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Case Report

Pseudomonas Scleritis following Pterygium Excision

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Keywords
Pseudomonas aeruginosa · Infectious scleritis · Surgical debridement

Abstract
Purpose: The aim of this case report was to describe a patient who presented with *Pseudomonas* scleritis after pterygium excision. The study was conducted at the Department of Ophthalmology, Faculty of Medicine, Chiang Mai University in Chiang Mai, Thailand. ***Methods:*** The record of a patient who was diagnosed as *Pseudomonas* scleritis after pterygium excision was retrospectively reviewed for history, clinical characteristics, laboratory findings, treatments, and outcomes. ***Results:*** We described a 66-year-old male patient with a history of pterygium excision in his right eye 10 years ago, he presented with infectious scleritis. Scleral thinning, tissue necrosis, and overlying calcified plaque were found. The culture of scleral scraping revealed *Pseudomonas aeruginosa*. Topical fortified amikacin (20 mg/mL) and intravenous ceftazidime were started. Urgent surgical debridement of scleral infiltrates and irrigation of necrotic sclera and surrounding conjunctiva with fortified amikacin (20 mg/mL) were performed. After 2 weeks of treatment, scleral thinning and inflammation decreased, and the best-corrected visual acuity improved from 6/24 to 6/9. Fortified amikacin eye drops (20 mg/mL) were continued until the fourth week, with no scleral thinning seen. ***Conclusions:*** *P. aeruginosa* is a virulent organism that causes infectious scleritis complicated by melting and necrotizing of the sclera. This report emphasized that early recognition, intensive antimicrobial treatment, and surgical debridement can prevent morbidity related to this *Pseudomonas* infection.

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Introduction

Scleritis has been classified as infectious scleritis and immune-mediated scleritis. Infectious scleritis is rare and typically occurs following trauma or surgery. The most common surgical cause of infectious scleritis is a previous pterygium excision [1, 2] with other causes from prior cataract surgery [1], prior strabismus surgery [3], and prior trabeculectomy [4]. The most common causative pathogen of infectious scleritis is *Pseudomonas aeruginosa* [2, 5–7], a virulent organism that can produce protease. Previous studies have reported various treatments of infectious *Pseudomonas* scleritis with topical antibiotic eye drops only [8], adjunctive oral imipenem [9], adjunctive intravenous ceftazidime and aminoglycoside [10], adjunctive surgical debridement [11], adjunctive cryotherapy [12], and autologous perichondrium graft [13]. This study demonstrated another option of treatment in a patient with infectious *Pseudomonas* scleritis.

Case History

A 66-year-old Thai male patient presented with a history of right eye pain and redness with mucopurulent discharge for 10 days. He had a pterygium excision in his right eye 10 years ago but no history of eye injury or underlying autoimmune disease. A secondary hospital referred him to our tertiary hospital after 1 week of treatment for necrotizing scleritis with gatifloxacin ophthalmic solution hourly in his right eye and ciprofloxacin (500 mg) 1 tablet twice daily, with no improvement of his lesion.

At his first visit, the best-corrected visual acuity (BCVA) was 6/24, OD and 6/6, OS. Slit-lamp examination revealed marked injection of the conjunctiva, mucopurulent discharge, and scleral thinning surrounded by edematous tissue in the temporal sclera near the limbus (Fig. 1a). The patient was admitted and was treated as infectious necrotizing scleritis. Scleral scraping was performed, and the scleral tissue was sent for bacterial and fungal culture, KOH examination, and gram staining. The result of bacterial culture showed *P. aeruginosa* (Fig. 1b), which was sensitive to amikacin, colistin, ceftazidime, imipenem, meropenem, ciprofloxacin, and levofloxacin. Treatment was started with fortified amikacin (20 mg/mL) hourly, acetylcysteine eye drops 4 times daily, intravenous ceftazidime 1 gm every 8 h, vitamin C (500 mg) 1 tablet twice daily, and doxycycline (100 mg) 1 tablet twice daily. Urgent surgical debridement of superficial necrotic tissue and all discharge was performed after 4 days of nonresponsive medical treatment. After 2 weeks of medication, the BCVA improved to 6/9 in the right eye with decreased scleral thinning, ciliary injection, and mucopurulent discharge (Fig. 1c). Intravenous ceftazidime was discontinued, and fortified amikacin (20 mg/mL) was decreased to every 2 h, while other medications were continued. After 3 weeks of intensive treatment, fortified amikacin (20 mg/mL) was decreased to every 4 h, and the other medications were maintained. Fortified amikacin (20 mg/mL) was discontinued after 1 month and replaced with levofloxacin eye drops. At 2 weeks of follow-up, the BCVA was 6/9 in the right eye. No scleral thinning was seen (Fig. 1d).

Discussion

The cause of scleritis in this case was prior pterygium excision, which has been reported as the most common surgical etiology for infectious scleritis [1, 2]. The causative organism

was *P. aeruginosa*, well known as a virulent organism that produces protease and causes melting and perforation of the sclera. It also has an ability to form a biofilm complex, which impedes its clearance by the immune-defense mechanism [14]. Various methods of treatment in patients with infectious *Pseudomonas* scleritis, including topical antibiotic eye drops only [8], adjunctive oral imipenem [9], adjunctive intravenous ceftazidime and aminoglycoside [10], adjunctive surgical debridement [11], adjunctive cryotherapy [12], and autologous perichondrium graft [13] have been reported in previous studies. A study by Codère et al. [8] showed failure of medical treatment with topical antibiotic eye drops only. After being treated with topical fortified amikacin (20 mg/mL) hourly and intravenous ceftazidime 1 mg every 8 h for 4 days, the scleritis seemed to be nonresponsive to treatment. This may be explained by the poor scleral penetration of topical antibiotic eye drops. Therefore, urgent surgical debridement and wound irrigation with fortified amikacin (20 mg/mL) was performed, and all necrotic tissue and discharge were removed to promote direct scleral penetration of antibiotics. We expected the protease and biofilm had also been washed out. This study found that early surgical debridement and wound irrigation with fortified amikacin (20 mg/mL) could expedite wound healing. Topical steroid was not used in this case because mixed organisms or infection combined with fungus had been reported in previous studies [1, 15]. Furthermore, cryotherapy was not performed in this case because of inadequate evidence proven in humans [12].

Conclusions

P. aeruginosa is a virulent organism that can cause infectious scleritis complicated with melting and perforation of the sclera. This study emphasized that early surgical debridement and wound irrigation with antibiotics is an effective treatment. Prompt diagnosis and vigorous surgical and medical treatment can prevent blindness in such cases.

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Statement of Ethics

The authors have no ethical conflicts to disclose.

Disclosure Statement

None of the authors has any conflicts of interest concerning the case report.

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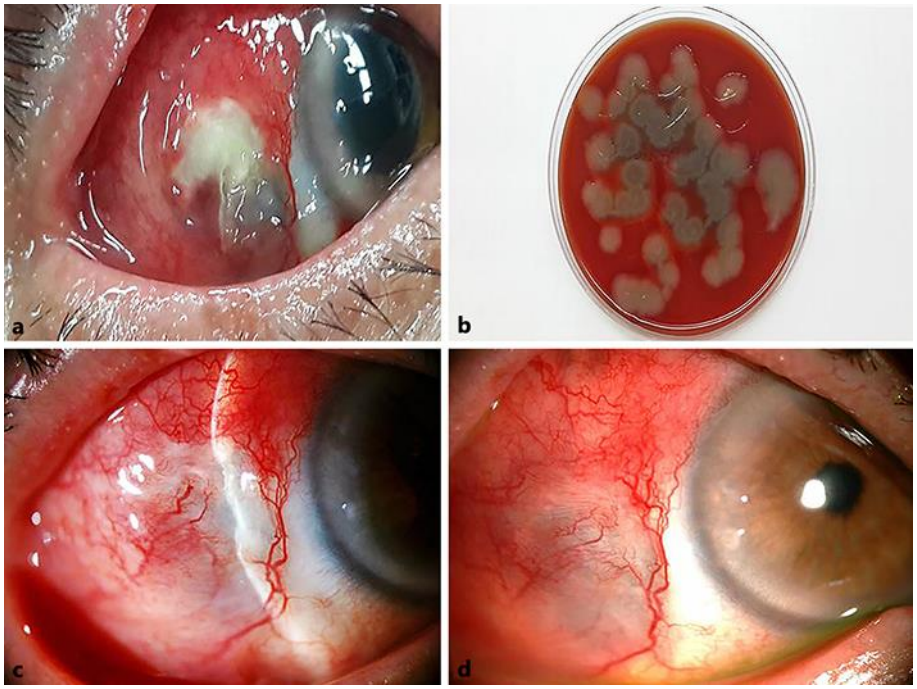

Fig. 1. Photographs of the right eye before and after treatment and colonies of *Pseudomonas aeruginosa*. **a** Marked ciliary injection, scleral thinning with necrotic tissue, and mucopurulent discharge are noted in the right eye at the first-visit eye examination. **b** Colonies of *P. aeruginosa* are demonstrated on blood agar. **c** After 2 weeks of medication, a decreased area of scleral thinning is seen. **d** Re-epithelialization without corneal involvement is shown at the first follow-up visit.