CASE REPORT

Dellen and corneal perforation after bilateral pterygium excision in a patient with no risk factors

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SUMMARY

Corneal perforation associated with dellen is a rare but serious complication of a primary pterygium excision. In this case report, we describe a 60-year-old man who underwent a 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. He was successfully treated with lamellar keratoplasty in his right eye and a conservative approach in his left eye, consisting of the use of artificial tears, antibiotic ointment and a patch. The clinical evidence from this brief interventional case report indicates that topical lubricants are proper therapy for corneal dellen. However, if corneal perforation is observed, lamellar keratoplasty is a good option.

BACKGROUND

Numerous surgical techniques have been developed for pterygium surgery. The surgical options available include the bare sclera technique combined with adjuvant postoperative β -irradiation, intraoperative or postoperative use of mitomycin C, conjunctival autograft, conjunctival limbal autograft and amniotic membrane transplantation.^{1–3}

Intraoperative complications related to pterygium surgery are uncommon. Mitomycin C and β -irradiation are effective in reducing the pterygium recurrence rate, but serious side effects have been reported, including corneoscleral dellen, scleral necrosis, corneal oedema and corneal perforation.^{2,3}

Corneoscleral dellen with corneal perforation is a rare complication of the bare sclera technique. We report a case of corneal dellen in one eye and corneal perforation associated with corneal dellen in the other, after employing a bilateral bare sclera technique without adjunctive therapy in a patient with no risk factors.

CASE PRESENTATION

A 60-year-old man with diabetes was referred to our hospital, for recurrent redness and a foreign body sensation in both eyes. His best corrected visual acuity (BCVA) was 20/25 in the right eye and 20/20 in the left. The intraocular pressure was 15 mm Hg in the right eye and 16 mm Hg in the left. He had no history of trauma, infection or surgery.

INVESTIGATIONS

Ophthalmological examination revealed the presence of nasal pterygium in both eyes, which measured 4 mm at the limbo and 3 mm into the cornea. A Schirmer test was performed without anaesthetic, and the results were 15 mm in the right eye and 13 mm in the left. The results of a tear film break-up time test were 15 s in the right eye and 17 s in the left eye. No significant findings were observed in the posterior segment. The patient was scheduled for bilateral pterygium surgery.

TREATMENT

The pterygium was excised from the patient's right eye using a bare sclera technique without intraoperative adjunctive therapy, under topical and subconjunctival anaesthesia. After excising the head and the body of the pterygium, the subconjunctival Tenon's tissue was separated and excised from the overlying conjunctiva. A conjunctival suture was placed, leaving 3 mm of bare sclera. Dexamethasone (0.1%) and tobramycin (0.3%) eye drops were administered four times a day for 1 week, and the eye was patched.

OUTCOME AND FOLLOW-UP

No complaints or complications were noted at the first follow-up visit. However, 13 days after the surgery, the patient reported pain in his right eye, which had persisted for 2 days. On examination, the BCVA was 20/25, and intraocular pressure was 7 mm Hg. Slit-lamp examination revealed a deep corneal dellen surrounded by an oedematous area. A prolapse of the uvea was noted in the centre of the dellen (figure 1A). Corneal sensations were normal. Clinical examination and laboratory tests failed to reveal autoimmune or inflammatory disease. A cryopreserved lamellar keratoplasty was performed using a 4 mm graft that was sutured onto the host bed with 10 interrupted 10–0 nylon sutures, without complications. At the patient's last follow-up visit 6 months after the lamellar keratoplasty, the BCVA was 20/25 with an intraocular pressure of 14 mm Hg. The graft was clear, and no rejection signs were noted (figure 1B).

The pterygium excision was performed in the patient's left eye using the same surgical protocol used for the right eye, without adjunctive therapy. No intraoperative complications were noted. Ten days after surgery, the BCVA was 20/20, and slit-lamp examination revealed round corneal thinning with limbal irritation. A case of corneal dellen

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Figure 1 Lamellar keratoplasty as a treatment of corneal perforation associated with dellen after primary pterygium excision. (A) Slit-lamp examination of the right eye reveals a focal area of extreme thinning in the nasal region of the cornea (dellen) surrounded by an oedematous area. In the centre of the dellen, a corneal perforation with a uveal prolapse is noted. (B) The corneal perforation was resolved with lamellar keratoplasty using 10–0 nylon sutures. Good graft survival was noted 6 months after surgery.

was diagnosed. Conservative treatment was administered as follows: topical lubricants were applied six times daily; an ointment consisting of 10 000 IU retinol, 5 mg methionine and 3 mg gentamicin was applied thrice daily; and the eye was patched for 1 week. Seven days later, the BCVA was 20/20, and the dellen appeared completely healed without complications.

DISCUSSION

Dellen were first described in 1911 as forming a saucer-shaped excavation of the cornea that typically occurs adjacent to a limbal elevation. Dellen are caused by interruptions of the tear film and local dehydration of the cornea.⁴ In the ophthalmic literature, dellen have been reported after pterygium surgery, large filtration blebs, dermoids, scleritis, episcleritis, scarring after extraocular muscle surgery or severe conjunctival chemosis.³

Among the complications of pterygium surgery, corneal dellen have been rarely reported regardless of the use of adjunctive therapy.^{3 5 6} Chen and Noonan⁵ reported one case of scleral dellen treated with a conjunctival flap and regular antibiotic ointment as a complication of a bare sclera excision without adjunctive therapy. Tsai *et al*³ reported a similar case as a complication of uneventful pterygium surgery performed with mitomycin C and then treated with topical lubricant therapy. Recently, Accorinti *et al*⁶ described a patient with corneal and scleral dellen after a bare scleral technique without the use of antimetabolites and a subsequent febrile episode. In our case, we did not use any adjunctive substances (eg, mitomycin C) during the bilateral pterygium excision. However, corneal dellen occurred 13 days after surgery in the patient's right eye and 10 days after surgery in his left eye. Although the mechanism underlying the development of corneal dellen is not well understood, the bare scleral technique may leave some sclera without conjunctiva, which could favour the onset of cornea dellen by inhibiting normal tear distribution over the cornea.⁶

Corneal perforation exhibits a high ocular morbidity that can lead to further corneal damage, cataract formation, glaucoma development, endophthalmitis and even eye loss.⁷ Dadeya and Fatima⁸ reported one case of corneoscleral perforation after pterygium excision with a single intraoperative application of mitomycin C. Dougherty *et al*⁹ reported a similar case as a complication of an uneventful pterygium surgery that was performed with mitomycin C and was treated with a lamellar keratoplasty. Our patient developed a corneal perforation in the absence of antimetabolite treatment. To the best of our knowledge, this case represents the first reported case of dellen and corneal perforation as complications of a bare sclera excision without any adjuvant treatment in a bilateral primary pterygium.

Diabetes was the only disease in our patient. Our patient exhibited no other predisposing risk factors to ulceration, such as Sjögren's syndrome, corneal pathological, corneal herpes, acne rosacea, scleritis, vasculitis or autoimmune processes.¹⁰ Diabetes is a well-known cause of dry eye, which is the main cause of non-traumatic corneal perforation.⁷ Although the origin of the corneal perforation is unknown, diabetes could potentially induce dry eyes, which could lead to the development of a corneal perforation. However, no objective element in our case report supported this hypothesis given that clinical evidence of dry eye was not evident in our patient.

Conservative topical treatment—which involved eye patching; the administration of retinol, methionine and gentamicin ointment thrice daily; and the administration of topical lubricants six times daily—resolved the situation in his left eye. One week later, the corneal thinning had healed. The patient underwent a lamellar keratoplasty in his right eye, without complications. Ti and Tan,¹ and Safianik *et al*,² reported that lamellar and tectonic keratoplasty is a useful therapy for scleral melting and corneal perforation after pterygium surgery.

In conclusion, dellen and corneal perforations are rare complications of an uneventful bare sclera technique. Corneal dellen improve with conservative treatment. However, when corneal perforation is noted, lamellar keratoplasty is an optional procedure, as noted in our patient.

Learning points

- ▶ Corneal dellen with corneal perforation is a rare but serious complication of the bare sclera technique in surgery for primary pterygium.
- ▶ A conservative approach consisting of the use of artificial tears, antibiotic ointment and a patch is a useful adjunct in the management of corneal dellen cases.
- ▶ However, when a case of corneal dellen is associated with a corneal perforation, a lamellar keratoplasty may be a good option.

Competing interests None declared.

Patient consent Obtained.

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REFERENCES

- 1 Ti SE, Tan DT. Tectonic corneal lamellar grafting for severe scleral melting after pterygium surgery. *Ophthalmology* 2003;110:1126–36.
- 2 Safianik B, Ben-Zion I, Garzozzi HJ. Serious corneoscleral complications after pterygium excision with mitomycin C. *Br J Ophthalmol* 2002;86:357–8.
- 3 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.
- 4 Fuchs E. Ueber Dellen in der Cornea. *Graefe's Arch Ophthalmol* 1911;78:82–92.
- 5 Chen S, Noonan C. Scleral dellen complicating primary pterygium excision. *Eye (Lond)* 2000;14:100–1.
- 6 Accorinti M, Gilardi M, Giubilei M, *et al*. Corneal and scleral dellen after an uneventful pterygium surgery and a febrile episode. *Case Rep Ophthalmol*. 2014;5:111–15.
- 7 Leksul M, Fracht HU, Cohen EJ, *et al*. Nontraumatic corneal perforation. *Cornea* 2000;19:313–19.
- 8 Dadeya S, Fatima S. Corneoscleral perforation after pterygium excision and intraoperative mitomycin C. *Ophthalmic Surg Lasers Imaging* 2003;34:146–8.
- 9 Dougherty PJ, Hardten DR, Lindstrom RL. Corneoscleral melt after pterygium surgery using a single intraoperative application of mitomycin-C. *Cornea* 1996;15:537–40.
- 10 Hartley C. Aetiology of corneal ulcers assume FHV-1 unless proven otherwise. *J Feline Med Surg* 2010;12:24–35.

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