

**Case Report****Corneal Perforation after Pterygium Excision in Rheumatoid Arthritis Patient**

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**Abstract**

A 73-year-old woman with rheumatoid arthritis (RA) presented with corneal perforation at nasal cornea of her left eye after primary pterygium excision and amniotic membrane grafting without other adjunctive therapy. She was successfully treated with lamellar keratoplasty using corneoscleral graft, without signs of graft rejection at 6 months postoperatively.

**Keywords:** Corneal perforation, Pterygium excision, Lamellar keratoplasty, Rheumatoid arthritis

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## Introduction

There are various postoperative complications of pterygium excision, including recurrence, graft edema, graft necrosis, graft retraction, dellen, persistent epithelial defects, corneoscleral thinning, corneal perforation, pyogenic granuloma, epithelial inclusion cysts, etc.<sup>1</sup>

Corneal perforation is a rare but serious complication of the pterygium excision.<sup>2</sup> It can lead to corneal infection, cataract, glaucoma, endophthalmitis, or even loss of the eye globe.<sup>3</sup> Corneal perforation following pterygium surgery may be associated with corneal dellen,<sup>4</sup> adjunctive antimetabolic agents using to prevent the recurrence,<sup>2,5</sup> excessive trauma to limbus and cornea during excision,<sup>6</sup> and patients' underlying conditions, especially keratoconjunctivitis sicca<sup>3</sup> and autoimmune disorders.<sup>3,6</sup> We report a case of rheumatoid arthritis patient with corneal perforation after primary pterygium excision and amniotic membrane grafting without other adjunctive therapy.

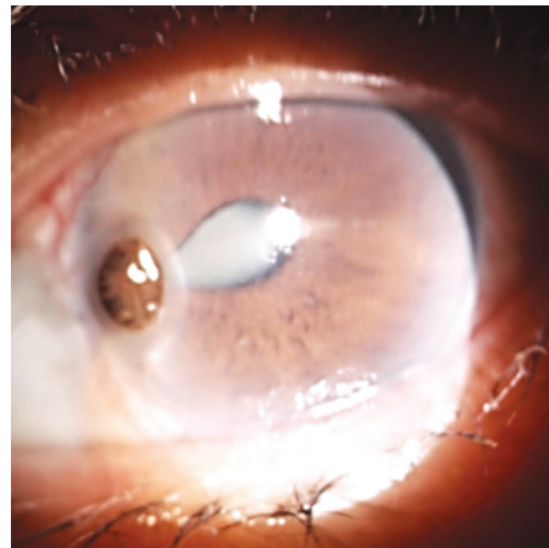
## Methods

A 73-year-old woman with hypertension and rheumatoid arthritis, well-controlled with methotrexate 7.5 mg per week, presented at the emergency room with blurred vision, eye irritation and tearing of the left eye for 3 days.

The patient had a history of pterygium both eyes. Preoperative ophthalmologic examination showed that both cornea were clear and did not have punctate epithelial erosion. She underwent primary pterygium excision and amniotic membrane grafting without other adjunctive therapy for right eye 10 months previously. The surgical area was completely healed without recurrence. Then she underwent primary pterygium excision and amniotic membrane grafting without other adjunctive therapy for the left eye 6 weeks previously. The surgery went well without any intraoperative complication. First day after left eye surgery, she had nasal corneal epithelial defect 2 mm in size. The patient was prescribed non-preserved artificial tears every 2 hours and a combination of prednisolone acetate (1%) and ofloxacin (0.3%) eye drops every 2 hour. Postoperative evaluation at one week after surgery, the amniotic membrane was well-attached, but the epithelial defect at nasal cornea was still in the same size as previous visit. Neither corneal

thinning nor dellen ulcer was seen. The combination of prednisolone acetate (1%) and ofloxacin (0.3%) eye drops was decreased to every 4 hours. The surgeon gave her an appointment the following week, but she lost follow up.

On ophthalmologic examination, her best corrected visual acuity (BCVA) was 20/80 and 5/200, right and left eye, respectively. Slit-lamp examination of her left eye revealed round-shaped corneal perforation at nasal cornea, the area which the pterygium was removed, size 2 mm in diameter, and positive for Seidel test. There was no infiltration around the perforation. Iris incarceration, peaked pupil and shallowed anterior chamber were observed (Figure 1).



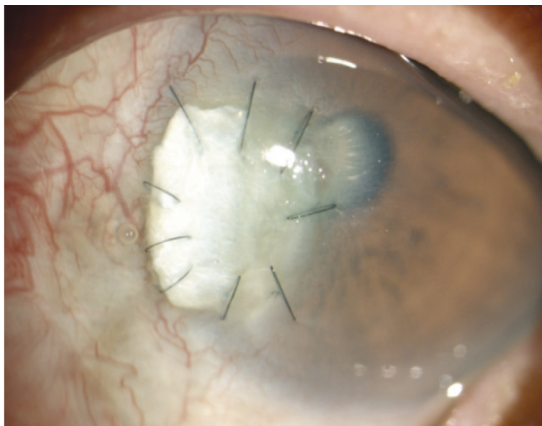
**Figure 1** Slit-lamp examination of the left eye reveals a focal area of corneal perforation with iris incarceration and peaked pupil.

The patient was admitted to the hospital and treated with lamellar keratoplasty using corneoscleral graft, sutured with 9 interrupted 10-0 nylon sutures, without complication. After surgery, she received sodium hyaluronate (0.18%) every 1 hour, 20% autologous serum every 1 hour, prednisolone acetate (1%) every 4 hours and moxifloxacin (0.5%) 4 times a day.

## Results

By the lamellar keratoplasty, the perforation was sealed, Seidel test was negative, and

the anterior chamber was formed. The epithelial defect was slowly healed and did not close despite full medication, so we used bandage soft contact lenses to help epithelialization and gradually tapered the frequency of topical corticosteroid. Corneal re-epithelialization was completed at 2 months after surgery (Figure 2). At 6 months postoperation, her left eye BCVA was 20/200. No signs of graft rejection were observed.



**Figure 2** The corneal perforation was sealed with lamellar keratoplasty using 10-0 nylon sutures.

### Discussion

Pterygium is a common ocular surface disease, characterized by fibrovascular growth of the conjunctiva onto superficial cornea. Patients with pterygium may be asymptomatic or may have symptoms such as eye irritation, blurred vision and limited ocular motility. Most of the patients can be alleviated by medical treatment; artificial tear, antihistamine eyedrops and short-course topical corticosteroids. Surgical excision is indicated in patients who have chronic eye irritation, blurred vision or irregular astigmatism from progressive growth of pterygium toward the central cornea or visual axis, and ocular motility restriction. Surgical techniques available include the bare sclera technique, conjunctival autograft, conjunctival limbal autograft, and amniotic membrane transplantation with or without adjuvant therapy, such as  $\beta$ -irradiation, mitomycin C, 5-fluorouracil, and anti-vascular endothelial growth factor (anti-VEGF).<sup>1,2</sup>

Corneal perforation is one of the postoperative complications of pterygium excision. It is

a rare but serious complication due to its morbidity. Corneal perforation following pterygium surgery may be associated with corneal dellen,<sup>4</sup> adjunctive antimetabolic agents using to prevent the recurrence,<sup>2,5</sup> excessive trauma to limbus and cornea during excision,<sup>6</sup> and patients' underlying conditions, especially keratoconjunctivitis sicca<sup>3</sup> and autoimmune disorders.<sup>3,6</sup>

Concomitant significant conjunctival edema after pterygium excision, especially with bare sclera technique, inhibits a normal tear distribution over the cornea, then results in corneal dellen and eventually causes corneal perforation.<sup>2,4</sup> Accorinti et al.<sup>4</sup> reported a patient with corneal and scleral dellen after pterygium surgery with a bare sclera technique without the use of antimetabolites, which appeared after the patient had a fever only 2 days. They discussed that the febrile episode seems to cause acute dehydration and be the promoting factor of the dellen. Gomez et al.<sup>2</sup> also reported the patient who developed corneal perforation in the centre of corneal dellen in his right eye and corneal dellen in his left eye after the surgical treatment of a bilateral pterygium with a bare sclera technique without adjunctive therapy.

To reduce the pterygium recurrence rate, the antimetabolic agents, such as mitomycin C, was used. Although mitomycin C has a benefit from its antiproliferative effect, it might delay conjunctival and corneal epithelial healing and cause dellen or even perforation of sclera and cornea.<sup>2,4,5</sup> Menghini et al.<sup>5</sup> described a case of rapidly progressive cornea melting 2 weeks after pterygium excision with intraoperative topical mitomycin C. The author did not apply any adjunctive substances to the patient's eye during the pterygium excision.

Drozhdzina et al.<sup>6</sup> reported 5 cases of patients with corneal ulceration and perforation due to deep pterygium excision, so they recommended the ophthalmologists to excise pterygium with minimal trauma to limbus and cornea. In the same article, there were 4 cases of corneal ulceration and perforation who have concomitant autoimmune diseases, including rheumatoid arthritis.

Rheumatoid arthritis is the most common chronic systemic inflammatory autoimmune disease. The patients may present with joint pain, joint stiffness, swelling, and decreased movement of the joints due to inflammatory polyarthritis.

Multiregional, extra-articular manifestations may be occurred. The ocular surface of the eye is one of the regions affected, keratoconjunctivitis sicca is the most common ocular manifestation. Corneal manifestations include marginal corneal thinning, keratolysis, stromal corneal opacities with peripheral vascularization, and associated iridocyclitis. Other common ocular complications are episcleritis, scleritis, and retinal vasculitis.<sup>7</sup>

Surgical trauma in rheumatoid arthritis patient can incite macrophage and neutrophil infiltration, initiate progressive immunologic response and immune complexes deposition which contribute to keratolysis.<sup>6,8</sup> Fibroblasts are recruited and activated during the initial inflammatory process, resulting in the complement cascade.<sup>8</sup> The surgical trauma itself may cause ocular immune privilege compromise and induce immune responses due to molecular mimicry.<sup>8</sup> This mechanism is the most likely cause of corneal perforation in our patient.

Our study supports that the ophthalmologist should give a special attention to a patient's concomitant disease, especially autoimmune disease, before going on a pterygium surgery. The patient should be provided close and careful follow-up postoperatively. Early detection of complication after surgery and prompt treatment is important. Corneal perforation after pterygium surgery can be successfully treated by lamellar keratoplasty.

### Acknowledgments

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