Short communication

Treatment of a neurotrophic corneal ulcer with solid platelet-rich plasma and Tutopatch®

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ABSTRACT

Case reports: We present the case of a patient with neurotrophic keratitis in the left eye treated with a Tutopatch® cover and platelet-rich plasma (PRP). Solid autologous PRP was placed in the bed of the ulcer and Tutopatch® was sutured to the conjunctiva.

Discussion: We found this form of treatment very effective for progressive ulcers. Tutopatch® may constitute an alternative to amniotic membrane transplantation.

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Introduction

Corneal lesions that progress towards stromal ulceration are a significant clinical problem due to the considerable risk of corneal perforation.1

There are many causes that can give rise to stromal ulceration, including neurotrophic keratitis which causes a reduction or loss of corneal sensitivity due to damage in the V pair. Diminished lachrymal tear production due to the loss of the tearing reflex plays an important role...
in the development of this condition. Corneal hypoesthesia or total anesthesia together with the involvement of the V pair can be associated to tumors (neurinoma, meningioma), demyelinizing disease (multiple sclerosis), cerebral infarct, aneurisms, herpes simplex or zoster. Other iatrogenic causes are the irradiation of the ocular surface, neurosurgery, corneal refractive surgery or ciliary body ablation.

The platelet-rich plasma (PRP) has been utilized in clinic as an adjuvant for tissue regeneration in specialties such as oral and maxillofacial, reconstructive, cardiovascular and plastic surgery as well as for the treatment of corneal ulcers. PRP is obtained after the centrifugation of complete non-coagulated blood. Autogenous PRP is obtained from the patient’s own blood. In its solid form it is highly valid for treating severe cases of corneal perforation where it carries out a scarring action.

Tutopatch® (Tutogen Medical GmbH, Neunkirchen, Germany) is a biological membrane obtained from bovine pericardium.

This paper presents the use of solid PRP associated to Tutopatch® as a protection in progressive ulcer cases produced by neurotrophic ulcers that did not respond to any treatment including amniotic membrane transplant.

Clinical case

A 72-year-old patient who had undergone surgery for neurinoma in the left jaw 5 years back.

Three months ago, the patient visited the emergency section referring intense pain and redening in the left eye. An exploration revealed a corneal ulcer in the left eye (fig. 1). Visual acuity was of hand movement. Meidel’s test was positive and the size of the ulcer was 3 × 1.5 mm. Treatment was established with therapeutic contact lens, tobramycin drops and ocular lubricants. In subsequent visits the null effect of the treatment could be evidenced due to progression of the ulcer both in area and in depth. Considering the condition, it was decided to carry out amniotic membrane transplant and total occlusion of the eye for 3 weeks, after which the condition worsened with imminent perforation risk. Due to the urgency of the condition it was decided to apply solid PRP at the base of the ulcer filling it in and covering it entirely with Tutopatch® and carrying out temporal tarsorraphy (fig. 2).

The intervention was carried out in April 2008. The tarsorraphy opened 3 weeks later and the remaining Tutopatch® was also withdrawn, evidencing complete re-epithelization and stromal filling (fig. 3). Seidel’s test was negative. During 3 months the patient followed topical treatment with PRP drops, after which the eye evidenced a paracentral leukoma in the ulcer area even though the imminent perforation risk was resolved successfully. This evidences the positive performance of PRP in its solid as well as liquid state for corneal healing as well as the validity of utilizing a biological membrane instead of amniotic membrane.

Discussion

Amniotic membranes have been used efficiently for treating corneal ulcers and limbal stem cell defects. Its use is based on the experience gained in other specialties. However, we consider that the heterologous origin of the amniotic membrane could be a significant problem, particularly in what concerns immune reactions, baseline morphology or risk of disease transmission. The effects
of the processing, conservation and pre-op preparations methods of said membranes are not sufficiently clear.

We have observed that the use of a biological membrane obtained from bovine pericardium, Tutopach®, is also very useful for treating tissue regeneration in the eye, with the added advantage that it is available in a sterile proform and does not require culturing.4

Autogenous PRP is a safe source of growth factor and platelets without the risk of immune reactions or disease transmission because it is obtained from the patient’s own blood.5

This is the first published case in which solid PRP together with Tutopach® have demonstrated high short-term effectiveness for resolving a problem as severe as corneal perforation due to chronic ulcer. Therefore, it is an excellent alternative to the use of amniotic membrane. Tutopach® is easily obtained, has no expiry date and does not require special biological conditions for its preservation. For these reasons, this collagen membrane is a good option for cases where easy access to amniotic membrane is not possible or where it has not given the expected clinical results.

Conflict of interest

None of the authors have declared any conflict of interest.

References