

Perforation of the globe – a complication of peribulbar anaesthesia

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Abstract

Peribulbar anaesthesia has been recommended as a safer alternative to retrobulbar anaesthesia. We report a case of perforation of the globe sustained during peribulbar anaesthesia which resulted in blindness. Orbital injections are potentially dangerous, be they peribulbar or retrobulbar. To minimise the risk, short, blunt needles are advocated for the peribulbar route.

Peribulbar anaesthesia has been advocated as a safer alternative to retrobulbar anaesthesia.^{1,2} With the injection of local anaesthetic placed outside the muscle cone there should be no risk of damage to the optic nerve and a decreased risk of perforation of the globe.³ We report a perforation of the globe sustained during peribulbar anaesthesia which resulted in blindness.

Case report

An 86-year-old myopic woman of -8.5 D with an axial length of 25.7 mm, underwent right cataract extraction on a day case basis. Eight years previously she had undergone a left cataract extraction and attained 6/12 vision. Anaesthesia was administered by a standard peribulbar technique. A 2.5 ml injection of a 50/50 mixture of bupivacaine hydrochloride (Marcain) 0.5% and lignocaine 2% was placed both superonasally and inferotemporally in the right orbit via a blunt, disposable Atkinson 25 g retrobulbar needle 3.7 cm length, which was introduced approximately 2 cm below the skin. No pre-operative complications were noted, and extracapsular cataract extraction with implantation of a posterior chamber intraocular lens was performed uneventfully.

The patient reported floaters one day after the operation, but these resolved by day 5, at which time her visual acuity was 6/18 with a pin hole. At 13 days she reattended with a one-day history of sudden visual loss in the operated eye. The anterior segment showed a normal postoperative appearance, with posterior chamber intraocular lens. The posterior segment showed an incomplete posterior vitreous detachment and a total retinal detachment with an area of retinal incarceration in the equatorial region of the superonasal quadrant. No peripheral breaks were identified. There was a small amount of vitreous haemorrhage inferiorly.

A pars plana vitrectomy was performed under general anaesthesia. An internal search revealed two adjacent ovoid retinal breaks at the site of retinal incarceration, suggesting the entry and exit wounds of the retrobulbar needle. Subretinal

fluid was drained internally via the breaks, which were treated with cryopexy and supported by a radial explant. A 30% SF₆/air mixture was introduced into the vitreous cavity. On the day after operation day she was noted to have suffered a haemorrhagic choroidal detachment, which spread into the vitreous cavity. One month after operation the haemorrhage had substantially cleared and the retina was seen to be flat, with the retinal breaks closed on the indent. Nine days later, however, her vision deteriorated markedly, with a recurrent total retinal detachment and extensive proliferative vitreoretinopathy. Further surgery was not undertaken.

Discussion

The case described is unusual in that perforation of the globe was not recognised preoperatively during the cataract extraction. While globe penetration has been previously reported in a case of peribulbar anaesthesia, this was recognised immediately owing to the presence of vitreous haemorrhage.⁴ Early vitrectomy was undertaken and vision was preserved at 6/12. The occult nature of the case described and the consequent delay in vitrectomy contributed to the poor outcome.

Perforation of the globe is a well recognised though rare complication of retrobulbar anaesthesia. It is likely to be more common in larger myopic eyes. In a series of 4000 cases of retinal detachment undergoing surgery under retrobulbar anaesthesia the three globe perforations encountered were, as in our case, in highly myopic eyes.⁵ Blunt needles have been recommended to decrease the chance of globe perforation when performing both retrobulbar⁶ and peribulbar anaesthesia.⁷ In our case a blunt tipped needle was used, but globe penetration still occurred. Davis and Mandel, who first described the technique of peribulbar anaesthesia, recommend a needle of 1.9 to 2.2 cm in length, and in a series of over 3000 cases of peribulbar anaesthesia there were no complications.⁸ The needle used in our case was 3.7 cm in length. Although the operating surgeon considered that it had been introduced 2 cm below the surface, the situation of the globe perforation suggested that it may have been deeper. Davis and Mandel⁸ also recommend a single inferotemporal peribulbar injection, which they find adequate in over 80% of their cases. They found that a superonasal injection was necessary only if inadequate akinesia was achieved with the inferotemporal injection. Presumably limiting the number of injections will decrease the risk of globe perforation. Nevertheless Loots and Venter⁹ have reported a series of 400 cases of

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peribulbar anaesthesia without serious complication, using both a 4 cm retrobulbar needle introduced to its full depth and employing two injections per patient.

This case demonstrates that peribulbar anaesthesia may be dangerous. It seems from the site of the perforation that the length of the needle used (3.7 cm) may have increased the risk of this occurrence. It seems prudent to heed the advice of Davis and Mandel to use short, blunt needles when employing peribulbar anaesthesia, and to give a single injection where possible. Indeed, the necessity for an orbital injection should perhaps be reconsidered when performing cataract extractions, as subconjunctival infiltration alone with local anaesthetic agents has been shown to provide satisfactory anaesthesia,^{10,11} with no greater incidence of complication than with retrobulbar anaesthesia.¹⁰ Using the subconjunctival route alone should virtually remove the risk of globe perforation and the

other well known serious, albeit rare, complications of orbital anaesthesia.

- 1 Murdoch IE. Peribulbar versus retrobulbar anaesthesia. *Eye* 1990; 4: 445–9.
- 2 Davis DB, Mandel MR. Posterior peribulbar anaesthesia: an alternative to retrobulbar anaesthesia. *J Cataract Refract Surg* 1986; 12: 182–4.
- 3 Weiss JK, Deichman CB. A comparison of retrobulbar and periorbital anaesthesia for cataract surgery. *Arch Ophthalmol* 1989; 107: 96–8.
- 4 Kimble JA, Morris RE, Witherspoon CD, Feist RM. Globe penetration from peribulbar injection. *Arch Ophthalmol* 1987; 105: 749.
- 5 Ramsay RC, Knobloch WH. Ocular perforation following retrobulbar anaesthesia for retinal detachment surgery. *Am J Ophthalmol* 1978; 86: 61–4.
- 6 Feibel RM. Current concepts in retrobulbar anaesthesia. *Surv Ophthalmol* 1985; 30: 102–10.
- 7 Mandel MR. Posterior peribulbar anaesthesia. *J Cataract Refract Surg* 1986; 12: 414.
- 8 Davis DB, Mandel MR. Peribulbar anaesthesia: reducing complications. *Ocular Surg News* 1989; 7: 21, 28, 29.
- 9 Loots JH, Venter JA. Posterior peribulbar anaesthesia for intra-ocular surgery. *S Afr Med J* 1988; 74: 507–9.
- 10 Redmond RM, Dallas NL. Extracapsular cataract extraction under local anaesthesia without retrobulbar injection. *Br J Ophthalmol* 1990; 74: 203–4.
- 11 Smith R. Cataract extraction without retrobulbar anaesthetic injection. *Br J Ophthalmol* 1990; 74: 205–7.