Letters to the Editor

Keratoprosthesis in cornea and ocular surface diseases☆

Queratoprotésis en la enfermedad de la córnea y la superficie ocular

Dear Sir,

In 1771, Guillaume Pellier de Quengsy,1 an ophthalmologist, proposed for the first time the possibility of substituting opaque corneal tissue by “an artificial cornea”. The proposal was for transparent glass plates to substitute the opaque cornea in order to enhance the transparency of optic media.

Improvements in topical and systemic immunosuppression and limbus transplant techniques for treating diseases involving the ocular surface have limited the use of keratoprosthesis in recent years. At present, the number of specialists who perform this type of surgery falls short of forty all over the world.2

In Spain keratoprosthesis has been reported to be applied in only 2 ophthalmological clinics. Even so, corneal prostheses subsist as a therapeutic option for patients with a high risk of post-surgery immunological rejection.

At present several types of surgical techniques are utilized for implanting keratoprosthesis, i.e. osteo-odontokeratoprosthesis and the Boston keratoprosthesis.2

In 1963, Benedetto Strampelli3 designed a cylindrical acrylic lens mounted on a support that was made with a tooth of the same patient. This was named as osteo-odontokeratoprosthesis and to this date it is considered to be the gold standard for severe corneal opacity with severe dry eye associated to a high risk of immunological rejection. In 1980, Dr. J. Temprano4 designed some modifications for Strampelli’s technique, including the use of tibia bone tissue for patients in whom it was not feasible to remove a tooth and the extraction of the lens (transparent or not) in order to avoid second interventions. This surgical technique was named as tibia keratoprosthesis. In 1992, after obtaining FDA approval, Claes Dohlman developed a new keratoprosthesis model: an acrylic lens with a diameter of 7.5 mm comprising 8 holes in the posterior part to enhance the biointegration of prosthesis. This keratoprosthesis model is the current design of the Boston type keratoprosthesis.5

Keratoprostheses are indicated in severe bilateral corneal cicatrization complicated with ocular surface disease such as conjunctivalization secondary to limbar insufficiency or severe dry eye.

Best corrected visual acuity must be under 0.1 in the eye candidate for surgery. The condition of the posterior pole must be analyzed by means of echography. In addition, electrophysiological studies and intraocular pressure monitoring are necessary.

The main indications of keratoprosthesis can be divided into 6 categories:

- Chemical burns.
- Cicatricial ocular pemphigoid.
- Stevens-Johnson/Lyell syndrome.
- Cicatricial ocular trachoma.
- Thermal burns.
- Miscellaneous (aniridia, Sjogren syndrome, host graft disease, repeated graft failure).1,2

Osteo-odonto-prosthesis is indicated for corneal bilateral cicatrizations cases complicated by severe dry eye. Tibia keratoprosthesis is indicated when a patient is not apt for osteo-odonto-prosthesis.3

Boston keratoprosthesis4,5 is the promising novelty in this field. It is indicated in cases of repeated graft failure in eyes with good lacrimal and palpebral function. This surgery is simple but involves a higher cost.

REFERENCES


Dear Sir,

Even though at present there are multiple options for surgically treating glaucoma, innovations continue to appear with the aim of improving the efficiency and predictability of penetrating surgery. Within the group of new devices for implants, Ex-PRESS® (Alcon Laboratories, Inc., 6201 South Freeway, Fort Worth, TX, USA), developed in 1998 (Optonol LTD, Kansas City, MO, USA), has recently changed its design as well as modified its implantation technique with the aim of improving biocompatibility as well as efficacy and predictability. Ex-PRESS is a valveless filtration device and accordingly allows two-way free flow which deviates the aqueous humor from the anterior chamber to the subconjunctival space once implanted under a scleral flap.

The diversity of techniques—and modifications thereof—and devices gives rise to confusion amongst users regarding the name and exact characteristics of each. This is repeatedly observed in presentations and some publications. For instance, the same procedure has been named as trabeculectomy with implant, glaucoma surgery with a small drainage device or deep sclerectomy modified with Ex-PRESS implant.

In summary, it can be said that initially the surgical protocol for the Ex-PRESS implant is similar to a classic trabeculectomy (Cairns, 1968) in the execution of the conjunctival flap, the superficial scleral flap and the addition or not of antimetabolites, with the exception that a portion of the trabeculum is not removed; instead, a perforation is made at the level of the sclerocorneal limbus (sclerostomía; Mackenzie, 1830) and iridectomy is avoided as it facilitates information and hyphema. The fact that the implant is placed under a scleral flap prevents complications including mobilization, conjunctival erosion, Seidel, endophthalmitis, etc. (PROTECTED). The final placement of the drainage device (Ex-PRESS implant) aims at maintaining the sclerostomy permeability (Fig. 1).

In accordance with the above and endeavoring to maintain clarity as regards concepts, we consider that the most

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**Ex-PRESS® implant protected sclerostomy**

Esclerostomía protegida con implante Ex-PRESS®

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![Phakic patient 2 weeks after a “protected sclerostomy with Ex-PRESS® implant”](image)

**Fig. 1** - Phakic patient 2 weeks after a “protected sclerostomy with Ex-PRESS® implant”. (A) Correct implant location, maintaining the anterior chamber. (B) Absence of inflammatory signs. (C) Absence of Seidel. (D) Formation of filtration bleb.