FACTORS INFLUENCING THE OUTCOME OF CORNEAL TRANSPLANTATION AND THE DEVELOPMENT OF COMPLICATIONS

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Key words: *cornea, diseases, prevention, research, treatment, personal hygiene, medicine and life,*

INTRODUCTION

Factors influencing the outcome of corneal transplantation include the recipient's ocular condition (e.g., vascularity, inflammation, glaucoma, ocular surface disease) and the properties of the graft itself (recipient age, graft size and eccentricity). The main causes of complications are immune rejection, infection, and suture problems.

Recipient-Related Risk Factors

● Inflammation and Vascularity: Active ocular inflammation, scarring, the presence of vascularity in the corneal stroma, and neovascularization increase the risk of rejection.

● Ocular Diseases: Conditions such as herpetic keratitis, atopic dermatitis, ocular cicatricial pemphigoid, tear film dysfunction, as well as neuveitis and untreated glaucoma, worsen the prognosis.

● Eyelid Abnormalities: Blepharitis, entropion, ectropion, and trichiasis should be corrected preoperatively. Other factors: Anterior synechiae, neurotrophic keratopathy, young age, and previous anterior segment surgery are risk factors.

● Graft and surgery-related risk factors

Graft size and position: A large or eccentrically positioned graft may increase the risk.

● Epithelial problems: Delayed formation of the corneal epithelial layer can lead to discomfort, infection, and graft loss.

● Suture problems: Improper healing or problems with the suture material used to secure the graft can lead to complications.

Corneal transplantation in high-risk penetrating keratoplasty (HRPK) patients, particularly those following ocular burns and ocular herpes, remains one of the most challenging areas of ophthalmic surgery. Systemic immunosuppressive therapy with cyclosporine A can suppress autoimmune reactions directed against the cornea, prevent classic graft rejection (GTR), and improve functional outcomes. To study the causes of persistent graft erosions and ulcers after high-risk penetrating keratoplasty for postinflammatory corneal lesions and postburn leukomas; to improve treatment efficacy.

Material and Methods: We observed 79 patients (107 eyes/cases) with category III-IV leukomas and corneal ulcers of various etiologies. Inflammation due to infection occurred in 78 cases (73%), and burn injury occurred in 29 cases (27%). In 54 cases (50.5%), an acute destructive process, such as a corneal ulcer or perforation, was present at the time of CP.

All patients received standard medical treatment after surgery. Local immunosuppression (injections, then dexamethasone instillations) was administered for a long period (up to 1 year).

In addition to conventional therapy, 27 patients received the immunosuppressant cyclosporine A (CSA) at a dose of 3 mg/kg body weight per day. In 22 cases with laboratory evidence of herpes infection activation or risk thereof (taking CSA, ophthalmic herpes, or extraocular herpes in the medical history), antiviral therapy (AVT) was prescribed (Zovirax ointment, Acyclovir tablets, 1000 mg per day; Valtrex, 1000 mg per day). Amniotic membrane transplantation (AMT) was used as a surgical method of prevention and treatment. In case of negative dynamics of the destructive process, temporary or bloody blepharorrhea was performed. To assess the rate of epithelial defect closure after CP and the role of this factor in the development of complications, we introduced the following terms: "primary persistent corneal graft erosion" (PPCE) (an epithelial defect that persists for more than 10 days after surgery, up to 1 month); "Persistent corneal graft erosion" (PEC) (erosion occurring sometime after the completion of epithelialization within 10 days after CP), "recurrent persistent corneal graft erosion" (RPCE) (recurring PEC). The incidence of PEC after CPVR reached 30%. Graft ulceration and perforation in these cases occurred in 28.1%, and cloudy engraftment occurred in 40.6%. In cases where graft epithelialization was completed by day 5 after surgery (without PEC), similar complications and outcomes were observed significantly less frequently—8.4% and 18.4%, respectively.

The incidence of complications peaked in patients with PEER in the first 6 months. Emergency corneal grafting for ulcers and perforations was associated with a higher incidence of PEER (46.3%) and RPE (20.4%) compared to elective surgeries—30.2% and 9.4%, respectively. Timely completion of epithelialization and the absence of subsequent PEER, both in cases of inflammatory and burn-related leukomas, were observed with approximately the same frequency—58.9% and 55.2% of cases, respectively. Routine epithelial removal from the donor corneal graft increased the incidence of PEER; graft epithelialization was completed later (6-10 days after surgery, 53.3%), and transparent engraftment was observed less frequently (15.6%) than with preserved epithelium (23.3% and 66.8%, respectively). To prevent PEER and RPEER, TAM was used in 36 patients. For therapeutic purposes, TAM was performed in cases of existing or recurrent erosions (35 cases). Bloody blepharorrhea (24 cases) was performed primarily at the conclusion of surgery (14 cases). In cases of a single promising eye (5 cases), under the same conditions, keratografting was completed with the formation of a permanent ankyloblepharon.

In 22 of 24 cases, graft epithelialization was achieved.

The occurrence of PEER in patients who underwent CVSR significantly (by 43.4%) increases the incidence of adverse surgical outcomes. When this complication develops in the early postoperative period (up to 6 months postoperatively), cloudy keratograft engraftment is observed less frequently (63%, compared to 80% in the late postoperative period).

Clinical factors contributing to the development of PER after CRVR include: the severity of the corneal pathology before surgery; removal of the donor cornea's epithelium before transplantation; and the absence of epithelialization for more than 10 days.

The use of amniotic membrane transplantation and blepharorrhea in the presence of prognostically unfavorable factors after high-risk keratoplasty can reduce the incidence of PER and improve overall CRVR outcomes.

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