We are in agreement that methods for early detection of submacular neovascularisation need revision. A trial using a white grid on a black background is justified. Certainly, the use of colour field test cards is a physiologically sound suggestion to test macular function. Their feasibility for elderly patients including those living at home needs to be assessed, but this would likely not be a major obstacle, although the cost of colour charts might be a more significant challenge. The benefits colour charts might confer over the black-on-white Amsler grid suggest a need for their inclusion in any rigorous comparison of practically feasible tests of central field.

Reference

1 Zaidi FH, Cheong-Leen R, Gair EJ, Weir R, Sharkawi E, Lee N *et al*. The Amsler chart is of doubtful value in retinal screening for early laser therapy of subretinal membranes. The West London Survey. *Eye* 2004; **18**(5): 503–508.

FH Zaidi[1], EJ Gair[2], N Lee[3] and K Gregory-Evans[1]

[1]Imperial College London, St Mary's and The Western Eye Hospital, London, UK

[2]St Bartholomew's and The Royal London Hospital, London, UK

[3]St Mary's The Western Eye and Hillingdon Hospital, London, UK

Correspondence: FH Zaidi,
Visual Neuroscience, Imperial College,
St Mary's and The Western Eye Hospital, Room 9L01, Laboratory Block, Charing Cross Campus,
Fulham Palace Road, London, W6 8RP UK
Tel: +44 20 83833690.
E-mail: f.zaidi@imperial.ac.uk

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Sir,

Treatment of bitumen burns: effective dissolution of hardened hydrocarbon residue on periorbital and eyelid burns using butter

A 35-year-old construction worker was referred having sustained molten bitumen burns when a road paving heater pipe loosened. He complained of an inability to open his left eye and facial pain. The burn had been irrigated immediately with large amounts of cold water for several minutes. On examination he had a 2.5% body area burn to the face (Figure 1a) and 1% to the hands.

Butter was allowed to soften to room temperature, applied directly onto the hardened bitumen (Figure 1b), gently mixed together and bitumen dissolved (Figure 1c). Using cotton buds the mixture was gently lifted off the skin. After 60 min later no visible bitumen remained (Figure 2a); exposing second-degree/partial thickness burns of red, mottled appearance with swelling and weeping of burst blistered surfaces (Figure 2b). His visual acuity, corneal, and ophthalmic assessment was otherwise normal. He was admitted for airway observation, given simple analgesics, no dressings, and clear fluids.

Hand burns were seen by a plastic surgeon. Facial scabs showing brownish trace residue precipitation at 1 week (Figure 2c) and healed without cicatrisation, pigmentation, contracture, or infection.

Bitumen is heated to 232C[1] for spray application and lower temperatures for road paving. When splattered, the temperature drops to 93–104C.[1] Molten bitumen cools to form a hardened water-resistant residue. A hardened surface coating, strongly adherent to underlying skin, characteristically covers thermal burns from bitumen. In a series of 92 bitumen burns,[2] 25% affected the critical areas of face, orbit, hands, and feet; 42% required surgical debridement and grafting. Bitumen skin residues persist.[3]

Bitumen is widely recognised as an occupational hazard and after topical application, bitumen-based paints induce DNA adducts in cells of adult and fetal human skin samples maintained in short-term tissue culture and inhibits human epidermal keratinocytes intercellular communication in a concentration-dependent fashion, an important effect of tumour promoters.[4] We are unaware of any studies of periocular neoplastic transformation. Oxidised or air-modified bitumen is classified as a possible human carcinogen with inadequate epidemiological evidence of a causal association for human cancers due to poor exposure data and potential confounders. Mice studies show increases in the incidence of skin and lung tumours.[5]

Facial Butt butter,[6] vegetable[7] and baby oil[8] have been reported as treatment in other bitumen burns with moist exposed burn ointment (MEBO) a suggested adjunct;[9] all contain a lipid solute to hardened bitumen. Rapid assessment enables early deep burn excision and grafting.

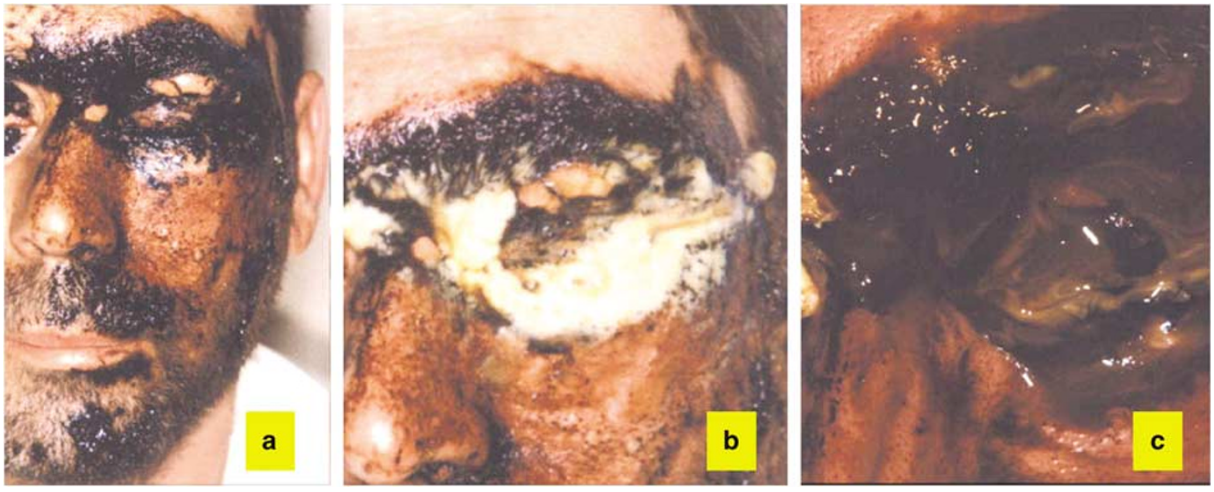

Figure 1 (a–c) Butter dissolving hardened bitumen.

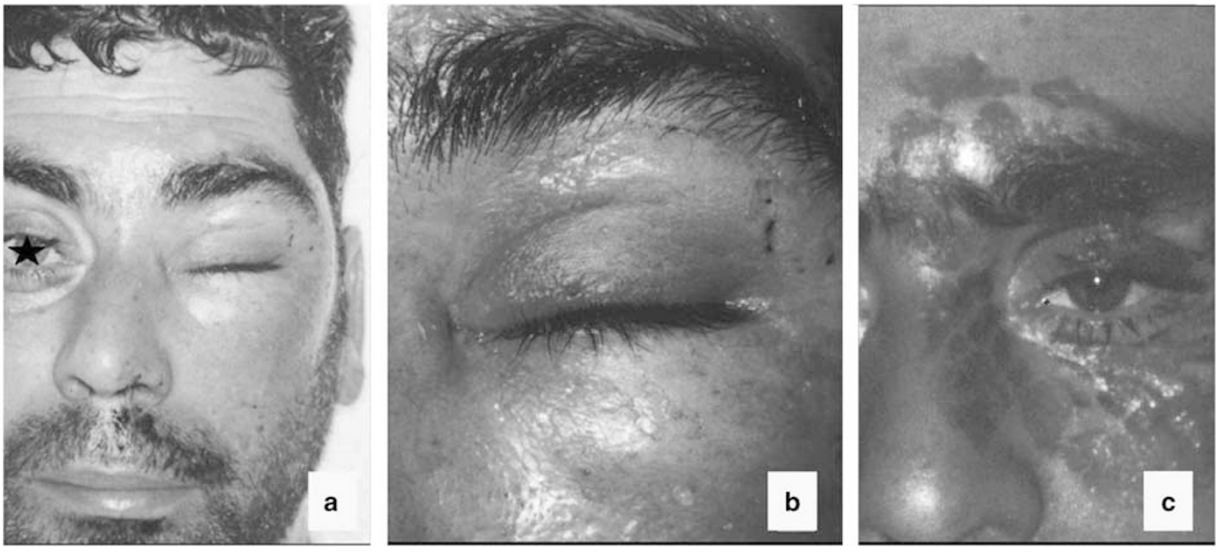

Figure 2 (a–c) Skin bitumen removed, residues precipitated.

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References

1 Stratta RJ, Saffle JR, Kravitz M, Warden GD. Management of tar and asphalt injuries. *Am J Surg* 1983; **146**(6): 766–769.
2 Baruchin AM, Schraf S, Rosenberg L, Sagi AA. Hot bitumen burns: 92 hospitalized patients. *Burns* 1997; **23**(5): 438–441.
3 Wolff MS, Herbert R, Marcus M, Rivera M, Landrigan PJ, Andrews LR. Polycyclic aromatic hydrocarbon (PAH) residues on skin in relation to air levels among roofers. *Arch Environ Health* 1989; **44**(3): 157–163.
4 International Programme on Chemical Safety: Concise International Chemical Assessment Document 59 Asphalt (bitumen), 2004. Retrieved 1 March 2005, from http://www.inchem.org/documents/cicads/cicads/cicad59.htm#8.2.1.
5 Schoket B, Hewer A, Grover PL, Phillips DH. Covalent binding of components of coal-tar, creosote and bitumen to the DNA of the skin and lungs of mice following topical application. *Carcinogenesis* 1988; **9**(7): 1253–1258.
6 Tiernan E, Harris A. Butter in the initial treatment of hot tar burns. *Burns* 1993; **19**(5): 437–438.
7 Turegun M, Ozturk S, Selmanpakoglu N. Sunflower oil in the treatment of hot tar burns. *Burns* 1997; **23**(5): 442–445.
8 Juma A. Bitumen burns and the use of baby oil. *Burns* 1994; **20**(4): 363–364.
9 Alexander G, Rajacic N, Ebrahim MK, Ghoneim I. MEBO and hot bitumen burns. *Burns* 2003; **29**(8): 863–865.

RE Weir[1,2], FH Zaidi[3], D Mathur[1], DEJ Whitehead[4] and BP Greaves[1]

[1]Ophthalmology Department, William Harvey & Kent and Canterbury Hospitals, East Kent, UK

[2]Institute of Ophthalmology, UCL, Surrey, UK

[3]Ophthalmology Department, Imperial College of London, London, UK

[4]Plastic Surgery Department, Wexham Park Hospital, UK

Correspondence: REP Weir, Research Fellow Moorfields Eye Hospital and Institute of Ophthalmology UCL, City road, London EC1Y 2PD, UK
Tel: +44 207 253 3411;
Fax: +44 20 7608 6925.
E-mail: repweir@yahoo.co.uk

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Sir,

Orbital cellulitis in a patient with orbital neuroblastoma and febrile neutropenia

Neuroblastoma is a rare malignant tumour of neural crest cells, which can metastasize to the orbit and present as proptosis and periorbital ecchymosis ('raccoon eyes'). This is deemed stage 4 disease.[1] It is associated with an unfavourable prognosis, and management of this stage is with chemotherapy (followed by local excision and radiotherapy of the primary). Chemotherapy constitutes an induction phase followed by myeloablative conditioning with haematopoietic stem cell reconstitution and treatment for minimal residual disease.[2] The diagnosis of orbital cellulitis in these patients may be difficult to establish, in the setting of pre-existing proptosis from the metastasis and febrile neutropenia from immunosuppression. Such a case is presented here.

Case report

A 4-year-old girl was referred with headaches, right subconjunctival haemorrhage, and proptosis. An immediate CT scan revealed a right superolateral orbital mass (Figure 1a). A biopsy of the orbital mass by an ophthalmic surgeon confirmed neuroblastoma. The primary lesion was localized to the left adrenal gland with abdominal ultrasound and CT. Eighty days of the neuroblastoma high-risk 1 protocol comprising IV vincristine, carboplatin, and etoposide was commenced. During chemotherapy, recurrent episodes of febrile neutropenia developed. During an episode of febrile neutropenia she was noted to have deteriorating proptosis and development of periorbital erythema on day 70 of chemotherapy. The doubt was whether this represented treatment failure with deterioration of the orbital tumour or an orbital infection. A CT scan revealed a right pansinusitis, and right medial rectus enlargement indicating extension into the extraconal compartment. The original orbital mass showed no radiological deterioration and orbital cellulitis was deemed by the probable pathology. She was placed on intravenous teicoplanin, meropenem, and amphoterocin. A sinus washout was performed, which revealed a fungus. Thoracic CT demonstrated multiple areas of lung consolidation. Lung biopsy confirmed the organism to be *Aspergillus flavus*. Voricanozole was added to maximize antifungal therapy. Intravenous metronidazole and ciprofloxacin were added for concurrent urinary infection. A week later the preseptal inflammation improved but visual acuity decreased to light perception only and an RAPD developed. An urgent CT showed the right medial rectus compressing the optic nerve (Figure 1b). Urgent antral washout with ethmoidectomy and medial wall decompression was performed (Figure 1c). Within days there was marked systemic improvement, reduction of the proptosis and preseptal inflammation. The visual acuity stabilized at 2/60 with a residual pale optic disc secondary to optic nerve compression.

Comment

The clinical dilemma here was to ascertain treatment failure or orbital cellulitis, as the symptoms and signs of orbital cellulitis in this situation became of questionable value. The normal signs of orbital cellulitis are fever, proptosis, and periorbital erythema. All of these signs could be attributed to the primary disease or to the complications of treatment. A CT scan was invaluable as it demonstrated pansinusitis and extraconal orbital involvement with no unfavourable change in characteristics of the original tumour.

Between 10 and 20% of cases[3] of neuroblastoma have orbital involvement all of whom undergo chemotherapy. As orbital neuroblastoma and orbital cellulitis have very similar features during chemotherapy, a high index of