Various possibilities for ocular surface protection

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Introduction

- Therapeutic contact lenses (TCL), amniotic membrane transplant (AM) and gold weight implant (GW) in the upper lid may be solutions to cover the ocular surface disorders.
I. The therapeutic contact lens in the management of different corneo-conjunctival diseases

- **Therapeutic contact lenses** are soft lenses with high content of water, they are indicated for treatment of corneal diseases successfully replacing ocular bandage which are anaesthetic, difficult to support and impairs binocular vision.
Indications of Therapeutic Contact Lenses

1. MEDICAL DISEASES:

Conjunctival diseases:
- pemphigus, Stevens Johnson syndrome (1);

Corneal diseases:
- epithelial-superficial punctate keratitis, filamentary keratopathy, keratitis sicca, corneal abrasion, recurrent corneal erosion, corneo-conjunctival burns;
- stromal: profound corneal sterile ulcerations;
- endothelial: aphakic/ pseudophakic bullous keratopathy, Fuchs’ endothelial dystrophy (1,4).
Indications of Therapeutic Contact Lenses

2. **SURGICAL DISEASES**:

- small penetrating corneal wounds;
- large corneal wounds without endoocular membrane issue until suture;
- aphakic and pseudophakic bullous keratopathy;
- large filtration bulla after trabeculectomy with athalamia;
- corneal graft after alkali burns (3,5);
- after photorefractive keratectomy for antialgic effect (2) and restoration of binocularity (3).
Indications of Therapeutic Contact Lenses

1. **Pain relief**
   - Edemato-bullous keratopathy
   - Recurrent corneal erosion or corneal ulceration after corneal foreign body
   - Herpetic keratopathy
   - Corneo–conjunctival burns

2. **Improving corneal re-epithelization**
   - Recurrent corneal erosions
   - Exposure keratopathy
   - Corneal burns
   - Chronic corneal ulcerations
   - Neurotrophic keratopathy

3. **Tectonic effect**
   - Descemetocel after corneal ulceration
   - Corneal – and corneoscleral laceration without endoocular membrane issue

4. **Permitting binocular vision**
   - All cases
LE: Inferior wound without membrane issue, TCL
RE: large corneo-scleral wound in the supero-temporal area with a small perforation and a lot of foreign bodies;

- We removed the foreign bodies and replaced the flap;

- We used a TCL without suture and we think this was the ideal choice
RE: infero-nasal sclero-corneal laceration, with flap:

- 2 sutures at the limbus;
- TCL fitting

1 year later, after the developing of cataract

without tcl
Monophthalmus patient, with AO successive ocular contusive trauma RE - 10 years ago and LE - 1 year ago; LE: Corneal laceration with flat AC

- LE - TCL

- After 3 month
RE: Corneal wound which necessitated minimal suture + TCL
RE: Inferior corneal wound with iris issue
Minimal suture + TCL
• In one case with neurotrophic keratopathy we noticed a slight amelioration of symptoms during therapeutic contact lens wearing;
• Sometimes these patients lose the TCL.
II. TCL +/- AMNIOTIC MEMBRANE TRANSPLANT

- The amniotic membrane is a biologic tissue that can be used as a graft for corneal and conjunctival reconstruction in a variety of ocular surface diseases. It is avascular and possesses antiangiogenetic, antiscarring and antiinflammatory properties. It is not a substitute but rather a substrate upon which cells can migrate and regenerate, forming new and healthy tissue [14].

- We applied the amniotic membrane on the corneo-scleral wound in pterigyum surgery, sutured at the limbus with nylon 10.o, but not on the cornea, in order to avoid further corneal scars and we applied a TCL for the fixation of the membrane.

- For the fixation of the membrane we also used TCL (in simblepharon, burns, corneal ulcer, descemetocel, perforation)

- The pain was reduced and the binocular vision was earlier restored. Using TCL instead of ocular occlusion restores the binocularity, permitting a normal activity early after the operation.
In small pterigyums, after its complete removal, we fitted a TCL (Purevision B&L). In large pterigyums and in recurrences we used amniotic membrane transplant and TCL.

We applied TCL at the end of the surgery. After the excision of the pterygium it remains a corneo-scleral wound, sometimes quite large. This area, covered by TCL allows the corneal epithelium to regenerate, forming a new tissue.

In large pterigyums and in aggressive recurrences after surgical excision we considered insufficient only the application of TCL, so we combined it with an amniotic membrane transplant.
• **RE. Pterigyum.** Preop.

• First day postop. - TCL + amniotic membrane

• 3 weeks postop. - TCL
• RE. **Pterigyum.** Preop.

• First day postop. - TCL + amniotic mb.

• 3 weeks postop. - TCL

• 7 days postop. - TCL + amniotic mb.

• 6 weeks postop.
- **RE. Pterigyum. Preop.**

- **First day postop. - TCL**
• **LE. Pterigyum.** First day postop. – TCL

• 3 days postop. – TCL

• 6 weeks postop.
• LE. **Pterigyum.** Preop.

• First day postop. - amniotic mb + TCL.
- LE. Pterigyum, 3rd. day postop. - amniotic mb + TCL

- 7 days postop. - amniotic mb + TCL

1 month. Post cataract surgery – IOL CP
- LE: Pterigyum.
  Preop.

- 1st day postop.: amniotic mb + TCL

- 30 days postop.

- 60 days postop.
RE: old corneo-conjunctival chemical burn.

RE: amniotic membrane transplant - surgery.

RE 14 days postop.
LE: chemical burn

LE: amniotic membrane transplant

1 month postop

After the correction of trichiasis
In cases of pseudophakic oedematous-bullous keratopathy we associated topical hyperosmotic agents (sodium chloride 5%) and beta blockers;

therapeutic contact lenses supressed the pain until the keratoplasty;

RE: KEB
TCL
In 9 cases of pseudophakic oedemato-bullous keratopathy we used also amniotic membrane transplantation.

**LE: KEB**

- 7 days postop.: amniotic membrane transplant + TCL
- 10 days postop.
III. THE MANAGEMENT OF EXPOSURE KERATOPATHY

- Exposure keratopathy is a chronic corneoconjunctival irritation caused by increased evaporation of tears, determined by an inadequate palpebral occlusion. In the absence of nocturne corneal protection, normally ensured by the lids, the lachrymal film is not properly distributed on the corneal surface (16).

- Clinical findings: conjunctivitis, keratoconjunctivitis, corneal erosions, corneal ulcer, descemetocel, perforation.
We analyzed different methods for the treatment of the exposure keratopathy of different cases hospitalized in the Ophthalmology Clinic Sibiu.

If recovery was anticipated, the treatment involved frequent instillation of lubricants during the day and ointment ant taping shut of the eyelids at night, fitting of therapeutic contact lenses. If permanent, lid surgery was usually required (20).

Our most cases were resolved using weight implant in the upper lid with/without the correction of the ectropion.

A supplementary palpebral weight determines a good lid occlusion and corneal protection (18).

The surgical procedure is simple and the functional and aesthetic results are favorable.
Concerning the surgical technique, for best results, it is very important to fixate the weight pretarsal in the upper lid, after the dissection of the palpebral muscles;

The weight can be made of gold or other materials (platinum);

The weight has to be very precise calculated in order to obtain the optimal occlusion.
We consider the weight implant in the upper lid +/- the correction of the ectropion in the management of the lagophthalmos in facial palsy the best choice in the management of exposure keratopaty.

Next, we present some suggestive cases solved using this method.
• Patient S.A., 42 years old - right facial nerve palsy (operated for acoustic neurinoma)
RE- lagophthalmos/ exposure kerathopathy

• PREOP.: with the eyes closed, the cornea of the right eye remains partial exposed

• 6 months POSTOP: RE: weight implant in the upper lid.
• the patient has a good lid occlusion, the cornea is clear, with complete epithelization and an aesthetic aspect.
• Patient L.E., 47 years old
• LE - corneal leukemia in the context of exposure kerathopathy, treated 7 years ago with an unefficient tarsoraphy (Acustic Neurinoma).

• when the eyes are closed, the cornea of the left eye remains partial exposed

• 4 months POSTOP., LE: weight implant in the upper lid. the patient has a normal lid occlusion.
Patient A.M., 58 years old
RE - facial nerve palsy

PREOP.: RE - the upper lid fails to drop down and close, the lower lid loses tone and sags downward, leading to ectropion, exposure keratopathy.

POSTOP. RE weight implant in the upper lid + correction of the ectropion. normal lid occlusion
• Patient B.M., 74 years old
  LE - facial nerve palsy

• PREOP.: LE - incomplete occlusion, ectropion.

• 1 month POSTOP. LE: weight implant in the upper lid + correction of the ectropion.
  normal lid occlusion.
- Patient C.N., 48 years old
  RE - facial nerve palsy

- PREOP.: RE - lagophtalmos

- 1 week POSTOP: RE: weight implant in the upper lid. the patient has a normal lid occlusion.
Patient G.V., 56 years old
LE - facial nerve palsy

PREOP.: LE - incomplete occlusion, with lateral tarsoraphy

1 week POSTOP. RE: weight implant in the upper lid. normal lid occlusion.
• Pacient B.N., 49 years old
• LE - facial nerve palsy

- 2\textsuperscript{rd}. POSTOP. LE: weight implant in the upper lid + ectropion correction.
- Pacient R.A., 72 years old - RE - facial nerve palsy after cranian trauma

- PREOP. RE - exposure keratopathy, corneal ulcer, corneal perforation

- RE: weight implant in the upper lid, pluristratified amniotic membrane transplant, therapeutic contact lens
• RE: operated 20 years ago for acoustic neurinoma; lagophtalmos
• RE: after surgical simblepharon and lagophtalmos correction
CONCLUSIONS

- Therapeutic contact lenses represent an efficient adjuvant therapy and in some cases they have a specific indications for corneal diseases;
- By replacing ocular occlusive bandages, therapeutic contact lenses re-establish binocularity and prevent amblyopia at children; for different socio-professional category they make work possible;
- LCT are a necessity for monophthalm patients with corneal disease;
- The complications of TCL are minor and they appear because of inadequate use and incorrect manipulation, over-wear and loss of the lens;
- In our opinion TCL are contraindicated in exposure keratopathy.
CONCLUSIONS

- Using therapeutic contact lens +/- amniotic membrane transplant after the surgical removal of pterygiums, we managed to reduce the postoperatory pain and the inflammatory reaction;
- The healing of the corneal wound was accelerated;
- This technique is repetitive and the costs are low;
- The transparency of the cornea and the aesthetic aspect of the eye are improved using this method.
CONCLUSIONS

- Surgical treatment is reserved in severe exposure kerathopathy without functional recover perspectives.
- Tarsorraphy is unaesthetic and reduces peripheric visual field (especially in monophthalmos) so we consider it shouldn`t be practiced anymore.
- At all the patients with exposure kerathopathy of neuroparalytic etiology the functional and aesthetic results were excellent after gold weight implant in the upper lid associated or not with ectropion correction.
Thank you!
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