Correspondence

Modified retrobulbar block

To the Editor:

We read with interest the recently published article by Drs. Wong, Koehrer and Sutton¹ introducing a modified retrobulbar block for eye surgery. A technique of ophthalmic regional anaesthesia should be based on sound anatomical principles, especially in the selection of a needle path and depth of insertion that will avoid structures such as important blood vessels, extraocular muscles and the optic nerve. In addition, it should include precise instruction as to direction of needle insertion. We have analysed the technique described in the article and suggest that it falls short in several of these areas and may be prone to the production of serious complications, such as globe perforation, optic nerve trauma, intraorbital haemorrhage or injection into one of the extraocular muscles with resultant local anaesthetic myotoxicity.

It is argued that, if a retrobulbar needle can be placed in a straight line rather than with redirection after partial orbital insertion, perforation of the globe is less likely. Since the globe is closer to the orbit roof than its floor² there is more reason for needle redirection with performing retrobulbar injection from above rather than from below the globe.

In the described modified retrobulbar technique the needle is advanced in the sagittal plane but no instruction is given regarding the angle of insertion. From illustration C, the needle path appears to be on the medial side of the superior rectus/levator palpebrae complex yet on the lateral side of the optic nerve. This is anatomically impossible for a needle advancing in a sagittal plane. With the description of the needle path and insertion to 32–33 mm it is possible to be in line with the optic nerve which is a more medial orbital structure than is commonly realized, particularly towards the orbit apex.

We believe selection of a superomedial needle entry point is ill-advised not only because of the trochlear complex, although it may well be lateral to the described path, but also because this quadrant is the most vascular part of the anterior orbit, containing the end arteries of the ophthalmic arterial system. In addition, the superior ophthalmic vein, the largest venous channel of the orbit, courses anteromedially to posterolaterally, in the orbit between the superior rectus muscle and the optic nerve, across the described path of the needle. Furthermore, we are concerned that the needle avoid the medial rectus

and superior oblique muscles along the pathway described.

Finally, the depth of needle entry into the orbit described both for the standard retrobulbar and the modified retrobulbar blocks are in excess of the 31 mm amount recommended as maximum orbit penetration by Katsev *et al.* in their extensive analysis of safe practice based on bony anatomy.³

Robert C. Hamilton MB BCH FRCPC

Rock G. Loken BSc MD FRCPC

Department of Anaesthesia

The University of Calgary

REFERENCES

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- 2 Grizzard WS. Ophthalmic anesthesia. In: Reinecke RD (Ed.). *Ophthalmology Annual*. New York: Raven Press: 1989: 265–94.
- 3 Katsev DA, Drews RC, Rose BT. An anatomic study of retrobulbar needle path length. *Ophthalmology* 1989; 96: 1221–4.

REPLY

I thank Drs Hamilton and Loeken for their interest in our paper, and apologize for the lack of detail in the description of our technique, and the somewhat misleading perspective of the accompanying illustrations. The needle is inserted through the upper eyelid, between the roof and the medial wall at 10 to 11 o'clock position (for the left eye), well clear of the upper orbital margin and the trochlea. It is advanced slowly downwards at a plane 10° to the floor of the orbit and with a very slight temporal tilt from the sagittal plane. There should be no resistance to the passage of the needle. The needle remains straight throughout its course. With no redirection around the equator of the globe, it passes below the trochlea and superior oblique/levator palpebrae complex, and enters the muscle cone between the medial and superior rectus muscles. The course of the needle was demonstrated in cadaver dissections before undertaking the study, and again before writing this reply.

Katsev et al. recommended, in the abstract of their paper, that needles be placed less than 31 mm (1.25 in) behind the orbital rim. Their study on 120 orbits showed a considerable variation of the retrobulbar needle path length (from the junction of the middle and lateral third of the infraorbital rim to the superior nasal aspect of the optic foramen) of 42 to 54 mm, due to racial or sexual differences. The needles used for retrobulbar injection at their institution ranged from 31.5 to 50 mm in length. The authors stated that "it is this variation that may put patients with smaller orbits at greater risk if 35-