

Late-onset intrascleral dissemination of *Pseudomonas aeruginosa* scleritis following pterygium excision

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Objective To report on two cases of late-onset intrascleral dissemination of *Pseudomonas aeruginosa* scleritis following pterygium excision.

Methods Case reports.

Results Two women, one 67 years old, the second 74 years old, were referred to Chiang Mai University Hospital for treatment of *Pseudomonas aeruginosa* scleritis 5 years after pterygium excision. In both cases, after admission appropriate antibiotics were extensively administered, both topically and systemically. That therapy was combined with surgical debridement in the second case. After being admitted for 20 and 48 days, the patients' best corrected visual acuity were 6/6-2, and 6/18+2, respectively.

Conclusion Regular follow-up and early diagnosis combined with prompt and intensive treatment may save vision in cases *Pseudomonas aeruginosa* scleritis following pterygium excision. **Chiang Mai Medical Journal 2018;57(2):83-8.**

Keywords: pterygium excision, scleritis, *Pseudomonas aeruginosa*, late-onset

Introduction

Pterygium is a degenerative change of the ocular surface which is common in tropical regions (1-3). Excision of a pterygium is usually considered a simple surgical procedure, but recurrence is a significant problem (4-6).

Infectious scleritis is the most severe and destructive complication which can occur after pterygium excision (7-15). *Pseudomonas aeruginosa* scleritis following pterygium excision is a devastating complication that is usually difficult to manage and has a generally poor outcome (7,14,15,19). This report describes

two cases of intrascleral dissemination of *Pseudomonas aeruginosa* scleritis five years after pterygium excision, including the management and outcomes of treatment.

Case 1

A 67-year-old woman was referred with severe pain, redness, and decreased vision in her right eye. The condition had been extant for 5 days. She was treated with a topical antibiotic (polymyxin B) every hour for two days, but the pain and redness increased over the

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next 2 days and was accompanied by a decrease in visual acuity. She had no previous history of systemic diseases. She had a right temporal pterygium excision 5 years ago, leaving a bare sclera; no information was available regarding any adjunct therapy.

On examination, her best corrected visual acuity (BCVA) was 6/18-2 in the right eye and 6/9-3 in the left eye. Slit lamp examination of the right eye revealed a necrotic scleral ulcer at the site of the pterygium excision and severe congestion of the temporal conjunctiva with copious mucopurulent discharge. There was no anterior chamber reaction (Figure 1A). The intraocular pressure was 12 mmHg. The ocular fundus was normal. The fellow eye was normal.

A bacterial smear taken from the wound showed gram-negative bacilli and a culture grew *Pseudomonas aeruginosa*, which was sensitive to amikacin, ceftazidime, ciprofloxacin, and levofloxacin. Systemic intravenous amikacin and ceftazidime were administered for 3 days. Following evaluation of results, treatment was modified to oral ciprofloxacin.

Topical gentamicin (14 mg/mL) and cefazolin (33 mg/mL) were given hourly for 3 days, the dose gradually being decreased to every 2 hours for 7 days. This was then reduced to every 4 hours for a further 4 days, then was changed to levofloxacin every 4 hours. After the start of treatment, the pain gradually diminished during the next 2 weeks. The lesion had improved after 20 days and the patient was discharged. The BCVA at discharge was 6/6-2 (Figure 1 B). The home medication was topical levofloxacin to be applied 4 times a day and oral ciprofloxacin (500 mg) which was to be taken twice a day.

Follow-up one week after discharge ascertained that the lesion was less inflamed with dark discoloration of the sclera and there was a calcium plaque (Figure 1 C). At the 1 month follow-up, systemic and topical antibiotics were discontinued (Figure 1 D).

Case 2

A 74-year-old woman had a history of a left nasal pterygium excision with bare sclera and mitomycin C application. The surgery was

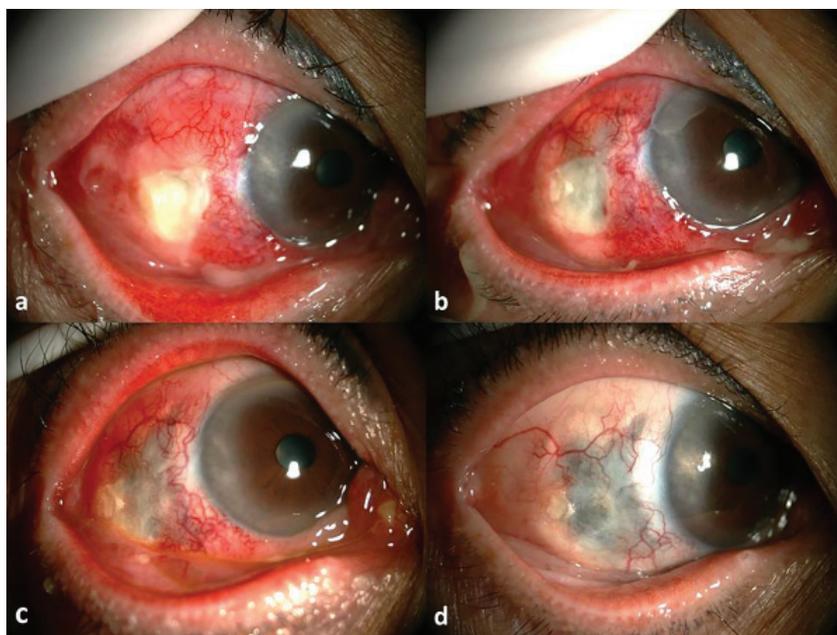


Figure 1. (A) Eye examination on admission: a necrotic scleral ulcer at the site of the pterygium excision and severe congestion of the temporal conjunctiva with copious mucopurulent discharge. (B) After 10 days of medication, the lesion showed improvement. (C) At the one week follow-up, the lesion was less inflamed with dark discoloration of the sclera and there was a calcium plaque. (D) At the 1 month follow-up, systemic and topical antibiotics were stopped.

carried out more than 5 years previously at a private clinic. She had some eye irritation and was given some lubricants and was regularly followed up at a private hospital for 3 years. At admission to the private hospital, the patient had severe eye pain, redness and lid swelling which had been present for 5 days. Her condition was treated as preseptal cellulitis and scleritis. The abscess was drained and the eye was irrigated with amphotericin B and ceftazidime. She was given systemic vancomycin and ceftriaxone in addition to topical fortified ceftazidime and fortified vancomycin. This was then changed to levofloxacin and prednisolone acetate four times a day plus oral augmentin (1gm) twice a day. She was referred to Chaing Mai University Hospital 10 days later because the lesion continued to progress.

On the day of admission at Chaing Mai University Hospital, the patient's BCVA was 6/9, 6/18-2. Slit lamp examination revealed marked injection of the conjunctiva and scleral thinning at the nasal and superior sclera near the limbus (Figure 2A). A pus culture of the lesion grew *Pseudomonas aeruginosa*, which was sensitive to amikacin, ceftazidime, ciprofloxacin, imipinem, and levofloxacin. Treat-

ment was systemic ceftazidime and vancomycin for 1 week plus topical fortified gentamicin (14 mg/mL) and levofloxacin every 2 hours for 1 week. The gentamicin and levofloxacin were reduced to every 4 hours and oral ciprofloxacin (500 mg) twice a day was added.

The lesion showed improvement and the patient was discharged after four weeks with BCVA of 6/9, 6/18+2 (Figures 2B and 2C). At the 2 week follow-up, the eye was less inflamed (Figure 2D).

Discussion

Severe complications of pterygium excision include both a non-infectious outcome, surgically induced necrotizing scleritis (SINS) (9-11), and infectious scleritis. Infectious scleritis may be caused by many microorganisms including *Stenotrophomonas maltophilia* (12), *Streptococcus pneumoniae* (13), *Aspergillus* spp., *Mycobacterium fortuitum*, and *Pseudomonas aeruginosa* (7,14,15,19). *Pseudomonas aeruginosa* scleritis may result from the extension of primary bacterial keratitis (16-18). It is the most devastating complication after pterygium excision (7,14,15,19).



Figure 2. (A) On the day of admission, marked injection of the conjunctiva and scleral thinning at the nasal and superior sclera near the limbus were observed. (B) and (C) On the day of discharge after being admitted for 4 weeks. (D) At the 1 month post-discharge.

The use of mitomycin C as a surgical adjuvant, either alone or in combination with grafting techniques, has been demonstrated to be effective in reducing recurrence after pterygium excision. Mitomycin C can be used as both an intraoperative and a postoperative adjunctive therapy. There have, however, been disastrous complications including stromalysis which might be present at any time after application (20-25). The bare sclera technique has been reported to cause scleral dellen with accompanied by acute scleral thinning after pterygium excision and intraoperative treatment with mitomycin C (26).

Since the pterygium excision in the first case was performed elsewhere, information on the preoperative characteristics of the pterygium, surgical procedures, and any adjuvant therapy were not available. Although there was no history of use of mitomycin C, a residual calcified plaque indicated probable previous application of mitomycin C. When mitomycin C is used as a surgical adjuvant in pterygium surgery, patients should be urged to continue long-term follow-up because of the potential for future anterior segment complications.

Treatment of *Pseudomonas* scleritis after pterygium excision should be aggressive. One study showed that surgical debridement in combination with appropriate antimicrobial therapy can shorten the course of treatment and may improve the visual outcome (7). There is a substantial risk, however, that the topical steroid treatment in case 2 could prolong and worsen the lesion. An infectious etiology should be considered if the presumed inflammatory scleritis does not respond to steroids as in the usual manner.

Conclusions

Regular follow up and early diagnosis plus prompt and intensive treatment may save vision in cases of *Pseudomonas aeruginosa* scleritis following pterygium excision, especially with the use of mitomycin C as an adjuvant following pterygium surgery.

Conflicts of interest

None

References

1. McCarty CA, Fu CL, Taylor HR. Epidemiology of pterygium in Victoria, Australia. *Br J Ophthalmol.* 2000;84:289-92.
2. Wong TY, Foster PJ, Johnson GJ, Seah SK, Tan DT. The prevalence and risk factors for pterygium in an adult Chinese population in Singapore: the Tanjong Pagar survey. *Am J Ophthalmol.* 2001; 131:176-83.
3. Gazzard G, Saw SM, Farook M, Koh D, Widjaja D, Chia SE et al. Pterygium in Indonesia: prevalence, severity and risk factors. *Br J Ophthalmol.* 2002;86:1341-46.
4. Hirst LW. The treatment of pterygium. *Surv Ophthalmol.* 2003;48:145-80.
5. Chaidaroon W, Thongkhao-Orn M, Wiwatwongwana D, Wiwatwongwana A. A survey of pterygium in Thailand 2010. *J Med Assoc Thai.* 2013; 96:64-8.
6. Kositphipat K, Tananuvat N, Choovuthayakorn J. Results of pterygium excision adjunct with conjunctival autograft transplantation for primary pterygium by ophthalmology trainees. *Int Ophthalmol.* 2016. doi:10.1007/s10792-016-0175-x.
7. Huang FC, Huang SP, Tseng SH. Management of infectious scleritis after pterygium excision. *Cornea.* 2000;19:34-9.
8. Lee JE, Oum BS, Choi HY, Lee JS. Methicillin-resistant *Staphylococcus aureus* sclerokeratitis after pterygium excision. *Cornea.* 2007;26:744-6.
9. Alsagoff Z, Tan DTH, Chee S-P. Necrotising scleritis after bare sclera excision of pterygium. *Br J Ophthalmol.* 2000;84:1050-2.
10. Sridhar MS, Bansal AK, Rao GN. Surgically induced necrotizing scleritis after pterygium excision and conjunctival autograft. *Cornea.* 2002; 21:305-7.
11. Jain V, Shome D, Natarajan S, Naverkar R. Surgically induced necrotizing scleritis after pterygium surgery with conjunctival autograft. *Cornea.* 2008; 27:720-1. doi: 10.1097/QAI.0b013e31815d2f27.
12. Lin HC, Ma DH, Chen yf, Yeh LK, Hsiao CH. Late-onset intrascleral dissemination of *Stenotrophomonas maltophilia* scleritis after pterygium excision. *Cornea.* 2011;30:712-5.
13. Paula JS, Simão ML, Rocha EM, Romão E, Velasco Cruz AA. Atypical pneumococcal scleritis after pterygium excision: case report and literature review. *Cornea.* 2006;25:115-7.

14. Hsiao CH, Chen JJ, Huang SC, Ma HK, Chen PY, Tsai RJ. Intrasceral dissemination of infectious scleritis following pterygium excision. *Br J Ophthalmol*. 1998;82:29-34.
15. Huang SC, Lai HC, Lai IC. The treatment of *Pseudomonas* keratoscleritis after pterygium excision. *Cornea*. 1999;18:608-11.
16. Fahim K, Houghton O, Dastjerdi M, Mian SI. Posterior scleritis secondary to *Pseudomonas aeruginosa* keratitis. *Cornea*. 2005;24:879-881.
17. Raber IM, Laibson PR, Kurz GH, Bernardino VB. *Pseudomonas* corneoscleral ulcers. *Am J Ophthalmol*. 1981;91:706-10.
18. Codère F, Brownstein S, Jackson WB. *Pseudomonas aeruginosa* scleritis. *Am J Ophthalmol*. 1981;92:353-62.
19. Su CY, Tsai JJ, Chang YC, Lin CP. Immunologic and clinical manifestations of infectious scleritis after pterygium excision. *Cornea*. 2006;25:663-6.
20. Lindquist TP, Lee W. Mitomycin C-associated scleral stromalysis after pterygium surgery. *Cornea*. 2015;34: 398-401. doi: 10.1097/ICO.0000000000000384.
21. Dougherty PJ, Hardten DR, Lindstrom RL. Corneoscleral melt after pterygium surgery using a single intraoperative application of mitomycin-C. *Cornea*. 1996;15:537-40.
22. Wan Norliza WM, Raihan IS, Azwa JA, Ibrahim M. Scleral melting 16 years after pterygium excision with topical Mitomycin C adjuvant therapy. *Cont Lens Anterior Eye*. 2006;29:165-7.
23. Safianik B, Ben-Zion I, Garzozzi HJ. Serious corneoscleral complications after pterygium excision with mitomycin C. *Br J Ophthalmol*. 2002;86:357-8.
24. Dadeya S, Fatima S. Comeoscleral perforation after pterygium excision and intraoperative mitomycin C. *Ophthalmic Surg Lasers Imaging*. 2003; 34:146-8.
25. Rubinfeld RS, Pfister RR, Stein RM, Foster CS, Martin NF, Stoleru S, Talley AR, Speaker MG. Serious complications of topical mitomycin-C after pterygium surgery. *Ophthalmology*. 1994;99: 1647-54.
26. Tsai YY, Lin JM, Shy JD. Acute scleral thinning after pterygium excision with intraoperative mitomycin C: a case report of scleral dellen after bare sclera technique and review of the literature. *Cornea*. 2002;21:227-9.

การอักเสบของผนังตาขาวโดยเชื้อ *Pseudomonas aeruginosa* ภายหลังการผ่าตัด ต้อเนื้อเป็นระยะเวลานาน

สมสงวน อัญญคุณ, จุฬาลักษณ์ ตังมั่นคงวรกุล, วินัย ชัยตรุณ, นภาพร ตนานุวัฒน์, เหมือนพลอย นิภารักษ์
และ สุเมธ สุพลเศรษฐ์
ภาควิชาจักษุวิทยา คณะแพทยศาสตร์ มหาวิทยาลัยเชียงใหม่

วัตถุประสงค์ เพื่อรายงานผู้ป่วย 2 ราย ที่มีการอักเสบของผนังตาขาวโดยเชื้อ *Pseudomonas aeruginosa* ภายหลังการผ่าตัดต้อเนื้อเป็นระยะเวลานาน

วิธีการ รายงานผู้ป่วย

ผลการทดลอง ผู้ป่วยหญิง 2 ราย อายุ 67 และ 74 ปี ถูกส่งตัวมาเพื่อการรักษา ผนังตาขาวอักเสบโดยเชื้อ *Pseudomonas aeruginosa* หลังผ่าตัดต้อเนื้อเป็นระยะเวลา 5 ปี ผู้ป่วยทั้งสองรายได้รับยาปฏิชีวนะที่เหมาะสมและครอบคลุมทั้งหยอดและเข้าทางร่างกาย และร่วมกับการผ่าตัดในผู้ป่วยรายที่สอง ผู้ป่วยได้รับการตัวในโรงพยาบาลเป็นเวลา 20 และ 48 วันตามลำดับ และการมองเห็นเมื่อแก้ไขสายตาแล้ว ได้ 6/6-2 และ 6/18+2

สรุป การติดตามผู้ป่วยเป็นประจำ การให้การวินิจฉัยในระยะเริ่มแรก การให้การรักษาทันทีและครอบคลุมอาจช่วยรักษาการมองเห็นของผู้ป่วยในรายที่มีการอักเสบของผนังตาขาวภายหลังการผ่าตัดต้อเนื้อจากเชื้อ *Pseudomonas aeruginosa* ได้ **เชียงใหม่เวชสาร 2561;57(2):83-8.**

คำสำคัญ: pterygium excision, scleritis, *Pseudomonas aeruginosa*, late-onset