

Transition from retrobulbar to subtenon anaesthesia in ocular surgery: a surgeon's perspective



Anaesthesia and akinesia are desirable in ocular surgery. Although effective, retrobulbar anaesthesia (RBA) carries the risk of serious complications.¹ Subtenon anaesthesia (STA) is an alternative anaesthetic technique with a better safety profile.^{2,3}

In an effort to reduce periocular anaesthetic complications, the University of Alberta Department of Ophthalmology promoted a transition from RBA to STA. In this study, we examine the institutional shift from RBA to STA.

This study was approved by the institutional research ethics board (Pro00097834). The type of anaesthetic used for ocular surgeries at the Royal Alexandra Hospital in Edmonton, Alberta, between 2010 and 2019 was extracted from the electronic medical record (EMR). An anonymized electronic survey, identifying anaesthetic preferences and complications, was sent to all intraocular surgeons from this institution. The survey contained 9 questions: a mix between multiple choice, short, and long answer (Appendix 1, available online). Responses were analyzed in Microsoft Excel.

STA has largely replaced RBA. In 2010, 31.8% (2950/9291) of intraocular surgeries used RBA versus only 1.1% in 2019 (175/15 558) (Fig. 1).

Twenty-five ophthalmologists perform intraocular surgery at the facility, and 22 of 25 surgeons (88%) completed the survey. The number of years of experience for each type of anaesthesia was summed; there has been 264 cumulative years of experience using RBA between 21 surgeons who used the technique, versus 130 years of experience using STA among 20 surgeons. Table 1 shows complication rates associated with each type of anaesthesia.

Surgeons judged their experience with STA compared with RBA: 47% (9/19) believed STA to be superior, 32% (6/19) believed both techniques comparable, and 21% (4/19) believed STA to be inferior. Glaucoma surgeons were the only group where no surgeon believed that STA is superior to RBA.

In the free-text option, multiple surgeons stated that there is better akinesia and analgesia with RBA (responders 3, 4, 5, 11, 18, 19, and 20), but many agreed that transitioning from RBA to STA is advisable due to lower risk of complications (responders 5, 11, 12, 19, and 20). Two surgeons raised concerns about STA inducing conjunctival swelling (responder 3 and 16). Additionally, 2 surgeons thought that there was better workflow with RBA performed by anaesthesiologists preoperatively than with the intraoperative STA performed by surgeons (responders 11 and 12).

Surgeons at our institution cited the superior safety profile of STA as the main reason to transition to its use over RBA. The most frequently cited disadvantages of STA were sub-optimal analgesia and akinesia. Given that it takes about 10 minutes for anaesthetic injected into the subtenon space to infiltrate the muscle cone,⁴ surgeons might consider waiting longer before commencing surgery when using STA.

Conjunctival chemosis can make anterior chamber surgery more challenging. Not surprisingly, glaucoma specialists were the least likely to favour STA over RBA. Adequate dissection of tenon's capsule, advancing the tip of the cannula posterior to the globe, and injecting a smaller volume of anaesthetic at a slower rate may decrease chemosis.³ A video of the retrobulbar technique used in our institution is available online.⁵

Limitations of this study include the retrospective design and surgeon recall bias. The reported complication rate of RBA and STA in this population may not be accurate. The true

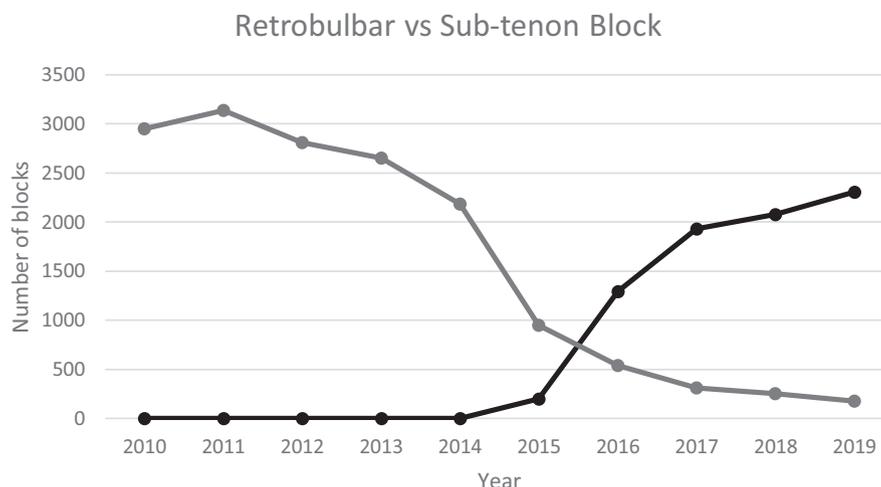


Fig. 1—Number of retrobulbar (grey) and subtenon (black) anaesthetic blocks performed between years 2010 and 2019 inclusive (source: RAH EMR).

Table 1 – Total number of complications and surgeon years per complication with retrobulbar and subtenon anaesthesia

Complication	Retrobulbar		Subtenon	
	Total number	Surgeon years per complication	Total number	Surgeon years per complication
Scleral perforation	12	22	1	130
Retrobulbar hemorrhage	36	7.3	0	N/A - not applicable
Central nervous system anaesthesia	8	33	0	N/A
Strabismus or diplopia	36	7.3	2	65
Optic nerve damage	5	52.8	0	N/A
Oculocardiac reflex	11	24	0	N/A

N/A not applicable.

complication rate could be higher or lower, given that complication rates in this study are based on surgeon recall rather than prospective documentation. A prospective study would be required to accurately provide a true complication rate.

STA is safer than RBA. We would recommend a transition from RBA to STA for most ocular surgeries in awake patients where topical anaesthesia is ineffective.

Supplementary Materials

This article includes online-only material. Appendix 1 can be found on the CJO web site at eyesite.ca. It is linked to this article in the online contents of the Month 20xX issue.

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Footnotes and Disclosure

The authors have no proprietary or commercial interest in any materials discussed in this article.