Short communication

Intracameral fibrin glue in spontaneous corneal perforation

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ABSTRACT

Case report: A 70-year-old male was referred to our department due to a herpetic corneal perforation in the left eye. The perforation was healed with intracameral fibrin tissue sealant (Tissucol®), an amniotic membrane, and a large diameter soft contact lens. Postoperatively there were complete dissolution of the fibrin sealant and closure of the perforation without endothelial damage.

Discussion: Intracameral fibrin glue may be effective in the closure of corneal perforations.

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Adhesivo de fibrina intracameral como tratamiento de perforación corneal espontánea

RESUMEN

Caso clínico: Paciente varón de 70 años remitido a nuestro servicio por una perforación corneal en el ojo izquierdo (OJ) de posible origen herpético. Se procedió a su reparación mediante la introducción de pegamento tisular de fibrina (Tissucol®) en cámara anterior, colocación de parche de membrana amniótica y lente terapéutica de gran diámetro. En el postoperatorio presentó cierre de la perforación y resolución de la fibrina intracameral sin daño endotelial.

Discusión: El pegamento tisular de fibrina puede ser utilizado en cámara anterior para tratar perforaciones corneales con excelentes resultados.

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Introduction

One of the main causes of spontaneous corneal perforation is herpetic stromal keratitis. Therapeutic approaches include conjunctival flaps, scleral patches and the use of amniotic membrane associated or not with tissue adhesives. Management is more complex if centrally located. The last resort would involve therapeutic keratoplasty.

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Fibrin adhesives are hemostatic agents that reproduce the last steps of the coagulation cascade. These adhesives are biocompatible, biodegradable and with low toxicity for corneal surfaces. The use of these adhesives in the anterior chamber for treating corneal perforation is presented.

**Clinic case**

Male, 70, referred to the service due to corneal perforation in the context of herpetic ulcer with 2 weeks evolution in the LE. Upon exploration, the patient exhibited visual acuity of hand movements, signs of 360° limbal insufficiency and central ulcer with stromal thinning of approximately 2 mm with perforation. The perforation was under 1 mm. In addition, the patient exhibited positive seidel and athalamia (Fig. 1).

Systemic antibiotic treatment was prescribed (ciprofloxacin 200 mg/12 h intravenous), oral acyclovir (400 mg/12 h), reinforced eyedrops (vancomycin 50 mg/ml and ceftazidime 50 mg/ml) and a therapeutic contact lens was placed (Lenflex II®, Lentiflex Labs with 18.5 mm diameter). The surgical approach was made with blade 15 G and introduction of a small amount of viscoelastic (Viscoat®, Alcon Labs) for partially reshaping the anterior chamber. Using a 27 G needle, the fibrin tissue adhesive was introduced (Tissucol®, Baxter Labs) with both components simultaneously to fill the perforation. Two amniotic membrane patches were cut with the epithelium facing upwards, attached without requiring stitching (Fig. 2).

In the immediate post-surgery period, the amniotic membrane remained in position and the chamber was reshaped with the tissue adhesive covering the perforation on its endothelial side (Fig. 3).

Four days after surgery and after withdrawing the occlusive bandages, the amniotic membrane dislocated but residues of Tissucol® remained in the anterior chamber adhered to the perforation and the formed anterior chamber. A large diameter therapeutic contact lens was placed. At week 3, the tissue adhesive had dissolved completely but the perforation had sealed (Fig. 4). Mirror microscopy counted 1235 cells with hexagonality of 58%.

**Discussion**

Corneal perforation is a severe ocular complication that requires urgent treatment in order to avoid more associated ocular morbidity.

Tissue adhesives are useful for immediate closure of small perforations. Adhesives can be classified as synthetic (derived from cyanoacrylate) and biological (fibrin adhesives).
Cyanoacrylate is a nonbiodegradable adhesive that induces inflammation and neovascularization, whereas fibrin is a biodegradable biological adhesive that does not induce stromal inflammation or neovascularization and enables complete closure of perforations.\(^2\)

Tissucol\(^\text{®}\) is a fibrin adhesive with two components, one including fibrinogen and the other thrombine. When both come together they represent the final steps of the coagulation cascade, forming a stable fibrin coagulus that enables hemostasia in bleeding and the adhesion of tissue.

There are numerous papers on the use of tissue adhesives in corneal perforations applied on the surface but very few studies on the use of fibrin adhesives in anterior chamber.\(^3,4\)

The results of a study carried out with rabbits\(^3\) demonstrated that intrachamber use of fibrin could produce temporary intraocular pressure increase as well as corneal pachymetry increase in the immediate post-surgery. However, no alterations were found in the corneal endothelium, trabecular mesh or iris.\(^3,4\) Fibrin dissolves 1–2 weeks after surgery.

Intrachamber Tissucol\(^\text{®}\) in combination with the use of amniotic membrane can be useful for treating small corneal perforations. Perforation management is more simple when introducing the adhesive in the anterior chamber and producing an internal stopper. The excess adhesive protruding from the perforation can be utilized for attaching the amniotic membrane, which improves the mechanical attachment of the adhesive and facilitates perforation covering.

Comparatively, cyanoacrylate is more difficult to manage and leaves a rough surface that causes discomfort in the postop and frequently detaches at an early stage.\(^5\)

The authors wish to emphasize the satisfactory results of the said treatment as well as adequate endothelial tolerance to the fibrin adhesive without the complications described at the experimental level with the use of Tissucol\(^\text{®}\) in the anterior chamber.\(^3\)

**Conflict of interests**

No conflict of interests has been declared by the authors.

**References**