Br Ir Orthopt J 2016; **13:** 45–47

Pharmacological management of a patient following strabismus surgery

GERALDINE R. MCBRIDE MSc FBDO (LVA Hons) BSc (Hons)

Orthoptics, Ophthalmology Department, University Hospital Galway, Galway, Ireland

Abstract

Aim: **To discuss the pharmacological management of a patient following strabismus surgery.**
Method: **The case of an 18-year-old woman who underwent strabismus surgery is described from the perspective of her post-operative pharmacological management.**
Results: **The patient underwent successful and uncomplicated strabismus surgery. The pharmacological treatment is explained from the perspective of controlling the possible post-operative complications.**
Conclusion: **The Royal College of Ophthalmologists does not have a specific guideline on the pharmacological post-operative care of patients following strabismus surgery. Given the lack of significant randomised controlled studies addressing pharmacological care after strabismus surgery, the management in this case was not evidence-based but based on the experience of a senior consultant ophthalmic surgeon.**

Key words: Post-operative pharmacological management, Strabismus surgery, Surgical complications

Introduction

Strabismus surgery is a common extraocular procedure with a low incidence of significant complications. The complications include pseudoptosis, corneal dellen, conjunctival folds, and punctate epithelial keratopathy.[1] Despite the low risk of infection there have been published case reports of orbital cellulitis after strabismus surgery.[1–4]

Pharmacological care following strabismus surgery is based not on current Royal College of Ophthalmologists or international guidelines but on the personal experience of the ophthalmic surgeon, and therefore varies between surgical units. Post-operative management can include the use of antibiotic drops, steroid eye drops, or no pharmaceuticals.

Case report

An 18-year-old woman presented to the orthoptic department following a GP referral for a cosmetically poor esotropia. The patient had attended Moorfields Eye Hospital, London as an infant, and was prescribed glasses aged 10 months. The glasses were stopped at age 9 years on the recommendation of the optometrist. The patient had not undergone amblyopia treatment or previous eye surgery. There was a family history of her mother also having a strabismus which required glasses and amblyopia treatment.

The vision was right 6/6+3 and left 6/6+4 using the Snellen acuity chart. Cover test at near and distance showed a moderate right/alternating esotropia with dissociated vertical deviation (DVD). There was a slight under-action of both lateral recti. Prism cover test for near was 45–50$^{\Delta}$ base out and for distance 45$^{\Delta}$ base out. Post-operative diplopia test for near and distance was negative up to 50$^{\Delta}$ base out. Cyclopentolate refraction was right $+2.00/+0.50 \times 80$ and left $+2.00$DS; no glasses were prescribed. The diagnosis was congenital esotropia, and the patient was listed for strabismus surgery.

In theatre the patient was given a general anaesthetic, and the globe and its adnexa were completely anaesthetised locally so that the surgery on the medial recti would be painless. The eye was prepared by applying 5% povidone-iodine (PI) directly into the conjunctival fornices, and sterile gauze pads soaked with 5% PI were used to clean the periocular skin. Povidone-iodine has been shown to reduce the incidence of post-operative infections by decreasing the presence of bacteria in the conjunctival fornices.[5,6] The area was then draped with a sterile drape. A limbal conjunctival opening was made, followed by a medial recti recession of 5 mm. The recessed medial rectus muscle was secured in place using 6-0 coated Vicryl sutures. Vicryl is a synthetic and absorbable suture. The conjunctiva was closed using Tisseel (a tissue adhesive). An injection of local anaesthetic was given (bupivacaine), followed by adrenaline to prevent systemic absorption and extend the duration of the local anaesthetic. This was injected into the area in which the surgery was performed, underneath Tenon's capsule, as a post-operative pain control. This procedure was then repeated on the second eye.

The patient was discharged with a post-operative management of chloramphenicol 0.5% 4 times daily to both eyes for 1 week. In addition Pred Forte was prescribed 4 times daily to both eyes for 2 weeks, then twice daily to both eyes for 2 weeks. A colour photograph of the right eye was taken 2 hours after surgery

Correspondence and offprint requests to: Geraldine McBride, Senior Orthoptist, University Hospital Galway, Galway, Ireland. e-mail: geraldine.mcbride@hse.ie

(Fig. 1*), but the patient felt nauseous and did not want further photographs taken.

Two weeks after the procedure the patient returned to the orthoptic clinic (Figs. 2–5). The vision was unchanged. Cover test showed for near and distance a minimal right/alternating esotropia with DVD. The ocular movements showed a slight under-action of both lateral recti, and convergence with deviation to 6 cm was now seen. The squint measured 6^{Δ} base out for both near and distance. Bagolini glasses at near and distance showed binocular single vision, but fusion was not present. There was mild redness over the nasal conjunctiva in both eyes but no discharge. The diagnosis was now a residual right/alternating esotropia with DVD and abnormal retinal correspondence. The pharmacological management was altered to Pred Forte twice daily to both eyes for 2 weeks. The patient was booked for a review 10 weeks later.

Twelve weeks after the procedure the patient returned to the orthoptic clinic (Figs. 6–9). The vision was unchanged, as were the cover test and prism cover test results, ocular movements, convergence and binocular functions. There was no conjunctival redness and the patient was discharged.

Discussion

Chloramphenicol 0.5% eye drops are prescribed by the ophthalmology department at University Hospital Galway (UHG) as part of patient care following strabismus surgery. Chloramphenicol is an ocular bacteriostatic with broad-spectrum action against gram-positive and gram-negative bacteria.[7] It inhibits bacterial protein synthesis by interfering with the transfer of activated amino acids from soluble RNA to the ribosomes.[7] Chloramphenicol does transfer into the aqueous humour after administration to the anterior ocular surface.[7] It is inactivated by the liver and excreted mainly in the urine, but toxicity can occur with chronic use.[7] Chloramphenicol was used in this case as a preventative treatment; however, it was developed for the treatment of bacterial conjunctivitis.[7] It is contraindicated in patients with a history of hypersensitivity and/or toxic reaction.[7] Chloramphenicol is known to interact with the enzyme chymotrypsin.[7] Eye swelling and ocular hyperaemia are a common side-effect and transient blurring of vision may occur on instillation.[7]

There are no controlled studies which support the rationale for a steroid to be given after strabismus surgery, but it appears to be the choice of post-operative care prescribed by ophthalmic surgeons at UHG. The thoughts of the ophthalmic surgeon in this case, based on his experience, were that a corticosteroid would aid the whitening of the eyes by reducing the secretions produced from the wound. It should be noted that one prospective randomised study concluded that anti-inflammatory agents were not beneficial.[8]

Pred Forte (prednisolone acetate ophthalmic suspension 1%) is a topical ocular anti-inflammatory agent.[9] It contains the active ingredient prednisolone acetate and preservative benzalkonium chloride.[9] Prednisolone acetate has 3 to 5 times the anti-inflammatory potency of hydrocortisone.[9] Pred Forte is contraindicated in viral diseases of the cornea and conjunctiva, *Mycobacterium* infections and fungal infections.[9] Pred Forte is also contraindicated in patients with a suspected hypersensitivity to any of the ingredients.[9] There is the complication of increasing intraocular pressure and glaucoma when Pred Forte is used for longer than 10 days.[9] Prolonged use may also suppress the eye's own immune response and increase the risk of a secondary ocular infection.[9] The safety and effectiveness in a paediatric population has not been established.[9] In addition it retards healing and so in theory may cause a reduced attachment of any operated muscle to the sclera.

Varying post-operative pharmacological regimes for strabismus surgery can be found inthe literature. In contrast to the regime used at UHG, a UK NHS hospital prescribed Pred Forte and chloramphenicol eye drops 4 times per day to the operated eye for 4 weeks,[10] and a US eye unit prescribes an antibiotic/anti-inflammatory combination drug (Maxitrol) 4 times per day for only 1 week.[11] However, the US unit reviews patients at day 1, day 7 and 1 month post-operatively.[11]

There has only been one study which suggested that antibiotic treatment should be used routinely.[12] The randomised trial of 104 children undergoing strabismus surgery found that the control group (no treatment) had to be stopped after 8 patients, as 3 children developed severe mucopurulent conjunctivitis.[12] The study continued but with all children prescribed either Fucithalmic eye drops or chloramphenicol eye drops.[12]

Conclusion

In the immediate post-operative period there was the expected moderate inflammation of the conjunctiva, especially in the medial aspect. This corresponds to the limbal conjunctival opening cut by the surgeon to access the medial rectus muscles. At the visit 2 weeks after surgery, conjunctival inflammation was only seen when the patient abducted each eye. The steroid was then reduced to twice daily for 2 further weeks. At the 12 week visit there was no sign of conjunctival inflammation.

The Royal College of Ophthalmologists does not have a specific guideline on the pharmacological post-operative care of patients following strabismus surgery. Given the lack of significant randomised controlled studies addressing pharmacological care after strabismus surgery, the management in this case was not evidence-based but based on the experience of a senior consultant ophthalmic surgeon. Therefore, other surgeons may choose alternative post-operative pharmacological management. As a combination of pre-operative antisepsis techniques are used there may even be some debate as to whether courses of post-operative pharmaceuticals are required, but this debate requires the evidence from prospective randomised clinical trials.

*Colour photographs Figs. 1–9 can be viewed in the online version of this paper at www.bioj.org/.

BIOJ ::: ::: MS No. 11 {gb} {F1}
Produced on Tuesday 2nd August 2016
File: O:/BRITORTH/VOL 73-2016/MAKE-UP/11 - MCBRIDE CR.3D

References

1. Palamar M, Uretmen O, Kose S. Orbital cellulitis after strabismus surgery. *J AAPOS* 2005; **9:** 602-603.
2. Basheikh A, Superstein R. A child with bilateral orbital cellulitis one day after strabismus surgery. *J AAPOS* 2009; **13:** 488–490.
3. Armesto A, Ugrin MC. Orbital cellulitis after Faden operation on the medical rectus. *Strabismus* 2007; **15:** 215–219.
4. Lau FHS, Leung TF, Fan DSP. An unusual complication after strabismus surgery. *Hong Kong Med J* 2009; **15:** 297–298.
5. Apt L, Isenberg SJ,Yoshimori R, *et al.* Chemical preparation of the eye in ophthalmic surgery. III. Effect of povidone-iodine on the conjunctiva. *Arch Ophthalmol* **102:** 729–729.
6. Isenberg SJ, Apt L, Yoshimori R, *et al.* Chemical preparation of the eye in ophthalmic surgery. IV. Comparison of povidone-iodine on the conjunctiva with a prophylactic antibiotic. *Arch Ophthalmol* 1985; **103:** 1340–1342.
7. Bausch & Lomb UK Ltd. Summary of product characteristics. Minims chloramphenicol 0.5% eye drops. 2007. http://www.medicines.ie/printfriendlydocument.aspx?documentid=7074&companyid=2250 [accessed 25 January 2015].
8. Wortham E, Anandakrishnan I, Kraft SP, *et al.* Are antibiotic-steroid drops necessary following strabismus surgery? A prospective, randomised, masked trial. *J Pediatr Ophthalmol Strabismus* 1990; **27:** 205–207.
9. Allergan. Pred Forte. 2013. http://www.allergan.com/assets/pdf/pred_forte_pi.pdf} [accessed 26 October 2015].
10. South Devon Healthcare NHS Foundation Trust. Patient information: squints and squint surgery. 2013. http://www.sdhct.nhs.uk/patientcare/pil/23615.pdf?last_updated=19%252F06%252F2013 [accessed 23 January 2015].
11. Rocky Mountain Eye Care Associates. Post-operative instructions for adult eye muscle surgery. http://rmeyecare.com/pdfs/Post_op_Adult.pdf} [accessed 23 January 2015].
12. Kearns PP, Cullen JF. Fucithalmic, chloramphenicol or no treatment after squint surgery in children: a single-blind randomised study. *Acta Ophthalmol (Copenh)* 1992; **70:** 132–134.

BIOJ ::: ::: MS No. 11 {gb} {F1}
Produced on Tuesday 2nd August 2016
File: O:/BRITORTH/VOL 73-2016/MAKE-UP/11 - MCBRIDE CR.3D