INTRODUCTION

The dry eye syndrome is a very common condition affecting a significant percentage of the population, especially those older than 40 years. It is a multifactorial disorder of the tear film which occurs when the tears secretion is insufficient or tears evaporation is high, that results in tear film instability with potential damage to the ocular surface. (1)

Normally, the tear film produced by lacrimal glands ensures the protection of ocular surface against harmful environmental agents and also serves as a nutritional, carrying antibodies and nutrients. Tear film is composed of three layers (from outside to inside):
- lipid layer, external, retards tears evaporation;
- aqueous, middle layer, aqueous, providing nutrition of the cornea, forms the largest part of the tear film;
- mucous layer, internal, in direct contact with the cornea allows the aqueous to spread over the corneal epithelium.

The tear secretion is regulated by neural communication between the ocular surface and lacrimal glands, also known as the integrated lacrimal functional unit. (2) The integrated lacrimal functional unit consists of ocular surface afferent sensory nerves, efferent autonomic and motor nerves that stimulated tear secretion and blinking, and the tear-secreting glands (main and accessory lacrimal glands, conjunctival goblet cells, and the meibomian glands). In dry eye disease this communication becomes disrupted, leading to tear hyperosmolarity and a self-perpetuating cycle of inflammation, that results in ocular surface damages and tear film instability.

The classification of dry eye syndrome

Aqueous Tear-Deficient Dry Eye

Lacrimal tear secretion failure causes tear film hyperosmolality leading to hyperosmolality of the ocular surface epithelial cells and a cascade of inflammatory events resulting in the generation of inflammatory cytokines (interleukin-1α, -1β, TNF-α, MMP-9). (3) Aqueous tear-deficient dry eye has two major subgrouping: Sjogren syndrome (SS) dry eye (primary or secondary) and non-SS dry eye.

Non-SS dry eye is a form of aqueous tear-deficient dry eye due to lacrimal dysfunction, where the systemic autoimmune features characteristic of SS have been excluded. The most common form is age-related dry eye, followed by the secondary lacrimal gland deficiencies, lacrimal gland duct obstructions, reflex hyposecretion. (4)

Evaporative Dry Eye

Evaporative dry eye is due to excessive water loss from the exposed ocular surface in the presence of normal secretory function. Its causes can be intrinsic, where they are due to disease affecting lid structures or dynamics, or extrinsic.

The major intrinsic causes of evaporative dry eye are meibomian gland dysfunction, poor lid congruity and lid dynamics, low blink rate, and the effects of drug action, such as that of systemic retinoids. The major extrinsic causes of dry eye are vitamin A deficiency, the action of toxic topical agents such as preservatives in ophthalmic products, contact lens wear, and certain ocular surface diseases, (e.g. allergic eye diseases).

The predispositional factors for dry eye syndrome can be grouped into:
1. Environmental factors: prolonged exposure to air conditioning, TV or computer screen, excessive heat.
2. Contact lens wear.
3. Drug consumption: oral contraceptives, beta-blockers, antidepressants.
4. Hormonal factors: hormonal imbalances (e.g. in women after the menopause).
5. Various diseases: rheumatoid arthritis, immune mediated diseases, vitamin A deficiency.

**Diagnosis of the dry eye syndrome** is primarily a clinical one based on characteristic symptoms, which can overlap with other ophthalmic diseases, clinical examination, and specific tests, which should be performed to establish a level of disease severity to guide treatment decisions and monitor progress. The goals of this testing are to assay several critical indicators of disease severity including level of discomfort, visual symptoms, ocular surface inflammation, lid and meibomian glands dysfunction, tear production, and tear film stability. (5)

The clinical symptoms of dry eye include: local burning/scratch sensation, itching, sensation of dryness or foreign body, photosensitivity, red eyes and difficulty in wearing contact lenses. Excessive tearing may also be a symptom of dry eye, and viscous discharge. Advanced stages produce corneal lesions, decreased quality of life by decreasing visual acuity and physical and psychological discomfort associated.

1. The Schirmer test is performed by introducing a piece of standard filter paper into the lower lid of the eye and the amount of wetting is measured with or without the use of topical anesthesia. Less than 10mm of wetting after 5 minutes without anesthesia and less than 5mm with anesthesia is considered abnormal.

**Figure no. 1. Schirmer Test**

2. Rose bengal staining consists of applying 1% solution of rose bengal and evaluation of the broken epithelium on bulbar conjunctiva and cornea: only the cells uncovered by mucin remain stained

**Figure no. 2. Rose Bengal Staining**

3. The tear film break-up time (BUT) is determined by measuring the time lapse between instillation of fluorescein and appearance of the first dry spots on the cornea. After several blinks, the tear film is examined using a broad-beam of slit lamp with a cobalt blue filter for the appearance of the first dry spots on the cornea. Decreased BUT of less than 10 seconds is considered abnormal, indicative of tear film instability.

**Fig. 3 The tear film break-up**


**The treatment of dry eye syndrome**

Therapeutic recommendations should be based on the etiology and the severity of the disease. To determine the disease severity level many parameters have been used, including: level of ocular discomfort, visual symptoms, conjunctival injection and staining, corneal staining, lid pathology, BUT, and Schirmer score. (6)

Until recently, treatment options for dry eye have centered on increasing lubrication of the ocular surface (artificial tears, gels, and ointments), improving conservation of existing natural tears (punctal occlusion, moisture chamber spectacles, contact lenses, tarsorrhaphy, changes in lifestyle), and treating eyelid and meibomian gland inflammation (eyelid cleansing regimens, antibiotic +/- steroid ointments, and oral antibiotics.

More recently, the use of anti-inflammatory therapy and biological tear substitutes for the treatment of dry eye has increased as our understanding of the pathophysiology of dry eye disease has improved. The main examples of anti-inflammatory therapy in dry eye are topical cyclosporine, topical corticosteroids (especially soft corticosteroids, which have a low potential to raise the IOP), and oral tetracyclines (for meibomianitis, rosacea). Biological tear substitutes (autologous serum, saliva) promote corneal and conjunctival epithelial health and homeostasis. (2)

Artificial tears are chemical eye drops that replace natural tears, used in the symptomatic treatment of dry eye. Their disadvantage is that only relieves symptoms and is applied continuously, every 3 to 6 hours or more often if necessary. The mild forms of dry eye benefit from symptomatic treatment with low-viscosity artificial tears (povidone). Moderate disease stage requires high viscosity artificial tears (hyaluronic acid), and severe stages can benefit from high viscosity artificial tears combined with ointments.

Many substances are used as artificial tears: methylcellulose, carbomers, sodium hyaluronate, with or without added preservatives. At present it is considered that preservative-free sodium hyaluronate eye-drops (hyaluronic acid salt) represent the “state-of-the-art” treatment of dry eye disease. Sodium hyaluronate is a natural constituent of the body (autologous substance). It shows a high water binding capacity and forms polymerized networks (even at low concentrations) that ensure its viscoelastic behavior. Thus, it is very similar to the mucous layer of the natural tear film and provides a strong and long lasting tear film compared to other substances used as artificial tears.

**Figure no.4. AH in repaus AH under pression**

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Preservatives are chemicals used to increase the validity of artificial tears. The most commonly used preservatives are: benzalkonium chloride, poliquad, thiomersal, EDTA, boric acid.

The adverse effects of the preservative on the ocular surface have been extensively studied and include:
- impaired epithelial barrier, (7)
- accelerating the evaporation and emulsification of the lipid layer of the tear film,
- interferences with the formation of the mucous layer, (8)
- irritations of the cornea and conjunctiva,
- allergies.

Therefore, currently everyone prefers to use preservative-free artificial tears. The first recommendation is to use preservative-free artificial tears containing sodium hyaluronate.

**CONCLUSION**

In conclusion, significant advances in our understanding of dry eye disease have established several important concepts. The classification of dry eye syndrome in either aqueous-deficient or evaporative helps guide both diagnostic testing as well as therapy. The first step in therapy remains the tear supplementation using preservative-free artificial tears.

**BIBLIOGRAPHY**

COMPLICATIONS OF THERAPEUTIC CONTACT LENSES

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Abstract: Therapeutic contact lenses are lenses used in the treatment of ocular surface pathology, manipulated by eye doctor alone. Although rare, complications may occur and are related not only to lens material and design, wearing modality and hygiene but also to the condition that they have to treat. Silicone-hydrogel lenses have solved many of the problems related to hypoxia, have less on-eye dehydration, fewer protein deposits but still are not risk-free. The course makes an overview of the possible complications and recommendation for the lens selection.

INTRODUCTION

Therapeutic contact lenses are worn in extended wear modality, for days or months, sometime for years, are manipulated only by ophthalmologist and are usually associated with topical medication.

Fitting of therapeutic contact lenses is done mostly for cases that represent contraindications for contact lens wear. That is the reason why complications that occur with TCLs are the same as for refractive purpose but have also some particular aspects.

Classification of complications – by cause

a. Hypoxia – edema, microchists, striae, endothelial folds, endotelial blebs, endothelial polimegatism, corneal thinning
b. Infiltrative events
- Inflammation – infiltrates, CLPU, CLARE,
- Infection - microbial keratitis
- Deposits
- Papillary Conjunctivitis (CLPC)
- Mechanical trauma – SEAL, conjunctival splits, corneal warpage

Complications related to patient
- Ocular Pathology – wounds, foreign bodies, distorted surface
- Associated dry eye
- Topical steroids and preservatives
- General health – diabetes, immunosupresion
- Compliance: local and general hygiene, medication, follow-up and TCL replacement

Types of therapeutic contact lenses

In the recent years we are using as therapeutic contact lenses silicon-hidrogel lenses, for extended or continuous wear, plano, that have received FDA approval for therapeutic use:
- Lotrafilcon A – 30 days , BC 8,4 and 8,6 mm, diameter 13,8 mm. (1)
- Senofilcon A - 7 days, BC 8,4 and 8,8 mm, diameter 14 mm (2)

These lenses combine the high oxygen transmissibility of silicone with the flexibility of hydrogel. Their water content is low, so they have limited on-eye dehydration and a good tear film behind the lens. They have a good wettability of the surface and less protein deposits.

Extended wear

When the eye is closed during sleep there are some important changes:
- Lower oxygen pressure available for corneal epithelium– from 155 mm Hg (atmospheric) to 55 mmHg (capillaries of palpebral conjunctiva)
- Rise of corneal oxygen consumption
- Rise of corneal temperature by 2-3 degrees Celsius
- Ph reduction from 7,45 to 7,25
- Reduction in the tear film osmolarity from 310-318 mOsm/kg to 285 mOsm/kg
- Changes in ocular biota

Hypoxia is responsible for corneal oedema. Over night normal corneal swelling is about 4%, but cornea has the ability to restore up to 8% of overnight oedema.

Lenses in extended wear modality can also induce mechanical trauma, depending on lens fit, material and design. Decreased tear film exchange under the lens may cause deposit and biofilm formation.

Hypoxia also induces a decrease of the nerve density (3) that can delay the discovery of complications and reduce the defence mechanisms. The minimum level of oxygen partial pressure for maintaining the corneal sensitivity is 8% (4) and all SiH lense deliver more than this value.

Normal ocular biota prevents colonization with pathologic...
organisms and participates in the immune response. S. Epidermitis and Corynebacterium spp may act synergetic against S. Aureus from the nasal mucosa and Propionibacterium spp may modulate local immune response

Over night wear identified a higher number of Gram-positive colonies and CLPU and CLARE have been associated with them.

Extended wear of contact lenses showed changes not in numbers but in the spectrum of microorganisms - samples show Gram-negative staining. (5)

Low tear film flow under TCL leads to biofilm formation, structure that has an increased antimicrobial resistance by matrix organisation and phenotypic alterations. (6)

Effects associated with oxygen

All hydrogel contact lenses induce corneal hypoxia.

The use on short term of hydrogel lenses with closed eye produces corneal oedema (7, 8), limbal hyperemia (9, 10) and endothelial blebs. (11). The continuous use of hydrogel lenses is associated with microchists and vacuoles (12, 13), corneal angiogenesis (9, 12), stromal thinning (14), endothelial polimegathismului (15) and miopic creep (16). There are few evidences of performance differences between silicon-hydrogel lenses.

Oedema, striae and endothelial folds

We do not expect corneal oedema during open eye wear of SiH and studies have confirmed it (17). On closed eyes we will find corneal oedema even without CL, between 0.7% and 5.5%.

In silicon-hydrogel range, values of additional oedema are low: from PureVision®, that induce 2% additional oedema.(12), to AIR Optix®NIGHT&DAY® with 1% additional oedema.

Microchists

The studies of Hickson et Papas on a population of non contact lens wearers measured an incidence of 49% of microchists, but no more than 5% cornea.

In closed eye condition there is a reversed proportion between microchists and Dk/t and the Dk/t value for recovery of initial values is estimated to be about 50. SiH lenses have central values above this value (PureVision is about 90), so microchists are not generally considered a problem for this type of lenses.

Brennan et colab. have studied three types of SiH cls and found an incidence between 30% and 59%, similar to Hickson-Papas initial values, but a higher incidence (9% - 17%) of more than 10 microchists. However, no correlation was found between microchists and Dk/t in the SiH extended wear range.

Angiogenesis

Data about incidence and relative risk of angiogenesis are anecdotal.

Brennan et colab. made a one year study to identify significant neovascular formation , but the incidence was almost 0% on both eyes in 212 subjects wearing PureVision® on one eye and ACUVUE® controlateral.

Santodomingo et colab. in a comparison between PureVision® and NIGHT&DAY®, for 18 months of wear had no mention of angiogenesis, only hyperemia.

A study on continuous wear, over 1 year, of PureVision®, NIGHT&DAY® and Biofinity®, (Brennen şi colab.), showed that almost half of the subjects have had certain amount of vascularisation at first visit, according to previous type of lens and modality of wear. In time vascularisation diminished, for all SiH lenses. After 1 year, 25% of PureVision® and 21% of NIGHT&DAY® wearers still showed some clinical signs.

Silicon-hydrogel lenses seem to eliminate angiogenesis and there is no clear difference between products.

Limbal hyperemia

Mechanical trauma and temperature during contact lens wear, together with Dk/t can influence limbal hyperemia.

7 studies compared the differences between limbal hyperemia with two types of SiH contact lenses in daily and extended wear, but no differences were reported.

Endothelial blebs

The extent of the area of endothelial blebs occurrence is correlated with the Dk/t of the lens.

In a study on east-asian patients, after 20 minutes of SiH contact lens wear, in open and closed eye conditions, variantions of the bleb formation connected to Dk/t were not demonstrated.

Endothelial polimegatism

Endothelial polimegatism seems to be the most sensitive clinical sign able to indicate long-term alteration of corneal physiology by chronic hypoxia.

The level of Dk/t that induces polimegatismul could not be determined yet. There is no evidence of polimegatism induced by SiH lenses or whether the switch to this type of materials may reverse the endothelial polimegatism induced by hydrogel lenses.

Other effects of hypoxia

There is no evidence that SiH lenses induce stromal thinning

Precaution

Although in silicon-hydrogel range the hypoxia-related complications seem to be avoided, there are some studies showing a significant variation of corneal oxygen consumption between individuals (19, 20, and 21) and also variations in time of the same subject (20). For this reason the therapeutic contact lens should be monitored for hypoxic signs, as an injured cornea may have higher oxygen demands than regular extended wear.

Infiltrative Keratitis

Infiltrative noninfectious keratitis is an important inflamation event that may induce discomfort, scar formation and lens intolerance. There are no indications that a higher Dk/t reduces the incidence of infiltrative keratitis, on the contrary, there is evidence that continuous wear of SiH lenses has a equal or even higher risk of infiltrates.

Szczotka-Flynn and Diaz have shown that the relative incidence of infiltrative events with SiH lenses was more than two times bigger than in the case of hydrogel lenses with low Dk/t, but the results were influenced by the longer periods of wear and the replacement frequency.

Probably the duration of wear, surface properties of the material or other aspects of the study have more influence than Dk/t.

CLARE

Acute red eye associated with over night contact lens wear is associated with Gram-negative bacteriae: H. Influenza, Ps. Aeruginosa, Serr. Marcenses and their endotoxines which are responsable for the clinical picture. Frequent replacement may have benefits by reducing the deposits build-up on the lens surface.

Kotow et colab. have shown in their studies that frequent replacement of the lenses managed to significantly decrease the incidence of CLARE.

Infectious Keratitis

Recent epidemiological studies continue to show that extended wear is the main ris factor for microbial keratitis. A wide study made by Cheng şi colab.in Holland showed an incidence of microbial keratitis of 3.5 and 20.0 in 10.000 soft daily contact lens wearers and respectively extended wear soft lenses (almost all wearers replaced their lenses every one or two weeks). Numbers of 4.1 and 20.9 in 10.000 wearers

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are also found by Poggio and colab., with conventional lenses.

There are some indications that severity of keratitis and the risk of sight loss are correlated with Dk/t, but there are no proofs of some effect in SiH range, even in different replacement frequencies.

Bacterial colonization on contact lens increases the risk of infection, therefore a shorter time of wear should be recommended. Saw and colab. have shown that disposable lenses with monthly replacement had a 4.7 times higher risk than those with daily, weekly or 2-week replacement. Wearing of the contact lens over the recommended period raised by 3.1 times the risk of Fusarium keratitis. A similar effect has been observed by Joslin and colab. in their study on Acanthamoebae.

The most frequent keratitis in extended wear is associated with bacteria, mostly with Pseudomonas Aeruginosa.

Complications not correlated with oxygen

There are reactions that have been proved to be independent of oxygen. Modulus of the material, surface properties and lens design have an impact on lens deposits, corneal staining, papillae and splits of the conjunctiva, superior epithelial arcuate lesions (SEAL), mucin balls, corneal warpage and comfort.

Deposits on lens surface

Deposits may be responsible for corneal and conjunctival inflammations, discomfort, visual disturbances. The bad quality of the surface may induce high friction, SEAL, CLPC and discomfort and deposits may also play a role in microbial keratitis.

The material of the lens is important, as SiH lenses attract more lipids on the surface but less proteins. There are differences between lenses, but on the majority of them the lipids tend to accumulate lineary for the first 14 days and then stabilize, as they tend to saturate the links on the surface (according to a study in vitro of Carney &colab.).

Because no care system is 100% effective in removing the deposits, frequent replacement is the best strategy to reduce the quantity of deposits.

CLPC

Some studies report an increase in CLPC frequency because of the use of SiH hidrogel, especially in extended wear modality. Higher modulus of these materials and the differences in surface quality may induce a higher friction and variable deposit formation.

Other studies failed to connect CLPC to a certain type of deposits, or of lens.

As in therapeutic contact lenses care systems are not used, replacement of the lens as soon as deposits build up may be the best way to reduce the risk of CLPC.

Mechanical complications

Corneal staining

Corneal staining may occur in hidrogel and Siliconhidrogel lens wear.

In case of therapeutic lenses there are no cleaning solutions involved, but medication may induce toxic or allergic reaction, especially because of the preservatives.

High modulus or bad fit may also induce staining.

 Conjunctival splits

Lofstrom and Kruse have recently identified cases of conjunctival splits near the SiH lens edge. Most of the patients are asymptomatic and there are no severe consequences.

Extended wear is involved more than daily wear. Modulus and lens design, especially edge shape, may be the cause.

SEAL

SEAL (Superior epithelial arcuate lesions) are reported more often with SiH lenses. The cause is now considered to be the pressure of the upper lid in extended wear, combined with a higher modulus, edge design and surface properties may generate an important friction that deteriorates the corneal epithelium.

Difficult fitting of a therapeutic lens on diseased eyes is a supplementary factor, so in case of SEAL a more flexible lens should be chosen.

Mucin balls

Mucin balls are small spherical structures that accumulate under the lens, especially with SiH in extended wear. They may transform in epithelial inclusions.

There are patient – related factors but also modulus, design and surface properties are involved in their formation.

Corneal distortions

SiH, especially in high dioptries, high modulus and flat base curve may have some ortokerathological effect, by compression of central cornea.

In some cases it may alter the epithelial healing.

Discomfort

Modulus, design, surface properties (lubricity) and lens fit are responsible for comfort and are different between SiH lenses, and also between hydrogel lenses. In therapeutic use, initial decrease of pain is important regardless the type of lens used as a first choice, but wettability and lens fit will influence the tolerance and therapeutic result on long term.

Complications related to patient

Ocular surface may be distorted by wounds (sometimes highly irregular), sutures, amniotic membrane. Lens fit is difficult and the lens is selected by keratometric measurements of the other eye. In case of a poor fit a lens with a different modulus and design is chosen.

Because of irregular corneal surface, dryness, medication, the therapeutic lens may easily fold, dislocate or become lost, much more frequent than cosmetic lenses.

There is a higher risk of infection: epithelial wound (epithelial barrier is disrupted), microbial contamination during trauma, foreign bodies, topical steroids, dry eye, associated general health conditions (diabetes, malnutrition, immunosupression).

Patients have a decreased ability to detect early complications because of the modified ocular surface (sensitivity, disturbed visual acuity because of the disease).

Soft therapeutic lenses accumulates preservatives from medications and may induce toxic reaction (corneal staining, delay of healing). Medication without preservatives or frequent replacement of the lens are advisable.

Compliance of the patients concerning local and general hygiene, medication, regular follow-up and TCL replacement are essential

CONCLUSIONS

SiH therapeutic contact lenses have eliminated the major effects of hypoxia.

Infiltrative events have the same high incidence associated with extended wear and the risk of microbial keratitis is even higher in ocular trauma, bulous kerathopathy, immunocompromised patients.

Mechanical trauma due to difficult fitting on an injured corneal surface may alter the therapeutic effect.

Folding, displacement and lens loss are more frequent than in lenses used for refractive purposes.

Patient education and compliance are major factors in avoiding complications

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HYBRID CONTACT LENSES (KERALENS) - AN OPTION FOR KERATOCONUS CORRECTION

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Keywords: contact lenses, ocular surgery

Abstract: The use of contact lenses after ocular surgery has the purpose of improving both the subjective phenomena and the postoperative functional results. In some cases they can be also used for aesthetic purposes, in order to improve the unaesthetical aspect of the eye. The types of contact lenses used vary from rigid gas permeable contact lenses, up to soft silicone-hydrogel contact lenses.

Cuvinte cheie: lentile de contact, chirurgie oculară

Rezumat:Lentilele de contact utilizate după chirurgia oculară au atât scop de ameliorare a fenomenelor subiective, cât şi de îmbunătăţire a rezultatului funcţional postoperator. În unele situaţii, pot fi utilizate şi în scop estetic, în vederea ameliorării aspectului inestetic al globului ocular. Tipurile de lentile de contact folosite variază de la lentile rigid gaz permeabile, până la lentile de contact moi, din silicon-hidrogel.

SCIENTIFIC ARTICLE PREDOMINANT THEORETICALLY

Contact lens fitting (CL) after eye surgery is a challenge because of the changes in the structure and function of the corneal surface. In “the refractive surgery era” what is the role and place of contact lenses? Despite the progress of refractive surgery, not all patients become emmetropic – therefore they are candidates for CL. Contact lenses are used to improve subjective and functional phenomena.

The purpose of the use of contact lenses is both optical, for visual acuity recovery, and therapeutic, as an analgic, protectiv and epithelizant mean.

The time of using contact lenses can be perioperative or postoperative, immediate or delayed, depending on the intended purpose.

Eye surgical techniques that require the use of contact lenses are: corneal refractive surgery, therapeutic photokeratectomy, Cross-linking riboflavin-UV technique, intracorneal rings, corneal transplantation, amniotic membrane implantation, after excision of internal pterygium, surgical aphakia, after trabeculectomy, after perforating ocular trauma.

A. CORNEAL REFRACTIVE SURGERY

1. Using the Excimer Laser
1.1 Photorefractive Keratotomy (PRK) / Lasek

Indications: up to -6D myopia, up to +6D hyperopia, up to ±4D astigmatism.

The purpose of the contact lens is either therapeutic (antialgic and epithelizant) or optical.

a) Therapeutic

The fitting moment of contact lenses is at the end of surgery. The type of the lens is disposable silicone-hydrogel, associating the local treatment with antibiotic, steroid or steroidal antinflammatory drops.

The follow up of the patients was performed at 24 hours postoperatively and at 3 days followed by the lens removal.

The literature [1,2] shows that therapeutic contact lenses after PRK, when performed at high myopia, help in the leveling of the central islands present due to the aberrant healing. Same authors [1,2] highlight better optical results through CL due asphericity and irregularity or corneal surface. The explanation lies in the healing in two phases:

- the epithelium is covering the corneal stroma with basal cells, which secrete basement membrane (MB), with the presence in the epithelium-stroma interface of normal hemesosomes and thick epithelium, generating the regression of the refractive effect;
- one month after PRK, the activation of keratocytes occurs together with production of collagen, resulting in regression and persistent stromal haze.

b) Optical

The indications for use of contact lenses are: residual refractive error, irregular astigmatism, persistent haze.

The fitting moment is at minimum 3 months postoperatively, but it is preferred at 6 months postoperatively.

The types of contact lenses used are: the gas permeable contact lenses (RGP) and the soft contact lenses.

b1. Gas permeable contact lenses (RGP) are rarely used after PRK or LASEK. The constituent material is fluorosilicone / acrylate.

Lens characteristics are:

- diameter: 9-10.5 mm enough;
- the optical zone smaller than ablated optical zone (in the myopic eye);
- curvature radius 0.5 D flatter than the preoperative K value;
- thickness: thin, giving good comfort, good vision and easy handling.

b2. The soft contact lenses (spherical or toric) are mostly used after PRK or LASEK. The material is silicone hydrogel formation, disposable type.

Lens characteristics are wider diameter and flat curvature radius.

The fact that wearing this type of contact lens induces hypoxic stress and regression of hyperopia should be taken in consideration [3].

1.2. Lasik (laser assisted in situ keratomileusis)

Indications: up to -8D myopia, up to +6D hyperopia, up to ±5D astigmatism.

The purpose of the contact lens is both therapeutic and optical.
a) Therapeutical
Contact lenses are used in case of complications: free flap, sliding flap, thin flap, button hole, flap striae, epithelial defects, corneal irregularities [4,5].
Contact lenses are silicone hydrogel disposable type, the wear is for 3-4 days, associated with topical antibiotics and artificial tears [6].
b) Optical
Indications: 3 months postoperatively when the cornea is more stable.
The types of contact lenses used are:
b.1. Rigid gas permeable contact lenses (RGP)
Constituent material is fluoro-silicone/acrilat with good oxygen transmissibility.
Lens characteristics are:
- large diameter of 9.5 up to 11.5 mm, that ensures optimum alignment of contact lenses;
- optical zone with 1-4mm in diameter;
- center curvature radius: flatter than preoperative curvature radius (one quarter of the total diopter reduction through Laski);
- thickness: as thin as possible [7].
b.2. Soft contact lenses (spherical, toric)
Constituent material is Hidrogel. The dioptric power of the myopic eye is sometimes the same as the preoperative one because of the tear film’s overflow behind the contact lens. Relative contraindications are hybrid contact lenses, piggyback or scleral contact lenses [8,9].
1.3. Incisional refractive surgery (radial Keratotomy-KR)
Indications relate to up to -5D myopia. The technique was performed in a high percentage in the past. The method principle involves performing deep, peripheral, radial incisions, leaving the center open more than 4mm. The corneal scars formed alter the profile of the cornea. The final result is determined by individual corneal healing. The technique shows low predictability, with regression and diurnal fluctuations. [10,11].
The purpose of the contact lens is optical, for the correction of refractive errors and diurnal fluctuations [12,13].
The types of the contact lenses used are the rigid gas permeable contact lens (RGP) and the soft contact lenses.
a) Rigid gas permeable contact lenses (RGP)
The advantages of the RGP contact lenses consist in the following: ability of residual refractive error correction, masking of irregular astigmatism, diurnal fluctuations stabilization, oxygen increased transmissibility, ensuring the tear film circulation and removal of plaque deposits.
The lens characteristics are: constituent material is fluoro -silicone / acrylic that provides a good stability, stable ocular surface characteristics and resistance to bending (flexibility), large diameter of 9.5 up to 13.5 mm, that ensures proper centering, small optical zone to avoid excessive tearing and blockage of air bubbles;
- the flattest curvature radius (one third of the refractive error reduction from the preoperative K values);
- lens design: aspheric posterior surface (the ability to adapt to a atypical topography);
- lens thickness: thin, providing comfort, optimized oxygen transmission and perfect centering.
b) Soft contact lenses
They are indicated in case of intolerance to rigid gas permeable contact lenses (RGP), due descentration or dry eye syndrome.
The material is silicone hydrogel, being the most reasonable option. The risk of corneal oedema (highlighted through changes in topography), deepepithelization along the incision, microbial keratitis and corneal neovascularization at the incision should be taken into consideration.
Lens wear can be: extended, daily or disposable. The design type of the lens in case of astigmatism is spherical or toric.

B. PHOTOTHERAPEUTICAL KERATECTOMY (PTK)
The indications of the technique are: recurrent corneal erosions, superficial scars, previous corneal dystrophies, "band" keratopathy. The aim of the contact lens is therapeutic (antialgic, epithelizant). The type of contact lens used is rigid gas permeable lens. The tears fill in the space between the posterior surface of the contact lens and the irregular anterior surface of the cornea, having an optical barrier effect. [13,14].

C. THE CROSS-LINKING UV TECHNIQUE
Indications: stage I, II or III keratoconus, corneal ectasia, edematous keratopathy, corneal melting.
The aim of the contact lens is therapeutic (antialgic, epithelizant).
Type is silicone hydrogel contact lens, to be worn for 3-4 days until corneal epithelization. The contact lens wear is associated with steroids, NSAIDs, antibiotics and artificial tears [15,16].

D. CORNEAL TRANSPLANT (PERFORANT KERATOPLASTY)
Indications: stage IV keratoconus, bullous keratopathy, Fuchs dystrophy, central corneal scars.
There is a postkeratoplasty altered corneal profile that makes the contact lens fitting difficult due either to sharp/ flat curvature of the donor cornea, or to problems related to junction.
The fitting moment is determined by the presence of an intact epithelium that sutures in place (buried knots) or after removing the sutures, this being preferable [17,18].
The lens wear is associated with topical steroid (1-2x/day) treatment.
The purpose of using contact lenses is:
- optical, in order to correct ametropia resulted due to perforating keratoplasty or to correct irregular astigmatism;
- contact lens is recommended at approximately 3 months postoperatively on clear graft [19];
- therapeutic for the reepithelization and protection of the graft [20].
a) Optical purpose:
The types of contact lenses used are:
1. Rigid gas permeable contact lenses (RGP)
They are preferred due to the presence of astigmatism. Lens type can be: spherical, with aspherical or bitorical backside. If the donor cornea is bulging, the contact lens is stable. If the donor cornea is flattened it requires a contact lens with larger diameter. It is necessary to monitor both the junction and the corneal stability without warpage phenomena [21,22].
Lens characteristics are:
- material is fluorosiliconacrylate, with high oxygen transmissibility;
- diameter of 9.5 up to 12 mm;
- there are mini-scleral contact lenses having a diameter of 13.5-19 mm that ensures proper centering;
- thickness as thin as possible.
2. Soft Contact Lenses
They are indicated in case RGP lenses are not tolerated.
Lens type in case of astigmatism is spherical or toric. The lenses provide comfort and stability. It is necessary to monitor the corneal oedema, infiltrates and corneal neovascularisation [23].
3. Hybrid Contact Lenses
In this category we mention: Softperm lens (RGP and hydrogel) and Keralens type (RGP and silicone hydrogel)
The advantages of these lenses types are good visual acuity and stability.

4. Piggyback lenses
Represent the combination system of a hydrogel lens covered with RGP lens type [26].

b) Therapeutical Purpose
Hydrophilic contact lenses (TCL) for continuous wear or silicone hydrogel are being used [27].
Patients are recommended the following: regular monitoring, meticulous hygiene, urgent presentation at the ophthalmologist in case of red eye and decreased visual acuity.
Contraindications of the fitting after perforant keratoplasty are:
- topographic alterations: curvature difference between the receiver and the donor cornea;
- physiological alterations: epithelial defects, inflammation, corneal oedema, loss of sutures, dry eye.

E. AMNIOTIC MEMBRANE IMPLANTATION
Indications of amniotic membrane implantation refer to corneal perforation in order to preserve the eyeball for perforant keratoplasty [27,28].
The contact lens used is of the soft, therapeutic type, being placed over the amniotic membrane.
The purpose of the contact lens is to maintain hydration.

F. INTERNAL PTERYGIUM SURGERY
The contact lens used after internal pterygium surgery is of soft type.
The aim of the contact lens is therapeutic, antialgic and epithelizant, being considered to prevent recurrence.

G. SURGICAL AFAKIA
Lenses fitting in these cases is rare in the age of artificial lens implants.
The wear of contact lenses removes visual field restriction, the prismatic effect of the air lens and magnification, offering better visual performance and aesthetic look.

1. Afakia in adults
Indications for contact lens wear in these cases are: all secondary implantation contraindications, best-corrected visual acuity, manual dexterity, ability to clean contact lenses.
CL fitting time is 4-6 weeks after the primary surgery.
The purpose of the contact lens is optical in order to improve visual acuity.
Examination before fitting consists of: evaluating the curvature radius of the cornea, refractive status of the patient, best-corrected visual acuity, exploring the tear film quality.
The types of contact lenses used are RGP and soft contact lenses.
a) Rigid gas permeable contact lenses
The indications refer to: those without having experience with soft contact lenses, when Re = ± 2D 43D or flatter ±2D cyl. (ACR) and in case of complications after contact hydrogel lens wear (tight lens syndrome, conjunctivitis, keratitis).
The design is: tricurve lenticular type, with a negative peripheral power to improve eyelid accession, spherical, toric, bithorice, bifocal, multifocal.
Lens characteristics are: diameter of ~ 9.5 up to 9.8 mm, with a larger optical zone, curvature radius : 7.5 mm, increased Dk (oxygen permeability).
b) Soft contact lenses (hydrogels, silicone-hydrogel)
The indications refer to: intolerance to RGP, improper fitting of the RGP lenses and minor residual astigmatism.
The design is: spherical, toric, multifocal, multifocal-toric.

Lens features: reduced thickness due lenticulation.
A type of silicone hydrogel contact lens is the lens O2-Optix Individual (Ciba Vision).

Soft contact lens wear can be daily or extended [23].
Complications induced by the wear may be: corneal hypoxia, risk of microbial keratitis, CL deposits, neovascularization, CL dislocation and CL colouring due to coloured eyedrops instillation.
2. Afaikia in children
Indications of the contact lens wear are: after congenital unilateral or bilateral cataract surgery and after traumatic cataract surgery.
The fitting moment is as soon as possible to avoid postoperative organic amblyopia or anizetopia (in unilateral aphakia) [16].
The types of contact lenses used are:
a) Soft hydrogel contact lenses
Their characteristics are: diopter power over 20 D, low Dk (15 to 18.8) having low oxygen permeability, risk of complications, they are difficult to handle by parents and they are indicated for daily wear.
b) Rigid gas permeable contact lenses
Their advantages consist in: easy handling, high oxygen transmissibility, provides a better visual acuity, large diopter scale, high durability.
The disadvantages consist in: low comfort, displacement of the contact lens, difficulty in fitting.
c) Silicone hydrogel contact lenses
The advantages consist in: highest oxygen permeability (Dk>340), extended wear (EW), excellent comfort, easy handling.
Their disadvantages consist in: high costs, frequent deposits that require lens replacement, possible adhesion to the eye, inducing "tight lens syndrome".
Diopter power of the lens is higher than +20→ +35D.
ii. POST TRABECULECTOMY
Lens wear indication is in cases of too large bubbles, with excessive filtration and small anterior chamber.
The aim of the contact lens is therapeutic in order to prevent excessive filtration.
The type of contact lenses is soft, with large diameter.

I. POST EYE TRAUMA
Eye injuries are caused by: ocular contusions, perforating or no perforating ocular wounds, chemical or physical burns.
Contact lens wear indication consists of: correction of monocular aphakia, correction of irregular astigmatism, improvement of eye appearance.
The purpose of the contact lens is optical and cosmetic.
a) Optical purpose:
Contact lenses used are:
1. RGP – having the following characteristics:
- Material: fluorosilicone / acrylate;
- low to moderate Dk (35 - 65);
- Diameter: over 9 mm;
- Curvature radius – a little flatter than the average keratometric values;
- Daily wear;
- Type: spherical, bitoric, aspherical
2. Piggyback / hybrid
These lenses can improve alignment, having a curvature radius of 8 mm.
3. Hydrogel soft contact lenses or silicone-hydrogel toric contact lenses
b) Cosmetic Purpose:
These contact lenses cover the opaque cornea and hide pupillary distortion [21].
Soft contact lenses are used with clear or black pupil (prosthetic lenses).
CONCLUSIONS

1. The future of contact lenses is not “threatened” by the Excimer Laser corneal refractive surgery. On the contrary, they could support the therapeutical or optical aim, changing an unsatisfied patient into a satisfied one.

2. In the other mentioned corneal surgery types, the contact lens wear for therapeutical purposes removes subjective phenomena.

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MEIBOMION GLAND DYSFUNCTION

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Keywords: meibomian glands, blepharitis, thermodermie

Abstract: The ocular surface, tear film, lacrimal glands and eyelids act as a functional unit. The 2 most commonly encoured ocular surface disorders are tear film disorders and blepharitis. The tear film is divided in 3 interdependent layers (lipidic, aqueous, mucinic) essential for visual acuity and ocular comfort. The Meibomian glands are modified sebaceous gland. Its lipidic secretion is dependent on temperature (32 – 40 Celsius). The meibomian dysfunctions play a major role in lid margin diseases. These can vary from meibomian kerato-conjunctivitis to evaporative dry eye. The treatment of meibomian dysfunctions can be: medical, surgical, symptomatic, thermodermie.

Cuvinte cheie: glânde Meibomius, blefarite, termoterapie


INTRODUCTION

Meibomian gland dysfunction (MGD) is a condition of meibomian gland obstruction and is frequently associated with many ocular diseases, such as posterior blepharitis or meibomitis, acne rosacea, chalasion, Meibomian keratoconjunctivitis, evaporative dry eye, contact lens intolerance etc.

Recognized as the root cause of these ocular diseases, the traditional treatment will consist of warm compresses, improved lid hygiene, systemic or topical antibiotics and steroids, surgical therapies.

PRESENTATION

The ocular surface, tear film, lacrimal glands and eyelids act as a functional unit. Any events that disturb the homeostasis of this unit involve ocular surface diseases.

The tear film is the most dynamic structure of this unit. Any condition that reduces the production, alters the composition, impedes the distribution of the tear film, may cause irritations of ocular surface and a degradation of vision.

These conditions are often related to problems with the structure or function of the eyelids, cornea or conjunctiva. The 2 most commonly encountered ocular surface disorders are tear film disorders and blepharitis.

The integrity of the tear film is essential for the ocular comfort and health. It plays a critical role in maintaining corneal and conjunctival integrity, protecting against microbial, allergic and traumatic aggressions and preserving visual acuity.

The superficial lipid layer (produced in major part by the Meibomian glands) is important for tear film stability; it prevents evaporation which is essential for the maintenance of the structural and refractive integrity of the ocular surface.

MGD is associated with a reduction of the tear film thickness due to an excessive evaporation of the lacrimal film by deficiency of lipid secretion, thereby inducing an increase in lacrimal osmolarity. This affects the corneal metabolism and increases the desquamation of epithelial cells, creating a potential site of bacterial invasion. The Meibomian glands are modified sebaceous glands, which are holocrine glands whose acini discharge their entire contents in the process of secretion. In normal subjects, 45 % of glands are active, independently of age. Meibomian gland secretion decreases with age. The chemical analysis of Meibomian lipids shows a mixture of non polar and polar lipids, mainly phospholipids. The Meibomian lipids melt between 32 – 40 °Celsius, not at a fixed temperature. However, Meibomian secretion in subjects with MGD start melting at 35 °Celsius, versus 32°Celsius in normal subjects.

Recent studies found out that temperature influences significantly the delivery of the Meibomian gland secretions and that there is a real benefit of warm wipes to improve the delivery from dysfunctional glands. This is most likely explained by a change in the Meibomian oil viscosity.

MGD plays a major role in lid margin diseases. It is extremely common but yet often overlooked and not diagnosed. Several studies estimate its prevalence from 39-50 % in the general population. This prevalence is associated with increasing age.

BLEPHARITIS

Often coexists with other related conditions, most frequently dry eye diseases, seborrhic dermatitis, Acne Rosacea, atopy
Posterior blepharitis affects the Meibomian glands and the gland orifices (known as Meibomian gland dysfunction). Treatment goals refers to warm compresses, eyelid hygiene, antibiotics, anti-inflammatory agents.

**CHALAZION**

Is a cyst in the eyelid, caused by sterile inflammation of a blocked Meibomian gland, usually on the upper lid; it is generally characterized by a complication of posterior blepharitis, usually associated with Meibomitis or Acne Rosacea. Treatment consists of: warm compresses followed by eyelid massage, topical antibiotics, surgical removal.

**CONTACT LENS INTOLERANCE**

Contact lens wear is associated (50 %) with a decrease in the number of functional Meibomian glands.

**ACNE ROSACEA**

Rosacea is associated with sebaceous gland hypertrophy of the face. The treatment consists of lid hygiene (warm compresses, massage, lid cleansing), systemic and topical antibiotherapy, antiseborrheic shampoos.

**OCULAR PEMPHIGOID**

Chronic bilateral conjunctivitis persisting for years; leads to increased scarring, symblepharon, increasingly shallow conjunctival fornix that may progress to total obliteration of the conjunctival sac between the bulbar conjunctiva and the palpebral conjunctiva.

Treatment: artificial tears (without preservatives), topical antibiotics (in case of suprainfection), topical/systemic steroids, immunosuppressive agents.

**EYELID WARMING**

For an efficient thermotherapy, it is important to warm the eyelid enough to raise the meibum temperature (normally 34.4-35.6 C) up to 40 C and to ensure successful melting and outflow

An alternative to warming compresses have been tested using hyperthermic treatment such as infrared, radiofrequency and microwave radiations devices, ultrasound, moist heat delivery devices.

The goal is to use a quite simple device for reaching the desired temperature of the glands without secondary effects.

The most safe and efficient appears to be an eyelid warming device with moist heat technology (Blephasteam).

The studies on this device showed that it improved the stability and the uniformity of the tear lipid layer in MGD patients by melting the Meibomian gland lipids.

The treatment consists of 10 minutes sessions followed by eyelid massage.

The temperature of the cornea never rose above 38.3 C, considered safe for the cornea (complications occurred in animal experiments over 40 C).

**PRELIMINARY RESULTS**

In the Research Center of the Ocular Surface Sibiu we studied 50 patients with MGD, treated by thermotherapy in the past 6 month. The cases were chronic blepharitis, chalasion, ocular pemfigoid.

6 of 12 cases of chalasion treated by thermotherapy were solved without needing further surgery.

In 2 case of ocular pemfigoid the symptomatology improved significantly after thermotherapy (fig. 1).

In 4 cases of chronic blepharo-conjunctivitis we noticed favourable evolution under thermotherapeutic treatment.

In all cases the new technique had favourable results.

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THE CONTACT LENS- AN IMPORTANT SUPPORT IN BINOCULAR VISION REHABILITATION IN CHILDREN (CASE PRESENTATION)

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Keywords: amblyopia, anisometropia, contact lens, fusion

Abstract: The paper presents a child case with high anisometropic amblyopia and esotropia. The initial treatment for amblyopia (patching) was applied using glasses during the occlusion. In 12 months the visual acuity (VA) on the amblyopic eye was recovered from 20/400 to 20/40 with correction. Because of persistent esotropia, diplopia and accompanying vertical deviation, we decided for surgery which was successful, achieving orthotropia. Two months later, a contact lens was fitted on the myopic eye. 6 months after surgery the patient was able to fuse at distance and near having an orthotropic position and a VA of 20/40 on the fitted eye. 5 years later she preserves the result.

INTRODUCTION

Amblyopia was defined as: “an impairment of vision arising from dysfunction of processing of visual information caused by degradation of the retinal image during a sensitive period of visual development” (1, 2).

Amblyopia causes a range of abnormalities of visual binocular function. Usually is the effect of another pathology as: a refractive error (difference > 2 D), strabismus and early onset cataract or other opacities. It seems to be the most frequently treated disorder in pediatric ophthalmic and orthoptic practice (3, 4, and 5).

Amblyopia is usually unilateral but can be also bilateral. Because of its profound consequences over the vision and life quality if non-treated, amblyopia should be early found and treated (6, 7, 8, and 9). The goals of treatment are to optimize visual function and binocular vision and to maximize employment opportunities. We also have to try to provide a useful “spare eye” in the event of trauma or pathology in the normal eye.

The treatment consists in the modulation of the visual input into the amblyopic eye. (6, 1, 2).

CASE PRESENTATION

The paper presents a case of a four years old girl, diagnosed in 2002 with left esotropia with onset between 12-18 months of age and high amblyopia. The previous treatment, started at age two, was unsuccessful because of low compliance and undercorrection of the amblyopic eye.

The clinical examination revealed a normal developed and cooperative child with left monocular esotropia of +30 PD and mild DVD (disassociated vertical deviation), unstable central fixation of the left eye (OS), absent binocular vision, visual acuity (VA) OD=20/20 and VAOS OS <20/800 at distance and 20/400 at near.

The measured refraction under cycloplegia was: OD +0, 75 Sph ^ +0, 5 cyl axis 90; OS -9, 00 Sph ^-1, 50 cyl axis170.

Anterior and posterior pole examinations were normal. No associated pathology was found.

The treatment options were analysed with the parents: glasses or contact lens, patching or atropinisation. (7, 8, 9, 10)

Patchig is very difficult for the child in cases with high amblyopia and not always accepted but in this case parents decided to give all the support for this treatment. In the meantime they had doubts regarding contact lens (CL) handling so they initially refused the CL fitting on the left eye. The patchig started using a pair of glasses with plano lens on the right eye and full correction on the left one with the recommendation to wear the glasses only during patching. The patching was done 8 hours/day. (10, 11, 12)

The first re-evaluation was done after two months and the improvement of the left eye VA was obvious: VAOS=20/100 (with glasses). After re-refraction and a new discussion with the parents we decided for a silicone-hydrogel contact lens fitting with daily removal on the left eye.

4 months later the VAOS became 20/80 (with glasses or CL) and we noticed the fixation improvement and a good alternation at the cover-test. 6 months after treatment start the measured refraction of the left eye was -8, 00 Sph/-1, 50 cyl/170 and VAOS=20/60 with correction.

After 9 months of treatment we found: VAOD=20/20 and VAOS=20/50 with correction and 12 months after the VAOS became 20/40 with correction.

The VAOS remained at this level in the following 6 months.

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months keeping the same occlusion schedule. At that time we re-evaluated the binocular status.

Alternating esotropia of +25 PD and OS DVD 10 PD were present. Diplopia in BV with glasses caused by anisoeiconia and the misalignment was significant. Diplopia in BV with contact lens on the left eye because of the esotropic angle was also present so we decided for surgery in 2004. The prisms adaptation test showed fusion potential. The surgery provided was: Bilateral Medial Rectus Muscle (MR) Recession: OD 4 mm and OS 4, 5 mm. We ignored the DVD because we considered its small amount and the connection with the lack of fusion.

The obtained result was orthotropia. We kept the patching with glasses 3 hours/day the following two months (until the surgical healing) to avoid the amblyopia recurrence (13).

Re-refraction and re-fitting of the CL on the left eye were done two months after surgery when fusion arrived after a short period of transitory diplopia. We came to the patching discharge in 2006 and since than our patient has been constantly wearing the CL on the left eye. The VAOS was preserved to the same level in the following years. In 2009 we recommended computer exercises for amblyopia (Ambly Net) as a routine training at the patient’s request.

In this moment the patient is 12 years old, she has fusion at distance and near, straight eyes and the VA on the left eye of 20/40. She wears a Si-H toric lens with daily removal on the left eye. The tolerance is excellent and she waits the moment when the refractive surgery will be possible.

CONCLUSIONS

The commonly used methods for amblyopia treatment are: patching on the good eye (occlusion), instillation of atropine drops in the good eye (penalization) and occasionally, occlusive contact lenses. (14, 15, 16)

The choice of correction type and treatment (atropine or occlusion) should be discussed with parents. (9) The results are deeply related to the child’s and parent’s compliance. According to the international guidelines, 6 hours patching per day is effective for acuities below 0.6 LogMAR (20/80 Snellen) (3). Amblyopia treatment in high amblyopia cases is a challenge. High anisometropia with an emetropic eye makes more complicated the binocular vision restoration because of anisoeiconia. The children are poorly motivated to wear glasses in such cases.

The treatment management is time consuming and unpleasant for both parents and children. They need clear information and advice.

The refractive error should be totally corrected and the follow-up should be done every 3 months. In the presence of undercorrected refractive error, the treatment efficacy is compromised and the child compliance is lower. (10) Strabismus should be surgically corrected for obtaining orthotropia as an anatomical and physiological support for binocular vision recovery. In the absence of eyes alignment the final result is compromised because of suppression and amblyopia recurrence.

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THE IMPORTANCE OF TREATMENT WITH CONTACT LENSES IN AMBLYOPIC CHILDREN

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Keywords: amblyopia, children, anisometropia, contact lenses

Abstract: The aim of this paper is to evaluate contact lens use in the management of different types of amblyopia for children. It is an observational retrospective study for 6 children with amblyopia (refractive and strabismic amblyopia) treated with contact lenses in an ambulatory department. Mean age of children at the beginning time of study is 13,06 ± 4,75 years (limits between 7 – 19 years). Clinical parameters are: the age of children in the moment at first diagnosis, type of amblyopia, visual acuity, heredity, the compliance for contact lenses of the child and parents. Results: The mean age at first diagnosis time is 8, 9 ± 2,66 years, the time of observation is between 2 and 12 years. Objective refraction limits were from -11 and + 14 diopters, and in 5 cases the treatment with contact lenses was unilateral and in only one case was bilateral for high anisometropia. The diagnosis was after an ophthalmological screening and in only 2 cases parents came alone for examination. Conclusions: Parents with refractive errors will come with children earlier and the compliance for treatment with contact lenses is better. Treatment with contact lenses for amblyopic children is an easy and a very good possibility. Treatment with contact lenses for high amblyopia will produce a better social integration.

INTRODUCTION

The WHO ophthalmological data confirm that at every 5 seconds one adult person is blind and at every minute – one child. Approximately 80% low vision persons have preventable disorders or these disorders can be treated.Amblyopia, together with diabetic retinopathy and glaucoma, can be considered „preventable ocular disorders” (1,2)

Amblyopia can be finding in 2 - 4% at children and young adolescent. Treatment of amblyopia is difficult, for a long time and will need many different types of management, adapted for the types of amblyopia (3,4,5). The sooner the amblyopia is diagnosed, the better results are regardless to the amblyopia type.(6,7,8)

The type of treatment more used is optical correction – which represent the first type of management for refractive amblyopia. In high anisometropia, the treatment with contact lenses is a good option and can be used even for young children. A particular type of contact lenses are “Oclude contact lenses” in treatment for occlusion when the child had skin irritation. (9,10)

PURPOSE

The WHO ophthalmological data confirm that at every 5 seconds one adult person is blind and at every minute – one child. Approximately 80% low vision persons have preventable disorders or these disorders can be treated. Amblyopia, together with diabetic retinopathy and glaucoma, can be considered „preventable ocular disorders”. (1,2)

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The type of treatment more used is optical correction – which represent the first type of management for refractive amblyopia. In high anisometropia, the treatment with contact lenses is a good option and can be used even for young children. A particular type of contact lenses are “Oclude contact lenses” in treatment for occlusion when the child had skin irritation. (9,10)

MATERIAL AND METHOD

This paper is an observational retrospective study for 6 children (4 girls and 2 boys) with amblyopia (refractive and strabismic amblyopia) treated with contact lenses in an ambulatory office. Mean age of children at the beginning time of study is 13,06 ± 4,75 years (limits between 7 – 19 years). Clinical parameters are: the age of children in the moment at first diagnosis, type of amblyopia, corrected visual acuity, heredity, the compliance for contact lenses of the child and parents. The time of observation was between 2 and 12 years.

RESULTS

Objective refractions were between -14 diopters and +11 diopters, and the refraction distribution for right (RE) and left eye (LE) are illustrated in figures 1 and 2. Figure no. 1. Refractive values RE

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The parents accepted treatment with contact lenses. Ocular tolerability was very good, and the child knows to use the contact lenses alone without parents help.

**DISCUSSION**

Visual acuity decreasing represents for a child a major impediment in future education, and also can produce abnormalities in development of a society (11,12). During childless, a good vision is necessary for 80% from all the process of education. It is necessary to know all the ophthalmological disorders. One child from 20 preschool children presents a visual problem. Early diagnosis is better for a better therapeutically success. (13,14,15)

If there is a unilateral amblyopia, the most frequent causes are strabismus and anisometropia. A difference of 1,5 diopters between both eyes in a hyperopia will develop amblyopia. A difference of 0,75 - 1 diopters in astigmatism will produce also amblyopia. Visual acuity in anisometropic amblyopia will be better with 2 - 3 lines after treatment. Optic correction in high anisometropia is with contact lenses treatment together with occlusion of the dominanted eye. (16,17,18,19)

The life quality of children is better after treatment with contact lenses. In our study a girl was very shy and a boy was very agitated before treatment and after contact lenses they have better school results.(21-24)

**CONCLUSIONS**

1. Ophthalmologist must recommend very early treatment with contact lenses at children with high anisometropic amblyopia.

2. Treatment with contact lenses for high amblyopia will produce a better social integration and more good school results for children with high anisometropia treated with contact lenses.

3. First ophthalmological consultation must be not more than 3 years old to prevent refractive amblyopia.

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Keratoconus treatment by collagen crosslinking for patients with extreme ages – case presentation

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Keywords: keratoconus, collagen crosslinking, extreme age

Abstract: In present the application of collagen crosslinking with riboflavin and UVA - light was extended for patients younger 16 years old or older 40 years old when the progression of keratoconus was observed. This paper shows the evolution of those clinical cases after the application of collagen crosslinking by monitoring visual acuity, corneal thickness and topographic aspects. Generally it was observed an improvement of these parameters.

INTRODUCTION

Keratoconus is a progressive, non-inflammatory corneal dystrophy characterized by changes in the structure and organization of corneal collagen fibers. It results in asymmetrical thinning of the cornea and causes severe refractive error (1).

When its onset is early, keratoconus progresses quickly during the pediatric years, often resulting in the need for early penetrating keratoplasty. When penetrating keratoplasty is performed in children the rate of graft failure is higher and visual prognosis is worse than in adults undergoing the procedure (2).

Corneal collagen crosslinking using riboflavin and UVA – light has been introduced recently as an effective means of stabilizing the cornea in keratoconus. The biomechanical basis of increased corneal strengths is the formation of covalent cross links; free radicals created by excitation of riboflavin at its absorption peak of 370 nm UVA are thought to interact with amino acids in neighboring collagen molecules to form strong chemical bonds.

C3R increases corneal stiffness by increase the fibril diameter (by the result of collagen molecules being pushed farther apart by the newly formed cross links, a phenomenon that also occurs in collagen crosslinking at patients with diabet mellitus and age related crosslinking (3).

Corneal stiffness increased linearly with age, doubling between the age of 20 and 100 years. There are a linear relationship between corneal Young’s modulus and age following collagen crosslinking with riboflavin/UVA, corneal Young’s modulus increased 4.5 times (4).

MATERIAL AND METHOD

The paper presents the application effects of collagen crosslinking with riboflavin and UVA – light for patients younger 16 years old or older 40 years old. The same technique was used for all patients. After topical anesthesia with oxybuprocaaine we removed 8mm of the central epithelium.

RESULTS AND DISCUSSION

Case 1:

Male patient, 14 years old with keratoconus stadium I at right eye. Preoperative refraction was -1.50 sf <-4 cyl ax 147°. After one year, postoperative refraction was -1 sf <-3.50 cyl ax 150', and after two years was -1 sf <-3 cyl ax 150'. Uncorrected visual acuity was improvement with 2 Snellen lines (0.6 preoperative and 0.8 postoperative). Visual acuity was corrected at maxim value (1.0) by application of soft contact lens -1.75 cyl ax 150°. Pachymetric value was improvement from 479μ at 489μ. Collagen crosslinking was performed two years ago when corneal value on steeping meridian (Kmax) was 47.51 D ax 15° and on flat meridian (Kmin) was 42.49 D ax 80° (figure 1). After one year postoperative corneal dioptric values recorded a decreasing with 0.50 D. After two years postoperative this patient presents 46.38 D ax 15° on steep meridian and 44.58 D ax 110° on flat meridian (figure 2).

Case 2:

Male patient 12 years old with keratoconus stadium I at left eye. Preoperative refraction was -2 sf <-2 cyl ax 11° and two years postoperative refraction was -1.75 sf <-2.50 cyl ax 180°. Pre- and postoperative, uncorrected visual acuity was 0.4. Correction of visual acuity was performed in this case with spectacle (-1D), BCVA obtained was 0.6. Pachymetric we observed increase of corneal thickness with 16 μ from a 474μ at 488 μ. In this case we recorded on topography maps a decrease of dioptric value on steep meridian from 46.80 D ax 10° at 46.21 D ax 2°, but on flat meridian decreasing was semnificative from

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Case 3:
Female patient 46 years old with keratoconus stadium III at right eye. Preoperative value of refraction -11 sf <> -6 cyl ax 45°, uncorrected visual acuity 0.03, best corrected visual acuity 0.2 with spectacle (-5 sf <> -3.50 cyl ax 90°) and corneal thickness 427 μ were constant postoperative to. In the first six months after performed corneal crosslinking (in 2007) didn’t recorded semnificativ modifications on main corneal meridian from 59.80 D ax 165° and 52.41 D ax 80° (figure 5) at 59.45 D respectively 52.53 D, but at one, two and three years after crosslinking we recorded 57.19 D ax 165° on steep meridian, respectively 48.58 D ax 80° on flat meridian (figure 6).

Case 4:
Male patient, 42 years old with keratoconus stadium II at right eye. Preoperative refraction was – 8.25 sf <> -1.50 cyl ax 90° and after two years postoperative cylindrical refraction was decrease at – 0.75 cyl ax 93°. Uncorrected visual acuity was improved with 2 Snellen lines from 0.2 at 0.4. Rigid contact lens was used in this case for correction of visual acuity at maximum value (1.0). Pre and postoperative corneal thickness was 458 μ. Topographyc dioptic value on steep meridian decreased from 51.44 D at 48.37 D after two years (figures 7, 8).

CONCLUSIONS
Corneal collagen crosslinking effect is more...
significant for old patient.
No ocular or systemic adverse events were observed.

Although patients complained of nighttime glare and halos for the first days, they subjectively perceived improvement clarity of visual acuity.

Improvement of visual acuity is probably due the regularization of the cornea and corneal flatting.

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HYBRID CONTACT LENSES (KERALENS) - AN OPTION FOR KERATOCONUS CORRECTION

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Keywords:

Abstract: Purpose: Directed evaluation, adaptation, functional benefits and results of the keratoconus correction with Hybrid Keralens (Kerasoft 3) contact lenses. Material and Method: The study was performed on 25 eyes of 14 patients diagnosed with keratoconus in stage I, II or II of evolution, which were applied Keralens hybrid contact lenses. Preoperative ocular examination included visual acuity with and without correction, eye refraction, keratometry, corneal topography (Pentacam), pachymetry (optical ultrasound). Patients were initially applied a trial lens chosen according to the keratometry and to the stage of keratoconus. The patients were left for 30 minutes with the trial lens on the eye, and reevaluation of the visual acuity was performed, together with the evaluation of the lens mobility and patients’ comfort. The follow up of the patients was made at 3 months when the reevaluation was performed, including visual acuity and overrefraction. The parameters evaluated in the study were: age, sex distribution of the cases according to the evolutionary stages of keratoconus, abandonment of the rough contact lenses, distribution of cases according to the therapy performed to stop progression of keratoconus (Cross-linking or Ferrara rings), best-corrected visual acuity assessment compared to the visual acuity with contact lenses. Results: The majority of patients in the study were found in age range of 21-30 years, of which most were males (71%). Keratoconus stage was mainly stage II / III followed by stage II. Most patients were treated by Cross-linking technique before applying the Keralens contact lenses. Visual acuity improved significantly (p <0.03) after 3 months of hybrid Keralens contact lens wearing. The comfort offered was 100%. Conclusion: The Keralens Hybrid contact lenses are a good way of correcting the visual acuity in patients having keratoconus. The advantages refer to the short time given to adapt, patient comfort and superior visual acuity compared to air correction.

Keywords:

INTRODUCTION

Development history of contact lens (CL) is closely linked to the desire and need to obtain at the same time a good visual acuity and comfort, accompanied by a minimal number of possible complications. Going on from this principle, there were more and more new materials discovered, in order to improve contact lenses. [1] Since the contact lenses were launched in 1988, there has been a constant evolution based on their use of new materials and manufacturing, lens becoming more comfortable, offering an increasingly visual acuity, better adaptability and a good extended wear. [2, 3]

This development led to the production of two major groups of lenses, which physically can be classified into hard and

Cuvinte cheie

Rezumat: Scopul lucrării: Evaluarea indicaţiilor, adaptării, avantajelor şi rezultatelor funcţionale ale corecţiei keratoconusului cu lentilele de contact hibride Keralens (Kerasoft 3). Material şi metodă: Studiul a fost efectuat pe 25 de ochi de la 14 de pacienţi diagnosticaţi cu keratoconus stadiul I, II sau III, cărora li s-au aplicat lentile de contact hibride Keralens. Examenul ocular preoperatoare a inclus acuitatea vizuală cu şi fără corecţie, refracţia oculară, keratometria, topografia corneană (Pentacam), pachimetria (optică ultrasonică). Pacienţilor li s-a aplicat iniţial o lentilă de probă aleasă în funcţie de keratometrie și stadiul keratoconusului. Pacientul a fost lăsat 30 de minute cu lentila de probă pe ochi și s-a efectuat reevaluarea acuității vizuale, mobilității lentilei, cută și confortul pacientului. Urmărirea și evaluarea parametrilor a fost făcută la 3 luni, când s-a efectuat corectarea cu lentilă hibridă și overrefractarea. Parametrii evaluaiți pe lotul buat în studiu au fost vârsta, sexul, repartiția cazurilor în funcție de stadiile evolutive ale keratoconusului, abandonul lentilelor de contact dure, repartiția cazurilor în funcție de terapia de stopare a progresiei keratoconusului (Cross-linking sau inele Ferrara), evaluarea acuității vizuale cu corecție optimă - comparativ cu acuitatea vizuală cu lentile de contact. Rezultate: Din pacienții luatai în studiu, majoritatea s-au aflat în intervalul de vârstă de 21-30 de ani, fiind de sex masculin (71%). Stadiul keratoconusului a fost în principal stadiul II/III, urmat de stadiul II. Majoritatea pacienților au fost tratați prin tehnica Cross-linking anterior aplicării de lentile de contact Keralens. Acuitatea vizuală s-a îmbunătățit semnificativ (p<0.03) după 3 luni de port al lentilelor de contact Keralens. Confortul oferit de portarea lentilelor a fost de 100% (afirmativ). Concluzii: Lentilele de contact hibride Keralens reprezintă o modalitate de corecție a acuității vizuale la pacienții cu keratoconus. Avantajele oferite se referă la timpul scurt necesar adaptării, confortul pacientului și acuitatea vizuală superioară, comparativ cu corecția aeriană...
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soft (jelly) lenses. The industry is currently focused on developing lenses capable of uniting the two main properties of rigid, permeable for gas lenses and the ones of the soft lenses, also called hydrophilic. [3,4]

The first research on gelatinous material was made in 1971 by using a lens made of the hydrophilic material called hydroxyethylmetacrilate (HEMA), and gelatinous material, polymethylmethacrylate (PMMA), a rigid material not permeable to gas.

With the advent of rigid materials, gas-permeable (RGP) lenses were developed, whom center was made of this material surrounded by a hydrophilic strip.

These lenses were called hybrid contact lenses. [5] Investigations in this direction have led to the development of flexible polymers.

This technology has created a synthesis of polymer molecular structure that differs from traditional soft lenses and classic gas permeable rigid lenses. It is, therefore, a new project aimed at combining the optical quality of the materials from the rigid gas permeable (RGP) lenses with the quality of gelatinous material. These lenses were called hybrid material (MH) contact lenses. [6]

**MATERIAL AND METHOD**

We studied a total of 25 eyes of 14 patients diagnosed with different stages of keratoconus, according to the Krumreich classification (I, I/II, II/III, III, IV). Patients were of both sexes and aged between 10 and 50 years. Patients in our study were treated either by Cross-linking technique, or by intrastromal rings, or by both methods in order to stop the progression of keratoconus. Keralens hybrid trial contact lenses were chosen according to the keratometry and stage of keratoconus, namely: - Early (7 to 7.4 mm): -2 or plano, 8.6, 14.5mm; - Moderately advanced (6.6 to 7 mm) -6/-4, 8.4, 14.5mm; - Advanced (less than 6.2 mm): -14/-12, 8, 14.5mm.

After 30 minutes we rechecked the following parameters:
- Visual acuity;
- lens mobility ;
- Patient comfort after which we prescribed a trial CL recipe;
- Patients were reevaluated after 3 months of lens wear checking the following parameters:
  - Visual acuity with contact lenses;
  - Overrefraction;
  - Comfort.

According with all mentioned above, the final contact lenses were prescribed.

We have evaluated the following parameters in our study:
- cases distribution according to age;
- cases distribution according to sex;
- cases distribution according to the stage of keratoconus;
- abandonment of the rough contact lenses;
- distribution of cases according to the therapy performed to stop progression of keratoconus (Cross-linking or Ferrara rings);
- best-corrected visual acuity assessment compared to the visual acuity with contact lenses.
- comfort

Depending on these we prescribed the final contact lens.

Statistical analysis of data and their significance was evaluated using Paired t-Student test. Statistical significance was considered relevant to p < 0.05.

**RESULTS**

Patients included in the study group were found mainly in the age range 21-30 years, followed by 31-40 years age range and a small number of patients were within the range of 41-50 years old and 10-20 years. (Fig. 1)

**Fig. nr. 1. Distribution by age groups**

In our study, the majority of patients were males (71%), whereas females were represented in a 29%. (Fig. 2)

**Fig. nr. 2. Gender distribution**

In the group studied, the most frequently encountered keratoconus stage was stage II / III (10 cases), followed by stage II (8 cases), stage I (three cases), stage I / II (2 cases), stage III and IV (1 case each). (Fig. 3) Staging classification was performed after Krumreich. We tried to adapt hybrid contact lenses mainly in cases with a moderate stage of keratoconus, and improvement of functional results were significant in these cases.

**Fig. nr. 3. Distribution of the cases according to the keratoconus stage**

We noticed the abandonment of hard contact lenses in patients diagnosed with progressive keratoconus in approximately 30.77% of the patients in the study, which preferred hybrid contact lenses (Fig.4).

**Distribution according to surgical techniques that have been performed**

We studied the techniques used to stop the progression of keratoconus in our group of patients, these being performed in advance of the hybrid contact lenses adaptation, in order to achieve a functional improvement. We observed that 7 eyes were treated by the Cross-linking therapy, four patients underwent intracorneal ring implantation, four patients were treated with both techniques and the remaining patients were not subjected to any therapy. (Fig. 5)

**Fig. nr. 4. Abandonment of hard contact lenses**
Best-corrected visual acuity compared with visual acuity with contact lenses

A statistically significant change has been observed in terms of visual acuity, (p <0.03) after hybrid contact lens wear compared to the one before the application. The functional improvement goal was reached by applying hybrid contact lenses. If most of the patients in the study group (12 cases) belonged to the visual range of 0.4 – 0.7 before the application, after the application of hybrid contact lenses most patients (16 eyes) were included in the visual range of 0.8 – 1.0. (Fig.6)

In terms of hybrid contact lens wearers comfort, we achieved a 100% comfort for the studied group. (Fig.7.)

CONCLUSIONS

1. The Keralens hybrid contact lenses (Kerasoft3) are a way of correcting visual acuity in patients with keratoconus.
2. Advantages are related to the short time needed for adjustment, greater patient comfort and better visual acuity compared with the air correction ones.

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INTRODUCTION

The alternatives of treatment in the corneal pathology experienced a great improvement in the past years, including, of course, the category of the corneal ectasia, where keratoconus is the most common. Once diagnosed and staged, keratoconus can be treated by conservative methods (which improve ocular refraction and visual acuity, but do not stop evolution of the disease - hybrid or RGP contact lenses), methods to stop the progression of disease (collagen cross-linking CXL) which may be associated with intrastromal corneal ring implantation, and radical methods applicable in the final stages (corneal transplantation). These methods of treatment are usually applied to young patients, so they need to understand very well the condition they present, for the functional results obtained after the therapy of keratoconus should not have a negative socio-psychological impact, especially during the period of convalescence.

CASE PRESENTATION

The patient, B.M., 24 years of age, from Hațeg (HD), a professional trader, shows up to our service with symptoms of blurred vision, many changes in spectacles' diopters in the last two years (last optical correction performed 2 months before). From his medical history we learn that the patient wears glasses from the age of 9.

The ophthalmic examination reveals the following: (Table 1) CVARE = 0.4 -0.5 (-1.0/-2.25 x 55) and CVALE = 0.5 (-9/-3.50 x 120).

Table no. 1. Initial refraction values

<table>
<thead>
<tr>
<th></th>
<th>OD</th>
<th>OS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARM</td>
<td>-10.25/-2.50 x 56</td>
<td>-9.50/-6.25 x 104</td>
</tr>
<tr>
<td>k</td>
<td>55.75 x 50</td>
<td>56.50 x 120</td>
</tr>
<tr>
<td></td>
<td>57.50 x 140</td>
<td>59.00 x 30</td>
</tr>
<tr>
<td>dK</td>
<td>-1.75 x 140</td>
<td>-2.50 x 30</td>
</tr>
</tbody>
</table>

The anterior segment of RE presents a fine linear (asymptomatic) scar in the periphery of the corneal optical zone of 6 mm, approx. on the 60° meridian; in LE we have a transparent cornea; at BE we observe irregular mires during refractometry.

On BE fundus examination - the papilla, the vessels and the macula show a normal aspect.

Further examinations are carried out using the Pentacam device. The topography and pachymetry show the characteristic aspect of keratoconus, sustained by the typical appearance of the Belin-Ambrosio diagram (RE - Fig.1. and LE - Fig.2.).

Figure no. 1. RE Pentacam Examination

Taking the local examination into account both the anamnesis, the topography and the pachymetry, we establish the diagnosis of BE - stage III keratoconus, with myopic astigmatism.

We had to take into account the differential diagnosis of other ectasia:
- marginal pellucid degenerescence - its onset is late (3rd-5th decade) and the aspect is a strip-like corneal thinning of cca. 1-2 mm, “crescent shaped”, inferior (at 4-8 h), marginal, about 1-2 mm from the limbus (separated from it by healthy cornea);
- keratoglobus - its onset is at birth, the cornea is thinner on the entire surface.

Keywords: keratoconus, Cross-linking intrastromal, corneal rings, corneal melting

Rezumat: Efectul Cross-linkingului, prin creșterea rezistenței corneei, poate fi benefic și pe melting cornean localizat. Explantarea inelului intracornean se impune atunci când există o cicatrice corneană,

Fig.2.)

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The evolution without treatment would be unfavorable, with the disease advancing into stage IV, then the rupture of Descemet membrane and finally hydrops, which would require penetrating corneal transplantation. With treatment, the disease progression can be stopped – through CXL, and refraction can be improved – by intracorneal ring implantation, which would eventually lead to the improvement of VA.

**Fig. nr. 2. LE: Pentacam Examination**

The therapeutical options that we consider in this case are:
- BE: Intrastromal corneal rings, followed by
- BE: Collagen Cross-Linking
So we decided the BE implantation of two intrastromal Kerrarings of 200 mm and 300 mm, arch of 160°, d = 5 mm, according to the nomograms. (Table 2.)

**Table nr. 2. Kerraring implantation data**

<table>
<thead>
<tr>
<th>OD</th>
<th>OS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ax 150°</td>
<td>Ax 30°</td>
</tr>
<tr>
<td>Profunzine 470 μm</td>
<td>Profunzine 450 μm</td>
</tr>
</tbody>
</table>

In evolution, on November 5th, 2009 we found the following examination values (Table 3.):

**Table no. 3. The ophthalmic examination on November 5th, 2009**

<table>
<thead>
<tr>
<th>OD</th>
<th>OS</th>
</tr>
</thead>
<tbody>
<tr>
<td>AV fc</td>
<td>0.33</td>
</tr>
<tr>
<td>AV cc</td>
<td>0.4 - 0.5 (-4.25/-3.50 x 150)</td>
</tr>
<tr>
<td>ARM</td>
<td>-4.25/-4 x 147</td>
</tr>
<tr>
<td>K</td>
<td>51.25/55.50</td>
</tr>
<tr>
<td>dK</td>
<td>-4.25 x 145</td>
</tr>
<tr>
<td>Aspect cornee</td>
<td>fină cicatrică liniară pe meridianul de 60°, în dreptul inelului S-N</td>
</tr>
</tbody>
</table>

On December 3rd, 2009 the patient undergoes CXL treatment at RE. At control, on January 25th, 2010 he presents a slight corneal haze, having UVA RE= 0.1, and UVA LE= 0.6 -0.7.

On March 29th, 2010 the patient comes for an ophthalmologic assessment in order to evaluate the opportunity of initiating the CXL treatment at LE. We note the following (Table 4.):

**Table nr. 4 The ophthalmic examination at about 3 months after CXL**

<table>
<thead>
<tr>
<th>OD</th>
<th>OS</th>
</tr>
</thead>
<tbody>
<tr>
<td>AV fc</td>
<td>0.25</td>
</tr>
<tr>
<td>AV cc</td>
<td>0.33 (-5 x 155)</td>
</tr>
<tr>
<td>ARM</td>
<td>-1.25/-6 x 155</td>
</tr>
<tr>
<td>K</td>
<td>51.25/55.50</td>
</tr>
<tr>
<td>dK</td>
<td>-4.25 x 145</td>
</tr>
</tbody>
</table>

The BE anterior segment shows the following: centered, clean rings, but on the supero-nasal ring at RE we observed a discontinuity in the corneal surface at the middle of the ring, at the level of the scar (on the 60° meridian), asymptomatical.

The BE anterior segment shows the following: centered, clean rings, but on the supero-nasal ring at RE we observed a discontinuity in the corneal surface at the middle of the ring, at the level of the scar (on the 60° meridian), asymptomatical.

We initiated a local treatment at RE with Vigamox (moxifloxacinum) 5 gtt/day + Pranoflog (pranoprofenum) 3 gtt/day + Corneregel (dexpanthenolum) 3 gtt/day for 10 days, and swab-touch of the lesion with Betadine.

At about 1 month, the patient showed up in our service after bathing in a public swimming pool, presenting photophobia, tearing at RE and UVA RE = 0.08 fc. On examination, the RE had a small corneal ulceration at the level of the pre-existing lesion, suprajacent to the intrastromal ring. We collected some wound secretion for a smear culture and the patient resumed topical treatment, this time with Nettacin (netilmicinum) 5 gtt/day + Pranoflog (pranoprofenum) 3 gtt/day.

As the corneal lesion persisted, although an improvement in symptoms occurred, we decided to explant the supero-nasal ring (on June 22nd, 2010) and wash thoroughly the intrastromal tunnel with an antibiotic solution. (Fig.3. and 4.)

**Fig. nr. 3. Corneal aspect before explantation**

**Fig. nr. 4. Corneal aspect after explantation**

At 1 month after the surgery, the patient presented UVA RE= 0.25, with a slight photophobia, and UVA LE = 0.7. The inferotemporal ring at RE was centered, clean, and the trace of the explanted ring was visible, with a scar on the middle of the tunnel. The refraction shows the following: (Table 5.)

**Tabel nr. 5. RE: Evolution after ring explantation**

<table>
<thead>
<tr>
<th>OD</th>
<th>OS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARM</td>
<td>-4/-8 x 152</td>
</tr>
<tr>
<td>K</td>
<td>50,25/56</td>
</tr>
<tr>
<td>dK</td>
<td>-5,75 x 149</td>
</tr>
</tbody>
</table>

The immediate ocular prognosis is represented by the recovery and VA remediation in RE. The ulcerative lesion healed only after the explantation of the ring and washing of the intrastromal tunnel with an; sol. Ceftriaxonum 0.3.%.

Late ocular prognosis: the scarring of the corneal tunnel will strengthen the structure of the cornea. Functionally, the VA at RE has evolved from 0.4 -0.5 (with a high spectacle

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correction) to 0.25 uncorrected, while at LE it went from 0.4 with the original spectacle correction and reached 0.7 uncorrected. With the help of hybrid contact lenses one can reach even better visual acuities. [3] In addition, we get to stop the progression of the disease by CXL.

Particularities of the case

The initial corneal lesion was asymptomatic, and not linked to any event remembered by the patient. The lesion was opened by the tension created by the implanted PMMA ring segment and led to a corneal localized infection at the public swimming pool. The microbial culture came up negative, although the patient has had discontinued the antibiotic treatment for 20 days before collection.

Left on the spot, the ring would have led to corneal necrosis (melting) and eventually to its spontaneous elimination, then corneal infection and ulceration. The explantation has shown to limit infection spreading and reduce tension, proper for wound healing. [5]

DISCUSSIONS

In a large study on 212 eyes that underwent intrastromal implants, Hulet et al. found an incidence of 1.4% of corneal postoperative infection, out of which 33% presented negative cultures.[1] The technique of polymerase chain reaction (PCR), though, is highly sensitive and rapid, being able to increase the amount of pathogen DNA even from an infinitesimal amount, therefore being able to detect the specific pathogen agent more accurately.[2] Studies generally show that infection resolution was not achieved. We took the specific pool analysis of microbial smear culture gives us only a 50%

The mechanical stress exerted by the PMMA ring on the corneal stroma, where there that small initial lesion existed, discovered on routine checks, led to an in depth development of corneal necrosis. Subsequently the small originally developed corneal ulcer was accidentally discovered before CXL therapy evaluation for the second eye. It was not symptomatic, but required treatment in order to close the entrance gate for the germs. This ulceration has not occurred at the incision site of the ring.

A recent study [5] shows that the most frequent causes of postoperative complications demanding ring explantation are: extrusion of the segments (48 %), most often associated with corneal melting, no matter of the method used to create the tunnels (manually or using the femtosecond laser); refractive failure (38 %), infectious keratitis (7 %), corneal melting (5 %), corneal neovascularization, intracanalicular deposits around the ring segment, segments’ migration (2 %).

CONCLUSIONS

1. The effect of the Cross-linking procedure can also be beneficial on localized corneal melting, by increasing the resistance of the corneal tissue

2. Intracorneal ring explantation is appropriate when we deal with either post-incisional corneal scars (i.e. like in radial keratotomy) or traumatic scars put into tension by the ring.[6,7]

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CACHET PHAKIC IOL - A NEW CHOICE FOR MILD AND HIGH MYOPIA CORRECTION - PRELIMINARY RESULTS

MONICA GAVRIŞ 1, GENOVEVA OLARU 2, DIANA POPA 3, L. LEVAI 4, I. HORGE 5

INTRODUCTION

The phakic IOLs or implantable lenses are refractive lenses that are inserted inside the eye to correct vision, while the eye’s natural lens remains intact. Phakic IOLs generally are used to reduce or eliminate nearsightedness that is too severe to be corrected by LASIK surgery or to correct myopia in patients whose corneas are too thin for LASIK, PRK or other laser vision correction procedures (including LASEK and Epi-LASIK).

There are three types of phakic IOL: anterior chamber IOL, iris fixation IOL and posterior chamber IOL. Until now all anterior chamber IOL models (Nuvita, Vivarte, Icare) presented difficulties related to their size, this IOLs are from PMMA and need large implantation incision. Also there was complications related to raising IOP, pupilla ovalization, endothelial cell lost, many of this IOL were explanted. The Artisan and Artiflex IOL are iris fixation IOL. The first one is a PMMA IOL which need a large incision with high risk of astigmatism. The second type of IOL is foldable and it can be implanted through a small incision, but in both cases is necessary a iridectomy. The posterior chamber IOL are implanted in the space between iris and anterior face of the lens, the main disadvantage is cataract formation.

The AcrySof CACHET Phakic Lens (fig.1) is made for correction of moderate to high myopia. The refractive power range is between -6.0 and -16.5 diopters. It is an anterior chamber, angle-supported lens, made from foldable, AcrySof lens material.

It has a spherical meniscus optic design with unique bridge/four-point haptics design. The optic diameter is 6.0 mm and the overall length is available in 4 types -12.5, 13.0, 13.5 and 14.0 mm, depends on anterior chamber diameter.

MATERIAL AND METHOD

Prospective clinical study on 7 patients (10 eyes) with mild and high myopia, in which AcrySof Cachet Phakic IOL’s were implanted, in Optisan Clinic Cluj-Napoca between May and October 2010. In study were included 7 patients (10 eyes), 4 women and 3 men, with age between 21 and 37 years. Seven eyes were with myopia and three eyes were with myopic astigmatism up to 2D which was corrected trough the steepest axis incision. All patients have stable refraction at least 2 years and in all the cases the target postoperative refraction was emmetropia.

The preoperative measurements were:
- UCVA, BCVA
- Cycloplegic refraction
- Anterior and posterior pol exam
- Gonioscopy and IOP
- Corneal topography

PURPOSE

To present a new therapeutically option for surgical correction of moderate and high myopia in patients under the age of 40

Keywords: crystalline

Abstract: The AcrySof Cachet Phakic IOL is a good option for correction of mild and high myopia. The implantation technique is easy, the visual recovery is very fast and the satisfaction grade of the patients is very good. The most important parameter in the selection of the phakic IOL dimension is the anterior chamber diameter (WTW). The right choosing of the phakic Cachet IOL dimension prevent the postoperative complications appearing like secondary glaucoma or corneal endothelium damage.

Cuvinte cheie: cristalin

Rezumat: Cristalinul artificial Phakic Acrysof Cachet este o bună opţiune pentru corecţia miopiei moderate şi mari. Tehnica de implantare este uşoară, recuperarea vizuală este imediată şi gradul de satisfacţie al pacienţilor este foarte bun. Cel mai important parametru pentru selecţia dimensiunii cristalinului phakic este diametrul camerei anterioare (WTW). Alegerea corectă a dimensiunii cristalinului phakic Cachet previne apariţia complicaţiilor postoperatorii precum glaucomul secundar sau afectarea endoteliului cornean.

Figure no. 1. ACRYSOF PHAKIC CACHET DESIGN

ARTICLE RECEIVED ON
ACTA MEDICA TRANSILVANICA Iunie 2010; 2(2) pag 29
- Pachymetry
- Mesopic pupil diameter
- Anterior chamber depth (ACD)
- Anterior chamber diameter (WTW)
- Keratometry
- Biometry
- Endothelial cell density
- Tear film evaluation

In the next table are presented the patients, the most important parameters, the model and the value of phakic IOL implanted.

CACHET™ IMPLANTATION TECHNIQUE
The implantation technique [1] has two steps:
I. The IOL preparation
II. The implantation

Prior to surgery with 20 minutes, in order to protect the crystalline lens along the anterior chamber maneuvers, instill pilocarpin 2%. The surgery is done under the topical anesthesia. The IOL will be implant through the P cardrige which is fill in excess with cohesive vascoelastic (Provisc).

Check the IOL position when it’s takes out from the support because it must be with the side-up indicator up on the right, in the clockwise direction.

The IOL is getting ready for the implantation moisten the anterior haptics in viscoelastic substance and putting in this manner in the diving position.

The IOL is introduced in the cardrige such as to symmetric roll up.

The implantation can be done with the Royale injector if the IOL is ready to implant after making the incision or with the Monarch II injector if the IOL preparation is made before making the incision.

The implantation of the phakic Cachet IOL is made a 2.6 mm corneal incision.

Check wound hydration and integrity.

Table no. 1. Prezentarea celor 7 pacienţi, principalii parametri analizaţi, modelul şi valoarea dioptrică a cristalinului phakic implantat

<table>
<thead>
<tr>
<th>P</th>
<th>cycloplegic refraction</th>
<th>BCVA</th>
<th>Pach</th>
<th>K</th>
<th>PD</th>
<th>WTW</th>
<th>ACD</th>
<th>Cel endot</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>OD: -8.50/-0.75/165</td>
<td>0.9</td>
<td>555</td>
<td>45.2</td>
<td>46.7</td>
<td>5.5</td>
<td>11.85</td>
<td>3.75</td>
<td>CACHET -10D L12500</td>
</tr>
<tr>
<td></td>
<td>OS: -9.50-2/10</td>
<td>0.8</td>
<td>554</td>
<td>44.6</td>
<td>46.7</td>
<td>5.5</td>
<td>11.90</td>
<td>3.71</td>
<td>CACHET -12D L13000</td>
</tr>
<tr>
<td>P2</td>
<td>OD: -7.25</td>
<td>0.8</td>
<td>474</td>
<td>45</td>
<td>45.7</td>
<td>5.5</td>
<td>11.78</td>
<td>3.50</td>
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</tr>
<tr>
<td></td>
<td>OS: -7.50</td>
<td>0.6</td>
<td>486</td>
<td>45.3</td>
<td>45.6</td>
<td>6.0</td>
<td>11.68</td>
<td>3.60</td>
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<td>OD: -9.25-2/170</td>
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<td>556</td>
<td>43.5</td>
<td>45</td>
<td>6.0</td>
<td>11.85</td>
<td>3.50</td>
<td>CACHET -11D L13000</td>
</tr>
<tr>
<td></td>
<td>OS: -10-1.50/85</td>
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<td>551</td>
<td>41.4</td>
<td>42.8</td>
<td>4.5</td>
<td>12.12</td>
<td>3.57</td>
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</tr>
<tr>
<td>P4</td>
<td>OD: -8.50-0.25/178</td>
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<td>538</td>
<td>41.8</td>
<td>42.5</td>
<td>5.0</td>
<td>12.37</td>
<td>3.60</td>
<td>CACHET -10.50 D L13500</td>
</tr>
<tr>
<td></td>
<td>OS: -10-0.75/179</td>
<td>0.6</td>
<td>531</td>
<td>41.5</td>
<td>43</td>
<td>5.5</td>
<td>12.65</td>
<td>3.80</td>
<td>CACHET -12.50D L13500</td>
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<tr>
<td>P5</td>
<td>OD: -9.75-0.50/160</td>
<td>0.8</td>
<td>607</td>
<td>41</td>
<td>41.7</td>
<td>5.5</td>
<td>12.18</td>
<td>3.53</td>
<td>CACHET -11.50D L13500</td>
</tr>
<tr>
<td></td>
<td>OS: -8.00-0.75/12</td>
<td>0.9</td>
<td>608</td>
<td>41.2</td>
<td>42.4</td>
<td>5.5</td>
<td>12.25</td>
<td>3.59</td>
<td>CACHET -9.50D L13500</td>
</tr>
</tbody>
</table>

Figure no. 2. Cachet intraocular position’s

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RESULTS AND DISCUSSIONS

The patients were evaluated at one day, one week, 6 weeks and 3 month postoperative.

In all cases the postoperative target refraction was emmetropia.

In 8 eyes (80%) the postoperative UCVA coincide with the preoperative BCVA. One eye gained 3 Snellen lines and one eye lost 1 Snellen line due to postoperative residual astigmatism.

In the multicentre study from Europe, USA and Canada, made on 360 patients hence 155 patients follow up at 4 years, at 39% of the patients the postoperative UCVA coincide with the preoperative BCVA, and in more than 55% of cases the visual acuity was improved.[2]

The IOP was normal in 9 eyes. In one eye IOP was 28 mmHg at one week postoperative. The treatment with steroid was stopped and after 3 days the IOP was 17 mmHg.

We call that the rising IOP is secondary to treatment with dexamethasone (patient “steroid responder”). In the same study the IOP raised in one case and it was need treatment. [2]

Because of the special design of the haptics, the contact area with the angle is very small, and therefore iridotomy or peripheral iridectomy is not necessary. Still, the producer let on the surgeon election the option to make or not iridectomy.

The IOL Cachet position in vivo in first patient is shown in fig 3. The position was optimal at 2/3 from corneal endothelium and 1/3 from anterior surface of the lens.

Figure no. 3. Scheimpflug photography – P1 – OS

At the same patient was evaluated the central endothelial density at 3 month postoperative. The decrease was 1.98% in right eye and 2.2% in left eye, values in accordance with multicentre study which showed a 4% decrease at 6 month postoperative.[2]

Anterior chamber diameter (WTW) is the most important parameter. The postoperative complications are due to inappropriate selection of phakic IOL dimension:
- if the IOL is too large: high compression rate can appear which can lead to pupil ovalization or even pupillary block
- if the IOL is too small: the IOL can rotate in the AC and it can affect the corneal endothelium

The special design of the IOL gives stability and optimal compression of haptics if the IOL dimension is well selected.[3]

CONCLUSIONS

1. The AcrySof Cachet Phakic IOL is a good option for correction of mild and high myopia.
2. The implantation technique is easy, the visual recovery is very fast and the satisfaction grade of the patients is very good.
3. The most important parameter in the selection of the phakic IOL dimension is the anterior chamber diameter (WTW). The right choosing of the phakic Cachet IOL dimension prevent the postoperative complications appearing like secondary glaucoma or corneal endothelium damage.

BIBLIOGRAPHY

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Dry eye syndrome is defined as a disorder of the tear film caused by tear deficiency or excessive tear evaporation, which causes damage to the interpalpebral ocular surface and is associated with symptoms of ocular discomfort.

The appearance of functional symptoms suggestive of dry eye in the days following corneal refractive surgery is frequently observed (discomfort, foreign body irritation). These symptoms are observed on the surface of the eye which may have been normal or with pre-existing clinical signs such as superficial punctate keratitis and/or conjunctival hyperemia, especially related to contact lenses.

Refractive surgery seems to determine dry eye syndrome by decreasing the tear secretion. Recent studies have found modifications of the aqueous phase of tears as well as alteration of tear film stability.

A decrease in Schirmer test values is found after both LASIK and PRK. The decrease seems to be more important for LASIK than PRK.

The change of the corneal curvature causes the alteration of tear film stability and vision fluctuations related to irregularities of the ocular surface. Break-up time (B.U.T) was significantly decreased after LASIK or PRK surgery. Time of return to normal values varies between 1 and 6 months postoperatively.

Communication between the ocular surface and lacrimal glands occurs through a neural reflex loop. The sensory nerves innervating the ocular surface connect with effenter nerves in the brain stem that stimulate secretion of the tear fluid. Central corneal sensitivity is mediated by stromal nerves originating in the ciliary nerves which penetrate the Bowman membrane. During refractive surgery, anterior stromal nerves are damaged, whether by direct photoablation or by section; this nerve damage causes irreversible corneal hypoesthesia. The decrease in corneal sensitivity may compromise the protective blink reflex, delay epithelial healing and especially decrease tear secretion, by blocking the sensory component of the neural reflex loop. On the other hand, ocular surface sensitivity has been found to decrease as aqueous tear production and clearance of tears from the ocular surface decrease. Thus, a self perpetuating cycle is created.

Disfunction of the neural regulation of lacrimal secretion seems to be the main cause for post refractive surgery dry eye syndrome, but inflammation plays an important role as well. Decreased tear production and tear clearance lead to chronic inflammation of the ocular surface. This inflammatory response consists of cellular infiltration of the ocular surface by activated T lymphocytes with increased expression of adhesion molecules and inflammatory cytokines in the tear fluid and increased activity of matrix degrading enzymes such as matrix metalloproteinase.

Artificial tears have been the primary treatment of the post keratorefractive surgery dry eye. Despite attempts to improve composition, artificial tears can never replace those produced by the lacrimal gland. In the last decade, it has been recognised that tears with preservatives may be toxic to the corneal epithelium. Therefore, it has been recommended the use of preservative-free products.

While artificial tears improve symptoms of dry eye, they do not eliminate the underlying inflammatory process. That is why anti-inflammatory therapy using topical corticosteroids has been reported to be an efficacious therapy for patients with dry eye. They have the most rapid anti-inflammatory action, but the long-term treatment is not advisable because of significant side effects (cataract, glaucoma).

Cyclosporine 0.05% ophthalmic emulsion targets the immune mediated inflammation as underlying pathological mechanism for chronic dry eye. Cyclosporine has minimal side-effects compared to corticosteroids and may be used for long periods of time, offering the advantage of immuno-modulation.

Punctal plugs appears to be a relatively safe, effective and reversible method of preserving tears on the ocular surface and reducing signs and symptoms of dry eye.

CONCLUSIONS

Patients should be informed about the risk of dry eye symptoms appearing or exacerbating after corneal refractive surgery (between 1 and 6 months post-operatively).

Special attention should be paid to pre-existing dry eye syndrome and its management prior to photorefractive corneal surgery.
surgery, thus improving the results of surgery and patients’ satisfaction.

REFERENCES

SJÖGREN SYNDROME – PATHOGENETIC ASPECTS

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¹ The surface of the eye research center Sibiu, ² „Lucian Blaga” University of Sibiu

Abstract: Sjögren syndrome is an exocrinopathy in which the lacrimal and salivary glands are targeted by an autoimmune process; other organs are also affected. The condition is characterized by lymphocytic infiltration of the exocrine glands and production of autoantibodies. The pathogenesis of Sjögren syndrome is incompletely understood, but glandular epithelial cells appear to play a key role in the genesis of a chronic immune reaction. The risk factors include the genetic profile, the hormonal status and the exposure to environmental agents.

Keywords: Sjögren Syndrome, autoimmune condition

Cuvinte cheie: Sindromul Sjögren, boală autoimună

INTRODUCTION

Sjögren syndrome (SS) is an autoimmune disease characterized by lymphocytic infiltration of the lacrimal and salivary glands, dry eyes and mouth and autoantibodies production (1). SS is classified as either primary or secondary. In primary SS, autoimmune destruction is limited to the exocrine glands, whereas secondary SS is associated with other autoimmune diseases, such as rheumatoid arthritis, systemic lupus erythematosus, inflammatory miopathies, dermatosclerosis, autoimmune thyroiditis, primary biliary cirrhosis. SS may be considered as a meeting point for all autoimmune conditions.

The complex pathogenesis of SS is incompletely understood. The glandular epithelial cells appear to play a key role in the genesis of the chronic immune reaction. The risk factors include the genetic profile, the hormonal status and the exposure to environmental agents.

1. The role of the genetic profile

For a particular genetic profile in SS patients plead many aspects. Familial aggregation of the SS is rare, but a higher frequency of other autoimmune diseases in family members of SS patients has been reported. The histocompatibility antigens are a predisposing factor: the phenotype A1 B8 DR3 DQ2 is associated with primary SS in Caucasians (2).

2. Cell populations

Epithelial cells

There are two epithelial cell types in salivary glands: acinar and ductal. The acinar cells have an exocrine function. Morphologic and functional alterations of the glandular acini have been noticed in SS patients. Epithelial cells express human leukocyte antigen (HLA) -DR antigens when stimulated with interferon-gamma (IFN-gamma). In the acinar cells there is a delocalization of the SS-A antibody from the nucleus to the cytoplasm, and even to the cell membrane, inducing an antigenic potential (3). This kind of anomalies may be found in other types of epithelial cells (biliary ducts, renal tubuli etc), therefore the term “autoimmune epithelitis” has been proposed instead of SS (4).

The lymphocytic infiltrate

The lymphocytic infiltrate of the exocrine glands is comprised of CD4 T lymphocytes (70-80%), CD8 T lymphocytes (10%), and B lymphocytes (10-20%) (3). CD4 T lymphocytes activate the immune pathways, after they have been recognized glandular antibodies: SS-A/Ro, SS-B/La and fdorin. CD8 T lymphocytes, less numerous, produce granzymes and have a cytotoxic activity. B lymphocytes are stimulated to produce autoantibodies: anti-SS-A, anti-SS-B and RF. The B cells infiltration of the salivary glands could have an oligoclonal expansion (5). This oligoclonal restriction may be a predisposing factor for further progression to lymphoma.

3. Autoantibodies

Recently, the role of a new member of the TNF family, so-called BAFF or BlyS (B cell Lymphocyte Stimulator), has been suggested in the B cell polyclonal activation. BAFF system has five components. Two of these: BAFF (B cell activating factor) and APRIL (a proliferation-inducing ligand) are expressed on the surface of monocytes, dendritic cells and activated T cells, or in a soluble form. BAFF molecules binds to three receptors: transmembrane activator, calcium modulator and cyclophilin ligand interactor (TACI), B-cell maturation antigen (BCMA), and BAFF receptor (BAFF-R) (6). All three are expressed on B cells. Low BAFF levels determine a marked suppression of lymphocyte B maturation. Elevated BAFF levels have been detected in the serum of patients with primary SS. The levels of serum BAFF and APRIL correlate with titres of autoantibodies anti-SS-A and RF (7).

BAFF cytokine is overexpressed in accessory salivary glands in SS patients (8). These evidences render BAFF as a potentially new therapeutic target in autoimmune diseases.

The SS-A and SS-B nucleoproteins abnormally
expressed in the cytoplasm and in the apoptotic vesicles within epithelial cells become immunogenic. The accumulation in the epithelial cells of the degradation products (120-kDa α-fodrina and 65-kDa β-fodrina) generated through cleavage by caspase-3 or granzyme B it’s also a consequences of abnormal apoptosis induced by cytotoxic T lymphocytes. Furthermore, intact β–fodrin, normally detected at the apical membrane of epithelia, was localized especially at the basal membrane, in SS patients (9).

All this factors induce an abnormal activation of the B lymphocytes followed by autoantibodies production (anti-SS-A, anti-SS-B, and anti-fodrin).

4. The role of immunity and interferon

Recent studies have demonstrated the existence of plasmacytoid dendritic cells in salivary and lacrimal glands in patients with SS. They are responsible for the interferon production. These cells are not present in normal salivary glands (10,11). They are stimulated by a viral or bacterial infection or by circulating immune complexes (SSA-anti SSA antibodies, SS-B anti SSB antibodies). Both mechanisms may be involved. Primary SS and systemic lupus erythematosus share IRF-5 gene polymorphisms as a common genetic susceptibility factor(12).

5. The lesion mechanisms

Apoptotic anomalies

Like in animal models, the presence of an apoptotic deficit in glandular lymphocytic infiltrate was suggested for explaining its accumulation. The presence of Bcl2 protein in the infiltrating lymphocytes may explain their inability to undergo apoptosis. The acinar epithelial cells, in contrast, undergo apoptosis through the Fas-Fasl, pathway (13). These apoptotic anomalies of the epithelial cells justify the term autoimmune epithelio pathy proposed for the SS (4).

Neuroendocrine junction anomalies

The immune-mediated lesions are responsible for the destruction of 50-70% of the acinar epithelia. However, the lacrimal and salivary gland tissues contain apparently normal acinar and ductal epithelia (30-50%) that should be able to secrete enough tears and saliva. Nevertheless, SS is characterized by an important sicca syndrome. That indicate the fact that the remaining epithelia is inhibited, perhaps by interfering with neural release of acetylcholine and its binding to muscarinic M3 receptors:
- proinflammatory cytokines released by glandular cells, such as IL1 and TNFα, may impair neural release of acetylcholine,
- autoantibodies to muscarinic receptors M3 was detected in SS patients serum (14),
- an abnormal distribution of aquaporin-5 was noticed in SS patients. This protein, which is a water channel, is normally situated at the apical pole of the acinar cell. In SS patients it was detected at the basal pole of the cell, which may lead to a decrease of glandular secretion (15).

The role of the enzymes

The acinar glandular cells stimulated by TNFα and other activator signals release enzymes (metalloproteinases) which worsen the cellular damages and are involved in the breakdown of extracellular matrix.

6. The role of viruses

Like in others autoimmune conditions, the viral infections may act as environmental triggers for the induction of SS. Tree types of viruses could be involved: Epstein-Barr virus (EBV), retroviruses, hepatic C virus (HCV).

Epstein-Barr Virus

Many studies showed that the presence of EBV DNA was significantly increased in the salivary glands of patients with primary SS in comparison with control subjects. The viral genome was detected by in situ hybridization and polymerase chain reaction in 50% of the salivary epithelial cells of SS patients and only in 8% of the control subjects (16). The results suggest that this virus may play a role in lymphocytic proliferation in the lacrimal and salivary glands in the SS patients.

Retroviruses

The infection with HIV (Human immunodeficiency virus) and HTLV-1 (Human T-lymphotropic Virus Type 1) may be involved in the pathogenesis of the SS. These patients develop a SS-like syndrome in the absence of the anti-SS-A and anti-SS-B antibodies (17).

Hepatic C virus

HCV is present in the saliva of approximate 50% of the patients with positive plasma viremia. These patients develop a lymphocytic infiltrate in the salivary glands identically with the salivary infiltrate from SS, but never associated with the presence of anti-SS-A and anti-SS-B antibodies (18). This salivary infiltrate is associated with a diffuse lymphoid infiltrate in other organs. The sicca syndrome from the HVC infection is similar with the one associated with HIV or HTLV-1 infection.

7. Other factors

For the contribution of the hormonal factors in the SS pathogenesis plead many arguments:
- the estrogens and the androgens participate to the regulation of the tear film;
- the sicca syndrome increase after menopause;
- the influence of the hormonal treatments has been demonstrated in a model of aromatase-deficient mice (ArKO). The mice develop a SS-like exocrinopathy in the presence of anti-fodrin antibodies. Estrogen treatment partially ameliorates the lesions in the exocrine glands (19).

CONCLUSIONS

Sjögren syndrome is an autoimmune epithelio pathy characterized by lymphocytic infiltration of the exocrine glands and production of autoantibodies, with a complex and incompletely understood pathogenesis, in which the glandular epithelial cells appear to play a key role in the genesis of the chronic immune reaction.

BIBLIOGRAPHY


IMPORTANCE OF CORNEAL TOPOGRAPHY IN PARTICULAR CASES OF DIFFERENTIAL DIAGNOSIS

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Keywords: corneal topography, differential diagnosis, keratometry

Abstract: There are situations in which adult patients presenting to an ophthalmologist complaining of decreased visual acuity, sometimes this is their first evaluation. After examination, it found the presence of a myopic astigmatism and low values of keratometry. In such cases, corneal topography is decisive for establishing the correct diagnosis and subsequent therapeutic attitude. In this study 32 patients were evaluated that were submitted over a year (12 from Ama Optimex Clinic, Bucuresti and 20 from Ophthalmology Clinic Sibiu) who presented a myopic astigmatism and low values of keratometry, at one eye at least. In all cases, the corneal topography was decisive for the diagnosis and it decided the correct therapeutic attitude. In special cases and in the absence of corneal topography, keratometry can be useful in proper diagnosis.

Cuvinte cheie: topografie corneană, diagnostic diferenţial, keratometrie

Rezumat: Există situaţii în care pacienţii adulţi se prezintă la consult oftalmologic acuzând scăderea acuţăţii vizuale, uneori acesta fiind primul lor consult. În urma examinărilor, se constată prezenţa unui astigmatism miopic şi valori scăzute ale keratometriei. În astfel de cazuri, topografia corneană este decisivă pentru stabilirea diagnosticului de certitudine şi a atitudinii terapeutice ulterioare. În acest studiu au fost evaluaţi 32 de pacienţi, selectaţi pe parcursul unui an (12 de la Clinica Ama Optimex Bucureşti si 20 de la Clinica de Oftalmologie al Spitalului Judeţean Sibiu) ce prezentau astigmatism miopic şi valori scăzute ale keratometriei la cel puţin un ochi. La toţi pacienţii s-a efectuat topografia corneană care a transformat diagnosticul şi a decis atitudinea terapeutică necesară. În cazuri deosebite şi în absenţa topografiei corneene, keratometria poate fi utilă în orientarea spre diagnosticul corect.

INTRODUCTION

Computer-assisted videokeratoscopy provides a colour-coded topographical map of the central (3-5 mm) of the corneal surface and calculated dioptic powers of the steepest and flattest meridian and their axes.

Most normal corneas remain within the yellow-green spectrum of the scale.

PURPOSE

To underline importance of corneal topography in particular cases of differential diagnosis.

METHODS

This study evaluates 32 patients (12 from Amaoptimex Clinic, Bucuresti and 20 from Ophthalmology Clinic Sibiu) who presented special refractive and correction problems, during 1 year. In all cases we performed corneal topography in order to establish the correct diagnosis and to decide the future therapeutic attitude.

RESULTS

We chose a few cases, we had found it enlightening, to emphasize importance of corneal topography for differential diagnosis.

CASE 1

TP – male; 41 years old; urban place
History: OC in high-school; in present without OC

Motives of presentation: gradual lowering VA by 3-4 years

Ophthalmological exam:
VA BA 1/3 not corrected
Refraction:
- RE: -5.25Ds/-5.25Dcyl ax 36
- LE: -4Ds/-5.5Dcyl ax 150
Keratometry:
- RE: K1: 7.01; K2: 6.09; MK: 6.55
- LE: K1: 7.44; K2: 6.08; MK: 7.67
Final diagnosis: BA KERATOCONUS STDII/III

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CASE II
VG - male; 35 years old; urban place
History: OC since 16 years old; in present: RE: -1.50Dsf; LE: -4Ddsf
LE: High myopia; Anisometropia; Amblyopia
Motives of presentation: refractive surgery LE
Ophthalmological exam: BCAV RE-1 (-1,5Dsf/-1Dcyl ax 85)
BCAV LE-1/2 (-7Dsf/-2Dcyl ax 175)
Refraction: RE: -1,5Dsf/-1,25Dcyl ax 82
LE: -7Dsf/-2Dcyl ax 174
Keratometry: RE: K1 – 7.63; K2– 7.45; Mk – 7.54
LE: K1- 6.96; K2- 6.58; MK- 6.77
Pachymetry: RE: 501µ; LE: 473µ
Final diagnosis: BA- KERATOCONUS STD I

BCVA LE- 1/3(-2,75 Dcylax21)
Refraction: RE: +0.25Dsf/-1.5Dcyl ax 21
LE: -3,5Dcyl ax 155
Keratometry: RE: 46,57; 43,68; Mk – 43,65
LE: 46,84; 43,29; Mk- 43,16
Final diagnosis: BA- SUSPICIONS OF KERATOCONUS

CASE III
SC - male; 27 years old; urban place
History: without OC
Motives of presentation: refractive surgery LE
Ophthalmological exam: VA RE-1 without OC;

CASE IV
CA- female; 45 years old; urban place
Motives of presentation: gradual lowering VA at LE by 2 years
Ophthalmological exam:
VA RE- 1 without correction;
BCVA LE- 1/5 (-2Dcyl ax 105)
Refraction: RE: +0,25Dsf/+ 0,25Ddcyl ax 8
LE: -4,5Dcyl ax 104
Keratometry: RE: K1- 7.61 ; K2-7,45; MK - 7.53
LE: K1- 7.38; K2-6,86; MK-7,12
Final diagnosis : LE - KERATOCONUS STD II

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CASE V
TR - male; 28 years old; urban place
History: OC from high-school
Motives of presentation: refractive surgery BA
Ophthalmological exam:
BCVA RE: 1(-3.5Dsf/-0.5Dsf ax 155)
BCVA LE: 1(-3.5Dsf/-0.5Dsf ax 125)
Refraction: RE: -3.75Ds/-0.75Dcyl ax 159
LE: -3.75Ds/-0.5Dcyl ax 126
Keratometry: RE: 42.57; 41.16; Mk - 41.15
LE: 43.14; 41.62; Mk - 41.60
Final diagnosis: BA- SUSPICIONS OF KERATOCONUS

CASE VI
PA - female; 21 years old; urban place
History: OC since 14 years old; CL since 18 years old; by 2 month she was stopped used CL; the last OC: RE: -1.75Ds; OS: -2.75Ds
Motives of presentation: suspicions of keratoconus
Ophthalmological exam:
BCVA RE: 1(-1.75Ds)
BCVA LE: 1(-3.5Ds)
Refraction: RE: -2.5Ds/-2Dcyl ax 9
LE: -4Ds/-2Dcyl ax 1
Keratometry: RE: K1-7.6; K2-7.1; MK - 7.35
LE: K1-7.57; K2-7.06; MK - 7.32
Final diagnosis: BA – MYOPIC ASTIGMATISM

CONCLUSIONS
- All the patients from this study have presented: MYOPIC ASTIGMATISM and reduced values of the keratometry, at one eye at least.
- In all cases, the corneal topography was decisive for the diagnosis and it decided the subsequent therapeutic. In obscure cases and in absence of corneal topography, for a correct diagnosis, achieved keratometry by refraction, can be helpful in elucidate the situation.
- For the correct and complete diagnosis nothing is not too much – mustn’t forgotten or ignore none of the investigations.
- Many surprises exist, and they may have different “faces”.

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LYMPHANGIOGENESIS IN HUMAN PTERYGium

M. POENARU-SAVA, ANCA MARIA CÎMPEAN, M. RAICA

Keywords: human pterygium, lymphatic vessels, lymphangiogenesis, D2-40

Abstract: Human pterygium is a benign fibrovascular outgrowth of the corneo-conjunctival junction, characterized by tissue remodeling, cellular proliferation, angiogenesis and inflammation. If the angiogenic process has been proved to promote pterygium development and progression, no data are still available concerning lymphangiogenesis in this fibrovascular proliferative and recurrent disorder. Aim: In the present study we evaluated by immunohistochemistry the presence, the morphology and the distribution of lymphatic vessels in human pterygium. Material and methods. Twenty bioptic specimens were surgically collected from patients with primary or recurrent proliferative lesions- pterygium. Lymphatic endothelial cells characterization by D2-40 was performed by applying single immunohistochemical avidin biotin peroxidase techniques. Results. High lymphatic vessels density was observed in human pterygium. Tortuous vessels with discontinuous wall close to the epithelium were found in pterygium, compared with adjacent normal tissue. Lymphatic microvessel density ranged between 1-3 vessels/field in normal conjunctiva to 7-10 vessels/field in human pterygium. Conclusion. Our results highlighted for the first time the presence of lymphatic vessels in human pterygium. Moreover, lymphatic microvessels density in this type of disease was higher and suggest a highly lymphangiogenic process in human pterygium. Further studies will be needed for a better characterization of mechanism involving in human pterygium lymphangiogenesis and also to elucidate the role of lymphatic vessels in human pterygium.

INTRODUCTION

Pterygium is a disease characterized by the encroachment of a fleshy, triangular portion of the bulbar conjunctiva into the cornea (1,2). The etiology of this disease is less understood. Nowadays, the irritation of the eye by ultraviolet radiation in sunny, dry, dusty areas and repeated microtrauma can lead to the development of pterygium in susceptible individuals (3). Despite of general accepted fact that human pterygium is a benign condition, local recurrences after surgical treatment are often seen. This is the reason why in the last years human pterygium was studied concerning histopathology and molecular aspects.

Histologically, pterygium was defined as a thickening or thinning of the epithelium, with elastoid and basophilic degeneration of the underlying connective tissues (4). This connective basis shows fibrinoid changes in the form of oval islets of different size, parallel to convexity of pterygium, or is in the form of unified focus. The number, caliber and the type of blood vessels showed excessive variability (5). Together with a better immunohistochemical understanding of pterygium connective tissue compartments(6), an extensive characterization of pterygial connective tissue angiogenesis was done in the last years, starting from angiogenic growth factors (7) and microvessel density (8) to data about antiangiogenic and...
antivascular effects of angiogenesis inhibitors administered in primary and recurrent pterygium (9), (10), (11).

It is known that pterygium is a lesion with limited local invasion and inability to send metastases but cells display genetic characteristics of a tumor (12). Scattered data were published concerning lymph vessels in the anterior compartment of the eye and no data concerning lymphangiogenesis were found in medical literature until now. Seifert et al (13) pointed that the distribution of lymph vessels varied widely and many large-diameter lymph vessels could be seen in a markedly edematous pterygium.

**AIM OF STUDY**

In the present study we evaluated, by immunohistochemistry, the presence, morphology and distribution of lymphatic vessels in human pterygium, trying to make the first step in understanding of the etiology and pathogenic mechanism of this disease.

**MATERIAL AND METHODS**

Twenty biopsies of ocular outgrowth tissues surgically removed from patients clinically diagnosed with primary or recurrent pterygium were included in the present study. The specimens were fixed in 10% buffered formalin and paraffin embedded. Five micrometers sections were obtained and one of each case was stained with routine haematoxylin and eosin method. Lymphatic vessels were highlighted with D2-40 monoclonal antibody against lymphatic endothelial cells by using immunohistochemical avidin biotin peroxidase method. The final product was visualized with 3,3’diaminobenzidine hydrochlorid and counterstain was done with modified Lille’s Haematoxylin. All immunohistochemical steps were performed in an automated manner with PT Link and Dako Autostainer.

Lymphatic microvessel density (LMVD) was assessed based on the hot spot method, using the following protocol: three hot spots from each section were chosen at low power magnification and counting was performed at x200. The arithmetic media of the three fields was the final result. The counting followed all the steps recommended by Weidner (14) and Van der Auwerer (15). Microscopic images were captured as JPEG format, and area of the LVs was calculated using Nikon Lucia G program of analysis of the microscopic image (NIKON, Japan).

The local research ethic committee approved the protocol of the study, and informed consent was obtained from all subjects according to the World Medical Association (WMA) Declaration of Helsinki.

**RESULTS**

All specimens collected had histopathologic specific pterygium lesions on haematoxylin and eosin stain. In five cases we also identified normal conjunctiva adjacent to pterygium. Briefly, the microscopic appearance of pterygium lesions included epithelial and connective tissue structural changes. Increased number of epithelial layers, appearance of goblet cells inside the covering epithelium, fibrous alteration and edematous areas of connective tissue were the main morphologic changes found in studied biopsies. A high number of dilated blood vessels was observed in pterygial connective tissue.

By D2-40 immunostaining we specifically highlighted the lymphatic vessels in normal conjunctiva and human pterygium. Like in other stratified epithelia, cells of basal layer from normal conjunctival epithelium were positive for D2-40. Moreover, rare positive lymph vessels with normal morphology were distributed far from the epithelium, deeply inside the connective tissue (figure 1). The arithmetic media of lymphatic microvascular density (LMVD) range between 1-3 vessels/x200 field.

By contrast, in human pterygium the basal layer of the covering epithelium lacked the positive reaction for D2-40 and the lymphatic vessels were different concerning distribution, morphology and density.

**Figure 1.** Normal conjunctiva stained with D2-40. Basal cells were found to be positive for D2-40 as a continuous layer with basal distribution. Rare, large lymphatic vessels were observed deeply inside the stromal component (magnification x 20).

The lymphatic vessels were distributed in close proximity of the epithelial layer in pterygium. Lymphatic vessels had tortuous morphology, their lumen was highly splitted (figure 2) and the vascular wall had numerous discontinuities. Most of lymphatic vessels in pterygium are distributed in a network-like fashion (figure 3) compared with normal conjunctiva where lymphatic vessels were distinctive structures, separated each other by connective stroma.

**Figure 2.** High density of lymphatic vessels in human pterygium. Note the lack of positive reaction for D2-40 in the basal layer of the epithelium and changed morphology and distribution of lymphatic vessels (magnification, x 20).

**Figure 3.** Network like appearance of pterygium lymphatic vessels with complete or incomplete vessel wall (magnification, x 400).

The arithmetic media of LMVD in human pterygium ranged between 7-10 vessels/x200 field.
The microscopic examination of D2-40 positive lymphatic vessels in human pterygium suggested two potential mechanisms of lymph vessels development in human pterygium. The highly splitting appearance of lymph vessels from pterygium strongly supported the intussusceptive mechanism of new lymphatic vessels formation. Sprout like projection from lymphatic vessels walls with D2-40 positive reaction centered by a nucleus (a lymphatic endothelial cell from the tip of the sprout, probably) sustained the presence of sprouting mechanism of lymphangiogenesis (figure 4a, b).

Figure 4. Microscopic view of the mechanism involved in pterygium lymphangiogenesis. Sprouting lymphangiogenesis (a) and intussusceptions (b).

CONCLUSION

To the best of our knowledge this is the first study concerning lymphangiogenesis in human pterygium. We demonstrate here, by immunohistochemistry, the presence of lymphatic vessels in human pterygium. Moreover, morphologic changes of lymphatic vessels suggested an intense lymphangiogenic process which involves both intussusceptive and/or sprouting mechanism. Our data demonstrated that lymphangiogenesis is an active process in pterygium even this lesion is considered benign. Further studies will be necessary for the complete evaluation of factors involved in pterygial lymphangiogenesis.

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LIGHT INTENSITY MEASUREMENTS PERFORMED IN SCHOOLS FROM RURAL AND URBAN AREAS

S. MICLESCU¹, CAMELIA BOGDANICI², ADRIANA STANILA³

Keywords: light intensity, school, artificial light, students

Abstract: Lighting classrooms need to be pursued by a number of specialists, to create optimal lighting conditions. This study aimed to provide data on natural and artificial lighting in schools and the impact on students. Light intensity measurements were made under natural light and artificial glow. His assessment followed the natural and artificial lighting in the room at various points, depending on the orientation of the building to light.

INTRODUCTION

Lighting classrooms and especially their artificial lighting needed to be pursued by igienisişti, ophthalmologists, physiologists, lighting technicians with a desire to create optimal conditions for rational use of ilumkinat visual equipment and optimal vision.

STUDY PURPOSE

This study aimed to provide data on natural and artificial lighting in rural and urban schools and the impact on students.

MATERIALS AND METHODS

Light intensity measurements were conducted in schools and colleges in rural and urban areas. Light intensity determinations were made with Lux Marwel L632277 series under natural light and artificial glow, morning and afternoon according to schedule students.

His assessment followed the natural and artificial lighting on students at various points in the room depending on the orientation of the building to light (maximum light reception).

Material base and human resources

School from rural area

Number of classrooms: 7
Number of pupils enrolled: 203

Tabel nr. 1. Measurements performed from the window to the wall

<table>
<thead>
<tr>
<th>Classroom</th>
<th>Nr. Of students</th>
<th>Windows orientation</th>
<th>Light source</th>
<th>Intensity of light (lx)</th>
</tr>
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<tbody>
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<td>Linel 1</td>
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The age of the pupils is comprised between 6 and 17 years

Abstract of the measurements on light intensity in schools from urban area.

The average of the light intensity in the schools of urban area where the measurements were performed is of 468.58 Lx.

• The maximal point of light intensity was of 580 Lx and the minimum point was of 390 Lx.
• These data were calculated at a number of 258 determinations.

One may note a lower light intensity in schools from rural area.

Figure nr. 1. Diagram of the light intensity average ratio from rural and urban area
Lighting for children with weak vision

By Norman B. Medow, MD, FACS (bibl. Poziția 2)

Children with weak vision require well lighted rooms and play locations both at home and in school, so that they make use of their vision in an efficient manner. Lighting is always a primary consideration and not a secondary one.

When one takes decisions in relation to lighting, it is important to take into consideration the quality, the placement and the ability to control and to reduce blinding light.

Blinding light is a light which does not serve to any visual function. There are two basic types of blinding light: reflected and dispersed. The reflected light appears when the light is focalized on glossy surfaces. Blinding light which comes from doors and glass, glossy paper, benches or sparkling tables must be diminished. Whenever possible, non-glossy paper must be used.

Placing the light sources in relation to small children is important. In classrooms, teachers should place the pupil so that the latter does not have to look directly in direct light. Blinding light and also the probability of some exhausted eyes are increased if we look directly into the light. Teachers should pay attention to this aspect and to avoid staying in front of windows when they speak to children who have sensitivity to a greater light that the normal one.

Children should be let alone to define the quantity of light which offers comfort and a maximum visual function. It is recommended to use focal lighting, controlled by the child and also a table lamp or a reflector.

University of Georgia

Influence of school arrangements on the results of the students

One of the most important physical characteristics of the classroom is lighting (Phillips, 1992). The importance of an adequate visual environment for study deserves a special attention. The visual environment affects the ability of the person who studies to perceive visual stimuli and affects his mental attitude and the thus the fulfillment of duties.

Lighting in classrooms plays a decisive role especially due to the direct relation between a good lighting and the performance of the pupil (Phillips, 1997 – Bibliography – position 9). Hathaway and Fielder (1986) have discovered the key of overall wealth of people limited to a physical performance a great part of the day.

The choice of the colors can also have an impact on teaching/learning process. Sinofsky and Knirck (1981) have discovered the influence of colours on attitude, behaviour and study of pupils.

Classrooms require the use of comfortable colours for students because their attention moves from the study place to different parts of the room. Light colours for walls and floors will diminish the contract between blinding light and shining of the study place and surrounding environments.

CONCLUSIONS

- The average of the light intensity in the schools of rural area where the measurements were performed is of 320.69 Lx. The maximal point of light intensity was of 580 Lx and the minimum point was of 110 Lx. This data was calculated taking into considerations a number of 472 determinations.

- The average of the light intensity in the schools of urban area where the measurements were performed is of 468.58 Lx. The maximal point of light intensity was of 580 Lx and the minimum point was of 390 Lx. This data was calculated taking into considerations a number of 258 determinations.

- One may note a weaker light intensity in schools from rural area.

- Moreover, we have analysed the position of banks in classrooms in relation to the windows and lighting type. In this sense, we have suggested the modification of the number of rows in the classrooms where the banks were placed in 4 rows.

- One may note that the level of light intensity is higher in classrooms oriented towards East, decreases in the classrooms oriented towards North and registers intermediary values in the classrooms oriented towards West and South.

- At the same time, one may observe that the light intensity level decreases at the level of the banks located near...
the window to the 2nd and 3rd row both in relation to natural lighting and to artificial lighting.

- It has been noted an increase of the school performance in children with corrected refraction defects and also in children who study in schools where the lighting system has been changes from incandescent lighting to fluorescent one.

BIBLIOGRAPHY
ECTROPION CORRECTION BY INFERIOR RETINACULAR LATERAL CANTHOPLASTY

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Abstract: Ectropion correction can be a surgical challenge. Many procedures have been described in literature. The inferior retinacular lateral canthoplasty, as described by G. Jelks, is an effective surgical treatment to restore and correct the position of the lower eyelid for reconstructive and aesthetic purposes.

Keywords: Ectropion, Canthoplasty

INTRODUCTION

Reconstruction of the malposition of the lower eyelid can be a difficult and delicate surgical procedure. Ectropion, if untreated, leads to chronic epiphora and secondary cicatricial changes of the lower eyelid skin (13,14). The reposition of the lower eyelid by the inferior retinacular lateral canthoplasty, as described by G. Jelks (1), is an effective surgical treatment to restore and correct the position of the lower eyelid for reconstructive and aesthetic purposes.

Patients

Between 2006 and 2010 we treated 126 cases of ectropion and scleral-show deformity with the technique described by G. Jelks (10). The patient’s age ranged between 21 and 87 years, the mean age was 58. The analysis of the etiology revealed in the majority of our cases (77%) a mechanical ectropion, in 12% cicatricial problems lead to a malposition of the lower eyelid. Paralytic and involutional ectropions were treated in 11% of the cases.

Technique

The procedures were performed under sedation or under general anaesthetics.

After infiltration of the eyelid skin by Xylonest 1% and Epinephrine 1:200.000, the incision was performed at the lateral aspect of the upper eyelid blepharoplasty approach or along the lower eyelid blepharoplasty approach (when additional procedures at the lower eyelid had to be carried out at the same time, e.g. contour correction of the lower eyelid by arcus marginalis release etc.).

A muscle flap was elevated along the lower eyelid extending to the lateral orbit rim. This exposes the lower lid lateral fat pad lying beneath the orbital septum. The inferior portion of the lateral retinaculum lies immediately superior to this fat and forms the roof of lower lateral fat compartment. The lower lateral retinaculum was then lysed with scissors from all attachments to the orbit to achieve free movement of the lower eyelid. The lateral inferior retinaculum was then pulled toward the upper orbital rim in a perpendicular direction and secured at the periosteum of the inner aspect of the lateral orbital wall by a 4-0 Vicryl stitch. The position of the lower eyelid should appear slightly overcorrected. If repositioning of the lower eyelid can not be completed due to shortage of lower eyelid skin (e.g. following overcorrection by aesthetic blepharoplasty), additional full thickness skin grafting has to be performed.

The orbicularis oculi muscle flap was pulled moderately into an oblique direction and secured to the periosteum of the lateral orbit by 5-0 Vicryl. The procedure was concluded by the closure of the skin using 6-0 Prolene.

Taping the lower eyelid for 10 – 14 days and avoiding any traction on the lateral lower eyelid is mandatory in the post operative period to maintain the position of the lower eyelid. Systemic antibiotics was given for 4-5 days. Stitches were be removed after 4 – 5 days.

RESULTS

In most of the cases a satisfactory long lasting repositioning of the lower eyelid could be achieved using Glenn Jelks’s technique of the inferior retinacular lateral canthoplasty (Fig 1, Fig 2).

Figure no. 1: Correction of a paralytic and mechanical ectropion following surgical intervention after a blowout fracture

Figure no. 2. Correction of an involutional ectropion
In 17% of the cases however a reccidive occurred requiring secondary operation. Various degrees of chemosis were seen in 36% of the patients. Since local steroids or any other treatment did not seem to have any effect, no medication was given later on. There were no cases of post operative infection or severe bleeding requiring surgical intervention.

DISCUSSION

The inferior retinacular lateral canthoplasty can be utilized for aesthetic and reconstructive purposes. It is well indicated to correct scleral-show deformity and ectropion due to various etiologies. Even though in the procedure described by Glenn Jelks (8, 9, 10) the approach is performed from the lateral incision line of upper blepharoplasty, access to the lateral canthus is also easily possible from the lower eyelid incision. In this case, the fixation of the lateral retinaculum to the upper orbital rim is a little more difficult.

The overcorrected appearance of the lower eyelid settles usually after 4-6 weeks. It is important however to advise patients of this preoperatively. To my opinion it is not useful to use a permanent suture for the suspension of the inferior lateral retinaculum. In many times granulomas may occur that have to be removed. The fixation by 4-0 Vicryl supplies enough support, until the structures have achieved stability. Even though chemosis is a frequent problem following lateral canthoplasty, it is well tolerated when the patient is aware of the fact, that it will settle down completely after some days. Even though the technique is able to compensate some degree of lower eyelid skin deficiency, in some cases an additional skin grafting can be necessary.

Many procedures to correct the malposition of the lower eyelid have been described in literature, eg. horizontal lid shortening with medial/ lateral canthoplasty, dermal orbicular pennant lateral canthoplasty etc. (2, 3, 4, 7, 10), the technique of the inferior retinacular lateral canthoplasty as described by Glenn Jelks is our preferred technique. Additional horizontal lid shortening is only performed in severe cases of lower eyelid laxity or ectropion.

BIBLIOGRAPHY