

A relentless peripheral corneal ulcer

Comments by:

Chi-Cheong Wong, FRCS, FHKAM (Ophth), Jack A. Singer, MD, Peter G. Watson, FRCS, FRCOphth

Case history

A 64-year-old lady with good past health first presented 7 years previously with left eye limbal congestion and a small peripheral corneal guttering ulcer at the nasal region (**Figure 1**) associated with mild pain. The ulcer healed with topical antibiotics and steroid in about 3 weeks.

A few months later, repeated ulceration developed which increased in size from 1 to 3 clock hours. Medications including topical steroid, antibiotics, timolol, and lubricants, were given. The patient was referred to a rheumatologist for systemic examination. There were no signs or symptoms suggestive of an autoimmune disease and all the investigations, including immune markers, were negative. Systemic and subconjunctival steroids together with oral non-steroidal anti-inflammatory drugs were given because of the worsening condition with circumferential extension of the ulcer. A bandage contact lens was also applied to promote healing. The ulcer gradually healed with ingrowth of fibrovascular tissue (**Figure 2**). The visual acuity in the affected eye was 0.3 unaided. The systemic medications were gradually tapered and the condition was maintained with low-dose topical steroid and antibiotics. The intraocular pressure was normal.

One year later, thinning of the cornea and leaking of aqueous were noted central to the fibrovascular ingrowth at 11 o'clock. Intraocular pressure was 10 mm Hg. Cyanoacrylate glue and

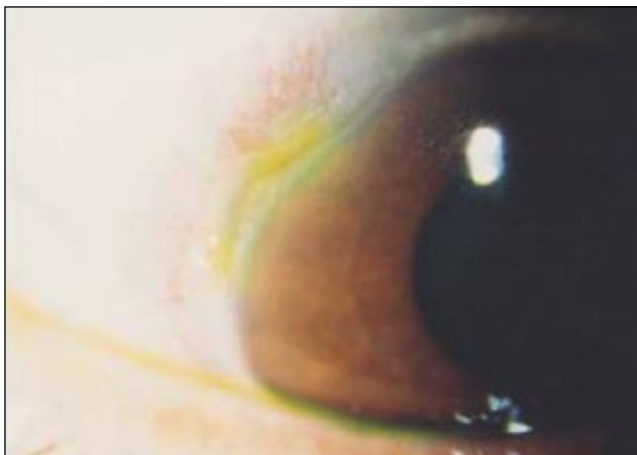


Figure 1. Limbal congestion and peripheral corneal guttering of the left eye.

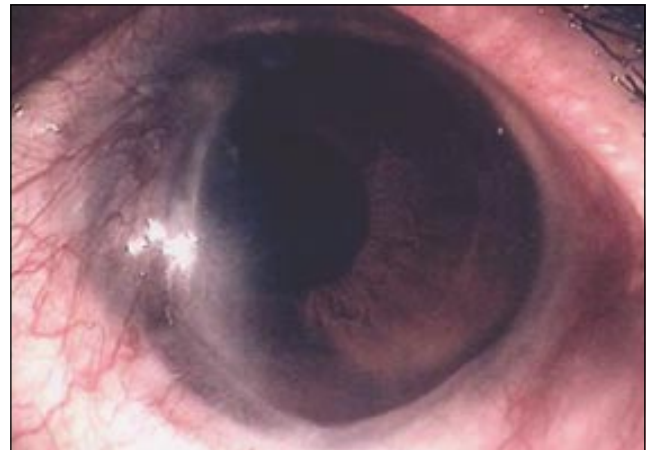


Figure 2. Healed ulcer with ingrowth of fibrovascular tissue.

bandage contact lens were applied to seal the leakage in addition to topical steroid and antibiotic eyedrops. The leaking gradually stopped with residual thinning and slight ectasia. However, the leakage recurred 6 months later and the procedure was repeated to treat the leakage. Topical cyclosporin was given in addition to the other medications. The perforation finally sealed with thinning and vascularization of the peripheral corneal gutter which extended for 270° from 3 to 12 o'clock. The visual acuity in the affected eye was 3/60 and 0.8 in the other eye. All the topical medications were continued.

Several months later, corneal edema was noted and a cataract began to form (**Figure 3**). Visual acuity later decreased to hand movement. Endothelial count was approximately 1200 cell/mm². The cornea was very thin at the inferonasal quadrant. Her right eye remained healthy apart from some crystalline deposits at the inferior limbus.

What are the comments on the pathogenesis, and previous and present management? Would you advise performing cataract surgery and corneal grafting for this patient?

Comments

by Dr Chi-Cheong Wong, Senior Medical Officer,
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This 64-year-old lady suffered severe peripheral corneal disease with relentless progression and secondary



Figure 3. Corneal edema with cataract.

complications of cataract and corneal decompensation. This is a very challenging anterior segment problem, which is very difficult to manage and should be comanaged by a corneal specialist, cataract surgeon, and physician.

For the initial management, I think a more aggressive approach should be taken after reviewing the history. This idiopathic unilateral ulcerative keratitis is very rare and has a devastating visual outcome. Initial aggressive therapy such as conjunctival resection, tissue adhesive and soft contact lens application, systemic tetracycline for its anti-collagenolytic effect, and topical medroxyprogesterone might have been used to retard the corneal destructive process. Newer agents such as topical cyclosporin have been claimed to be effective to halt the progression. Although the use of topical FK 506 is still in clinical trials, it may be proved to be a promising agent in the future as it is said to be 10- to 100-fold more potent than cyclosporin. However even with these modalities of treatment in the early phase, the disease may progress and the search for any other underlying autoimmune disease should be emphasized. Although more justified in bilateral cases, the use of systemic immunotherapy agents such as methotrexate, azathioprine, and cyclophosphamide can be considered for severe and recurrent attacks.

For the current management, this is a very difficult situation. First of all, it is a very advanced peripheral corneal thinning with 270° involvement, and any lamellar tectonic graft will be very difficult to perform surgically and adequate immunosuppression before the operation is very important as there is a high chance of recurrence. Also eccentric corneal graft may be served for tectonic purpose in the initial phase of treatment.¹ Definitive penetrating keratoplasty can be done at a later stage after the tectonic graft. The cataract can be managed during the keratoplasty in an open sky manner but special attention to technique is very important to avoid excessive postoperative inflammation. Management of any coexisting anterior segment problems should be kept in mind. In the bag placement of intraocular lens, meticulous cleaning of the cortex, and use of heparin-coated intraocular lenses are measures that can add to the reduction of postoperative inflammation.

Although quite controversial and with reports of many severe complications, large corneal transplant has been used to deal with this problem.² Corneoscleral transplantation has also been advocated for the management of this type of case, but complications such as glaucoma, epithelial defect, rejection, and recurrence of disease have been reported.³ The need for life-long immunosuppression also hinders the use of this operation. With the advancement of technology, artificial cornea is being developed with more biocompatible material, which may help to manage these cases in the future.

After any surgical intervention, it is not the end but the beginning of another challenging management problem. Frequent follow-up with special attention to any flare-up of the disease and adequate and timely immunosuppression is the key to success. Treatment of any complications such as glaucoma is also vital.

In summary, this is a very challenging anterior segment case. The goal of management should be realistic and patients should be well informed about the prognosis, implications of surgical treatment, and side effects of toxic immunomodifying agents. The ophthalmologist should act promptly and aggressively early in the course of the disease and collaborate with a corneal specialist, cataract specialist, and physician to ascertain the best solution for the patient. With advances in medicine such as potent immunosuppressive agents with fewer side effects and newer materials to make artificial corneas, we hope that the discouraging picture of this disease can be improved.

References

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Comments

by Dr Jack A. Singer, Associate Professor of Surgery (Ophthalmology), Dartmouth Medical School, Dartmouth-Hitchcock Clinic, 40 South Main Street, Randolph, VT 05060, USA

This lady has a chronic progressive peripheral ulcerative keratitis, known as Mooren's ulcer, which is now complicated by corneal decompensation and cataract. As this is an autoimmune disease, the use of topical and systemic cyclosporin has been recommended in light of its ability to increase the population of suppressor T cells.

Attempts at reparative corneal surgery are seldom successful unless the underlying Mooren's disease activity has been controlled. Even when the disease has 'burned itself out,'

attempts at corneal grafting are usually associated with recurrence of the Mooren's ulcer and destruction of the graft. Wide conjunctival resection to bare sclera, followed by resection of the overhanging lip of the ulcerating cornea and application of tissue adhesive will presumably remove the source of the antibody and inflammatory cells that may be mediating the ulcerative reaction. Additionally, amniotic membrane transplantation may promote healing of the damaged and thinned corneal tissue.

If amniotic membrane transplantation does not result in sufficient healing and regeneration of peripheral corneal tissue, then lamellar tectonic grafting would be needed prior to definitive central penetrating grafting. Immunosuppression therapy prior to corneal grafting may help prevent a recurrence or rejection. An 'open sky' extracapsular cataract extraction with posterior chamber intraocular lens implantation can be performed together with the penetrating keratoplasty.

Comments

by Dr Peter G. Watson, 17 Adams Road, Cambridge CB3 9AD, UK

This patient has the typical history and appearance of a Mooren's ulcer. Pain is usually a marked feature of this disease although it is not necessarily severe. The characteristic features are a painful peripheral corneal ulceration

starting about 2 mm from the limbus. The ulcer advances both circumferentially and centrally, preceded by thickening and edema of the cornea. The ulcer usually has an undermined edge but this is not a feature in this case.

As the ulcer advances centrally, the endothelium becomes affected and eventually corneal decompensation occurs. Perforation, if it occurs, is usually the result of minor trauma. Cataract is a late complication. There is never any accompanying systemic disease nor any associated scleritis. The limbus is congested. Full human leukocyte/lymphocyte antigen testing may confirm the diagnosis. Helminthic infestations should be excluded or treated. Mooren's ulcer is often bilateral and any minor trauma to the other eye could easily result in the process starting there.

Treatment is unsatisfactory and rarely curative. In Aravind in India, where this disease is common, some success has been achieved by the use of cyclosporin eye ointment. Corneal transplantation is rarely successful as the ulcer recurs in the graft. If cataract surgery or transplantation is performed, this needs to be accompanied by full immunosuppression as the evidence is that the ulcer is an immune response to calgranulin C which is uniquely present in the corneal stroma. This explains why the epithelium and endothelium remain unaffected until very late in the disease. Cataract extraction must be done through a scleral tunnel.

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