Botulinum toxin for the treatment of acute-onset concomitant esotropia in Chiari I malformation

Acute-onset esotropia (ET) is a rare presentation of Chiari I malformation. The ET may resolve following neurosurgical decompression, although this is not usually immediate.\(^1\) Where neurosurgery is not undertaken, Koval et al.\(^2\) suggest prismatic correction or strabismus surgery. The latter may result in temporary correction of the strabismus, as the strabismus can recur and resolves only following decompression.\(^3\) Botulinum toxin (BT) has been reported as successful in one case where the ET did not resolve following neurosurgery.\(^4\) Despite BT being a common treatment for acute acquired concomitant ET,\(^5\) no previous case has been reported in which BT was used prior to neurosurgical decompression for Chiari I malformation.

Case report

A 16-year-old girl experienced diplopia during swimming, and presented to the A&E Department on the day of onset. She gave a history of occasional, brief diplopia. On examination, there was 16\(^\circ\) ET at near and 20\(^\circ\) ET at distance. The angle of deviation reduced on versions. Saccade to the right was possibly hypometric; no nystagmus was present. Over 2 weeks, the angle increased to 40\(^\circ\) ET, saccades to the right became definitely hypometric and abducting nystagmus developed. MRR scan revealed Chiari I malformation with tonsillar descent to about 12 mm below the foramen magnum, with loss of cerebrospinal fluid (CSF) spaces indicating impaction of neural tissue (fig 1). Neurosurgery was discussed, but delayed for 8 months.

Three months after onset, the angle had increased to 45\(^\circ\) ET at near and distance. Four units of BTA were injected into the right medial rectus muscle with electromyographic units of BTA were injected into the right.

Comment

BT restored binocular single vision (BSV) in a patient awaiting neurosurgical decompression for Chiari I malformation. Neurosurgery was delayed to fit in with the patient’s education. BT was used in the expectation that repeat injections would be necessary as the aetiological cause had not been treated at this time. Following the BT, BSV was maintained for 8 months prior to decompression surgery. Recurrence of ET following strabismus surgery has occurred over a variety of time frames upwards from 3 months following strabismus surgery.\(^6\)

Surgical decompression improves ocular manifestations such as nystagmus, but this may not be for several months.\(^7\) In our case, nystagmus and hypometria had not resolved 3 months following surgery.

BT should be considered as a treatment option to restore alignment in acute-onset ET due to Chiari I malformation. Further case series are required to determine the effectiveness of BT compared with strabismus surgery.

References


Microfoam surgical tape as practice object for scleral sutures

Performing scleral sutures in strabismus and retinal surgery poses a challenge for residents as it requires high precision and allows only little room for error, with possible complications including endophthalmitis and retinal detachment from scleral perforation or muscle dehiscence.

The human sclera consists of collagen and elastin, with a thickness ranging between 0.33 mm beneath the recti muscles, 0.66 mm at the muscle insertion and 1 mm posteriorly. Three layers of the sclera are ill defined and comprise episclera, sclera proper and lamina fusca.\(^1\)

Pig eyes, which are commonly used as practice objects for surgical procedures, are not always readily available, change their consistency after conservation in formalin and potentially present a risk for contamination or infection. Other commonly used practice objects include fruits such as oranges, bananas and grapes, or hard-boiled eggs.

Microfoam surgical tape manufactured by 3M consists of rolls of closed-cell foam and is designed for securing dressings and compression applications to joints, with a thickness of 0.8 mm and width of 1, 2 or 3 inches (fig 1). It is elastic and has an adhesive lower surface. When used as a practice object for scleral bites, achievement of appropriate suture depth can be easily checked by lifting the superficial layer from underlying layers (fig 2). In addition, the elastic tape can be easily stretched to 0.4 mm for simulation of a thinner sclera.

Our department’s retina and strabismus specialists evaluated Microfoam surgical tape as a practice object and uniformly agreed on its authemetic feel, resistance, thickness and curvature when compared with the actual human sclera.

In conclusion, Microfoam surgical tape represents a readily available, cheap, storable and easily transportable alternative to pig eyes or fruits for practicing the placement of scleral sutures with authentic characteristics and immediate feedback.

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Reference


The use of voriconazole in the treatment of Aspergillus fumigatus keratitis

There are a few reports of the use of voriconazole for the treatment of fungal keratitis.\(^2\) We report another case of its apparent success in Aspergillus fumigatus keratitis and discuss the dilemma of succeeding eruptions in patients with keratitis.
prescribing an expensive drug in the absence of defined ophthalmic therapeutic levels.

A 51 year old diabetic man presented a week after being poked in his eye by a child’s finger, with a 3.0×3.5 mm central corneal ulcer overlying full thickness stromal infiltrate with associated hypopyon (fig 1). Pinhole visual acuity was 2/60 in this eye. Topical ciprofloxacin 0.3% was started. Aspergillus fumigatus was isolated after 48 hours’ incubation and topical amphotericin B 0.15%, voriconazole 1% hourly, and oral voriconazole 800 mg twice daily were introduced, the latter reducing to 400 mg twice daily after 48 hours. Topical voriconazole was prepared aseptically with 0.9% sodium chloride, with 48 hour expiry (24 hours from opening). The ulcer size, infiltrate, and hypopyon slowly reduced, although recurrent hypopyon at day 13 led to rescraping, aqueous paracentesis, and administration of intracameral amphotericin. A bacillus and coagulase-negative staphylococcus were isolated following enrichment culture. With no further treatment alteration the ulcer healed. At six weeks the eye appeared quiet with a corneal scar, 30% stromal thinning and visual acuity of 6/24; oral voriconazole was discontinued and topical treatments four weeks later.

Comment

Fungal keratitis is difficult to treat and carries a significant risk of intraocular involvement. Traditional antifungals usually have good topical transcorneal penetration, but even systemic therapy has limited intraocular penetration. Primary treatment failure is reported in 31%, with predictive factors being Aspergillus infection, large ulcer size, and hypopyon. We therefore used a novel agent in this high risk case.

Voriconazole is a highly potent triazole, with 100% in vitro susceptibility reported in 34 common ocular fungal pathogens, compared to only 60–82.4% for fluconazole, itraconazole, amphotericin B, and ketoconazole. Although unlicensed in this capacity, topical and oral voriconazole (4–6 mg/kg twice daily for 4–12 weeks) are reported in the successful treatment of Fusarium, Scedosporium, Alternaria, Candida albicans, and Aspergillus fumigatus keratitis. Despite initial good response, two of these cases also showed disease exacerbation at 10 to 14 days which settled with intracameral infusion or further/ increased systemic treatment or both. Intracameral amphotericin may have been instrumental in our case, but this is difficult to disentangle from the voriconazole effect.

Orally administered, voriconazole reaches therapeutic levels in the aqueous and vitreous of the non-inflamed eye, and aqueous of the infected eye. Its penetration topically is less clear; although levels exceeding the minimum inhibitory concentration are reported in the cornea, vitreous, and chorioretina of rabbit control and infected eyes, human data are conflicting.

The good ocular penetration of oral voriconazole has encouraged its use. Although the properties of this agent are attractive its cost far exceeds that of traditional antifungals. A 28 day course costs £3645.44 orally (400 mg twice daily) and £2884.00 topically (hourly), compared with only £86.24 for oral fluconazole (200 mg four times a day) and £190.40 for topical (hourly) amphotericin B.

Restricting voriconazole use to cases involving resistant organisms is difficult as there are no ophthalmic data on resistance and susceptibility breakpoints. Guidelines for the treatment of fungal keratitis need to be established.
Isotretinoin and night vision

We read with interest the article by Mollan et al. who have concluded that previous isotretinoin use does not cause a clinically significant reduction in night vision in most people, and that the retinal toxic effects of isotretinoin may be measurable by electroretinography (ERG) and dark adaptation (DA). Although the authors have successfully highlighted the importance of counselling patients for potential irreversible loss of DA following isotretinoin use, their report, in our opinion, has failed to substantiate the need for routine screening of potential military and civilian commercial aviators.

In their study, 2 of 47 patients had both abnormal ERG and DA, whereas 11 others had certain abnormal ERG parameters that may or may not be of practical significance. The interpretation of this finding is debatable in the context of this study being a retrospective analysis, where we cannot assess the electrodiagnostic status of the patients in the study group before treatment. Only two patients in the study had abnormalities in both ERG and DA. Those two patients, X and Y, received treatment for a comparatively shorter period of time (8 and 12 weeks, respectively) than others (treatment range 6 weeks to 6 months). Whether these patients had previously taken isotretinoin or had any predisposing retinal problems are not adequately explained in the report. It would have been informative if the authors had compared the dose-effect relationships among patients in whom the dose of treatment was known (8 patients with abnormal ERG and 23 patients with normal ERG in the isotretinoin group).

In this particular study, the authors have mentioned a patient who continued to show signs of retinal toxicity 8 years after cessation of treatment, presumably with changes in ERG, but there is no description of this patient either in table 1 or elsewhere in the article. Further, the authors have compared the persistence of retinal toxicity in this particular patient with the study conducted by Oner et al.1 In their study, Oner et al have looked into the visual acuity, anterior segment changes, intraocular pressure, Schirmer’s test, tear film break-up time, colour vision and changes in microbial flora. They specifically mention in their article that they did not perform any electrodiagnostic studies in their patients. Perhaps it is inappropriate to compare the two studies, which have looked at entirely different aspects of side effects of isotretinoin.

Although Mollan et al have mentioned in their methods that colour vision was tested in their patients, they have not elaborated on the relevant results in the article. It is interesting to note that the authors have not justified in the main report their recommendation for routine electrophysiological screening for professions that are critical for night vision, except in the abstract. It would be appropriate to conduct a prospective study to look into the colour vision and other described ocular changes following the use of isotretinoin, to precisely address their question.

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References

Surgical embolus removal in retinal artery occlusion

I was interested to read the article by Garcia-Arumi and colleagues on “Surgical embolus removal in retinal artery occlusion.” The authors claim that “Surgical removal of retinal arterial emboli seems to be an effective and safe treatment for RAO (retinal artery occlusion).” Briefly, the study was based on 16 eyes with temporal branch retinal artery occlusion (BRAO) and one with central retinal artery occlusion (CRAO). The surgery was performed in the eyes with BRAO 4, 12, 19, 22, 28, and 33 h after onset and in the eye with CRAO 29 h after visual loss. The first postoperative evaluation, 48 h after surgery, showed reperfusion of the occluded branch retinal artery in four and none in one; in

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