



## Original Contribution

# Assessing the quality of ophthalmic anesthesia <sup>☆, ☆, ☆</sup>



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Received 6 October 2014; accepted 21 January 2015

**Keywords:**

Anesthesia;  
Cataract;  
Ophthalmology

**Abstract**

**Study objective:** The study objective is to evaluate a scoring system to assess the quality of anesthesia used in ophthalmic surgery.

**Design:** This is an observational prospective study.

**Setting:** The setting is at an operating theater.

**Patients:** Patients are all patients undergoing ophthalmic surgery, October 2012.

**Interventions:** Quality of ophthalmic anesthesia was measured using an interval scale by the operating surgeon. Parameters were graded depending on the type and route of anesthetic: central eye position, anesthesia, akinesia of the eye and or body, soft tissue or orbital hemorrhage, and absence of vitreous bulge.

**Measurements:** The measurements are quality score and proportion of optimal and suboptimal cases of anesthesia and number of surgical complications.

**Main results:** Data were collected on 349 consecutive cases including cataract (55%), retinal (14%), corneal transplant (6%), and strabismus surgery (6%). Sub-Tenon was the most commonly performed (31%) followed by peribulbar (PB) (26%), general anesthesia (GA) (20%), topical (17%), and retrobulbar (RB) (6%) anesthesia. There were 11 surgical complications: posterior capsule rupture (7), dislocated lens (2), and orbital hemorrhage (2). Sub-Tenon had lower quality scores than PB ( $P = .006$ ), RB ( $P = .028$ ), and GA ( $P < .001$ ); and PB and RB had lower scores than GA ( $P < .01$ ). There was a significant association between suboptimal anesthesia and surgical complications ( $P < .001$ ), odds ratio = 3.94 (95% confidence interval, 1.03–15.12;  $P = .046$ ).

**Conclusions:** The quality of ophthalmic anesthesia is an important component of the surgical procedure and should be considered in any risk stratification. Suboptimal anesthesia is associated with an increased rate of surgical complications.

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## 1. Introduction

There are several available choices of anesthetic in current practice in ophthalmic surgery, including route and type from topical (TA), sub-Tenons (STs), peribulbar (PB), retrobulbar (RB), and general anesthesia (GA). There are advantages and disadvantages associated with each type of anesthesia. The preferences of the surgeon and of the

<sup>☆</sup> Disclosures: No grants, sponsors, or funding were obtained to support this work.

<sup>☆☆</sup> Collected data: Joshua Bellevue de Sylva, Alexander Boeker, Joshim Khan, and Gaik Min Tan.

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anesthetist influence the choice of anesthesia for a particular operation. Patient choice, suitability, and health are also important considerations. All of these factors make it impossible to have a single type of anesthetic for all ophthalmic procedures. The Royal College of Anaesthetists and the Royal College of Ophthalmologists state that the goal of local anesthetic for ophthalmic surgery is to “provide pain-free surgery, to facilitate the surgical procedure, to minimize the risk of systemic and local complications, and to reduce the risk of surgical complications [1].”

To our knowledge, there is no tool available for the surgeon to assess and or compare the quality of the various ophthalmic anesthetic techniques. In particular, it is unclear whether the quality of ophthalmic anesthesia might be a risk for surgical complications. This is clearly an important issue, which may be useful for stratifying risk. For example, undertaking cataract surgery when the position of eye is in abduction or adduction or in the presence of vitreous bulge can make the surgery much more difficult. Whether this

leads to an increase in surgical complications is, however, unclear. Sparrow et al [2] identified preoperative factors associated with an increased risk of complications in patients undergoing cataract surgery. They developed a risk stratification to help with surgical planning and to minimize risk [3]. The aims of this study therefore were to develop a grading system to assess the quality of anesthesia and whether there was an association with surgical outcome.

**2. Materials and methods**

An interval scale was developed to grade the quality of anesthesia (Fig. 1). A pilot study was initially undertaken (February 2010) after which modifications were made to the system. An observational prospective study was then undertaken on all ophthalmic surgical cases performed at the Royal Liverpool University Hospital, St Paul’s Eye Unit, during the month of October 2012. Patients who were

**Grades**

- 0 = not accomplished
- 1 = partially accomplished
- 2 = accomplished

<b>Anaesthetic administered by:</b>	Operating surgeon / Other (delete as applicable)																	
<b>Operation:</b>	Phaco+IOL / Other (please specify):																	
<b>Anaesthetic Type</b>	Analgesia			Eye Position appropriate for procedure			Akinesia of eye			No soft tissue or orbital haemorrhage			Eye Soft (No vitreous bulge)			Akinesia of Body		
<b>Topical</b>	0	1	2	0	1	2												
<b>Sub-tenon’s</b>	0	1	2	0	1	2	0	1	2	0	1	2	0	1	2			
<b>Peribulbar</b>	0	1	2	0	1	2	0	1	2	0	1	2	0	1	2			
<b>Retrobulbar</b>	0	1	2	0	1	2	0	1	2	0	1	2	0	1	2			
<b>General Anaesthetic</b>	0	1	2	0	1	2	0	1	2				0	1	2	0	1	2
<b>Comments (inc complications):</b>																		
<b>Would you use the same type of anaesthetic if you were to repeat this procedure on this patient?</b>																		
Yes / No (delete as applicable)																		

**Fig. 1** Proforma used for collection of data. Information gathered by the operating surgeon included whether the anesthetic was completed by the operating surgeon or another individual as well as the type of operation. Depending on the anesthetic technique performed, various criteria (analgesia, eye position, akinesia of eye and body, and eye softness) were graded from 0-2 (0, not accomplished; 1, partially accomplished; 2, fully accomplished). A free text box was available for documentation of complications and other comments.

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