

Vitamin A deficiency presenting with fungal keratitis and bilateral corneal perforations

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DESCRIPTION

A woman in her 60s presented to our tertiary ophthalmic centre with a 2×2 mm right and a smaller left corneal perforation. The patient had corneal glues as temporising measures at a periphery hospital. However, further treatment was delayed as she initially declined transfer due to concerns over COVID-19. On arrival, the right eye had a 4×4 mm corneal perforation with visual acuity (VA) of hand movements, and the left eye had a 3×3 mm corneal perforation with VA of 6/180 (figures 1A and 2A). The right eye had a leaking glue with shallow anterior chamber, and the left glue patch was stable. There was no hypopyon. Ofloxacin eye-drops were started for the clinical impression of bacterial keratitis.

Series of tests investigated the cause of bilateral perforations. Autoimmune and infection screens were negative. Left corneal scrape revealed light mixed organisms and a yeast colony. She required tectonic corneal grafts to treat the perforations (figures 1B and 2B). The right corneal button had an infiltrate underneath, which showed light growth of *Candida Albicans* sensitive to fluconazole and voriconazole. Interestingly, the patient was also vitamin A deficient despite not demonstrating classic ocular features of hypovitaminosis A. This deficiency was likely due to a severely restricted diet, consisting of only bananas and yoghurt. The final diagnosis was corneal perforations secondary to bilateral fungal keratitis and hypovitaminosis A. Retinyl palmitate was initiated along the surgical management of tectonic grafts with oral and topical voriconazole as per infectious disease specialists' recommendation. The transplantations were retained and the VA improved but poor diet and non-compliance continued. A dense cataract limited her right vision, and the left eye had a persistent corneal epithelial defect. The patient declined to manage epithelial defect despite being informed that it can cause recurrent microbial keratitis, threatening the viability of the transplant. The final VA was hand movements in the right eye and 6/30 in the left eye.

Although vitamin A deficiency is rare in the developed world,¹ its ocular sequelae can be significant with adverse outcomes such as nyctalopia, corneal ulcer and scarring.² It can present ocular features such as Bitot's spots, conjunctival and corneal xerosis. Superimposed microbial keratitis has been reported in the literature, including cases from developed communities.¹⁻⁴ Typically, such small infiltrates secondary to microbial keratitis would not lead to rapid corneal perforation, as seen in this case. Therefore, the diagnosis of hypovitaminosis A is likely to have contributed to the rapid corneal perforation. This case highlights the importance of

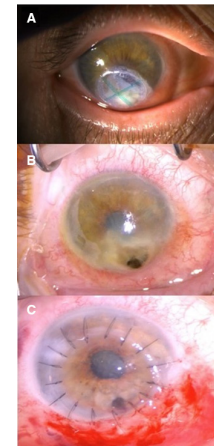


Figure 1 Right eye; (A) at presentation (glued), (B) demonstrating an intraoperative finding of 4×4 mm corneal perforation, (C) demonstrating grafted appearance.

considering a multifactorial cause in corneal perforations and provides an important reminder to take a thorough history in unusual cases to include dietary history. Hypovitaminosis A is classified into (1) low vitamin A or restrictive diets, (2) psychiatric eating disorders, (3) bariatric surgeries and (4) chronic diseases that affect organs involved in vitamin A digestion or clearance. The prevalence of each condition varies on the population.⁵ Therefore, early and specific questioning to explore the

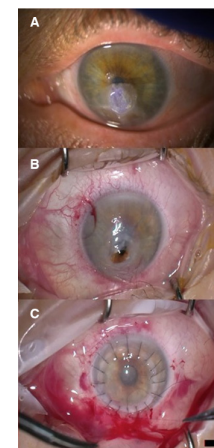


Figure 2 Left eye; (A) at presentation (glued), (B) demonstrating an intraoperative finding of 3×3 mm corneal perforation, (C) demonstrating grafted appearance.



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causative condition is imperative in routine clinical practice to avoid omitting the history of hypovitaminosis A.

Learning points

- ▶ Vitamin A deficiency, although rare in developed countries, is a risk factor for corneal perforation. Coexisting microbial keratitis may be superimposed.
- ▶ Classically described ocular features of vitamin a deficiency, such as Bitot's spots, conjunctival and corneal xerosis may not be present on examination; their absence should not preclude clinical suspicion of vitamin A deficiency.
- ▶ Consider vitamin A deficiency in cases of corneal perforation or impending perforations, especially in the context of an unusual or nutrient deficient diet.

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Case reports provide a valuable learning resource for the scientific community and can indicate areas of interest for future research. They should not be used in isolation to guide treatment choices or public health policy.

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REFERENCES

- 1 Connell BJ, Tullo AB, Parry NRA, *et al*. Vitamin A deficiency presenting with microbial keratitis in two patients in the UK. *Eye* 2006;20:623–5.
- 2 Gilbert C. The eye signs of vitamin A deficiency. *Community Eye Health* 2013;26:66–7.
- 3 Morjaria R, Mitra A, McDonnell P. Bilateral microbial keratitis in a case of severe xerophthalmia following small bowel resection. *J R Soc Med* 2011;104:124–6.
- 4 Hsu H-Y, Tsai I-L, Kuo L-L, *et al*. Herpetic keratouveitis mixed with bilateral Pseudomonas corneal ulcers in vitamin A deficiency. *J Formos Med Assoc* 2015;114:184–7.
- 5 Faustino JF, Ribeiro-Silva A, Dalto RF, *et al*. Vitamin A and the eye: an old tale for modern times. *Arq Bras Oftalmol* 2016;79:56–61.

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