

Use of scleral contact lens in the therapeutic approach of corneal neurotrophic ulcer

Utilização de lente de contato escleral na abordagem terapêutica da úlcera neurotrófica corneana

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ABSTRACT

In this paper we describe how we successfully conducted a case of neurotrophic ulcer not responsive to conventional therapy using scleral contact lens and the advantages of this therapy.

Keywords: Corneal diseases; Corneal ulcer; Corneal injuries; Contact lens; Sclera; Case reports

RESUMO

Neste artigo descrevemos como conduzimos com sucesso um caso de úlcera neurotrófica não responsivo à terapia convencional com o uso de lente de contato escleral e as vantagens desta terapêutica.

Descritores: Doenças da córnea; Úlcera da córnea; Lesões da córnea; Lentes de contato; Esclera; Relatos de casos

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INTRODUCTION

Neurotrophic keratitis (NK) is a corneal disease caused by impairment of trigeminal innervation, reduction or total loss of corneal sensitivity, leading to epithelial damage, impairment of healing, and development of ulceration. It is among the most difficult and challenging eye diseases to be treated.^(1,2)

The treatments typically described NK are topical lubricants, occlusive dressing^(3,4), lacrimal point occlusion, gelatinous contact lens^(5,6), tarsorrhaphy⁽⁷⁾, topical autologous serum⁽⁸⁻¹²⁾, and amniotic membrane.⁽¹³⁾

Evidence shows that the use of the scleral contact lens may be a good alternative for NK treatment.⁽¹⁴⁾ In the present paper we will describe the use of the scleral contact lens as a form of therapy for this condition.

CASE REPORT

J.C.E.S., 54 years old, male, caucasian, native and from São Paulo, attended the service on July 26, 2013, with a complaint of low visual acuity (LVA) in the right eye (RE) for 2 months. He had a personal history of firearm injury in the face in 2003 with loss of left eye bulb (he uses an ocular prosthesis) and decreased sensitivity in the right hemiface.

Corrected visual acuity of finger count (FC) 1.5 meters in the RE. Biomicroscopy RE: slightly blurred cornea, diffuse epithelial keratitis 3+/4+, well delimited central ulcer without infiltrate (3.7 mm x 2.7 mm) and phakic. At funduscopy, retina applied without changes. Corneal sensitivity test absent in the RE, and Schirmer I test of 11.0 mm.

The diagnostic hypothesis was of neurotrophic ulcer due to the history of firearm injury with altered sensitivity test, ulcer characteristics and reduced blink reflex. Preservative-free lubricant eyedrops, ofloxacin every 6 hours, and epithezan 3x a day were prescribed. The ulcer cure occurred 14 days afterwards, with the VA being in 20/200, and regular use of lubricants and follow up.

On 11/5/2014, patient returned with complaint of LVA, and VA with correction of FC 0.5 meters. He presented recurrence of ulcer at biomicroscopy (Figure 1).



Figure 1: Recurrent ulcer.

During the period from 11/05/2014 to 01/27/2015 we prescribed: topical antibiotic, autologous serum eyedrops, preservative-free lubricants, therapeutic contact lens, gabapentin eyedrops, and oral doxycycline 100mg every 12 hours (anticollagenase effect).

The ulcer was maintained despite the treatment carried out (Figure 2).

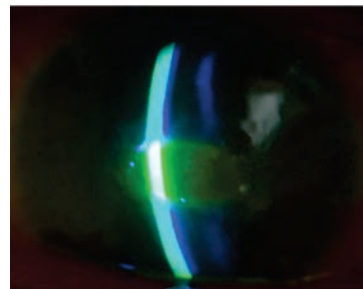


Figure 2: Ulcer refractory to conventional treatment.

On 01/27/2015, due to functional limitation and the social aspect of the patient, we chose to perform the adaptation of a scleral contact lens for therapeutic purposes (Figures 3 and 4). The scleral lens parameters were: 7.5mm radius, 16mm diameter, 4.44mm sagittal depth, and -7.00 diopters. Used day and night, the lens was removed one to two times a day for cleaning and replacement of the reservoir fluid (sterile saline solution with one drop of Tobramycin 0.3%).

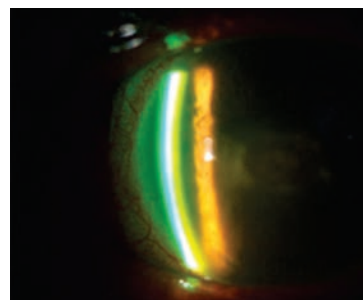


Figure 3: Adapted scleral contact lens.

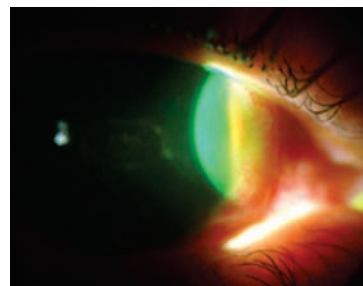


Figure 4: Adapted scleral contact lens.

On 02/25/15, the ulcer had already been completely healed, and he presented VA 20/200 with contact lens use (Figure 5).

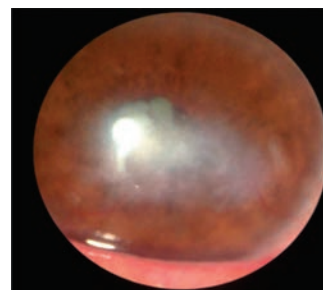


Figure 5: Healed ulcer.

DISCUSSION

Scleral lenses have the property of lachrymal retention, favoring constant lubrication due to their reservoir full of fluid. This allows for the absence of contact of the cornea with the eyelid and the frictional force of the eyelid under the cornea as it occurs during the blinking and also during the movements of the eyes below the closed eyelid as it occurs in cases of use of occlusive dressing or tarsorrhaphy.⁽¹⁴⁻¹⁶⁾ In addition, the scleral lens provides mechanical protection of the ocular surface and has a high permeability to oxygen, favoring an adequate oxygenation and creating an environment that favors corneal healing.⁽¹⁴⁻¹⁶⁾

The dilution of the proinflammatory substances and the reduction of osmolarity of the precorneal fluid are also suggested as mechanisms of reepithelialization of the scleral contact lenses.⁽¹⁷⁾ Some authors consider applying to these lenses formulas with growth factors that could enhance their capacity for corneal regeneration.⁽¹⁷⁾

Of course, the constant daytime and nighttime use of scleral lenses favor the installation of bacterial keratitis, and it is of great importance to prevent the patient against them. For the prevention of microbial keratitis, topical antibiotics have been used in the reservoir fluid of the lens, as in our case, and preferably without preservatives.⁽¹⁴⁾ The use of topical antibiotics does not exempt the patient from a constant evaluation for early diagnosis of a possible infectious keratitis that may have settled on the diseased cornea.

Economically, the use of scleral lenses has also been shown to be beneficial. An economic evaluation indicated that the use of scleral lenses is cost-effective in patients with severe visual impairment due to ocular surface disease⁽¹⁸⁾, and this is an extremely important aspect, especially for countries under development such as ours. It is important to conduct Brazilian studies to evaluate the cost-effectiveness in our country.

The scleral lenses present another benefit that is their functioning as a medication reservoir. The desired medication can be put into the reservoir fluid and it will be available in a more extended way to the patient's eye.⁽¹⁶⁾ Preservative-free drugs should be selected so as not to potentiate the toxic effects of the drugs on the injured cornea.

We conclude that the use of scleral lenses may be a great choice for patients who have limitations in complying adequately with the therapy prescribed and recurrent to conventional treatment. In this case, we considered that it was determinant for the therapeutic success and cure of our patient.

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