Anaesthesia-related diplopia after cataract surgery

Editor—We were interested in Gomez-Arnau and colleagues’ paper, which reported incidences of anaesthesia-related diplopia of 0.39 and 1% following 2024 retrobulbar and 98 peribulbar blocks. Nineteen anaesthetists had performed these blocks during a 3 yr period. Our own retrospective audit of 940 consecutive peribulbar blocks for cataract surgery, performed personally or directly supervised by four anaesthetists between June 1999 and June 2000, found six cases of persistent postoperative vertical diplopia—an incidence of 0.64%.2

All our patients with diplopia showed an immediate post-operative hypertropia in the injected eye, and evidence of muscle weakness, which changed over the subsequent 4–6 weeks to hypotropia with restricted elevation of the affected eye. This suggests that the inferior rectus was the affected muscle. All the anaesthetists had used 4–7 ml of 2% lidocaine injected through a 25 mm 25G needle passed percutaneously and infero-temporally to the globe using the temporal limbus as a horizontal reference point. Interestingly, five of the six cases occurred after left eye surgery and when the anaesthetist was right handed, similar to the preponderance of left eyes found in Gomez-Arnau and colleagues’ paper.1 In our series, hyaluronidase was used in 435 blocks (46% of the total) in a dose of 150–300 U; yet none of the six patients who developed postoperative diplopia had received hyaluronidase (Pearson Chi-squared value of 5.22, \(P=0.023\)).

We note that the authors used hyaluronidase in only 102 patients due to supply problems, and accept that there is disagreement as to its role. Hyaluronidase is an enzyme that cleaves the β-1,4 glycosidic bond between 2-acetamide-2-deoxy-d-glucose and d-glucuronic acid contained in hyaluronic acid. As hyaluronic acid is a glycosaminoglycan forming the interstitial ground substance between cells, the disruption caused by the enzymatic action of hyaluronidase improves penetration of injected substances within tissue planes.3 There is little consensus on the dose of hyaluronidase to use in oculocutaneous blocks, but our own data, and that of others, suggest that it should be used.4,5 Indeed, when hyaluronidase was temporarily unavailable in the USA in 1998, there was a sharp increase in the number of referrals of postcataract surgery diplopia to the practices of four strabismus surgeons.5 We therefore suggest that the use of hyaluronidase may reduce the risk of induced diplopia, when peribulbar and retrobulbar anaesthesia is used.

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Editor—We wish to add some comments to the article about ‘Anaesthesia-related diplopia after cataract surgery’.1 This article underlines another complication of ‘sharp’ needle techniques (retro- and peri-bulbar injections), that is muscle trauma and consequent diplopia. However, the article does not underline the fact that diplopia can follow injection within the orbit by any technique, including sub-Tenon’s local anaesthesia (STLA) with a blunt Stevens’ cannula. Obviously, topical local anaesthetic drops would eliminate this particular risk completely.

Jaycock and colleagues7 reported three cases of diplopia following STLA, with the following features: immediate periorbital bruising (all cases); initial muscle paresis (two cases); and subsequent muscle restriction (i.e. inability to look away from the affected muscle—all cases).

This cluster of cases occurred in a 6-month period in 1998. All were performed by consultants who had already performed a minimum of 300 such blocks uneventfully. In the ophthalmic literature, diplopia is a recognized postoperative complication of cataract surgery. The multiple causes can be subdivided into: (i) unrecognized medical conditions, such as thyroid disease, that become manifest after surgery has restored vision; (ii) surgical trauma; and (iii) anaesthetic trauma.2 This last group of restrictive myopathies can be caused by either local anaesthetic myotoxicity or direct sharp needle trauma damaging a rectus muscle. The former, it is suggested, is caused by fibrosis when local anaesthetic is injected within a rectus muscle, whilst in the latter, direct trauma causes haemorrhage and subsequent scar formation. The fibrosis or scar then restricts the movement of the globe in the direction ‘away’ from the affected muscle.

To minimize the risk of causing diplopia during cataract surgery, we recommend STLA as the technique of choice over sharp needle techniques. In the light of our three case reports, several anaesthetists have modified their STLA technique, such that:

(i) no ‘blind’ deep dissection with Westcott scissors is used;
(ii) extra care is taken to pass the Stevens’ cannula radically without deviation medially or inferiorly;
(iii) no force is used against resistance (which is understood here as any force that causes rotation of the globe). Thus, if and when the Stevens’ cannula encounters resistance, no further force is applied. Only hydrodissection is then used;
(iv) frequently a plastic cannula, such as a standard 20g i.v. cannula (with the needle removed), or Greenbaum cannula are used, to reduce any tendency to deep blind dissection.

We hope these strategies will eliminate, or greatly reduce, the risk of all complications associated with eye blocks such as diplopia, and also haemorrhage, CSF injection and globe perforation, whilst at the same time providing excellent operating conditions.

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Editor—Thank you for the opportunity to comment on the letters about our article.1 They both raise subjects of interest in regional anaesthesia for cataract surgery. Lanigan and Hammond report their experience after almost 1000 consecutive peribulbar block procedures over 12 months, in which six cases of diplopia were recorded (0.64%). As interesting as the rate itself, however, is the protection afforded in their experience by the addition of hyaluronidase, which is similar to the results of Brown and colleagues.6 There is weak evidence that the addition of hyaluronidase to the anaesthetic solution produces better akinesia but no further analgesia,8 and no adverse effects seem to have been observed with doses of up to 300 IU.9,10 The removal of hyaluronidase from the market in Spain prevented us from confirming the data of Lanigan and Hammond in our series, though a number of our anaesthetists would have preferred to continue using it to enhance block.

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Mather and McSwiney’s point is to choose sub-Tenon’s to enhance eye block over sharp needle techniques. The modern method of performing this block was described by Stevens in 1992, and it has grown in popularity since then, though the technique is still not widely used. There is moderate evidence that such a block can improve intraoperative analgesia. However, although blunt needle sub-Tenon’s block would be expected to produce fewer complications, a number of problems have been described with this approach, ranging from mild and self-limiting, to irreversible loss of vision and central nervous system depression, or diplopia as described by Mather and McSwiney. Unfortunately, no data are available to demonstrate a lower incidence of diplopia following sub-Tenon’s block.

Simplification of the surgical technique and a delicate approach by the ophthalmologist make it increasingly possible to perform cataract surgery under topical anaesthesia even in complicated cases. Thus, in our centre in 2002, we performed 1091 cataract operations, of which 872 involved topical anaesthesia (80%); and 201 retrobulbar blocks (18.5%). In comparison, in the preceding year the respective percentages were 39.6 and 56.4%. During 2002, we documented no case of anaesthesia-related diplopia.

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DOI: 10.1093/bja/aeg581