

OCULAR SURFACE PATHOLOGY IN EYE SURGERY

KARIN HORVATH¹, FLORINA VULTUR²

^{1,2}Ophthalmology Clinic, Târgu-Mureş

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Abstract: Ocular surface disorder such as „dry eye” significantly affects subjective and objective postoperative results, especially in anterior segment surgeries. Preoperative recognition of ocular surface pathology, along with an eyelid-meibomian co-affection and appropriate preoperative preparation of the ocular surface remain essential conditions for successful surgery. It discusses the factors that determine the setting of ocular surface diseases, its pathophysiological mechanisms, diagnostic methods and therapeutic approaches.

Cuvinte cheie: OSD, chirurgie oculară

Rezumat: Patologia suprafeței oculare de tip „ochi uscat” influențează semnificativ, obiectiv și subiectiv, rezultatele postoperatorii în intervențiile chirurgicale în special de pol anterior. Recunoașterea preoperatorie a unei patologii de suprafață oculară, alături de o coafectare palpebrală-meibomiană, cu inițierea unei pregătiri preoperatorii adecvate a suprafeței oculare constituie o condiție esențială a reușitei chirurgicale. Se discută factorii ce determină instalarea unei patologii de suprafață oculară, mecanismele sale fiziopatologice, metodele de diagnostic precum și abordările terapeutice.

INTRODUCTION

The term ocular surface disease (OSD) was first used by John Dart to describe a group of disorders of diverse pathogenesis in which disease results in failure of mechanisms that maintain a healthy ocular surface.

Dry eye or Ocular Surface Syndrome (OSS) is a term which is now used to describe a variety of conditions, sharing common symptoms and clinical signs, leading to a physical and functional break-down of the tear film.

Etiology of dry eye may be divided into 2 entities:

1. Lacrimal deficiency
2. Excessive evaporation of unstable lacrimal film

Lacrimal deficiency on the sidelines include Sjögren's syndrome and other syndromes (also called non-Sjögren) such as congenital and or acquired lacrimal deficiency in some diseases such as sarcoidosis, HIV, xerophthalmia, lacrimal obstruction in trachoma, pemphigus, after burns injuries, respectively insufficient lacrimal secretion due to nerve blocking in neuroparalytic keratopathy and in contact lens wearers.

Excessive evaporation due to insufficient lipid layer of the tear film is present in eyelid meibomian glands dysfunction, anterior or posterior blepharitis.

Also anatomical deficits, the shape and position of the eyelids or palpebral fissure, respectively functional deficits may expose the ocular surface to evaporation.

Holland and Mannis in 2002 defined the OSD as an imbalance that occurs in complex interrelation between the 3 major elements: lacrimal film (with its 3 components), blink as a reflex phenomenon influencing the distribution of tears on ocular surface being itself activated by tear evaporation, and tearing witch provides an aqueous component to lacrimal film, the result of trigeminal stimulation by various external factors such as pollutants, allergens.

The complains of the patients generally lead to a

plausible etiology. Itching is specific in allergic phenomenon, burning sensation guide us to dry eye pathology. It seems that in our everyday practice OSS is incredibly underdiagnosed (1) Everyone knows the typology of the patient, usually women who claim to suffer from constant and repetitive eye stinging, tearing, or even describe the sensation of dry eye. Consultation is completed in the best case prescribing a particular type of artificial tears, which often is changed due to unsatisfactory results found by the patient.

OSS recognition is even more important as the patient is to undergo surgery such as refractive surgery or cataract surgery.

The true refractive surface of the eye is the tear film, therefore the quality of vision depends on a healthy ocular surface.

Attention should be given for preoperative identification of high risk patients:

- patients with a history of diagnosed dry eye
- patients with intolerance to contact lenses presented for refractive surgery, intolerance itself constitutes a sign of OSD
- patients with hormonal disorders, androgen deficiency (which is associated with lacrimal glands and meibomian glands dysfunction), diabetics, people with rheumatic diseases
- abnormalities of the eyelid, conjunctiva, cornea, local trauma history
- older patient, menopause
- systemic medications: alpha, beta blockers, antiarrhythmia, antidepressives, antiparkinson, antihistamines, others (marijuana).

Preoperative evaluation must be more comprehensive as the patient falls from anamnesis in high-risk group. The evaluation starts with thorough visual inspection of the ocular

¹Corresponding Author: Karin Horvath, Ophthalmology Târgu-Mureş, 26 Marton Aron street, 540082 Târgu-Mureş, România, e-mail: kuhorvath@gmail.com, tel +40- (0265) 26.21.22

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surface and surrounding structures. Apart from changes in cornea and conjunctiva detectable in the slit lamp examination and in the absence of vital dye staining, changes in the eyelid and particularly of meibomian gland orifices, such as thickening and congestion of the eyelid or obstruction of the glands orifices can be observed.

Vital dye staining commonly used are fluorescein and lissamine green. If fluorescein occupies a primary role in detecting mild-to-moderate dry eye disease because epitheliopathy is not yet apparent at this stage, instead lissamine green staining reveals damage to ocular tissue at its earliest stage and will stain the conjunctival epithelium when there is no fluorescein staining.

Tear film break up time is determined by ocular staining with a small amount (1-5 μ l) of fluorescein, normal value being considered 10s. Diagnostic value of the test is qualitative because it provides information about the lipid deficiency even in the early stages of dry eye.

Despite its wide spread, Schirmer test loses importance regarding the diagnosis of dry eye. It shows a decreased tear production, without giving any details on the stability or composition of tear secretion. Currently the most common is the Schirmer test with prior anesthesia of the ocular surface, the normal value being at least 6mm in 5 min. He remains a valuable examination in patients with collagenosis.

OSD Index (Ocular Surface Disease Index) is actually a questionnaire of 12 questions used in staging the disease by the symptoms related to dry eye.

Recently, it seems that the tear osmolarity test executed with a device that requires a 50 nl sample offers more information than OSD index, so is used in the diagnosis of early forms, subclinical dry eye, to determine the severity of the disease (2) and for developing an appropriate treatment.

Regarding the cataract surgery, OSD can not be a contraindication to operation despite its severity. Unfortunately postoperative problems arise not only from an existing OSD, approximately 80% of patients operated for cataract accuse OSD symptoms, exacerbation period ranging from 3 to 6 months, to peak at 1 month postoperatively. The correlation between the appearance of OSD and cataract surgery is easy to understand. If in conventional extracapsular extraction of the lens, large wound, especially corneal explains the postoperative decreased sensation up to 120°, currently of about 2 mm corneal wounds are no longer an impediment to the recovery of postoperative corneal sensation. Endophthalmitis prevention measures accepted worldwide include mandatory use of povidone iodine solution 5% for preoperative disinfection of the conjunctival bag. Some surgeons prefer to repeat this maneuver postoperatively. This solution associated with a prolonged exposure of the cornea to microscope light during surgery, inevitably lead to further tear film instability (3)(4). Postoperative topical treatment for 4-6 weeks is also a risk factor in this regard, because on one hand the active substance - antibiotics, steroids and nonsteroids anti-inflammatory for prevention of cystoid macular edema and secondly because of the preserved substances. The conjunctival creases (conjunctivochalasis) along with lower eyelid laxity due to excessive tension of the blepharostat during surgery, can lead to postoperative epiphora. (5)

Refractive surgery requires careful preoperative evaluation of the patient. Female patients are more frequently predisposed to intraoperative epithelial damage and subsequent difficult healing. A high-risk category is that of patients with blepharitis and meibomian gland dysfunction, those with papillary conjunctivitis, pinguecula, pterygium and corneal decreased sensitivity due to diabetes or herpetic infection.

Corneal neovascularization involves a high risk of bleeding and shows a serious corneal hypoxia, which may be at some point a contraindication for LASIK. Also atopy and eczema are risk factors as they can delay healing, encourage inflammation and increase risk of diffuse lamellar keratitis (DLK). Smaller flap with a wide hinge placed nasally rather than superiorly preserves corneal sensation and decreases the risk of LASIK-induced dry eye. (6)

Preoperative diagnosis of blepharitis and meibomian gland dysfunction is another aspect neglected in many cases. An adequate surgical preparation in these situations may improve postoperative OSD symptoms. Thus, in mild and moderate forms daily eyelid hygiene, hot compresses (even 4 times a day), eyelid massage with antibiotic and steroid ointment and drops lubricants are indicated. Special attention is given to fish and flaxseed oil supplements omega-3 to stabilize the lipid layer of the tear film. In more severe cases, the above treatment needs the association of antibiotics from tetracycline group (tetracycline, doxycycline) or macrolide - azalide (azithromycin) in prolonged courses like acne treatment. Topical cyclosporine emulsion 0.05% showed promising results. The immunomodulating effect of cyclosporine is installed only after several weeks, even months of treatment, so it is better to be administered 1 month preoperatively. Beneficial effect of cyclosporine is due to the inhibition of inflammatory mediators like corticosteroids and therefore the combination of these two preparations is recommended. Cyclosporine and corticosteroid combination is beneficial both in meibomian gland dysfunction and in aqueous deficiency of the tear film. Ocular lubricants, preferably those without preserved substances are indicated 4 times daily in mild dysfunction and 8 times in severe cases. In case of unsatisfactory results progress to lubricating ointment or punctal occlusion. Efficiency of these measures is provided only if a patient is informed and educated about his condition.

Postoperative treatment requires artificial tears without preservatives as possible. If dry eye persists after 3 months topical cyclosporine is introduced. Treatment with steroids is reduced to a minimum, and NSAID drugs are avoided because of corneal toxicity.

CONCLUSIONS

Every anterior segment surgical procedure can worsen preexistent OSS or even be a trigger factor for OSS. Etiology is represented by the applied procedures on the ocular surface, but most of all are implicated the disinfection maneuvers necessary for avoiding the scariest complication – endophthalmitis. Dry eye after surgery is a manageable entity with fairly good results if diagnosed and treated early and appropriately. Detecting ocular surface risk factors prior to surgery and placing borderline candidates on appropriate treatment not only reduces the risk of dry eye following surgery but will enhance visual outcomes as well.

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CLINICAL ASPECTS

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