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Case Report

Ophthalmology Section

Non Infectious Descemetocele Treated with a Surgical Drape Patch: A Case Report

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ABSTRACT

A corneal descemetocele is the anterior herniation of an intact Descemet membrane through an overlying stromal defect. Though, a rare complication, it is a serious one that needs to be treated at the earliest. If not treated promptly, it may result in a full-thickness corneal perforation which will hinder the ocular integrity and may end up with vision-threatening complications. Here, the authors report a case of a 58-year-old female patient who came to the Outpatient Department with complaints of redness and pain in the Right Eye (RE). The patient on examination had a descemetocele impending perforation of the right eye. On the initial visit, a Bandage Contact Lens (BCL) was placed. On follow-up, after one week, the BCL was displaced due to undue rubbing of the eye by the patient, and on readjustment, it ended up with corneal perforation. As an emergency, treatment was required and due to a shortage of donor corneal tissue in the ongoing pandemic, a tectonic patch was made by trephining non-sticky part of sterile plastic drape which was available on-site and a double drape patch technique was performed. Both the patches were then placed over the perforation, which sealed the perforation completely. On a consecutive follow-up of one week and one month, the authors found the patch to be intact and maintaining ocular integrity. A tectonic drape patch technique is a viable and easy method of closing an open wound with nontraumatic corneal perforations when other methods to immediately seal the wound are not available.

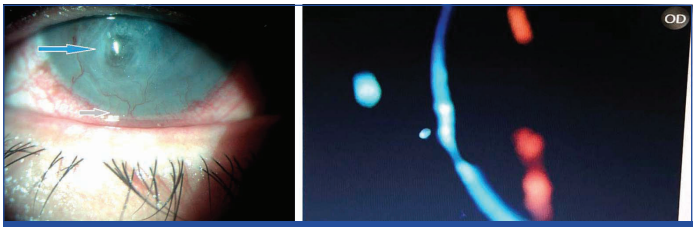
Keywords: Cyanoacrylate glue, Corneal perforation, Descemet membrane, Double drape tectonic patch

CASE REPORT

A 58-year-old female patient, a housewife, visited the Ophthalmology Outpatient Department, Dr. D. Y. Patil Medical College Hospital and Research Centre, Pimpri, Pune, Maharashtra, India, with complaints of pain in the right eye for two days, which was sudden in onset, progressive, continuous, sharp and radiating to the forehead. The patient also complained of associated diminution of vision, intolerance to light, redness and watering in the right eye which was also sudden in onset and progressive in nature with no aggravating or relieving factors. There was no history of any sticky discharge from the eye, no itching and no history of any mechanical or chemical trauma that the patient could recall. Also, there was no history of instillation of any eye drops. The patient gave a history of right eye cataract surgery done 12 years back and Left Eye (LE) cataract surgery two years back which were uneventful.

The general examination was within normal limits. On ocular examination, (RE) vision was reduced to 6/36 not showing any improvement by pinhole on Snellen's visual acuity and near vision N/12. The Left Eye (LE) Best Corrected Visual Acuity (BCVA) was 6/9 and near vision was N/6. On slit lamp examination of the RE, Anterior segment showed circumcorneal congestion, a circular area of approximately 1.5×1.5 mm with approximately 80 percent thinning present. This area was surrounded by folds in the Descemet's membrane with stromal haze present. Superficial punctate keratopathy was present all over the cornea. Iris pigments were present on the endothelium. The anterior chamber was deep and showed no cells and flare. A paracentral area at 6:30 O'clock position not taking up a stain was noted [Table/Fig-1,2]. The seidel's test was negative. Posterior chamber intraocular lens was placed in-situ; and the posterior segment examination showed, Optic disc was within normal limits, Macula was normal with dull foveal reflex, and the peripheral fundus appeared hazily within normal limits.

On examination of LE, the anterior segment examination on the slit lamp showed no abnormalities and a posterior chamber intraocular lens was placed in-situ. The posterior segment examination showed

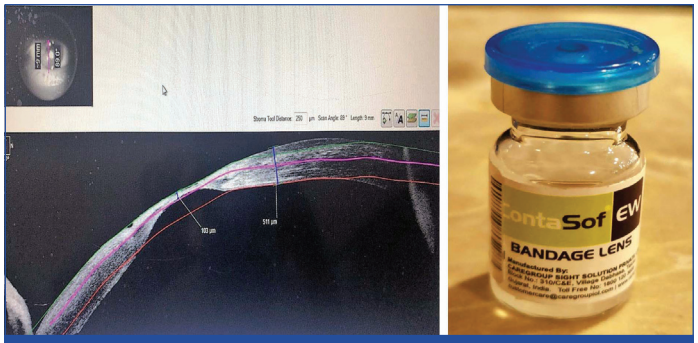


[Table/Fig-1]: Image of the Right Eye (RE) on the first day of the presentation showing circumcorneal congestion (Grey arrow), stromal haze, folds in the Descemet's membrane and a thinned-out cornea at 6.30 O'clock position paracentrally around 1.5×1.5 mm (Blue arrow). **[Table/Fig-2]**: Slit lamp image of the right eye (RE) showing the thinning of cornea in the slit section. (Images from left to right)

optic disc within normal limits, macula was normal with a dull foveal reflex and peripheral fundus was also within normal limits. Intraocular Pressure (IOP) of RE was not recorded as the corneal integrity was compromised, IOP of LE was 14 mmHg. An Anterior Segment Optical Coherence Tomography (AS-OCT) imaging of the RE was done which showed marked thinning of the cornea [Table/Fig-3].

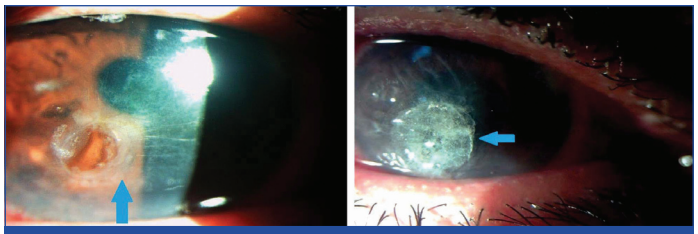
All routine investigations were done and the results were within normal limits. The Rheumatoid Arthritis (RA) factor, Antinuclear Antibodies (ANA) was within normal limits and the patient was seronegative. Chest X-ray and X-ray lumbosacral spine were normal. The patient was prescribed regular medical treatment with topical antibiotics, lubricants and a cycloplegic with IOP lowering medications. A BCL(Contasof EW, care group sight solutions, India) was placed [Table/Fig-4]. On the first follow-up after one week, an intense anterior chamber reaction was noted with the formation of the pupillary membrane and a displaced BCL was noted. On further enquiry, the patient confessed that she rubbed the eye. On readjusting the BCL, the Descemetocele perforated with the iris plugged the perforation [Table/Fig-5].

As an emergency treatment was required and due to a shortage of donor corneal tissue in the ongoing pandemic, a tectonic patch made by trephining Spunbond/Meltblown/Spunbond (SMS) polypropylene fabric was placed over the perforation [Table/Fig-6].



[Table/Fig-3]: AS-OCT (Anterior segment optical coherence tomography) image of the right eye showing marked thinning of the cornea. **[Table/Fig-4]**: Image of the Bandage Contact Lens (BCL) used. (Images from left to right)

The patient was also started on oral steroids with tapering dosage and topical antibiotics and homatropine eye drops. The patient was asked to follow-up after one week. On presentation, the visual acuity was hand movement close to face, Projection of Rays (PR) accurate and anterior chamber reaction was reduced along with circumcorneal congestion. At one month follow-up, the patient elicited a visual acuity of 6/60 according to Snellen's visual acuity chart. It also showed that the drape material was biocompatible and maintained ocular integrity.



[Table/Fig-5]: Image of the left eye on first follow-up showing a corneal perforation with the iris plugging it (Blue arrow); **[Table/Fig-6]**: Post procedure image of the right eye showing the double drape patch covering the perforation with the cyanoacrylate glue (Blue Arrow). (Images from left to right)

DISCUSSION

The anterior herniation of an intact Descemet membrane (DM) through an overlying stromal defect is called a corneal descemetocele. Though, it is a rare complication, it is a serious one [1]. In this uncommon but serious complication of corneal ulceration, the stroma thins to such an extent that only the DM maintains the integrity of the globe [2-4]. Although, causes of descemetocele may include collagen vascular diseases, autoimmune disorders, rheumatoid arthritis, ocular pemphigoid, local irradiation, in cases with trauma and Mooren's ulcers [5,6], but in the present case, a specific local or a systemic cause even after testing for systemic causes could not be ascertained.

A full-thickness corneal perforation can result if the conditions are not treated promptly. Jyoti Deswal et al., reported a case of bilateral corneal perforation in a patient with a severe dry eye disease which was treated using a sterile plastic sheet, cyanoacrylate glue and a BCL (Bandage contact lens) was placed over it which showed promising results [7]. A case of sterile corneal perforation in a 20-year-old Indian male with severe dry eye disease was reported by Baranwal VK et al., [8]. Four patients with chronic graft-versus-host disease with dry eye who suffered corneal perforation have been reported by Inagaki E et al., [9].

Corneal perforation is classified as traumatic or nontraumatic, with nontraumatic causes classified as infectious or non infectious [10]. The most common non traumatic cause of corneal perforation is Keratoconjunctivitis sicca, although, exposure to keratopathy, neurotrophic keratitis, herpes simplex keratitis and bacterial keratitis can all lead to perforation [10,11]. Using a BCL with or without cyanoacrylate glue [12,13]. Cryopreserved amniotic membrane patch with or without fibrin glue and partial (lamellar or tectonic) and full-thickness keratoplasty operations are some of the therapeutic approaches [11,14,15]. In a perforation of less than 1 mm in diameter, the cyanoacrylate glue can be an effective modality of treatment if the perforation is located away from the limbus and is concave in shape [10]. Sometimes a clinical scenario might arise, in which the traditional methods to seal the perforation with glues, amniotic membrane grafts, or corneal tissue are not available, then the options for sealing the corneal perforations and maintaining the ocular integrity are very limited. It is vital to diagnose and treat nontraumatic corneal perforations immediately to prevent complications such as endophthalmitis, corneal decompensation, glaucoma and cataract. In non traumatic perforations, tissue loss in the cornea can make management more difficult than in lacerations with traumatic wounds.

Various techniques for applying cyanoacrylate glue have been proposed [13]. One method involves cutting out a piece of drape and applying a lubricant jelly to the cotton swab; then the cyanoacrylate glue is applied to the other side. This is done by applying cyanoacrylate glue to the surface of the drape [13]. Another technique that was reported was fabricating a sterile surgical drape into a tectonic patch that was applied directly to the perforation instead of the glue [16]. Present system used a skin punch to cut a 2 mm diameter and a 3 mm diameter disc from the nonsticky part of the sterile surgical drape (SMS polypropylene fabric). The 3 mm disc was first centered on the corneal perforation to protect the iris. The larger patch was then glued over the 3 mm patch and covered with a therapeutic bandaged contact lens, this technique was also reported by Gandhewar J et al., [17].

Cryopreserved amniotic membrane and fibrin glue were used in the sealing of non infectious corneal perforations by Duchesne B et al., [14]. Taking into consideration that fibrin glue may potentiate bacterial and fungal infections, it is important to avoid it for these kinds of cases. Nevertheless, fibrin glue may aid corneal healing by stimulating the production of scar tissue. However, some authors have reported that cyanoacrylate glue is bacteriostatic [13]. Both types of glues are well tolerated by the corneal tissue. In some clinical scenarios, corneal tissue is not available on demand for sealing of the corneal perforations and cyanoacrylate glue may not hold and even fail before a corneal tissue is available for further treatment. Many surgeons prefer to use glue as a temporising measure rather than penetrating or lamellar keratoplasty procedures, which are ideally carried out when the eye is stable and inflammation is minimal [18]. This case shows a relatively less used method of how a tectonic double drape patch with cyanoacrylate glue could help restore the integrity of the eye. There is no known maximum size of perforation for which tectonic drape patching can be utilised, but we managed to patch the perforation successfully using this method and this temporary measure was well tolerated. This measure kept the eye stable for a period of one month. On follow-up of one month, clinical examination showed that the drape material was favourable, durable and non-immunogenic, maintained the ocular integrity of the globe and we could salvage a visual acuity of 6/60 on Snellen's visual acuity chart.

CONCLUSION(S)

A tectonic drape patch technique is a viable and easy method of closing an open wound with nontraumatic corneal perforations, when other methods to immediately seal the wound like using bandaged contact lens with cyanoacrylate glue have failed and in cases of unavailability of amniotic membrane graft or corneal tissue, as observed in the present case due to the ongoing pandemic situation.

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