References

- 1 Ng JS, Lam DS, Li CK, Chik KW, Cheng GP, Yuen PM, Dennis SC *et al.* Ocular complications of pediatric bone marrow transplantation. *Ophthalmology* 1999; **106**: 160–164.
- 2 Coskun NM, Jabs DA, Dunn JP, Haller JA, Green WR, Vogelsang GB *et al.* The eye in bone marrow transplantation. VI. Retinal complications. *Arch Ophthalmol* 1994; **112**: 372–379.
- 3 Ringdén O, Labopin M, Bacigalupo A, Arcese W, Schaefer UW, Willemze RA *et al.* *J Clin Oncol* 2002; **20**: 4655–4664.
- 4 Fawzi AA, Cunningham ET Jr. Central serous chorioretinopathy after bone marrow transplantation. *Am J Ophthalmol* 2001; **131**: 804–805.
- 5 Karashima K, Fujioka S, Harino S. Two cases of central serous chorioretinopathy treated with photocoagulation after bone marrow transplantation. *Retina* 2002; **22**: 651–653.
- 6 Kazuaki M, Satoshi K, Yoshihito H. Serous retinal detachment caused by leukemic choroidal infiltration during complete remission. *Br J Ophthalmol* 2000; **84**: 1318–1319.
- 7 Cheng LL, Kwok AK, Wat NM, Neoh EL, Jon HC, Lam DS *et al.* Graft-vs-host-disease-associated conjunctival chemosis and central serous chorioretinopathy after bone marrow transplant. *Am J Ophthalmol* 2002; **134**: 293–295.
- 8 Jabs DA, Hirst LW, Green WR, Tutschka PJ, Santos GW, Beschoner WE *et al.* The eye in bone marrow transplantation. II. Histopathology. *Arch Ophthalmol* 1983; **90**: 4–13.
- 9 Tewart MW, Gritter KA, Cohen G. Acute leukemia presenting as a unilateral exudative retinal detachment. *Retina* 1989; **9**: 110–114.
- 10 Lopez PF, Sternberg P Jr, Dabbs CK, Vogelp WR, Crocker I, Kalin NS *et al.* Bone marrow transplant retinopathy. *Am J Ophthalmol* 1991; **112**: 635–646.

K-L Peng¹, S-J Chen¹, P-Y Lin¹, W-M Hsu¹, M-H Yang², C-H Tzeng³ and P-M Chen²

¹Department of Ophthalmology
Taipei Veterans General Hospital
201, Section 2, Shih-Pai Road
Taipei 112, Taiwan

²Division of Medical Oncology
Department of Medicine
Taipei Veterans General Hospital
201, Section 2, Shih-Pai Road
Taipei 112, Taiwan

³Division of Transfusion Medicine
Department of Medicine
Taipei Veterans General Hospital, Taipei, Taiwan

Correspondence: S-J Chen
Tel: + 886228757325
Fax: + 886228720959
E-mail: sjchen@vghtpe.gov.tw

Eye (2005) **19**, 603–606. doi:10.1038/sj.eye.6701547
Published online 27 August 2004

Sir, Meningococcal group B meningitis associated with a focal chorioretinitis

Meningococcal meningitis is a medical emergency with numerous possible ophthalmic manifestations. We present an unusual story of unilateral visual loss associated with meningococcal meningitis.

Case report

An 18-year-old man presented with a 36 h history of headache, rigors, and malaise. There were signs of meningism and a widespread petechial rash. There was no focal neurological deficit. He was treated with intravenous cefotaxime (2 g q.i.d.). The cerebrospinal fluid showed a white cell count of 3680 per mm³ (90% polymorphonuclear leucocytes) with Gram-negative diplococci seen on microscopy. There was no bacterial growth on culture of the CSF; however, polymerase chain reaction confirmed the presence of *Neisseria meningitidis* group B DNA.

He made a good recovery; however, on the 10th day following admission he complained of blurring of the vision of the right eye with a 'ghost' image and pain in the right ankle. The visual acuity was 6/60 on the right and 6/9 on the left. There was a mild cellular reaction in the right anterior chamber. Fundoscopy showed a focal pale yellow, raised chorioretinal lesion on the right macula just superotemporal to the fovea (Figure 1a). There was no clinical effusion in the right ankle and the range of movement appeared normal.

The vision in the right eye improved gradually with no further treatment. His Snellen's acuity on the right was 6/18- after 2 weeks and continued to improve to 6/9 at 6 months. He had mild metamorphopsia on Amsler's grid testing with a small positive scotoma inferonasal to fixation. At the latest review at 18 months, he was seeing 6/5 with a pinhole on the right eye and the scotoma was unchanged. The fundus shows distortion of the foveal reflex and a small, flat, poorly defined parafoveal chorioretinal pigmentary disturbance (Figure 1b).

Comment

Ophthalmic manifestations of meningococcal meningitis include ocular motility abnormalities due to third, fourth, and sixth nerve palsies and nystagmus. Raised intracranial pressure associated with meningitis may cause papilloedema and secondary optic atrophy. Optic neuritis and papillitis are potential causes of visual loss in patients with meningitis.¹

Meningococcal septicaemia may result in vascular obstruction secondary to disseminated intravascular coagulation with ocular features including retinal

Figure 1 (a) On presentation the right macula showed a raised pale yellow chorioretinal lesion. (b) After 18 months, the macula showed a poorly defined flat chorioretinal pigmentary disturbance.

haemorrhages and infarcts; iris infarction has also been described.²

Meningococcus normally causes systemic infection via the nasopharynx; however, the conjunctiva may provide an alternative sight of entry for the bacteria. A few reports of meningococcal conjunctivitis associated with meningitis have been described, predominantly in children.^{3,4} Endogenous endophthalmitis is the most serious sight-threatening complication, although very rare, it is often bilateral.⁵

Our patient presented with an isolated chorioretinal focus of inflammation that caused symptoms due to the close proximity to the fovea. There was only a mild cellular reaction in the anterior chamber that did not cause any ocular discomfort. The inflammation could

have resulted from metastatic spread of the organisms or possibly an immune-mediated hypersensitivity reaction.⁶

Evidence exists for the crossreactivity between antibodies to the polysaccharide capsule of group B meningococci and neural cells expressing embryonic neural cell adhesion molecules (N-CAM),⁷ and other human glycolipid/glycosphingolipid antigens.⁸ Immune complex deposition has been postulated as a cause of 'allergic' meningococcal arthritis.⁹

Features of the case report that supports an immune-mediated event include the timing of the presentation of visual loss following 10 days of intravenous cefotaxime and the simultaneous complaint of monoarticular arthralgia of the right ankle. Both the ankle and the visual complaint improved without further intravenous antibiotics. Alternatively, haematogenous spread of organisms already rendered sterile by the antibiotics may have caused a self-limiting focal chorioretinitis.

Although the exact pathogenesis is unclear, we believe this to be the first case of a focal chorioretinitis associated with meningococcal meningitis, illustrated with fundus photographs, in the English literature.

References

- 1 Hanna LS, Girgis NI, Abu El Ella AH, Farid Z. Ocular complications in meningitis: 'Fifteen years study'. *Metab Pediatr System Ophthalmol* 1988; **11**: 160–162.
- 2 Kennedy CJ. Sectoral iris infarction caused by meningococcal septicaemia. *Aust NZ J Ophthalmol* 1995; **23**(2): 149–151.
- 3 Tejwani D, Von Lany H, Reck A, Pathmanathan T. Haemorrhagic conjunctivitis as an initial manifestation of systemic meningococcal disease. *Eye* 2001; **15**(2): 235–236.
- 4 Ellis M, Weindling AM, Davidson DC, Ho N, Damjanovic V. Neonatal meningococcal conjunctivitis associated with meningococcal meningitis. *Arch Dis Childhood* 1992; **67**: 1219–1220.
- 5 Wong JS, Balakrishnan V. *Neisseria meningitidis* endogenous endophthalmitis: case report and literature review. *J Pediatr Ophthalmol Strabismus* 1999; **36**(2): 145–152.
- 6 Whittle HC, Abdullahi MT, Fakunle FA, Greenwood BM, Bryceson AD, Parry EH *et al*. Allergic complications of meningococcal disease I—clinical aspects. *BMJ* 1973; **2**: 733–737.
- 7 Nedelec J, Boucraut J, Garnier JM, Bernard D, Rougon G. Evidence for autoimmune antibodies directed against embryonic neural cell adhesion molecules (N-CAM) in patients with group B meningitis. *J Neuroimmunol* 1990; **29**: 49–56.
- 8 Harvey HA, Swords WE, Apicella MA. The mimicry of human glycolipids and glycosphingolipids by the lipooligosaccharides of pathogenic neisseria and haemophilus. *J Autoimmunity* 2001; **16**: 257–262.
- 9 Greenwood BM, Mohammed I, Whittle HC. Immune complexes and the pathogenesis of meningococcal arthritis. *Clin Exp Immunol* 1985; **59**: 513–519.

D Rathod¹ and JD Heath²

¹Graduate Student (MSc), University Department of Ophthalmology, Manchester Royal Eye Hospital, Oxford Road M13 9WH, UK

²The Luton and Dunstable Hospital, Lewsey Road, Luton LU4 0DZ, UK

Correspondence: D Rathod, Brotherton Court, Block A, Flat 2, Room D, Opal Gardens, Ansons Road, Manchester M14 5EX, UK
Tel: + 447976651370.
E-mail: rathoddj@aol.com

Eye (2005) **19**, 606–608. doi:10.1038/sj.eye.6701548
Published online 25 February 2005

Sir,
Modification of Flieringa ring fixation

Flieringa ring is useful for globe maintenance during penetrating keratoplasty. There are few articles on the techniques of Flieringa ring fixation. Flieringa ring is indicated in eyes that are aphakic, postvitrectomy, for combined procedures, and in infants and children with low scleral rigidity.¹

Fixation ring is usually secured with interrupted sutures (eg 7-0 Vicryl[®] Ethicon Inc., USA). The eye is mobilised by grasping the conjunctiva and episclera with a pair of toothed forceps (eg Castroviejo 0.3 mm). The bites should be short, radially orientated and placed directly beneath the ring.² As direct visualisation of the sclera is not possible, the needle is usually driven 'blindly by feel' through conjunctiva, episclera, and superficial sclera.^{3,4} Undesirable subconjunctival haemorrhage is not uncommon and more seriously, inadvertent globe penetration may occur, particularly for the occasional or inexperienced surgeons.

Our modification consists of four small radial conjunctival incisions (in each of the four quadrants) over the intended sites for suture placement of any chosen ring size. The subconjunctival tissue is undermined and freed to expose the underlying sclera. This modification allows for direct visualisation of sclera, facilitating

precision in suture placement and access for accurate haemostasis (thus avoiding the unsightly red eye after an uneventful elegant corneal graft procedure). The risk of globe perforation is thus minimised. At the completion of keratoplasty, the four radial incisions do not require suturing and may be coapted as necessary. We would like to recommend this modification to junior or trainee surgeons for consideration.

References

- 1 Rapuano CJ, Luchs JL, Kim T. Anterior segment surgery and complications. In: *Anterior Segment (The Requisites)*. Mosby: St Louis, 2000, pp 243–245.
- 2 Albert DM, Irvine J, Jacobs JS, Alldredge CD, Alldredge OC, Barney NP. Intraocular lens management in penetrating keratoplasty. In: *Ophthalmic Surgery: Principles and techniques*, Vol. 1. Blackwell Science: Malden, MA, 1999, pp 51–52.
- 3 Kaufman H, Barron B, McDonald M. Penetrating keratoplasty. In: *The Cornea*, 2nd ed. Butterworth-Heinemann: Boston, 1998, pp 809–813.
- 4 Hersh PS. Penetrating keratoplasty. In: *Ophthalmic Surgical procedures*. Little, Brown: Boston, 1988, pp 194–195.

AL Young¹, GYS Leung¹, LL Cheng¹, ACK Cheng^{1,2} and DSC Lam^{1,2}

¹Department of Ophthalmology and Visual Sciences, The Chinese University of Hong Kong Prince of Wales and Alice Ho Miu Ling Nethersole Hospitals, NTE Cluster, Shatin, Hong Kong

²Department of Ophthalmology and Visual Sciences, The Chinese University of Hong Kong Hong Kong Eye Hospital, Hong Kong

Correspondence: AL Young
Tel: + 852 26322878
Fax: + 852 26482943
E-mail: asmyoung080896@yahoo.com

Financial Support: Supported in part by the Action for Vision Eye Foundation, Hong Kong.

Eye (2005) **19**, 608. doi:10.1038/sj.eye.6701650
Published online 10 September 2004