificial tears 2x/day
- Stop alpha-agonist and anti-inflammatory

- **5 preservative-free drops/day**

> RESULTS

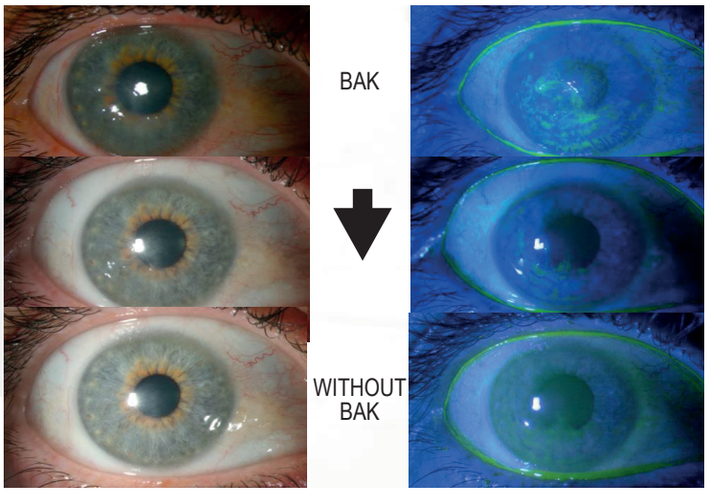
IOP 12 mmHg-DIURNAL CURVE FLATTENED



- By removing the preservatives, the IOP and ocular surface were improved, the quality of the near vision was better and the patient was more satisfied and more compliant.

Therefore the treatment efficacy was better

EFFICACY
TOLERABILITY
COMPLIANCE



With the collaboration of Dr G. Dupont, CHU de Liège

Courtesy of Prof. B. Duchesne

KEY MESSAGE

- **Spare the conjunctiva for further surgery management (if necessary) especially among relatively young patients with a long life expectancy.**

> *Preservatives also affect the subconjunctival tissue. Long term use of preserved drugs increase collagen formation thus decreasing success of filtering surgery.*
> *Prof. José M. Benítez-del-Castillo Sánchez*

Under the auspices of

