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Bandage Contact Lens as an Alternative to a Temporary Keratoprosthesis for Vitrectomy With Concurrent Corneal Opacity

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Abstract

Purpose: To present a case of a bandage contact lens being used as an alternative to a temporary keratoprosthesis for urgent vitreoretinal surgery. **Methods:** A single case was evaluated. **Results:** A 72-year-old man with monocular vision presented with a retinal detachment (RD) after repair of a traumatic globe rupture. His ocular history included previous penetrating keratoplasty (PKP) and RD surgery in the eye that had visual ability. The previous corneal graft was opacified and a conventional temporary keratoprosthesis was unavailable. After removal of the corneal graft, a bandage contact lens was used as an alternative to a temporary keratoprosthesis. Subsequently, pars plana vitrectomy and a PKP were performed. The bandage contact lens provided excellent visualization for the vitrectomy and resulted in a successful final outcome. **Conclusions:** When corneal opacity precludes vitrectomy and a temporary keratoprosthesis is unavailable, a bandage contact lens is a viable option.

Keywords

temporary keratoprosthesis, bandage contact lens, vitrectomy, corneal opacity

Introduction

Clear visualization is essential in vitreoretinal surgery. Significant corneal opacities pose a challenge in treating and monitoring retinal conditions. Patients with opaque corneas who require nonurgent vitreoretinal surgery undergo a staged approach that begins with corneal intervention followed by postoperative monitoring. Once the new graft is sufficiently clear to allow posterior viewing, retinal surgery is performed. In retinal pathologies requiring urgent intervention, however, this approach would lead to a delay of several months. Various models of temporary keratoprostheses, such as the Eckardt, Landers, and Cobo,[1–3] have been developed to allow a clear intraoperative surgical view during vitreoretinal procedures combined with penetrating keratoplasty (PKP). However, it is not possible to use these models in all clinical situations,[4] and they are not always readily available, especially in time-sensitive pathologies.

Recently, a bandage contact lens used as an alternative to a conventional temporary keratoprosthesis was described by Skevas et al[4] in 3 cases and by Cisiecki et al[5] in 1 patient. We present a successful case in which a bandage contact lens was used instead of a temporary keratoprosthesis for urgent vitreoretinal surgery and discuss the benefits and challenges of this application.

Case Report

A 72-year-old man with monocular vision and a history of previous PKP, primary open-angle glaucoma with a Baerveldt tube in situ, and repair surgery for a retinal detachment (RD) in the eye that had visual ability suffered traumatic dehiscence of his keratoplasty. His fellow eye was blind (no light perception) as a result of advanced glaucoma. The visual acuity (VA) in the left eye was hand motions (HM).

Two weeks after primary repair of the ruptured globe, the patient developed a new RD. The old corneal graft was opacified and limited posterior viewing. An urgent pars plana vitrectomy (PPV) with the intraoperative use of a temporary keratoprosthesis was required to reattach the retina. However, a conventional keratoprosthesis could not be obtained within a reasonably short

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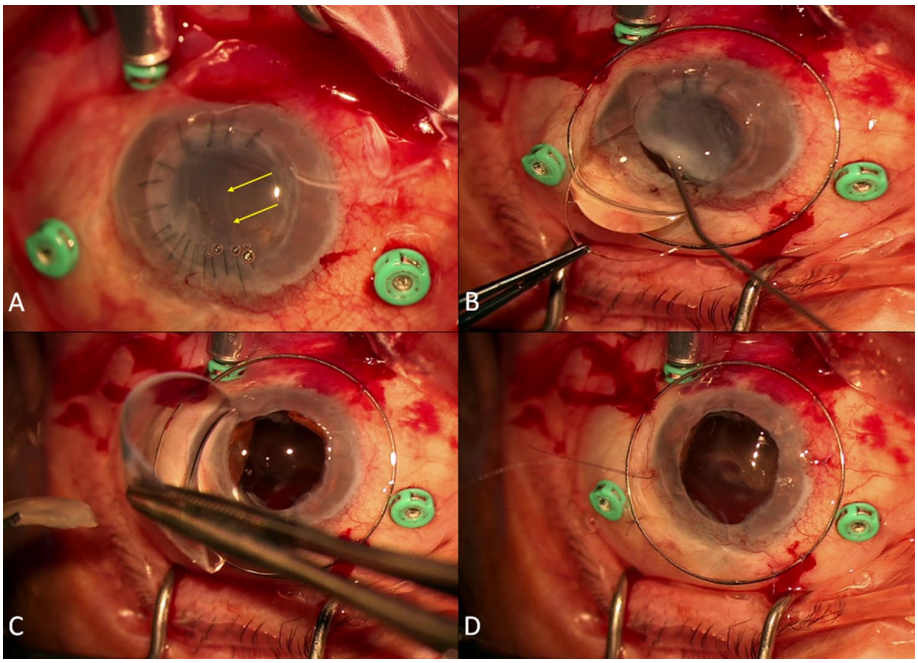

Figure 1. Preparation before vitrectomy. (A) The original corneal graft shows scarring and edema with an off-center intraocular lens (IOL) (arrows). (B) Three ports are introduced through the pars plana. A Flieringa ring is sutured around the cornea to provide stability. The superonasal corneal sutures are removed, and the IOL is explanted. (C and D) After removal of the patient's opacified corneal graft, a 14.0 mm bandage contact lens is affixed to the sclera using interrupted 8-0 polyglactin sutures.

time frame locally or in the region. Therefore, a bandage contact lens was used as an off-license alternative.

After obtaining informed consent from the patient, surgery was performed under general anesthesia. Three 25-gauge ports (Alcon) were placed and a Flieringa ring (Storz Ophthalmics) was secured to the sclera (Figure 1, A and B). The patient's opaque corneal graft and the traumatically dislocated intraocular lens were removed (Figure 1C). A 14.0 mm bandage contact lens (Bausch + Lomb) was sutured to the patient's sclera with interrupted 8-0 polyglactin (Vicryl, Ethicon) sutures (Figure 1D). The PPV proceeded, with the contact lens providing excellent visualization (Figure 2, A and B). Perfluorocarbon was used to reattach the retina, and subretinal fluid was drained through the retinal breaks. After laser retinopexy of the peripheral retinal breaks, an exchange with heavy liquid, air, and silicone oil (SO) (5700 cc) was performed. After the bandage contact lens was removed, a new 7.75 mm corneal graft was secured with 16 interrupted 10-0 nylon sutures (Figure 2, C and D).

Over the next 3 months, additional procedures were needed for epimacular proliferative vitreoretinopathy (PVR) and recurrent RD under SO. Six months postoperatively, with corneal sutures and SO in situ, the patient's retina remained attached and the VA was counting fingers (CF) at 50 cm (Figure 3).

Conclusions

The use of a bandage contact lens as a temporary alternative to a conventional keratoprosthesis represents an innovative and pragmatic approach in cases of urgent vitreoretinal surgery involving significant corneal opacities. This case highlights the feasibility, benefits, and limitations of this modality for intraoperative visualization as well as the challenges associated with managing complex coexisting corneal and retinal pathologies.

The primary advantage of the bandage contact lens is its ability to provide excellent widefield intraoperative visualization of the retina, allowing surgeons to precisely perform critical maneuvers such as vitrectomy, laser retinopexy, and fluid–air exchange. This clarity is crucial in cases of urgent RD repair where delays could result in irreversible vision loss. Moreover, bandage contact lenses have significant benefits, including availability and cost-effectiveness. Unlike conventional temporary keratoprostheses, which may not be readily available in all settings or regions, bandage contact lenses are widely accessible and can be adapted for off-license use, thereby minimizing delays in urgent surgical interventions. The ease of preparation and adaptability for intraoperative application make them a practical choice when conventional temporary keratoprostheses are unavailable.

Bandage contact lenses have distinct advantages over conventional options such as the Eckardt temporary keratoprosthesis, whose trephination size is a limiting factor. Bandage contact lenses are versatile and can be readily used in eyes with smaller graft sizes, as shown by Skevas et al.[4] In addition, unlike permanent solutions such as the Boston keratoprosthesis, the bandage contact lens is temporary and can be easily replaced with an allograft at the conclusion of the operation. The sterility and single-use nature further reduce the risk for endophthalmitis, enhancing the safety profile of this innovative approach.

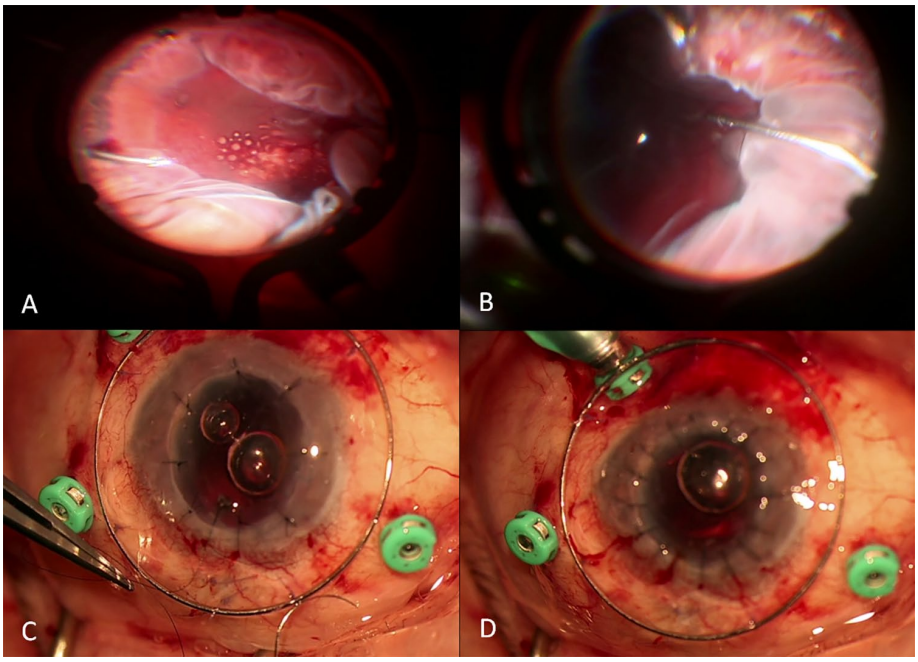

Figure 2. (A and B) Intraoperative view through the bandage contact lens during vitrectomy. Turbulence caused by an intraoperative fluid leak is seen. (C and D) After placement of silicone oil (SO), the bandage contact lens is removed and a new corneal graft transplanted. Additional SO is then applied as needed.

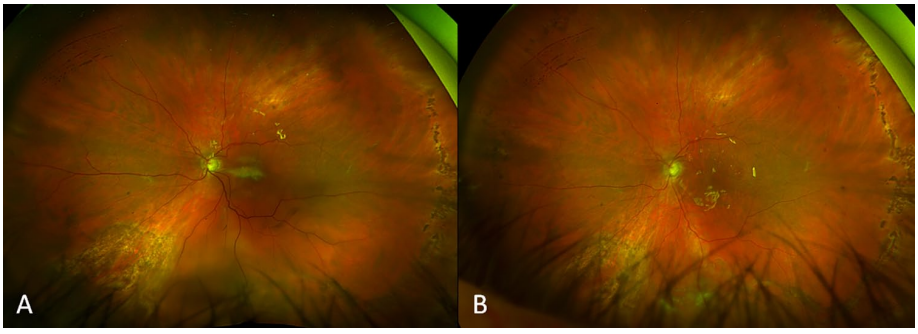

Figure 3. (A) One week postoperatively, the posterior pole is completely attached with a small amount of inferior subretinal fluid, which progressed as a result of epimacular proliferative vitreoretinopathy. (B) After 2 additional surgeries, the retina remains attached.

Despite its advantages, the bandage contact lens as a substitute for a temporary keratoprosthesis presents specific challenges. The soft, pliable nature of the material increases the risk for fluid leakage during surgery. This was effectively managed in our patient's case by securing the lens with additional interrupted sutures and exercising careful surgical technique, in particular during globe indentation. However, this approach requires meticulous stitching to prevent cheese-wiring of the sutures through the lens material.

As shown by Sinha et al,[6] RDs associated with open-globe injuries carry a notoriously poor prognosis as a result of the compounded challenges of managing PVR, aphakia, and recurrent detachment, all of which were present in our patient. These factors, coupled with the delayed intervention required by the initial corneal repair, contribute to the guarded visual outcomes (VA of CF or worse) often observed in such cases. The reports by Skevas et al[4] and Cisiecki et al[5] support this observation, with their patients' final visual outcomes limited to HM (all 3 patients in the Skevas et al series) or light perception (1 patient in the Cisiecki et al report). Considering all the complicating factors, our patient had a relatively favorable visual outcome of CF.

The management of patients with concurrent corneal opacities and RDs requires a highly coordinated approach involving both vitreoretinal and corneal specialists. The simultaneous need for urgent retinal intervention and corneal clarity imposes a narrow window for effective treatment. Although temporary keratoprostheses remain the gold standard for such cases, the adaptability of the bandage contact lens offers a viable alternative when access is limited.

The current case adds to the growing body of evidence supporting the off-license use of bandage contact lenses as temporary intraoperative measures in urgent vitreoretinal surgeries. The main challenges are the rarity and clinical variability of such cases, and further research is needed to systematically evaluate the outcomes of this approach across a larger cohort of patients. Although not without limitations, this approach offers a valid alternative in time-sensitive pathologies when access to conventional temporary keratoprosthetics is limited. With careful surgical technique and a multidisciplinary approach, bandage contact lenses can facilitate sight-preserving procedures in even the most challenging clinical scenarios.

Ethical Approval

The authors' institution does not require ethical approval for reporting individual cases or case series.

Statement of Informed Consent

Informed consent for information published in this article was not obtained because no potentially identifiable images or data are included in this article.

Declaration of Conflicting Interests

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