

thickness, wall tension increases with increased radius, although the radius cannot rapidly increase if the wall is not very elastic. However, if the very makeup of the wall varies from place to place, thicker or less elastic in one area as opposed to another, one would expect variation to develop over time in the radius of that portion of the vessel with varying wall thickness (Figure 2a). In DSM, it is known that there is an annulus of scleral thinning around a central area of macular scleral thickening.⁵ The annular area of scleral thinning would be expected to stretch to a greater degree than the central (sub-macular sclera), where the sclera is known to be thickened. The result is a central area that is less distended than the area of scleral thinning surrounding it, producing the characteristic dome-shaped appearance of DSM (Figure 2b).

Conflict of interest

The authors declare no conflict of interest.

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Sir, Bispectral index monitoring in vitrectomy surgery under local anaesthetic block with sedation: a single surgeon, single anaesthetist review

We have undertaken a case review using the Bispectral index monitoring (BIS, Covidien—Medtronic, Boulder, CO, USA) in vitrectomy surgery under local anaesthesia, and would suggest that it may have a role in improving

surgeon satisfaction and reducing intraoperative movements.

The BIS considers the EEG and EMG data, monitoring parameters of the waveforms to provide a final score that may be used to assist with titrating sedation. The exact level to target in the operating room is still unknown, with Kelley suggesting that for moderate sedation, a BIS of 80 is appropriate with a broader range extending from 70–100 also provided.¹

Case series

We present a case series of 54 patients undergoing a vitrectomy for retinal detachment, macular hole repair or epiretinal membrane peel, who were followed prospectively by a single surgeon and anaesthetist. A predominance of peribulbar blocks with 1% ropivacaine and 150 IU hyaluronidase and an average of 50 µg of intravenous fentanyl and propofol titrated for the patient's comfort were used. Intraoperative target-controlled infusion of propofol was programmed to a serum level utilising the patient's age and weight. Adjustments to the infusion were made by the anaesthetist based on BIS and clinical parameters collectively.

A mean surgeon satisfaction of 8.8 (95% CI 8.3–9.3), was recorded with a peak at a mean BIS level of 80–85 and 85–90. See Figure 1. This was recorded immediately after the surgery had been completed, and was measured using a 10 cm linear scale to allow for a continuous variable.

Optimal outcomes in vitrectomies are dependant on a low number of intraoperative movements. In our series

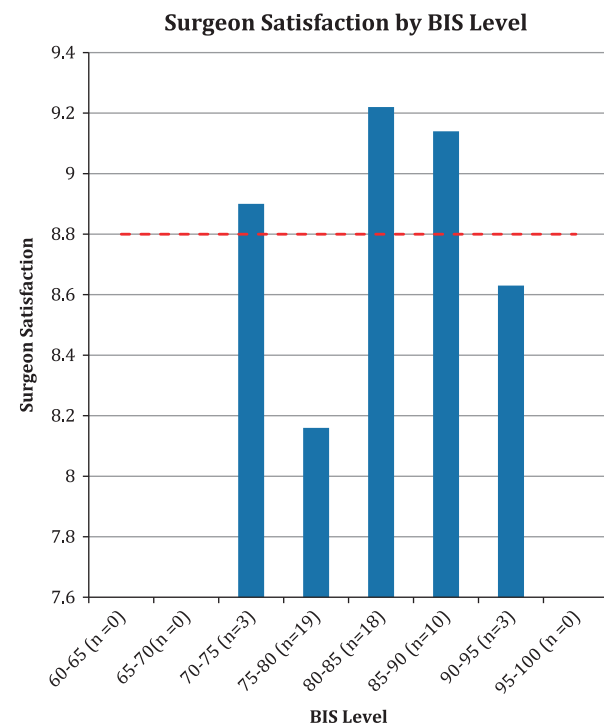


Figure 1 Levels of surgeon satisfaction by mean BIS level. Mean satisfaction is shown by the dotted line.

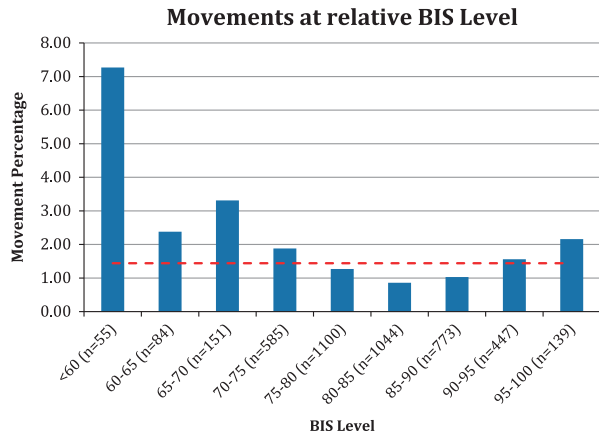


Figure 2 Rates of intraoperative movements at relative BIS levels, with the mean rate shown by the dotted line.

there were 0.7 obtrusive movements (95% CI 0.4–1.0) and 0.4 non-obtrusive movements (95% CI 0.2–0.6) per operation. Of the 4378 minutes of collected data, a total of 63 (1.4% per min) intraoperative movements were recorded. The BIS level between 80–85 had the lowest number of movements (0.86% per min, $n = 1044$) and increased as the BIS became closer to 95–100 (2.1% per min $n = 139$) and <60 (7.3% per min $n = 55$). See Figure 2.

There were no cases of patient mortality or significant morbidity throughout the case series. Thirteen complaints by eight patients (for example, nasal pruritis) were amended with simple interventions.

Comment

In practice, ophthalmic anaesthesia techniques are varied.² Local anaesthesia is preferred in ophthalmic surgery, with general anaesthesia utilised in prolonged or difficult cases and when local anaesthesia is contraindicated.³ With monitored anaesthetic care, it provides improved cardiovascular and respiratory stability intraoperatively, a good recovery and high patient satisfaction.⁴

With vitrectomy surgery including peeling procedures, and the duration of surgery being considerably longer than cataract surgery, a stable level of sedation and a need for minimal movements is increasingly important. The BIS may assist the anaesthetist with titrating the sedation

when used collaboratively with other clinical indicators. If the patient is moving, with a low BIS score, there may be a role to reduce the sedation and vice versa. This may also help to reduce over-sedation of patients.

This review found that when using BIS monitoring, a level between 80–85, had the highest level of surgeon satisfaction and the lowest number of movements. It provides a tighter target window for monitored anaesthetic care with local anaesthetic block.

Conflict of interest

The authors declare no conflict of interest.

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