ABSTRACT:
Keratitis without proper management tends to perforate the cornea, resulting in severe adverse consequences. In recent studies, amniotic membrane is reported to have anti-inflammatory effect and promote wound healing of corneal ulcer.

Purpose: To report on the efficacy of permanent amniotic membrane transplantation (AMT) in the treatment of keratitis.

Case report: A 58-year-old man with severe keratitis in both eyes caused by long term administration of topical anesthetic (alcaine) for electric ophthalmia. Single layer of amniotic membrane (AM) was placed on the defect and secured to the limbus with interrupted 10-0 nylon sutures. A bandage contact lens was applied on the AM. Postoperative medication included topical antibiotic, artificial tears and mydriatic. Three months later corticosteroid was included. There was an immediate decrease of patient’s pain after surgery. Complete epithelialization was noted after 1 month.

Conclusion: AMT is an alternative adjunctive method of treatment of keratitis; it promotes epithelialization process, decreased inflammation, corneal haze and neovascularization.

Key words: keratitis, corneal ulcer, amniotic membrane,

Ocular surface is covered by epithelium which is in a state of constant regeneration. This process can be disrupted by numerous factors, causing corneal defect with poor epithelialization, stromal inflammation and corneal vascularization. Treatment of such patients involves correcting the underlying condition, suppressing the inflammation and promoting the healing process - antibiotic, lubricants, tears, contact lens, growth factors. Despite the treatment, this defect may progress, and eventually, perforation may occur. In such cases surgical intervention is required – conjunctival flap, tarsorrhaphy, application of glue or keratoplasty is performed.

More recently, in such progressive cases, amniotic membrane transplantation (AMT) has been considered in combination with medical treatment. Studies have shown that AMT promotes rapid epithelialization, reduce stromal inflammation and scarring. [1, 2, 3] AMT has antimicrobial properties and acts as an effective drug delivery system. Several studies have described the use of AM (amniotic membrane) for the management of deep corneal ulcer. [4-11] Herein we report the efficacy of permanent AMT for the treatment of keratitis.

Case report:
A 58-year-old man with severe keratitis in both eyes caused by long term administration of topical anesthetic (alcaine) for electric ophthalmia. He had a history of pain, decreased vision, redness and watering in his both eyes. Visual acuity was PPLC in both eyes. Slit lamp biomicroscopy showed central corneal ulcers with hypopyon in anterior chamber in both eyes. (Fig. 1)
Fig. 2. Surgical procedure of amniotic membrane transplantation

Postoperative medication included topical antibiotic, artificial tears and mydriatic. Three months later, corticosteroid was included.

There was an immediate decreased of patient’s pain after surgery. Complete epithelialization was noted on 1 month. (Fig. 3)

Fig. 3. One month after surgery

At the last follow up visit, 7 months after surgery, vision was 0.7 for right eye and 0.6 for left eye. (Fig. 4)

Fig. 4. Seven months after surgery
DISCUSSION:
This report shows that AMT is an effective method for treatment of severe keratitis, where other strategies have failed. Therapeutic effect of AM involves two basic actions that work synergistically in promoting epithelialization and suppressing inflammation.

Studies show, that AM acts as a new healthy substrate suitable for epithelialization. It serves as a “basement membrane”, produces various growth factors and promotes the corneal healing. In our case we noted complete epithelialization after the first month. [12]

AM contains anti-inflammatory mediators. It was found that AM suppresses the expression of inflammatory cytokines. In addition, polymorphonuclear cells adhered to its stromal side and underwent rapid apoptosis. Kim and coworkers have reported on a large series patients with keratitis that were successfully treated with AMT. [13] Talmi et al. reported that when the AM method was used, no bacteria developed and this may be explained with a close adherence of AM to the wound surface or presence of antimicrobial peptides. [14]

The membrane integrates into the host corneal tissue and spontaneously dissolves upon epithelialization as shown in the case reported here. (Fig. 4) [15]

AM has been considered in combination with medical treatment. A recent study reported that AM acts as a reservoir system for antibiotics, which increases the beneficial effect of AMT for the treatment of keratitis. [16]

CONCLUSION:
AMT is an alternative adjunctive method for treatment of keratitis: it provides tectonic support, promotes epithelialization process, decreased inflammation and corneal haze.

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