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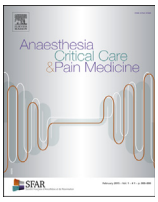

Letter to the Editor

Learning medial canthus retrobulbar anaesthesia for eye surgery: Ophthalmic surgeons versus anaesthetists

1. Introduction and methods

Since the 1980s, anaesthetists have become increasingly involved in eye blocks. However, in some countries including France, there is a lack of anaesthetists, who are more likely to attend theatres of other specialty than ophthalmic surgery, which is unduly considered as a marginal activity of their discipline. To bridge this gap in our institution, anaesthetists proposed to teach ophthalmologists to perform eye blocks. In this letter, we report the comparison of the learning curves of trainees in anaesthesia and ophthalmology, respectively. Repeated measures were performed in a single teaching hospital, with 30 consecutive rotating postgraduate students both in ophthalmology ($n = 30$) and in anaesthesia ($n = 30$) over an 18 month-period. All residents were given a preliminary teaching session on medial canthus retrobulbar anaesthesia technique by a trained anaesthetists (GG) and consisted in a commented video demonstration, including contraindications of techniques, proper positioning, aseptic technique, needle position and control, adequate eyeball movement and injection modalities. Block technique used was similar in both groups and consisted in retrobulbar medial canthus injection of 2% mepivacaïne (3 mL) and 0.75% ropivacaïne (3 mL) using a 32 mm 25-gauge needle for vitro-retinal surgery.

Eye akinesia was assessed by the following three-category classification:

- total akinesia – no movement in any plane;
- satisfactory akinesia – < 2 mm of movement in any direction, not warranting further action before surgery;
- unsatisfactory akinesia – ≥ 2 mm of movement in any one or more direction warranting further injections.

Block success was defined by an akinesia score of 1 or 2. A blinded attending anaesthetic nurse assessed the quality of blocks. Reinjection rates to achieve akinesia and complications were recorded.

2. Results and discussion

Both groups of trainees were similar (Table 1). Ocular axial length, and median injected volume were also similar. Success rates for the first 50 retrobulbar blocks (or all the attempts if trainees had less than 50 attempts) were compared. Linear regression was applied to subsets of the data from attempt 1 to attempt 50 (Fig. 1). A zero slope parameter was found at attempt 19 and 9 for anaesthesia and ophthalmology trainees, respectively. Subsequent attempts have a constant success rate of 89% in both groups. Similarly, the number of reinjections required to achieve complete akinesia was significantly higher among anaesthetists compared with ophthalmologists (30 [26–31] vs 2 [0–3], $P = 0.001$). Five complications occurred in both groups (transient strabismus by medial rectus paresis = 4; orbital haemorrhage = 1).

The present study suggests that the necessary number of procedures to achieve competency was lower among ophthalmologists. One potential explanation for the observed differences in learning curve between residents in ophthalmology and anaesthesia is a lack of understanding of anatomy and proper grasp of complications among anaesthetists. The complex orbital anatomy is not necessarily well known by anaesthetists in terms of training. Anaesthetists may avoid performing eye blocks because of the perceived risk of globe perforation, muscle damage and optic nerve injury.

Since ophthalmologists are able to perform safely and efficiently medial canthus anaesthesia for eye surgery, this may significantly alleviate the increasing burden of work for anaesthetists linked to economic pressures result in the greater use of

Table 1
Trainee characteristics and anaesthesia details by groups.

Group of trainees	Anaesthesiologists $n = 30$	Ophthalmologists $n = 30$	*P*-value
Year of residency	2 ± 1	2 ± 1	0.91
Patients' sex F/M	770/730	710/790	0.52
Side operated R/L	801/679	769/725	0.24
Ocular axial length (mm)	24.9 [22.9–27.6]	25.1 [23.2–27.1]	0.51
Median injected volume (mL) (25%–75% IQR)	6 (5–7)	6 (5–6)	0.81
Time from caruncular puncture to akinesia scoring (min)	2 [1–3]	1 [1–3]	0.35
Total number of procedures per trainee	49 [45–51]	50 [46–52]	0.9
Number of procedures per trainee to achieve complete akinesia without support	19 [10–27]	9 [5–11]	< 0.001
Total number of reinjections to achieve complete akinesia	30 [26–31]	2 [0–3]	< 0.001

Data are expressed as number or median [interquartile range].

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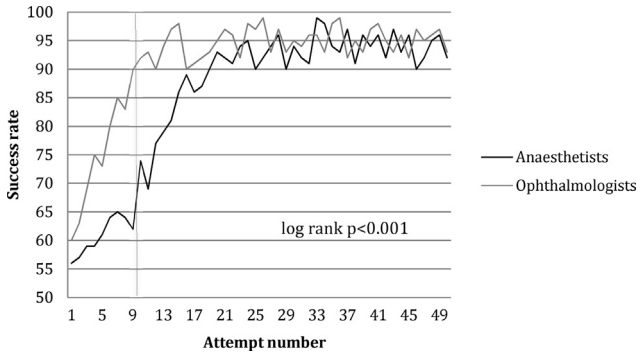

Fig. 1. Mean success rate for the first 50 attempted retrobulbar blocks. The success rate is constantly above 90% after attempt 9 for ophthalmologists and 19 for anaesthetists where the slope parameter of the regression line was zero.

eye blocks with general anaesthesia being reserved for paediatric and deserving adult cases. Moreover, surgeons would be able to renew the regional anaesthesia when necessary (unexpected prolonged surgery). This approach may reduce the delay in the recognition of an adverse event including globe perforations positively impacting on the prognosis for returning useful vision. However, peribulbar and caruncular anaesthesia, even regarded as safe, could lead to rare but life-threatening complications such as cardiopulmonary arrest, central nervous system depression, optic atrophy from compression or direct injury, nerve palsies, retrobulbar haemorrhage, retinal or choroidal vascular occlusions and globe perforations. When one of these complications occurred, an anaesthetist should be quickly available.

Our results may stimulate subsequent publications of the competency of surgeons in administering ocular anaesthesia. If adequately provided by the operating surgeons, they should ultimately share the responsibility for regional anaesthesia. The ophthalmic community may also progress in reference to other types of ocular anaesthesia, surpassing topical anaesthesia or sub-Tenon's administration. These are important topics that may supplant the discussion of who should be trained and under whose direction this training should occur. Also, future studies should assess competencies on a long-term basis.

Some limitation should be advanced. The present study was a single-centre observational one, potentially limiting the extrapolation of its main findings. In addition, some of the trainees had a prior exposure to non-ophthalmic ultrasound-guided regional anaesthesia, which could influence the success rates and the learning curve. Our results could extend beyond ophthalmology to obstetric, gynaecology, plastic and all endoscopic surgery. Even if such strategy could make the physicians remind the specific role of each speciality, anaesthetists should remain experts who counsel, monitor and safeguard the patients and deal with perioperative complications.

Authors' contributions

GG designed and planned the study. GG, PRR, ML performed the study. GG, PRR analysed the data and wrote the first draft; GG, PRR, FBC and CB revised the manuscript. All authors read and approved the final manuscript. GG is guarantor of the paper.

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Disclosure of interest

The authors declare that they have no competing interest.

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