Malaysian Journal of Ophthalmology

© Malaysian Journal of Ophthalmology 2023; 5:1-7
Case report
https://doi.org/10.35119/myjo.v5i1.353

Complications from the use of cyanoacrylate glue in conjunctival grafting for pterygium surgery: a case report

Lim Yi Xuan , Kenneth **Teow** Kheng Leong

Department of Ophthalmology, Hospital Bintulu, Sarawak, Malaysia

Abstract

Background: Pterygium is a wing-shaped fibrovascular tissue overgrowth of the conjunctiva that crosses over the nasal or temporal limbus, or both, and grows onto the corneal surface. We report a case of complications due to the use of cyanoacrylate glue in conjunctival grafting in pterygium surgery.
Case presentation: A 70-year-old Iban woman presented with worsening foreign body sensation in the nasal aspect of the left eye 10 years after undergoing nasal pterygium excision. The foreign body sensation had worsened over the course of 1 year. Upon examination, a greyish foreign body in the nasal aspect of the left eye (acrylate-like material) was noted.
Conclusion: In this case report, we highlight the complications of the usage of cyanoacrylate glue in pterygium surgery and the possible intraoperative complications in this case.

Keywords: conjunctiva, cyanoacrylate, glue, graft, pterygium

Correspondence: Dr Lim Yi Xuan, Department of Ophthalmology Hospital Bintulu, Jalan Nyabau, 97000, Bintulu, Sarawak, Malaysia.
E-mail: kimberly_yixuan@hotmail.com

Laporan kes: komplikasi dari pengunaan gam sinoakrilik pada geraf konjunktiva dalam pembedahan pterygium

Abstrak

Latar belakang: Pterygium adalah fibrovaskular tisu berbentuk sayap berasal dari konjunktival yang tumbuh dari bahagian nasal dan temporal atau kedua-duanya merentas bahagian limbus permukaan kornea. Kami melaporkan satu kes komplikasi akibat penggunaan gam sinoakrilik pada graf konjunktiva dalam pembedahan pterygium.
Laporan kes: Seorang wanita berbangsa Iban yang berusia 70 tahun mengalami sensasi kehadiran benda asing pada bahagian nasal mata kiri selepas pembedahan pterygium 10 tahun yang lalu dan semakin teruk setahun kebelakangan ini. Terdapat kehadiran benda asing yang berwarna kelabu (seakan akan bahan akrilik) pada bahagian nasal mata kiri semasa pemeriksaan mata dijalankan.
Kesimpulan: Pengunaan gam akrilik dalam pembedahan pterygium bukan tanpa komplikasi. Dalam laporan kes ini, komplikasi gam akrilik boleh berlaku selepas pembedahan dalam jangka masa yang lama.

Kata kunci: cyanoacrylate, gam, graf, konjunktiva, pterygium

Introduction

Pterygium is a wing-shaped fibrovascular tissue overgrowth of the conjunctiva that crosses over the nasal or temporal limbus, or both, and grows onto the cornea lsurface. Pterygium is more prevalent in countries located in the “pterygium belt”. This might be due to the effect of UVB on limbal cells leading to production of interleukin (IL)-6, IL-8, and growth factors which are linked to inflammation, blood vessel formation, cellular proliferation, and antiapoptosis. Multiple surgical techniques have been described for pterygium excision.

Case presentation

A 70-year-old Iban woman with underlying diabetic mellitus, hypertension, dyslipidaemia, and bronchial asthma presented to the Ophthalmology Clinic in Hospital Bintulu with a complaint of bilateral blurring of vision for 1 year and left eye on and off discomfort with foreign body sensation for the past 10 years and worsened over the past 1 year. She claimed she only had a left eye pterygium surgery done 20 years ago in a hospital and it was uneventful. Otherwise, there was no history of ocular trauma.

On examination, vision was 6/30 and pinhole 6/18 in the right eye, and 6/48 pinhole 6/15 in the left. The patient was diagnosed with bilateral immature cataract and temporal, grade 1 pterygium in the left eye, where a greyish conjunctival foreign body was seen nasally to the limbus (Fig. 1). The foreign body was hard in consistency and strongly adhered to the sclera. Fluorescent stain showed evidence of a small epithelial defect in the central site of the conjunctival foreign body. In view of her symptoms, she was advised to undergo conjunctival foreign body removal with conjunctival grafting under local anaesthesia, to which she agreed.

During the surgery, the left eye's nasal conjunctiva was explored. A hard cyanoacrylate like material firmly adhered to the surface of sclera was slowly excised with a crescent knife. The excision was done meticulously to avoid perforating the sclera or injuring the medial rectus muscle. After removing the foreign body, a very thin,

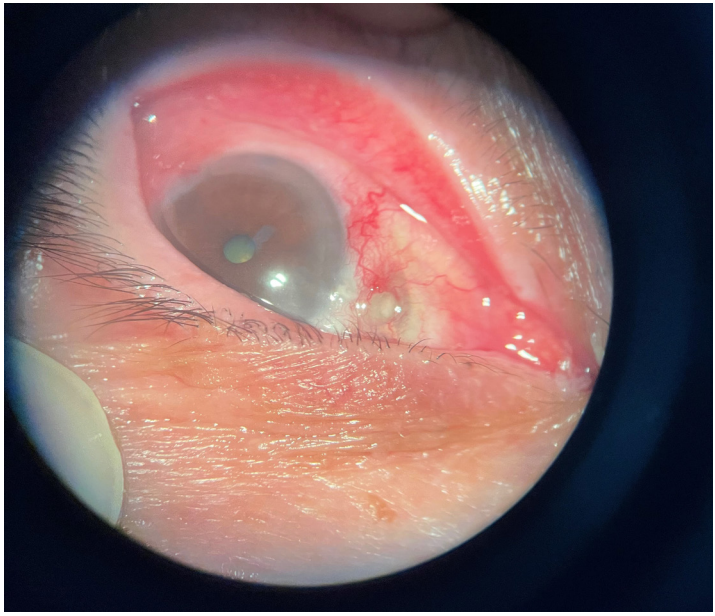

Fig. 1. Preoperative photograph showing a foreign body nasally.

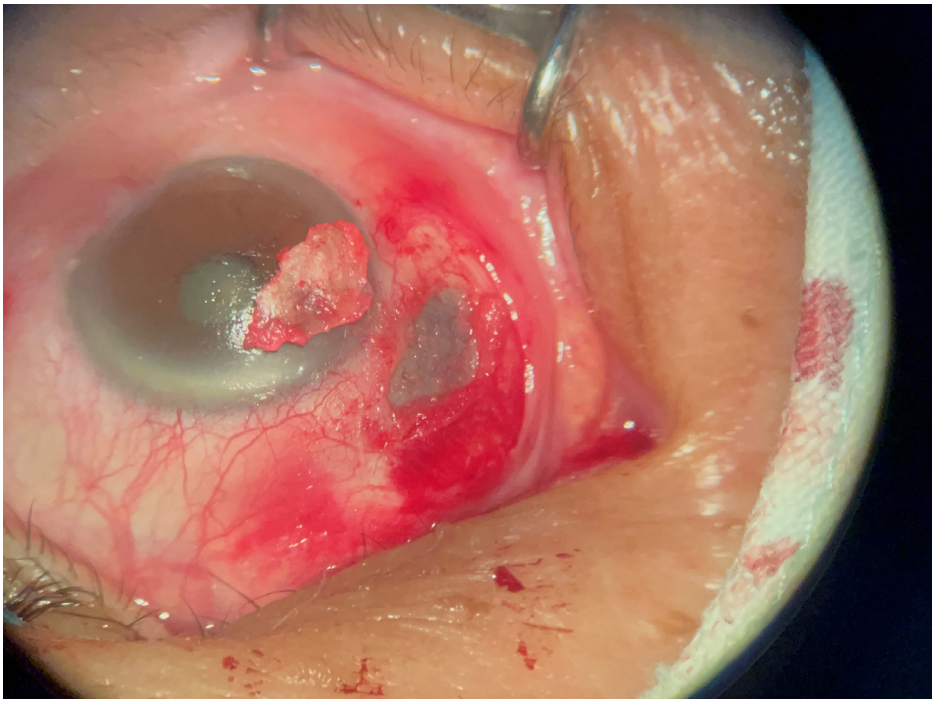

Fig. 2. Intraoperative photograph Foreign body material was successfully removed and a very thin scleral noted at the base.

almost transparent sclera was seen at the base (Fig. 2). A free conjunctival graft was harvested from supero-temporal bulbar conjunctiva and subsequently transferred onto the thinned scleral area. The graft was secured with an absorbable Vicryl 8/0 suture. The foreign body removed measured 7.0 mm in length. On postoperative review, the conjunctival graft was intact and healed well. Postoperatively, the patient was prescribed topical antibiotics, topical steroids, and oral antibiotics. Postoperatively, the patient claimed the foreign body sensation was gone and felt more comfortable.

Discussion

Pterygium surgery is commonly performed due to various reasons. These reasons include symptomatic individuals experiencing foreign body sensation and discomfort, visual disturbances such as astigmatism and blurry vision, or simply due to cosmetic reasons. The aim of the surgery is to improve symptoms and prevent recurrences. The bare sclera method is perhaps the earliest method used

in pterygium surgery. However, this method is associated with a high recurrence rate and therefore is not ideal.[1] Later, the use of autologous limbal conjunctival graft to cover the bare sclera after a pterygium excision was explored and has been reported as the most effective method in lowering the recurrence rate.[2] This method has become the most common technique currently used in pterygium surgery.

A conjunctival graft can be fixed with or without sutures. With the suture technique, the postoperative outcome, duration of surgery, and patient comfort is largely dependent on the surgical skills and experience of the surgeon. The use of suture-less technique has been shown to shorten the operation time, lesser inflammatory reaction due to sutures, and reduced postoperative discomfort. However, the suture method is still widely used because the suture material is more cost-effective compared with glue.[3]

There are two groups of tissue adhesives commonly used: synthetic adhesives and biological adhesives. In pterygium surgery, the two commonly used adhesives are fibrin glue and autologous blood. Fibrin glue is a biological adhesive, a blood-derived product consisting of two biologic components: fibrinogen and thrombin. It mimics the final stage of the coagulation cascade and forms a strong network between the conjunctival graft and the sclera. The advantages of fibrin glue compared to synthetic adhesives include better tolerance, non-toxicity, and minimal inflammation. In addition, fibrin glue forms a smooth seal along the entire length of the wound edge, resulting in higher tensile strength and greater resistance to shearing stress.[4] Analogous blood is an alternative for surgical closure in pterygium surgery except for patients on anticoagulants or those with an underlying coagulation factor disease. The autologous blood acts as a natural clotting cascade, resulting in fibrin polymerization. However, studies show that fixation with autologous blood result in less stable grafts at follow-up and therefore a higher recurrence rate as compared with fixation with fibrin glue.[5]

Cyanoacrylate is a synthetic adhesive; it is non-biodegradable and is used externally. It forms a solid impermeable mass in situ and may induce an inflammatory foreign body reaction, including neovascularization and tissue necrosis. It is commonly used as a corneal patch for corneal thinning and small uncomplicated corneal perforation.[6]

In this patient, we suspected that cyanoacrylate had been used as a gluing agent for the conjunctival graft. Unfortunately, biochemical analysis was not available at our centre. As the cyanoacrylate remained in the patient's eye for nearly 20 years, we believe her frequent complaints of foreign body sensation throughout those years may have been due to recurrent undiagnosed exposure of the cyanoacrylate foreign body with subsequent repeated conjunctival healing. Cyanoacrylate is a relatively cheaper material and easily available compared to fibrin glue. However, it is not a common choice for surgical wound closure in pterygium surgery, as it is not biodegradable and induces inflammation which may lead to discomfort.

Therefore, cyanoacrylate is not suitable for conjunctival grafting and its use for this purpose is discouraged.

The possible intraoperative complications in this case included scleral thinning, scleral perforation, and medial rectus muscle injury, which may lead to strabismus. In view of these risks, a more conservative approach might have been explored, such as a simple amniotic membrane transplant or conjunctival graft, to promote the closure of the conjunctiva over the foreign body. However, if this approach failed, surgical removal of the foreign body might have been an option.

Based on the outcome of her surgery, the patient was happy and comfortable, as she no longer experienced discomfort and foreign body sensation. However, the sclera remained thin and she has a higher risk of perforation even with mild to moderate ocular trauma.

Conclusion

The use of cyanoacrylate glue in pterygium surgery is not recommended in view of the postoperative complications, which may require a future complicated surgery to rectify.

Declarations

Informed consent for publication
The patient provided informed consent for the publication of the clinical data and images contained in this case report.

Competing interests
None to declare.

Funding
None to declare.

Acknowledgments
The case report could not have been possible without the guidance of my mentor Dr. Teow (Head of the Department of Ophthalmology, Hospital Bintulu). I would also like to thank my colleagues and stuff nurses for taking part in managing this case.

References

1. Sánchez-Thorin JC, Rocha G, Yelin JB. Meta-analysis on the recurrence rates after bare sclera resection with and without mitomycin C use and conjunctival autograft placement in surgery for primary pterygium. Br J Ophthalmol. 1998 Jun 1;82(6):661-5. https://doi.org/10.1136/bjo.82.6.661
2. Kumar S, Singh R. Pterygium excision and conjunctival autograft: A comparative study of techniques. Oman J Ophthalmol. 2018 May-Aug;11(2):124-128. https://doi.org/10.4103/ojo.OJO_6_2017
3. Damle V. A study to compare conjunctival autografting with sutures and glue free sutureless technique after primary pterygium excision. Int J Sci Study. 2017;5(9):142-7.
4. Panda A, Kumar S, Kumar A, Bansal R, Bhartiya S. Fibrin glue in ophthalmology. Indian J Ophthalmol. 2009 Sep 1;57(5):371-9. https://doi.org/10.4103/0301-4738.55079
5. Nadarajah G, Ratnalingam VH, Mohd, Isa H. Autologous blood versus fibrin glue in pterygium excision with conjunctival autograft surgery. Cornea. 2016 Dec 20;36(4):452-6. https://doi.org/10.1097/ICO.0000000000001106
6. Vyas S, Kamdar S, Vyas P. Tissue adhesives in ophthalmology. Journal of Clinical Ophthalmology and Research. 2013 May 1;1(2):107.