CASE REPORT

Topical proparacaine abuse resulting in evisceration

Adnan Aksoy,¹ Ahmet Metin Başkan,² Lokman Aslan,¹ Murat Aslankurt¹¹Department of Ophthalmology, Faculty of Medicine, Sutcu Imam University, Kahramanmaraş, Turkey²Department of Ophthalmology, Uğur Eye Hospital, Kahramanmaraş, Turkey**Correspondence to**Dr Lokman Aslan,
lokaslan46@yahoo.com;
maslankurt80@hotmail.com**SUMMARY**

A 72-year-old man was admitted to our clinic because of pain in the right eye. Corneal oedema, peripheral anterior synechiae formation and intraocular lens were determined in the right eye. The left eye was normal except for nuclear sclerosis. Intraocular pressure was 35 mm Hg in the right eye and 14 mm Hg in the left eye. The patient was diagnosed as having bullous keratopathy and glaucoma. He was treated with antiglaucoma drugs and artificial tears as an outpatient. Persistent keratopathy was observed at follow-up, despite adequate therapy. In the detailed anamnesis of the patient, we discovered that he had used a topical anaesthetic instead of the prescribed medicine owing to ocular pain. The patient was still using topical anaesthetic eye drops, despite warnings. Finally, evisceration was performed on his right eye because of corneal melting and perforation.

BACKGROUND

A topical anaesthetic is commonly used by ophthalmologists in clinical practice, and in emergencies to remove corneal foreign bodies. Although the suitability of topical ophthalmic anaesthetics for controlling pain is controversial, they may only be needed for a short time and may guarantee pain relief in these patients under close medical supervision.^{1–3} These drugs are used for a long time by some patients owing to their pain relieving effects and can lead to drug abuse over time.^{1 2} Prolonged topical application of anaesthetic agents can result in inhibition of mitosis and cellular migration and cause severe toxic keratopathy, which is characterised by corneal epithelial defects, as well as a sterile focal infiltrate and ring-shaped stromal infiltrate.^{3 4} Eventually, corneal melting or perforation may occur in an advanced case.

In this case report, we aimed to emphasise that a topical anaesthetic-related toxic keratopathy should be considered in the differential diagnosis with regard to corneal pathologies that do not respond to treatment.

CASE PRESENTATION

A 72-year-old man was admitted to our clinic because of pain in the right eye. Visual acuity test results were light perception in the right eye and 0.8 in the left eye. The patient was pseudophakic and had corneal oedema and peripheral anterior synechiae at two quadrants. Fundus details were not seen. The left eye had nuclear sclerosis and a normal fundus appearance. Intraocular pressure (IOP) was 35 in the right eye and 14 mm Hg in the left eye. The patient's case was diagnosed as that of pseudophakic bullous keratopathy and end-stage

secondary glaucoma of the right eye. After intravenous 20% mannitol administration, IOP reduced to 20 mm Hg in the right eye at the time of presentation, a timolol–dorsolamid fixed combination and brimonidine were prescribed and he was followed up as an outpatient.

After 10 days, the patient presented to the clinic with corneal epithelial defects secondary to toxic keratopathy in the right eye. In the detailed anamnesis, we discovered that he had used a topical anaesthetic instead of the prescribed medicine owing to ocular pain. The cause of ocular pain was bullous keratopathy, and it was understood that he dropped proparacaine only for the painful eye. After excluding other possible causes, the reason for toxic epitheliopathy was realised as Alcaine abuse. A therapeutic contact lens was fitted in the patient's eye and hospitalisation was recommended to the patient, but he refused. The patient was informed about the toxic effects of topical anaesthetics and advised to avoid it. One month later, the patient was admitted to the hospital with an evidence of corneal melting secondary to toxic keratopathy. Amniotic membrane transplantation was performed in the right eye. The patient was discharged as an outpatient, but he did not attend the follow-up examination.

OUTCOME AND FOLLOW-UP

After 8 months, he was readmitted to the hospital with keratolysis and corneal perforation (figure 1). Following a progression to absolute glaucoma with severe pain, corneal perforation that resulted from repeated proparacaine use despite the warnings against it, and non-responsiveness to medical and surgical interventions, evisceration was performed on the patient's damaged eye as a last resort.

DISCUSSION

To the best of our knowledge, although cases of Alcaine toxicity have been reported, a case ending

Figure 1 Keratolysis and uveal tissue prolapsus from the central corneal perforation wound.

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with evisceration dramatically has not been found in the literature. The side effect of topical anaesthetics on the cornea has been reported in previous studies.^{3–8} Topical anaesthetic use prevents corneal epithelial cell proliferation and migration with direct toxic effects on the cornea, so corneal wound healing is delayed.^{1–2} Even after a single application, it could enable the development of direct toxic effects on the corneal epithelium.¹ The tear film stability is distorted as a result of corneal sensory loss, diminished reflex tear secretion and decreased eye blinking. Accordingly, tear deficiency, as a result of increased susceptibility of the ocular surface, such as punctate epitheliopathy, may also indirectly lead to the occurrence of toxic side effects of topical anaesthetics.⁹ Chronic toxic effects of topical anaesthetics lead to the antigen–antibody complex, and this results in ring-shaped stromal keratitis.^{3–4} The characteristics of toxic keratopathy have been punctate epithelial keratopathy, loss of corneal epithelial cells, delay of epithelial wound healing, ring-shaped stromal infiltration, corneal oedema, associated infectious keratitis, stromal melting, corneal perforation, pain disproportionate to endothelial cell loss and decreased visual acuity.^{2–3–10}

Topical anaesthetics inhibit corneal epithelial cell migration and damage existing cells.^{1–2} Depending on the severity of corneal involvement, the following are applied: eye closure, bandage contact lenses and 20% autologous serum drops. However, in cases when healing is not achieved, surgical interventions such as amniotic membrane transplantation and penetrating keratoplasty are performed as last treatment options.⁶ Initially, amniotic membrane transplantation was applied to our patient. However, he did not attend the follow-up examination, so penetrating keratoplasty was not performed. Despite all efforts, the patient continued to use the drug persistently, and he was admitted to the hospital after toxic keratopathy resulted in corneal perforation.

Topical anaesthetics may be used by patients in case of painful eye disease for pain-relieving effects. The use of these agents for a long time can lead to toxic keratopathy, impair the ocular surface, reduce corneal sensitivity and cause misdiagnosis with other corneal diseases. The use of topical anaesthetics should be considered in the treatment-resistant corneal disorders.

Learning points

- ▶ A topical anaesthetic prevents corneal epithelial cell proliferation and migration.
- ▶ A topical anaesthetic may cause delayed corneal wound healing, resulting in corneal melting.
- ▶ A topical anaesthetic-related toxic keratopathy should be considered in differential diagnosis with regard to corneal pathologies that do not respond to treatment.

Contributors AA contributed todata collection. AMB performed diagnosis and therapy. LA conducted a critical revision and MA performed the writing of the manuscript.

Competing interests None.

Patient consent Obtained.

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REFERENCES

- 1 Dass BA, Soong HK, Lee B. Effects of proparacaine on actin cytoskeleton of corneal epithelium. *J Ocul Pharmacol* 1988;4:187–94.
- 2 Boljka M, Kolar G, Vidensek J. Toxic side effects of local anaesthetics on the human cornea. *Br J Ophthalmol* 1994;78:386–9.
- 3 Rocha G, Brunette I, Le François M. Severe toxic keratopathy secondary to topical anaesthetic abuse. *Can J Ophthalmol* 1995;30:198–202.
- 4 Harnisch JP, Hoffmann F, Dumitrescu L. Side-effects of local anaesthetics on the corneal epithelium of the rabbit eye. *Albrecht Von Graefes Arch Klin Exp Ophthalmol* 1975;17:71–81.
- 5 Moreira LB, Kasetsuwan N, Sanchez D, et al. Toxicity of topical anaesthetic agents to human keratocytes in vivo. *J Cataract Refract Surg* 1999;25:975–80.
- 6 Yeniad B, Cantürk Ş, Özdemir E. Toxic keratopathy due to abuse of topical anesthetic drugs. *Cutan Ocul Toxicol* 2010;29:105–9.
- 7 Baykara M, Akova YA, Budak B, et al. [Our keratopathy cases associated with proparacaine.] *Uludağ Üniversitesi Tıp Fakültesi Dergisi* 2011;37:131–3.
- 8 Katsimpris JM, Sarantoulakou M, Kordelou A, et al. Clinical findings in patients with topical anaesthetic abuse keratitis: a report of five cases. *Klin Monbl Augenheilkd* 2007;224:303–8.
- 9 Rosenwasser GO, Holland S, Pflugfelder SC, et al. Topical anaesthetic abuse. *Ophthalmology* 1990;97:967–72.
- 10 Yagci A, Bozkurt B, Egrilmez S, et al. Topical anaesthetic abuse keratopathy: a commonly overlooked health care problem. *Cornea* 2011;30:571–5.

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