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Case Report

Management of perforated corneal ulcer with iris prolapse by cyanoacrylate glue: A case report

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ABSTRACT

We report a rare case of perforated corneal ulcer due to recurrent viral keratitis with stromal necrosis and iris prolapse. The patient was 75 years old farmer, normotensive, diabetic, and presented with complaints of pain, watering, photophobia, redness and dimness of vision in the left eye. The left eye's visual acuity was perception of light and projection of rays in all four quadrants. Slit lamp examination found swollen eyelids, matted eyelashes, congested conjunctiva, seidel test positive, an inferonasal corneal perforation, shallow anterior chamber, irregular pupil, and prolapse of the iris through the perforated cornea. The patient was diagnosed with a left-sided perforated corneal ulcer (recurrent viral keratitis with stromal necrotizing variety) having iris prolapse. The perforation was sealed by cyanoacrylate glue and a soft bandage contact lens. This improved the patient's condition. Early medical and surgical interventions thus can save vision as well as the eyeball.

Keywords: cyanoacrylate glue, iris prolapse, perforated corneal ulcer, recurrent viral keratitis

INTRODUCTION

Corneal ulcer is a manifestation of infectious keratitis due to organisms that cause necrosis and pus formation in the corneal tissue.[1] It is associated with an epithelial defect usually with infiltration and necrosis.[2] Corneal perforation may cause severe visual loss and ocular morbidity.[3, 4] Different non-infectious and infectious conditions such as trauma, microbial keratitis, and immune disorders are responsible for corneal perforation.[5, 6] Prolapse of ocular tissue may be found with corneal perforation and needs immediate diagnosis and treatment. As a result, the anatomical integrity of the cornea is preserved and we can prevent serious complications such as secondary glaucoma, endophthalmitis, etc. We report a case of a 75-year-old male who presented with complaints of dimness of vision, pain, redness, photophobia and watering in the left eye.

CASE DESCRIPTION

A 75-year-old man, normotensive and diabetic patient presented with complaints of pain, watering, photophobia, redness, and dimness of vision in the left eye for 14 days. Dimness of vision in the left eye was sudden in onset and gradually deteriorated. He gave no history of ocular trauma, ocular surgery or use of spectacles but was using topical steroids for the last seven months. He also gave a history of similar ocular attack happening 10 months back followed by admission at Bangabandhu Sheikh Mujib Medical University (BSMMU), a tertiary care specialized hospital of Bangladesh. He was diagnosed as diffuse non-healing vascularized corneal ulcer and treated conservatively. He was a betel leaf chewer and smoker. He belonged to a low socio-economic group. He gave history of taking tablet acyclovir, tablet gliclazide, moxifloxacin e/d, natamycin e/d, loteprednol e/d,

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LEARNING POINTS

1. **Perforated corneal ulcer with iris prolapse can be treated effectively by cyanoacrylate glue.**
2. **Application of cyanoacrylate glue in case of corneal perforation with iris prolapse is very effective for immediate restoration of**

carboxymethylcellulose e/d, brimonidine + timolol e/d, and homatropine e/d. Ocular examination revealed that the right eye's visual acuity was 6/9 unaided with pinhole 6/6 and the left eye's visual acuity was perception of light and projection of rays in all four quadrants. Findings of slit lamp examination in the left eye were: a) eyelids- swollen and matted eyelashes, b) conjunctiva- congested, c) seidel test- positive, d) cornea- an inferonasal corneal perforation about 2.5 mm and thinning surrounded by infiltration about 5×6 mm with corneal epithelial defect about 5×6 mm in size (vascularization present at 4 to 6 o'clock and 11 to 2 o'clock positions, e) anterior chamber- shallow, f) iris- anteriorly prolapsed through the corneal perforation, and g) pupil- irregular. Lental opacity was present in both eyes. Other systemic examinations were normal. The investigation report were a) corneal scraping for gram's stain- negative, b) culture sensitivity test- negative, c) KOH test- negative, d) anti HSV-1 IgG- positive, IgM-negative, and e) random blood glucose– 10.2 mmol/L. Our provisional diagnosis was left-sided perforated corneal ulcer with iris prolapse with lental opacity in both eyes with diabetes mellitus. Differential diagnosis was: a) recurrent viral keratitis with stromal necrotizing variety, b) sterile corneal melt, c) bacterial corneal ulcer, and d) fungal corneal ulcer.

a b

FIGURE 1 a. Photograph of both eye, b. Perforated corneal ulcer with iris prolapse in the left eye

CASE MANAGEMENT

Non-surgical management: a) counseling of the patient, b) injection insulin aspart (s/c) 100 IU/ml, c) moxifloxacin 0.5% eye drop, d) atropine 1% eye drop, e) tablet paracetamol 500 mg, f) tablet cefixime 400 mg, g) tablet acyclovir 400 mg, h) tablet prednisolone 20 mg, i) tablet calcium 500 mg, j) capsul esomeprazole 20 mg.

Surgical management: Cyanoacrylate adhesive works best for small (<3 mm) concave central defects.[7] Here, the perforation was sealed by cyanoacrylate glue and application of soft bandage contact lens. This glue has three special properties: a) bacteriostatic, b) anticollagenase activity, c) initiate epithelialization and promote healing.[9]

Follow up

On several scheduled follow-up; we observed persistent improvement of the left eye condition at 10 months, mild corneal thinning over the applied tissue adhesive area and visual acuity CF-3 feet were found. Finally, central permanent tarsorrhaphy was done to prevent impending perforation due to corneal thinning. In these cases, if medical and surgical interventions can be started immediately, valuable vision and eyeball might be saved. Finally, diagnosis was left-sided perforated corneal ulcer (recurrent viral keratitis with stromal necrotizing) with iris prolapse.

DISCUSSION

The classical feature of the stromal necrotizing variety of herpes simplex viral keratitis is corneal melting followed by perforation. Non-healing persistent epithelial defect leads to corneal stromal melt followed by perforation and it is one of the most devastating complications. In the case of herpetic keratitis, corneal perforations are caused by necrosis of the corneal stromal layer. Active viral replication may also be present in some cases but the host immune response is supposed to be the main factor. The corneal stromal destruction is mostly mediated by collagenases and matrix metalloproteinases which come from the macrophages and polymorphonuclear cells.[8]

Noncompliant and severe infectious keratitis is considered the common cause of corneal perforation. Whereas recurrent herpetic keratitis stimulating stromal necrosis is the important cause of corneal perforation in

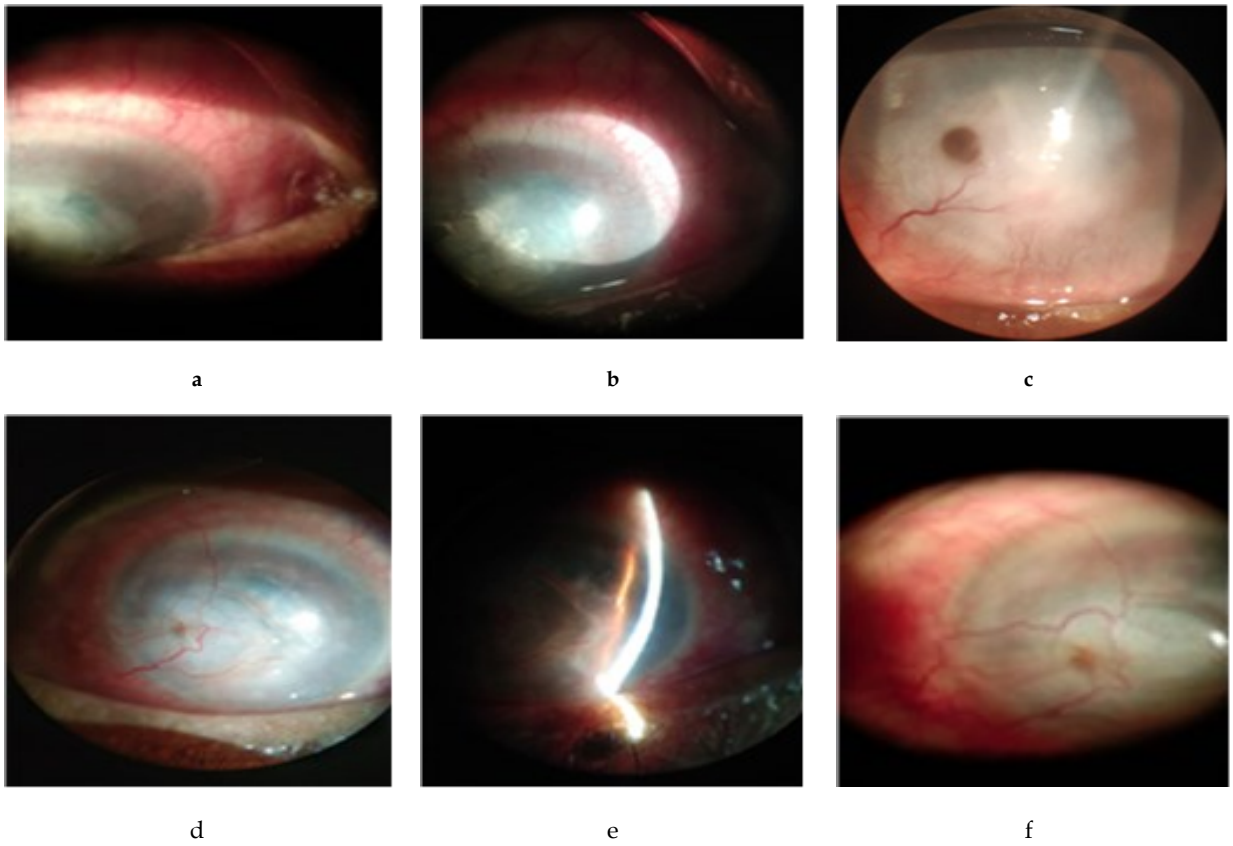

FIGURE 2 a. and b. After two days: formation of anterior chamber a bit superiorly; c. After 21 days: V/A- CF 2ft, cornea is edematous but ulcer is healing, previous BCL was removed: d. and e. After one month: superficial and deep vascularization with inferonasal corneal scaring and thinning: f. after two months: corneal scar formation

developed countries, fungal and bacterial corneal infections are common in the developing world. Noninfectious causes of corneal perforation are ocular surface-related, autoimmune causes and traumatic corneal perforation.[10]

As stromal necrosis progresses the infection expands deeper into the corneal layers and ultimately causes perforation. Even after stopping the bacterial growth, there is a native imbalance occurs between the cytokines which contributes to corneal melting and causes. Bacterial and fungal infections favour corneal perforation.[11] Some collagen vascular diseases, e.g., systemic lupus erythematosus, rheumatoid arthritis, sarcoidosis, inflammatory bowel disease, Wegener granulomatosis and temporal arteritis may be involved with corneal melting.[11]

Herpetic keratitis corneal perforations are caused by necrosis of the corneal stromal layer. Active viral replication also may be present in some cases, in this situation the host immune response is supposed to be the main factor. The corneal stromal destruction is mostly mediated by collagenases and matrix metalloproteinases which come from the macrophages and polymorphonuclear cells.[8] Recurrent infection along with progressive corneal thinning further extends to corneal perforation.[8] In the case of necrotizing stromal keratitis, the cornea epithelial layer breaks down over the area of a dense stromal infiltrate, producing a superficial ulcer that may be slowly or rapidly deepen, developing a descemetocele and ultimate perforation of the cornea.

An early initiation of treatment and close monitoring is very important. Otherwise, these ulcers may perforate abruptly with too much use of topical corticosteroid or antiviral therapy.

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Author Contributions

- Conception and design: MSA
- Acquisition, analysis, and interpretation of data: MHB, RD, MSR, MSK
- Manuscript drafting and revising it critically: MHB, MSA, MMH
- Approval of the final version of manuscript: MHB, MSA, RD, MSR, MSK, MMH
- Guarantor accuracy and integrity of the work: MHB

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Conflict of Interest

The authors have no conflict of interest to declare.

Ethical approval

Although ethical clearance was not sought, consent from the patient was obtained.

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