An update : Anaesthesia for Strabismus surgery
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Introduction

Strabismus surgery involves altering the direction of gaze by detaching one or more extraocular muscles from its insertion on the globe and repositioning it to effectively shorten the muscle (resection) or to lengthen it (recession).

The key anaesthetic implications of this procedure are:
1. Nausea and vomiting
2. The oculo-cardiac reflex (OCR)
3. Adequate postoperative analgesia
4. It is most commonly performed on the paediatric population.
5. Associated conditions
6. It is usually a Day-stay or almost an out-patient procedure.
7. The Forced Duction test (FDT)
8. Choice of anaesthetic technique.

Nausea and Vomiting.

The incidence of nausea and vomiting (PONV) in the first 24 hrs after strabismus surgery has been found to be as high as 72% in some studies\(^1\). There are several possible reasons for this\(^2\). Firstly, during surgery, impulses from the extra-ocular muscles are relayed to the vestibular nuclei III, IV and V of the medial longitudinal fasciculi, which lie in the brainstem reticular formation. These nuclei lie in close anatomical proximity to the vomiting centre and impulses in the former may stimulate the vomiting centre. Support for this theory comes from the fact that there is an association between the oculocardiac reflex (OCR) and subsequent PONV\(^3\) such that children who had demonstrated an oculocardiac response intra-operatively were 2.6 times more likely to vomit postoperatively than those who had not. Secondly, alteration of the direction of gaze is thought to produce a conflict in the CNS processing of positional information from vision and that from the vestibular apparatus in the inner ear leading to a “travel sickness” effect commonly termed the “oculokinetic reflex”.

This effect lasts for several hours postoperatively until the brain readjusts to the altered proprioceptive information it is receiving. Furthermore, children are also more prone to nausea and vomiting. Anaesthetic technique plays a significant part (see later): the use of opiates significantly increases the incidence and the use of prophylactic antiemetics lowers it.

The choice of which anti-emetic is most suitable is unclear. However, ondansetron 0.15 mg/kg appears to be more effective than metoclopramide 5 droperidol appears to be as effective as ondansetron 6,7 but is not the most suitable anti-emetic for day stay procedures because of the dysphoria that affects up to 29% of patients over the first 24 hrs. postoperatively even at doses as low as 10mcg/kg 8.

Since the receptors involved in the vomiting pathway include D2, 5HT-3, H1, and ACh, theoretically administration of a combination of anti-emetics such as metoclopramide (D2), ondansetron (5HT-3) and prochlorperazine (H1 and ACh) to block all the above receptors may be more effective than a single agent.

In high risk or refractory cases, dexamethasone 0.15 mg/kg 9 may enhance the effect of other anti-emetics. Oral clonidine 4mcg/kg 90min. pre-operatively 10 or lignocaine 2 mg/kg intravenously at induction of anaesthesia could also be considered.

Insertion of a sub-Tenon’s block prior to closure of the conjunctiva appears to significantly reduce the incidence of PONV11,12. The exact mechanism of this is unclear but may be due to the blockade of proprioceptive impulses from the operated eye preventing the “oculokinetic reflex”. Bearing in mind the association of PONV and the occurrence of the OCR, the insertion of a sub-Tenon’s block before muscle traction to block the OCR may be of additional benefit. This technique also makes it unnecessary to administer any opiates to these patients.

Modification of anaesthetic technique (see below) can reduce the incidence of PONV to less than 6% in the immediate postoperative period although the incidence of late PONV rises in a temporal relation to the offset of the block.

**Oculocardiac reflex (OCR)**
The OCR is a Trigemino-Vagal reflex 13 and is produced by traction on the extraocular muscles during surgery. (Fig 1.) Reproduced with permission.

The afferent pathway is via the long and short ciliary nerves to the ciliary ganglion and thence to the main sensory nucleus of the trigeminal nerve via the Gasserian ganglion and the ophthalmic branch of V. Short internuncial fibres in the reticular formation link with the motor nucleus of the vagus, which lies slightly further down the brainstem. Efferent fibres then pass via X to the heart.

**Oculocardiac Reflex Pathways**

![Oculocardiac Reflex Pathways](image)

**FIGURE 1. Afferent pathway (---):** long ciliary nerves (LCN) and short ciliary nerves (SCN); ciliary ganglion (CG); ophthalmic branch of the Vth cranial nerve (O); Gasserian ganglion (GG); main sensory nucleus of the trigeminal nerve (1). Short internuncial fibres (——) in the reticular formation (2).

**Efferent pathway (→):** motor nucleus of the vagus nerve (3); cardiac depressor nerve from the Xth cranial nerve (X); ends in the muscular tissue of the heart.

The reflex has several features:

a) It is fatigueable: repeated traction produces progressively less effect.

b) It is produced to an equal extent from all extraocular muscles. However, because of its fatigueability, the first muscle to be pulled produces the biggest response.

c) It may be more common in the presence of a high PaCO2 (>40 mmHg)
d) It is more common if there is acute (square-wave) and aggressive traction on the EOM.
e) It is not reliably prevented by anticholinergic premedication\(^{14}\).

There is little value in pre-treating with IV anticholinergics at induction. If the reflex becomes clinically significant despite careful surgical traction, complete cessation of traction and the administration of anticholinergic (Eg. atropine 10 mcg/kg) is all that is required.

Adequate postoperative analgesia
Traditionally, many of these children would be given narcotic analgesics during or immediately after surgery, which greatly increases the incidence of PONV in this group. Modification of the anaesthetic technique (see below) makes the use of narcotic analgesics unnecessary.

Paediatric and Associated conditions
Detailed accounts of the specific aspects of anaesthetising children are out of the scope of this review, but several points are worth emphasising. These children are usually otherwise fit and well. However, there appears to be an association between strabismus and neuromuscular disease such as muscular dystrophy\(^ {15}\) and malignant hyperthermia (MH) particularly if there is associated ptosis\(^ {16,17}\). It is therefore important to ascertain if there is any family history of anaesthetic problems. However, it is important to note that a history of a previous uneventful anaesthetic does not exclude susceptibility to MH even if known trigger agents had been administered.

Because nausea and vomiting are a significant concern with strabismus surgery, a history of PONV or motion sickness should be noted.

A history of any bleeding disorders should also be sought as well as current medications and allergies. It is now uncommon, but occasionally phospholine iodide (ecothiopate iodide) may be used in the management of strabismus. This drug blocks pseudocholinesterase and therefore prolongs the effects of succinylcholine and ester-type local anaesthetics.

Other medical conditions that may be associated with strabismus in children are summarised in table 1.

<table>
<thead>
<tr>
<th>Medical condition</th>
<th>Anaesthetic implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Down syndrome</td>
<td>Atlanto-axial instability, cardiac defects, macroglossia, sub-glottic stenosis, tonsillar hypertrophy, hypothyroidism</td>
</tr>
<tr>
<td>Cerebral palsy</td>
<td>Seizures, gastroesophageal reflux, joint contractures</td>
</tr>
<tr>
<td>Congenital heart disease</td>
<td>May require SBE prophylaxis</td>
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Table 1. Other medical conditions associated with strabismus

Day-stay considerations
Unless indicated by an associated medical condition, apart from a FBC in females 16-60 yrs., no preoperative laboratory tests are required.

The optimal duration of preoperative fasting is not unanimously agreed. However, in this institution there is restriction of solids for 6hrs. and clear fluids for 2hrs. in children and adults, and 4hrs for breast and bottle-fed infants.

Patients having strabismus surgery are usually ready for discharge within 2 - 4hrs. postoperatively, and therefore sedative premedication is usually omitted. However, paediatric patients routinely receive 30mg/kg oral paracetamol on arrival (about 60 min. preoperatively). A 250mg/5ml strength syrup is used to decrease the volume of fluid given. Anticholinergic premedication is not routinely employed since it is unreliable at preventing the oculo-cardiac reflex \(^{14}\), and drying of secretions is not required.
**Forced Duction Test (FDT)**
This is a manoeuvre performed by the surgeon after induction of anaesthesia to check for free passive movement of the eye in order to differentiate between a paretic muscle and a physical restriction impeding ocular movement. Some authors recommend non-depolarising neuromuscular block as well as avoiding succinylcholine so that muscle tone is absent permitting a more “accurate” FDT. The paediatric ophthalmologists in this institution are of the firm opinion that although avoiding succinylcholine is desirable, it is unnecessary to produce neuromuscular block in order to accurately perform the FDT.

**Choice of Anaesthetic Technique**
At Auckland hospital, the following technique is used: oral preoperative Paracetamol 30mg/kg, spontaneous respiration on a laryngeal mask with Oxygen/Nitrous oxide/Sevoflurane, avoiding narcotics and performing a sub-Tenon’s block using a lignocaine/bupivacaine mix at the end of surgery. A randomised, prospective double-blind trial of 70 children employing this technique and without ondansetron 0.1 mg/kg, was associated with minimal postoperative discomfort and a PONV incidence of less than 6% in the first two hours postoperatively. PONV in the subsequent 24 hrs. (when the sub-Tenon’s block would have worn off) was higher, but still less than 20%. Interestingly, the incidence of PONV was not reduced by addition of ondansetron. No patients required admission overnight and no narcotic analgesia was required postoperatively.

A previous study by Fry and Walker on 45 patients using a similar technique but with routine use of ondansetron and prochlorperazine was associated with a zero incidence of PONV in the first 24hrs. postoperatively.

**Summary**
The management of children having strabismus surgery has changed over recent years both from a surgical and anaesthetic management aspects. Traditionally these children would spend at least most of the day if not a night in hospital after surgery. Strabismus surgery has been associated with one of the highest incidences of PONV of any surgical procedure. Also, these patients were routinely intubated, with all the associated problems that that may cause in day-stay patients.

Understanding the mechanisms behind many of the postoperative problems has led to significant improvements in the way these children are managed for their anaesthetic with a corresponding reduction in postoperative morbidity. This has contributed to a reduction in time spent in hospital such that most children are now ready for discharge within 2 hours after surgery.

**References**
After the unfortunate cancellation of the 3rd Annual meeting of the Society in London, the fate of BOAS 2001 was uncertain. However due to the hard work and enthusiasm of Dr Chandra Kumar, we need not have worried. BOAS 2001 WOULD happen and WOULD be a success.

Tall Trees Conference Centre again proved itself to be an excellent venue for the meeting with its unique blend of high quality accommodation and sports facilities in a rather “Out of Town” environment.

Despite the organisers’ short time scale, the meeting attracted speakers from as far as Egypt and New Zealand, as well as 92 delegates from all corners of the UK and Portugal.

The meeting commenced on the afternoon of Thursday 30th with a series of workshops on such topics as Peribulbar/Retrobulbar blocks, Sub-Tenons block, Orbital Anatomy and Fast Track Cataract Surgery. Due to popular demand each workshop was run twice, giving both presenters and delegates a very busy afternoon.

Professor Chris Dodds, the President of BOAS welcomed delegates to the meeting at the start of proceedings on Friday morning, which was well attended despite the excellent dinner and wine the previous evening.

The first Scientific Session began with Monica Hardwick presenting a summary of the recently published, Joint Colleges Guidelines on Local Anaesthesia for Intraocular Surgery. This provoked a few comments from delegates on the more controversial issues, but generally it appears that these guidelines have been well received, unlike their predecessors!

The remainder of the first session was devoted mainly to the technique of Sub-Tenons block, which seems to be rapidly gaining in popularity. Chandra Kumar gave a fact-filled presentation on the history of the technique along with illustrations of the various Cannulae used, possible drug mixtures and complications.

Phil Guise presented the results of a large prospective study carried out in his unit in Auckland, which compared efficacy and complications of Sub-Tenons with their previous sharp needle techniques. They concluded that Sub-Tenons should be the method of choice for eye surgery.

Sean Tighe ended the first session with a comparison of Sub-Tenons and Topical Local Anaesthesia in respect of their complications and efficacy, concluding that Sub-Tenons was probably superior. He also tackled the cost issue of including an Anaesthetist, and concluded that since they contributed greatly to efficiency and provided the necessary ALS back up, that their expense was justified!

After Coffee the Free paper session contained six excellent presentations where again the most frequent subject was that of Sub-Tenons.

Mr H Ruschen presented four case reports of complications following Sub-Tenons; two patients developed hyphaemias, one a central retinal artery occlusion and the fourth vitreous haemorrhages from a presumed globe perforation. This served as a warning to all that Sub-Tenons may not be as free from complications as we imagine.

Chandra Kumar presented the results of a study in Middlesbrough using a short (6 mm) metal cannula. This proved to be equally as effective as standard Cannulae and may reduce the risk of complications.

The next paper, also from Middlesbrough described the results of an audit comparing 3 commonly used Sub-Tenons Cannulae. All three Cannulae gave good results but the deep plastic cannula was more effective than the anterior one, and was equal or better than the metal cannula.

The third paper from Middlesbrough given by Mr N Prasad described the fascinating subjective visual experiences described by patients undergoing phacoemulsification cataract surgery under Sub-Tenons anaesthesia.

On a different subject, Dr Andy Mitchell presented a study, which he carried out in Worcester, looking at postoperative morbidity after cataract surgery under three different local block techniques. Although there was no serious morbidity reported after any of the techniques, it was surprising to note the high incidence of minor morbidity such as a “blood-
shot” eye, double vision, periorbital numbness and post op pain.
The second paper on a subject other than Sub-Tenons, was given by Prof S Aziz from Cairo, and looked at the use of deep topical fornix nerve block as an aid to the one step adjustable suture technique for horizontal strabismus surgery. They concluded that this was an effective method of performing this technique without the need for general anaesthesia.
The last scientific session of the morning included two National Survey reports.
The first was an excellent presentation by Ed Morris from Bristol on the National Survey of Fasting in Ophthalmic Regional Anaesthesia, which was published recently in Anaesthesia. The second Survey report was that of current cataract practise in the UK by UKISCRS members, presented by David Smerdon from Middlesbrough. The questionnaires of which 79% were returned, asked numerous questions on surgical technique, biometry formulae and recording outcomes. There were also questions on Anaesthesia, including techniques, who gave the anaesthetic and methods of monitoring.
At the Annual General Meeting of the Society Prof Chris Dodds officially took over as President of BOAS and thanked his predecessor Rob Johnson for getting the society off to such a good start. Two new council members were approved – Dr Steve Mather and Dr Gurvinder Thind, and details were announced of forthcoming meetings, particularly that in Birmingham in June 2002.
After lunch the first scientific session of the afternoon included three papers on more practical issues of patient management for various types of ophthalmic surgery.
The first was by Jonathan Lord from Moorfields on General Anaesthesia for Paediatric Glaucoma. Although Paediatric Glaucoma is very much a specialist area many of the principles outlined in Dr Lord’s presentation would be equally applicable to children undergoing other types of ophthalmic surgery.
Dr Rob Johnson gave an illuminating presentation on General and Local Anaesthesia for Vitreoretinal Surgery. He also included some fascinating and useful background to the surgical techniques used, and how they affect the anaesthetist – this was “all you ever wanted to know about vitreoretinal surgery but were afraid to ask (...a surgeon)!”
The third presentation was by Ken Barber from Worcester who gave a colourfully illustrated practical guide to dealing with problem patients presenting for cataract surgery under local anaesthesia. These included the very anxious, those with a marked tremor, COPD, or an inability to lie flat. Various methods were suggested to alleviate what are very common problems for surgeons and anaesthetists.
A Case discussion was the next item on the programme, and this was presented by Robert Boyce from Middlesbrough, who described two patients that developed acute orbital inflammation after cataract surgery. The local anaesthetic techniques were different, but hyalase was used in both cases. The discussion revolved around the causes of orbital inflammation and whether these were cases of pseudotumour induced by hyalase. Delegates were asked to report any similar cases in their practice to BOAS.
The final presentation of the day was the guest lecture sponsored by Abbot Laboratories and the speaker was Dr Graem McLeod from Dundee. Dr McLeod’s presentation was entitled Levobupivacaine - improved safety for Regional Anaesthesia? In which he eloquently reviewed the preclinical, human toxicity, potency and clinical data for Levobupivacaine. He provided evidence from large studies that Levobupivacaine is consistently less toxic than Bupivacaine, and has been used effectively in central and peripheral blocks including ophthalmic blocks.
The meeting closed with a vote of thanks from Prof Chris Dodds to the organisers of an excellent meeting, namely Chandra Kumar and his team from Middlesbrough, including the stalwart conference secretary Pat McSorley. All those present; Council members, faculty and delegates had enjoyed an entertaining and informative meeting which would ensure the continuing success of the British Ophthalmic Anaesthesia Society.

Dr Monica Hardwick, Worcester, UK
The annual scientific meeting of the American Ophthalmic Anesthesia Society took place in Chicago from the 5th to the 7th of October. It was a very successful meeting and well attended by North American members as well as by 5 members of BOAS despite everyone's concern with air travel after September the 11th.

The quality of the scientific programme was of a uniformly high standard and it covered areas of interest to all delegates. Indeed there appeared to have been a move to reduce the UK questions (usually - why not give a GA?) by providing expert discussion of points raised in the lectures.

I will hint at the flavour of the meeting by mentioning just a few of the presentations, not because of lack of merit in those missed out, but because a comprehensive listing can be found on the OAS website (oas@amainc.com). There were anaesthetically orientated topics such as a fascinating review of the history of ophthalmic anaesthesia by Warren Hill, another on the impact of coagulopathy on ophthalmic anaesthesia from Marc Feldman, and the cluster of diplopia following regional orbital anaesthesia without bovine hyaluronidase from Sandra Brown. There was an update on the American Resuscitation guidelines from Len Romanowski that reinforced some of the differences in practice across the Atlantic. How many of us are aware of the changes recommended in February this year by the European Resuscitation Council, or have actually been re-certified as an ACLS provider?

The ophthalmic surgical perspective was clear and incisive - just as we would expect! The lecture by Steve Charles on the anaesthetic and surgical interface for V-R surgery was grounded in both clear expertise and great common sense. Those who care for these patients all learnt from the lecture and those who didn't were even more determined not to get involved. Steven Gayer gave a masterly review of intraocular melanoma and the challenges from both surgical and an anaesthetic view. We were treated to two excellent workshops. Dr Gary Fanning presented a master class on orbital anatomy and the virtues of using a SHORT needle in the correct place. Dr Scott Greenbaum ran a master class on sub-tenon's anaesthesia with a very balanced view of the alternative techniques and their respective merits - or otherwise.

Socially, (I have no doubt the BOAS website will testify to this!) we had a great time but it played havoc with our diets. It was so good that several airlines reduced the number of passengers to maintain a safe weight of cargo for the return trip. Even staunch trenchermen had wonderful time too (from left to right Mrs Arline Fanning, Dr Ann Dodds, Mrs Suchi Kumar and Mrs Ursula Johnson)
like Chandra Kumar failed to complete at the Eire Café, although Bob Johnson and another did manage to order and eat pudding.

Dr Gary Fanning entertaining BOAS representatives and their wives (from left Ursula Johnson, Bob Johnson, Arline Fanning, Gary Fanning, Chandra Kumar and Chris Dodds)

All in all it was a great meeting and one that we would encourage more members of BOAS to include in their CEPD list of places to go. Certainly they were very interested in the next BOAS meeting in Birmingham next June.

Chris Dodds, President, BOAS
BOAS is grateful to Abbott Laboratories for sponsoring the printing of this Newsletter. We hope to receive future support.
Is he as strong as she thinks?

51% of patients over 60, undergoing general anaesthesia in the UK, have cardiac problems

Sevoflurane does not significantly alter the heart rate

Sevoflurane Prescribing Information: Presentation: amber glass bottle containing 200ml sevoflurane. Indications: For induction and maintenance of general anaesthesia in adult and pediatric patients for inpatient and outpatient surgery. Dose: MAC values increase with age and the addition of nitrous oxide. Summary of Product Characteristics: Induction: in adults up to 8% sevoflurane usually produces surgical anaesthesia in less than 2 minutes, in children up to 7% sevoflurane usually produces surgical anaesthesia in less than 3 minutes. Up to 8% sevoflurane can be used for induction in unpremedicated patients. Maintenance concentrations range from 0.5-3.5%. Elderly: lower concentrations normally required. Administration: Deliver via a vaporiser specifically calibrated to use with sevoflurane. Induction can be achieved and maintenance sustained in oxygen or oxygen-nitrous oxide mixtures. Contraindications: Sensitivity to sevoflurane. Known or suspected genetic susceptibility to malignant hyperthermia. Precautions: For use only by trained anaesthetists. Hypoventilation and respiratory depression increase as anaesthesia is deepened. Malignant hyperthermia. Experience with repeat exposure is very limited. Until further data is obtained, sevoflurane should be used with caution in patients with renal insufficiency. Levels of Compound A (produced by direct contact with CQ aerosol) increase with: increase in cardiac temperature; increase in anaesthetic concentration; decreases in gas flow; rebreathing; increase in the use of Bovylene rather than saline. Interaction: Respiration often decreases during muscular relaxation. Similar to sevoflurane in the sedation of the myocardium but the arrhythmogenic effect of atrial arrhythmia. Lower concentrations may be required following use of an anaesthetised. Sevoflurane metabolism may be induced by CYP3A4 inhibitors but not by barbiturates. Side Effects: Dose-dependent cardiovascular depression. The use severity and frequency of adverse events are comparable to those seen with other inhalation anaesthetics. Most adverse events are mild to moderate and transient: nausea, vomiting, increased cough, hypertension, agitation and bronchospasm. Reactions have been reported rarely. Contraindications may occur extremely rarely, particularly in children. There have been very rare reports of pulmonary oedema. As with other anaesthetics, twitching and jerking movements, with spontaneous resolution have been reported in children during induction. Patients should not be allowed to drive for a suitable period after sevoflurane anaesthesia. Use in Pregnancy and Lactation: Use during pregnancy only if clearly needed. It is not known whether sevoflurane is excreted in human milk – caution in nursing women. Overdose: Stop sevoflurane administration, establish a clear airway and initiate assisted or controlled ventilation with pure oxygen and maintain adequate cardiovascular function. Special Storage Conditions: Do not store above 25°C. Do not refrigerate. Keep out of sight of children. Legal Category: POM. Marketing Authorisation Number: PL 00310286. Basic NHS Price: 350ml Bottle £155.00

Further information is available on request from Abbott Laboratories Ltd, Abbott House, Ronden Road, Mardenfield, Berkshire SL5 4OE. Ref. PV01/001.


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Responsive and Reliable

Sevoflurane
Chirocaine has a lower potential for cardiovascular\(^1\) and CNS\(^2\) toxicity than bupivacaine

- Consists only of the S()-enantiomer of bupivacaine (levobupivacaine)
- Equivalent efficacy to bupivacaine when used for local infiltration and peripheral and central nerve blocks\(^3,4\)
- Proven efficacy in paediatric,\(^5,6\) obstetric,\(^7,8\) and post-operative pain management\(^9,10\)
- Unlike bupivacaine, Chirocaine is also licensed for post-operative pain management\(^{11,12}\)

* for ilioinguinal/iliohypogastric blocks

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**Ophthalmic Anaesthesia News, Issue 5, October 2001**

Email: secretary@boas.org    Website http://www.boas.org
An update: Sub-Tenon’s Block
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(NB. The contents of this article was presented in the recent BOAS meeting but new facts have been added.)

There is a substantial international variation in the care and provision of ophthalmic regional anaesthesia\(^1\text{-}^5\), both non-akinetic\(^5\) and akietic methods are in use. Akietic blocks using needle such as retrobulbar, peribulbar and combined retro/peribulbar are the commonest techniques practiced around the world\(^1\text{-}^5\). Although sub-Tenon’s block is common in certain parts of the world such as Japan and Denmark but only 7% practiced sub-Tenon’s block in the UK in 1997\(^4\text{-}^5\). A recent survey of the members of United Kingdom and Ireland Cataract and Refractive Society (UKISCRS) suggests that the sub-Tenon’s block is practised in 51%\(^6\) units. The complications related to needle blocks such as retrobulbar haemorrhage, globe perforation, retinal vascular obstruction, respiratory arrest and death\(^7\text{-}^8\) may be the reasons for the re-introduction of sub-Tenon’s block in the last decade. This block is reported to be simple, effective and versatile\(^9\) but nevertheless there are minor problems are associated with this technique.

The sub-Tenon’s technique involves obtaining surface anaesthesia, access to the sub-Tenon’s space, insertion of a cannula and subsequent administration of local anaesthetic agent into the sub-Tenon’s space. There are many variations of the sub-Tenon’s block but they are essentially similar in principle. However, the techniques differ in the access to the sub-Tenon’s space, cannula used, local anaesthetic agent, volume and the use of adjuvant.

The sub-Tenon’s technique was first described by Turnbull in 1884\(^10\) and later by Swan in 1956\(^11\). Over the last decade interest by Mein et al\(^12\), Hansen et al\(^13\), Stevens (1992)\(^14\), Greenbaum (1992)\(^15\), Fukasaku (1994)\(^16\), Ripart (2000)\(^17\) and others have made sub-Tenon’s block popular. Sub-Tenon’s block has different names and is also known as single quadrant injection\(^18\), parabulbar block\(^15\), pinpoint anaesthesia\(^16\) or episcleral block\(^17\).

Access to sub-Tenon’s space
Access to sub-Tenon’s space can be achieved from all four quadrants, however, access to the space by inferonasal quadrant dissection is the commonest approach described because the placement of the cannula in the inferonasal quadrant allows good fluid distribution superiorly while avoiding the area of surgery and reducing the risk of damage to the vortex veins. The space has also been accessed from the superotemporal quadrant by Fukasaku\(^16\) and the medial canthal side Ripart\(^17\).

Cannulae
Many cannulae, both commercial or in-house are available for this block. The cannulae are either made of metal or plastic. Most metal cannulae are 1 inch long (posterior sub-Tenon’ cannula), curved with a blunt end, and come in various sizes ranging from 19 to 23 gauges. The cannulae have either end or side hole. Greenbaum’s cannula\(^15\) is blunt 15G, ‘D’ shaped, flat bottomed, plastic cannula (anterior sub-Tenon’s cannula) which is approximately 12mm long and 2mm in diameter. The opening on the flat bottom is designed in such a way that it faces the sclera after insertion. Alternatives to these cannulae include: Southampton cannula\(^19\text{-}^20\) (metal) the ophthalmic irrigation cannula\(^19\text{-}^20\) (metal) the intravenous cannula sheath\(^21\text{-}^22\) (plastic) and the Kumar-Dodds cannula\(^23\) (plastic, mid-sub-Tenon’s cannula). The selection of a cannula depends on the availability and the preference of the anaesthetist. Metal cannulae mostly feature in the published studies. The placement of a polyethylene catheter into sub-Tenon’s space has been described for surgery of long duration\(^24\).

Passage of local anaesthetic agent after the sub-Tenon’s injection
The passage of the local anaesthetic during sub-Tenon’s block has been studied using ultrasound. Ultrasound reports confirm that the fluid injected into the sub-Tenon’s space, finds its way into the retrobulbar space giving a T-sign\(^25\text{-}^26\). T-sign on ultrasound imaging during the injection of local anaesthetic agent was confirmed in a recent study where three
different cannulae, long metal, mid and anterior sub-Tenon’s cannulae were used\textsuperscript{27}.

**Choice of local anaesthetic agent**

The ideal agent for ophthalmic block should be safe, painless to inject and produce a rapid onset of dense motor and sensory block, the duration of which must be sufficient for surgery yet not excessively prolonged\textsuperscript{28}. The speed of onset is partially determined by the properties of the anaesthetic, but more directly by the proximity to the nerves. All the commonly used agents have a place, the choice depending on the technique used and the duration of action required to cater for a variety of surgical procedures and surgical skills. 2\% lidocaine with or without epinephrine and hyaluronidase is the most commonly used agent\textsuperscript{28}.

**Volume of local anaesthetic agent**

There is a wide variation in the volume of local anaesthetic used in sub-Tenon’s block, and this has been a subject of debate. The volumes vary from 1 to 11mL\textsuperscript{15,29} but 3 to 5mL are generally used\textsuperscript{9,14,30,31}. Smaller volumes usually provide globe anaesthesia\textsuperscript{15} but larger volumes are required if akinesia is desirable\textsuperscript{30}.

**Adjuvant and sub-Tenon’s block**

**Vasoconstrictor**

Vasoconstrictor (epinephrine and felypressin) are commonly mixed with local anaesthetic solution to increase the intensity and duration of block, and minimise bleeding from small vessels. Absorption of local anaesthetic is reduced thus avoiding surge in plasma levels. Epinephrine may cause vasoconstriction of the ophthalmic artery compromising the retinal circulation. However, the use of epinephrine containing solution should be avoided in elderly patients suffering from cerebrovascular and cardiovascular diseases. Phaco cataract extraction is of short duration; hence the duration of block achieved by lidocaine without epinephrine usually suffices. Research is needed if epinephrine is needed at all for sub-Tenon’s block.

**Hyaluronidase**

Hyaluronidase is an enzyme, which reversibly liquefies the interstitial barrier between cells by depolymerization of hyaluronic acid to a tetrasaccharide, thereby enhancing the diffusion of molecules through tissue planes\textsuperscript{28}. It is available as a powder readily soluble in local anaesthetic solution. The amount of hyaluronidase mixed with the local anaesthetic varies from 5 to 150 units/ml. Hyaluronidase (30 units/mL) has been shown to improve the effectiveness and the quality of sub-Tenon’s block\textsuperscript{32,33}. Side effects are rare, though hyaluronidase has been implicated in allergic reactions and the formation of pseudotumours\textsuperscript{34}.

**pH alteration**

Commercial preparation of lidocaine and bupivacaine are acidic solution in which the basic local anaesthetic exists predominantly in the charged ionic form\textsuperscript{28}. It is only the non-ionised form of the agent that traverses the lipid membrane of the nerve to produce the conduction block. At higher pH values a greater proportion of local anaesthetic molecules exist in the non-ionised form, allowing more rapid influx into the neuronal cells. Alkalinisation has shown to decrease the onset and prolong the duration after needle blocks\textsuperscript{35,36} but no benefit has been observed in sub-Tenon’s block\textsuperscript{37}.

**Complications and problems**

Sub-Tenon’s anaesthesia are associated with usually minor but a few major complications have been reported.

**Minor Complications**

Pain during injection

Pain experienced during ophthalmic blocks are multi-factorial. The incidence of pain during sub-Tenon’s injection is reported in up to 44\% of patients\textsuperscript{9,14,20,38} and pain scores on a visual analogue scale [0=no pain, 10=worst imaginable] have been reported as high as 5\textsuperscript{14}. Premedication or sedation of patients during sub-Tenon’s injection has not added any benefit. Preoperative explanation of the procedure, good surface anaesthesia, gentle technique, slow injection of warm local anaesthetic agent and reassurance are considered good practice and may reduce the discomfort and anxiety during the injection.

**Chemosis**

Chemosis signifies anterior injection of the anaesthetic agent. This usually occurs if a large volume of local anaesthetic is injected and if the Tenon’s capsule is not dissected properly.
The incidence of chemosis varies from 25-60% and there is an increased incidence with short cannula and may not be confined to the site of injection. It may resolve after the application of digital pressure, and no intraoperative problems have been reported. Surgeons performing glaucoma surgery may feel that significant chemosis compromises the procedure.

**Conjunctival haemorrhage**

Conjunctival haemorrhage is caused by fine vessels inevitably severed on making the conjunctival cut. The incidence of haemorrhage varies from 20-100%. This can be minimised by careful dissection avoiding damage to fine vessels plus the application of cautery and the use of topical epinephrine. Patients should be warned of the possibility of this occurrence preoperatively.

**Loss of local anaesthetic volume during injection**

Overspill of local anaesthetic during its administration is commonly observed. This is likely to occur if the dissection of the sub-Tenon’s capsule is not complete, if there is resistance to injection, due to enlargement of the initial dissection following traction during injection or large volume for injection is used. Careful dissection and use of diathermy may minimise the loss.

**Anaesthesia and akinesia**

Anaesthesia accompanying sub-Tenon’s block is usually good but akinesia is variable and may not be complete. Akinesia is volume dependent and if 4-5mls local anaesthetic is injected, a large proportion of patients develop akinesia. Superior oblique muscle and lid movements may also remain active in significant number of patients.

**Significant complications**

These include short-lived muscle paresis and orbital haemorrhage. Recently, scleral perforation during sub-Tenon’s block has been reported in a patient who had previously undergone retinal surgery. Trauma to inferior and medial rectus muscles leading to restrictive functions resulted in diplopia have been reported following damage to the muscles by metal cannula.

**Subjective visual sensation and sub-Tenon’s block**

Published studies have reported that patients having phacoemulsification cataract surgery under topical, retrobulbar and peribulbar blocks experience light and various visual sensations during surgery. A recent study has also shown that patients experience a wide range of visual sensations undergoing phacoemulsification cataract surgery with IOL under sub-tenon’s anaesthesia. Although majority of the patients felt comfortable with the visual sensations they experienced, however, a small proportion found the experience to be unpleasant or frightening. Patient receiving sub-Tenon’s block should receive preoperative advice and this may alleviate this unpleasant experience.

**Intraocular pressure and pulsatile ocular blood flow after sub-Tenon’s block**

It is known that retrobulbar and peribulbar injections may have little effect on IOP but pulsatile ocular blood flow falls, at least for a short time. In another recent study, where changes in IOP and Ocular Pulsatile Amplitude (OPA) were compared during peribulbar and sub-Tenon’s blocks. The IOP remained stable throughout the study with both the blocks. One minute after injection of the anaesthetic agent, the OPA was significantly decreased in the injected eyes in both the sub-Tenon’s (24%) and peribulbar (25%) groups. The decrease in the OPA in the sub-Tenon’s group (14%) was also detectable after 10 minutes in the control eyes. Caution is required in the management of patients whose ocular circulation may be compromised and an alternative anaesthesia such as general anaesthesia may be desirable.

**Uses of sub-Tenon’s block**

Sub-Tenon’s block has been used for a variety of surgeries which include vitreoretinal surgery, panretinal photocoagulation, strabismus surgery, trabeculectomy and optic nerve sheath fenestration.

**Sub-Tenon’s block and patients receiving Non Steroidal Anti-inflammatory Drugs and anticoagulants**

It is generally accepted that needle block should be avoided in patients who are receiving anticoagulants and NSAID and a recent review...
suggests that sub-Tenon’s block may be used safely in these patients provided the blood results are within normal therapeutic range. 

References:
19. Rubin AP. Personal communication.
22. Amin S. Description of a new technique for delivering sub-Tenon’s anaesthesia BOAS 2001, Middlesbrough.
23. Kumar CM, Dodds C. A disposable plastic sub-Tenon cannula. Anaesthesia 2001;56:399-400.
27. Kumar CM, McNeela BJ. Comparison Of Ultrasonic Localization Of Anesthetic Fluids In Sub-Tenon’s Block With Different Cannulae (Abstract). Ophthalmic Anesthesia Society Meeting, 2001, Chicago, USA.
40 Olitsky SE, Juneja RG. Orbital haemorrhage after the administration of sub-Tenon's infusion anaesthesia. *Ophthalmic Surg Lasers* 1997; 28: 145-6
A Device for Inhalation Anaesthesia in Children

Alberto Affonso Ferreira, TSA
Av. Andrade Neves, 611
13013-161 Campinas, SP

Maintenance of airway patency is of primary concern in anesthetized and unconscious patients. We recommend tracheal intubation as the most efficient technique. The second best technique is the laryngeal mask airway (LMA) which is closely followed by the cuffed oropharyngeal airway (COPA).

In some situations, a Guedel airway is used. It is available in a variety of sizes suitable for the patient. 100% oxygen or a mixture of oxygen and volatile anaesthetic agent is delivered through a catheter, which is inserted in a Guedel airway.

Monitoring of respiratory movements also follows the same sequence above. The best method is the observation of changes in reservoir bag volume in intubated patients; next, in order of efficiency is the observation of these bag movements in patients ventilated through a laryngeal mask airway and a COPA. A Guedel airway does not permit assessment of the inspiratory and expiratory flows. In the latter situation, we need to observe the patient clinically to see the chest and abdominal movements and feel the inspiratory and expiratory flows by hand.

Manual control of ventilation is perfectly feasible through a tracheal tube and through a laryngeal mask airway when positive-pressure is applied to the reservoir bag (air or oxygen plus volatile anaesthetic agent).

The COPA only permits the application of a few cmH₂O of positive-pressure ventilation. The oropharyngeal airway does not allow positive-pressure ventilation or an increase in the depth of anesthesia.

The present correspondence is intended to demonstrate the adaptation of an endotracheal tube connector made of plastic or metal into a Guedel airway. The connector is available in a variety of sizes according to the size of the Guedel airway, which conforms to the patient’s anatomy. The Guedel airway, with the proposed connector, permits direct attachment to an inhalation system, such as the Rees-Baraka paediatric system and thus enables the assessment of respiratory flows and the delivery of gases and vapours to the patient. A similar system was described by Sethy and colleagues using the Jackson-Rees system.

The device, which we named DAF, presents the following advantages: (a) it is extremely inexpensive; (b) it can be employed in many cases of inhalation anaesthesia; (c) it allows the clinical observation at a distance of changes in inspiratory and expiratory flows; (d) it allows the anaesthesiologist to deepen the anaesthetic plane by using volatile halogenated agents; (e) it reduces the surgeon’s exposure to the same anesthetic mixture delivered to the patient during the performance of examinations and operative procedures on the face.

The device may be employed solely in inhalation anaesthesia for less painful operative procedures or for inhalation sedation in conduction anaesthesia.

We have used the device for ophthalmologic (tonometry, ultrasound, fundoscopy, slit lamp exam) and otolaryngologic (electrochleargraphy, evoked potentials) diagnostic procedures and in minor surgeries such as: chalazion, xanthelasma, abscesses, sutures, tympanotomies and the removal of foreign bodies from the ear or cornea.
Sub-Tenon’s anaesthesia for cataract surgery using a plastic cannula

Dr Z. I Sheikh, Specialist Registrar
& Dr J. Luthman, Consultant Anaesthetist
Kettering General Hospital
Rothwell Road
Kettering – Northamptonshire NN16 8UZ

Introduction: Local anaesthesia for cataract surgery is widely used at the Kettering General Hospital. Peribulbar block for local anaesthesia described by Hamilton [1] is the most popular technique. From the last two years there has been an increase in the use of Sub-Tenon’s block for cataract surgery using a single compartment technique described by Steven’s [2]. Kumar et al [3] reported the use of plastic cannula to deliver local anaesthetic in the Sub-Tenon’s space to perform local block for cataract surgery. We used a modified technique to what has been described by Kumar et al to perform the Sub-Tenon’s block for cataract surgery [4].

This study was undertaken to evaluate the usefulness and effectiveness of a plastic cannula to perform the Sub-Tenon’s block for cataract surgery.

Methods: After ethics committee approval and patients consent. This study included all patients presenting for cataract surgery that were deemed fit to receive local anaesthesia for cataract extraction. Experienced ophthalmic nurses undertook the screening procedure, which included a through medical history and the ability of the patient to lie still for atleast 45 minutes. The anaesthetists addressed any problems identified by the nurses. A questionnaire was completed for every patient. The patients were randomised to receive the local anaesthetic via plastic cannula or the commercially available curved metallic cannula according to the operator’s choice.

Results:

The following table shows the results of patient’s assessment of the block following the injection and patient’s satisfaction after the operation.

<table>
<thead>
<tr>
<th>Time of Injection</th>
<th>No Pain</th>
<th>Discomfort only</th>
<th>Pressure only</th>
<th>Touch only</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>nr</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>64 (79%) m=14 p= 50</td>
<td>5 (m=2) (p=3)</td>
<td>16 (m=1) (p=6)</td>
<td>5 (m=3) (p=2)</td>
<td>3 (m=1) (p=2)</td>
<td>0</td>
<td>10 (m=8) (p=2)</td>
<td></td>
</tr>
<tr>
<td>After the Operation</td>
<td>73 (90%) m=22 p= 51</td>
<td>4 (m=1) (p=3)</td>
<td>15 (m=4) (p=11)</td>
<td>27 (m=5) (p=22)</td>
<td>6 (m=2) (p=4)</td>
<td>1 (m=1) (p=0)</td>
<td>0</td>
<td>2 (m=1) (p=1)</td>
</tr>
</tbody>
</table>

|m= metallic cannula; p= plastic cannula; nr = not recorded|

During the three months period 82 patients had the Sub-Tenon’s block for cataract surgery. Metallic cannula was used in 26 (32%) patients, and in 56 (68%) plastic cannula was used to perform Sub-Tenon’s anaesthesia. Four to six mls of Lignocaine 2% was used in over 95% of patients. Eyelid akinesia was achieved in 51(63%) and Globe akinesia in 72 (88%) of patients after the injection.

Mild & moderate pain experienced in a small no of patients during the establishment of the block and operation was not desirable, however it was encouraging to note that none of the patients suffered severe pain at the time of injection or during the operation. 90% of the patients
reported no pain during the operation, and there were no complications recorded in the three months follow-up of the patients.

**Conclusions:** Sub-Tenon’s anaesthesia using a plastic cannula is an effective and reliable method & can be successfully achieved with little training. The use of a plastic cannula to establish Sub-Tenon’s block may be much safer than the commercially available metallic cannula. Much larger randomised studies are needed to compare the two techniques.

**References:**
News and information

Immediate Past President
Dr Robert Johnson has completed his term of office of the first President of the Society. British Ophthalmic Anaesthesia Society wishes to thank him for his unqualified support to the society. He will continue to be one of the officers of the council as a Scientific Advisor.

Mr Stuart Cook
The BOAS Council wishes to thank the outgoing council member, Mr Stuart Cook, Consultant Ophthalmologist, Bristol, for serving as a council member for 3 years.

New Council Members
Dr Stephen Mather
Qualified 1974. London Hospital Medical College. SHO Jobs in A&E, paediatrics, obs & gynae, general medicine. Then started anaesthesia at London Hosp. After that SHO in Gloucester. SHO and registrar Bristol. Chef du Clinique (SR equivalent) in Bruges, (Brugge), Belgium, Senior Reg in Sheffield. Consultant in Anaesthesia, 90% paediatric in Bristol from 1974, based at Royal Hospital for Sick Children and Bristol Eye Hospital. Now reduced paediatric commitment and more ophthalmology. Chairman of the Management Board for Bristol Medical Simulation Centre Examiner for primary and now final FRCA, past College Tutor at Bristol Royal Infirmary. BMA POWAR. Sit on Confidential Enquiry into Stillbirths and Deaths in Infancy (CESDI). Books and publications mainly on paediatric anaesthesia. Research interests in materials science interfaces with software in the simulator and anaesthesia for strabismus surgery. Previously council member of Paediatric Intensive Care Society. Organising Committee of BOAS 2000 in Bristol. Has been a member of the Society since its foundation.

Dr Guri Singh Thind
Present Appointment - Consultant Anaesthetist, University Hospital Aintree NHS Trust, Liverpool
Special interests include teaching and training of difficult airway management including fibreoptic intubation.
Member of the faculty of the local difficult airway training group including representative of the University Hospital Aintree NHS Trust to this group.
Lead Obstetric Anaesthetist at the Trust since 1995 to present.
Lead developments in ophthalmic anaesthesia at the trust and teaching of the same for the last 15 years. Deputy clinical director from 1997-99. Incharge of teaching local FRCA candidates for many years. Has been a member of the Society since its foundation.

Mr Tome Eke
Appointed as Consultant Ophthalmologist in Norwich & Cromer; interests glaucoma & cataract.
Was Principal investigator for the national survey of LA for intraocular surgery (RCA nand RCOphth 1996), which is also the subject of my MD.

4th BOAS Conference
4th BOAS conference will be held on 27-28th June 2002 in Birmingham. The details will be sent to the members in due course and will be posted on www.boas.org. Information from CONTACT:Mrs Karen Scott, Email: boasscott@aol.com,07903 560 359,BOAS 2002,WALCOT FARM, WALCOT, WORCS,WR10 2AL.
5th BOAS Conference

4th BOAS conference will be held in Chester 2003. The details will be sent to the members in due course and posted on the web www.boas.org Information from Meeting Organiser, Dr Sean Tighe, Consultant Anaesthetist, Countess of Chester Hospital, Chester, Email: Sean_Tighe@email.msn.com

International Ophthalmic Anaesthesia Society (IOAS)

1st IOAS meeting will be held on 15-16th April 2004 in the premises of the Royal College of Physicians, London in conjunction with the 6th BOAS and other Ophthalmic Societies of the world. For more information, please contact Dr Chandra Kumar, Consultant Anaesthetist, James Cook University Hospital, Middlesbrough, TS4 3BW, UK, Tel 01642 854601, Fax 01642 854246, Email: cmkumar@globalnet.co.uk

Progress on the Joint Colleges Working Party Report

The working party of the Royal Colleges of Anaesthesia and Ophthalmology has been published. The document can be downloaded or printed from www.boas.org home page or www.rcoa.ac.uk or by writing to the Royal College of Anaesthetists, 48-49 Russell Square, London.

No subscription for retired members

Retired members do not need to pay the annual subscription fee.

Income Tax Rebate to Society Members

BOAS is registered with Her Majesty’s Inland Revenue for the purposes of Corporation Tax. Members can claim income tax allowance against the BOAS subscription.

Charity status to BOAS

The application process has already started to make BOAS a charity organisation.

Contribution for the 6th Newsletter

The next Newsletter will be published in April 2002. Please send your articles or any contributions for inclusion in the Newsletter by the end of March 2002 to Dr Chandra Kumar, Secretary BOAS, James Cook University Hospital, Middlesbrough TS4 3BW or email secretary@boas.org

Subscription to Journal of Cataract and Refractive Surgery

Anaesthetist members of BOAS can receive the journal at a discounted rate of £65 by writing to Andre Welsh, ENTER, North Riding Infirmary, Newport Road, Middlesbrough.

Acknowledgement

BOAS office is grateful to Mr Stephen Moore, Information Officer and Mrs Pat McSorley(School of Anaesthesia), James Cook University, Middlesbrough for valuable help in the production of the Newsletter.

Reasons for joining BOAS

BOAS was formed in 1998 to provide a forum for anaesthetists, ophthalmologists and other professionals with an interest in ophthalmic anaesthesia to facilitate co-operation on all matters concerned with the safety, efficacy and efficiency of anaesthesia for ophthalmic surgery. It is concerned with education, achievement of high standards, audit and research. BOAS will organise annual scientific meetings, produce a newsletter and maintain a web page.
Membership
Member of BOAS includes anaesthetists, ophthalmologists and other professionals with an interest in ophthalmic anaesthesia.

Membership subscription
Membership runs from January each year. The current subscription is £25.00 payable by banker’s standing order.

Liaison and specialist professional advice
With the Association of Anaesthetists of Great Britain and Ireland and the Ophthalmic Anesthesia Society of the USA.

Benefits of Membership
• Opportunity to participate in BOAS annual scientific meetings
• Reduced registration fee for BOAS annual scientific meetings
• Reduced registration fee for other ophthalmic anaesthesia meetings and courses in UK
• Free advice from experts on matters related to ophthalmic anaesthesia
• BOAS newsletter and Directory of Members
• Opportunity to contribute towards development and improvement of ophthalmic anaesthesia
• Access to BOAS web page and scientific literature database
• Eligibility for election to Council of BOAS

Administrative Office and Membership information from
Dr Chandra M. Kumar
Secretary, BOAS
James Cook University Hospital
Middlesbrough
TS4 3BW UK
Tel 01642 854601
Fax 01642 854246
Email cmkumar@globalnet.co.uk or secretary@boas.org

Web address http://www.boas.org

Change of address
Members are advised to inform the secretary if there is a change of email or postal address.
BOAS Executive Committee

Immediate Past President
Dr Robert Johnson

President
Dr. Chris Dodds

Vice President
Mr. Ken Barber

Secretary
Dr. Chandra M Kumar

Treasurer
Mr Tim C Dowd

Council Members
Dr. Caroline Carr
Mr. Louis Clearkin
Mr Tom Eke
Dr. David Greaves
Dr. Monica Hardwick
Dr Stephen Mather
Dr. Anthony P Rubin
Mr. David Smerdon
Dr Guri Singh Thind
Dr. Sean Tighe

BOAS Website Address
www.boas.org
# British Ophthalmic Anaesthesia Society Member Registration Form

To The Branch Manager Midland Bank

<table>
<thead>
<tr>
<th>Bank</th>
<th>Branch Title (not address)</th>
<th>Sort Code Number</th>
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<tr>
<td>Midland Bank</td>
<td>South Cleveland Hospital Branch</td>
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Please Pay for the credit of British Ophthalmic Anaesthesia Society

<table>
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<tr>
<th>Beneficiary’s Name</th>
<th>Account Number</th>
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the sum of £25.00 Twenty Five Pounds

Amount in words

Date of first payment and thereafter every Yearly

Due date and frequency

Date of last payment and debit my/our account accordingly

STANDING ORDER MANDATE

PLEASE CANCEL ALL PREVIOUS STANDING ORDER/ DIRECT DEBIT MANDATES IN FAVOUR OF

Account to be debited

Account Number

Signature(s)……………………………………………………………………………………………….. ……………………………………………………………………………………………………..

Date………………………………

Banks may decline to accept instructions to charge Standing Orders to certain types of account other than Current Accounts

NOTE: The Bank will not undertake to
a) make any reference to Value Added Tax or pay a stated sum plus V.A.T., or other indeterminate element.
b) advise remitter’s address to beneficiary.
c) advise beneficiary of inability to pay
d) request beneficiary’s banker to advise beneficiary of receipt.
e) accept instructions to pay as soon after the specified date as there are funds to meet the payment, if funds not available on the specified date.

Payments may take 3 working days or more to reach the beneficiary’s account. Your branch can give further details.

Personal details

Last name (Dr, Mr, Mrs, Miss, Ms)…………………………………………………………………………

First Name……………………………………………………………………………………………………

Department…………………………………………………………………………………………………

Institution…………………………………………………………………………………………………

Address……………………………………………………………………………………………………

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City/County/………………………………………………….Post code……………………………………

Phone………………………..Fax…………………………Email………………………………………..

If you would like to become a member of the British Ophthalmic Anaesthesia Society, please complete the bank standing order and your personal details.

Completed form should be sent to:-

Dr. Chandra M Kumar
Secretary, BOAS
Dept. of Anaesthesia
James Cook University Hospital
Middlesbrough TS4 3BW, UK
A DATE FOR YOUR DIARY!

**BOAS 2002**

4TH ANNUAL SCIENTIFIC MEETING

BIRMINGHAM INTERNATIONAL CONFERENCE CENTRE

27TH AND 28TH JUNE 2002

<table>
<thead>
<tr>
<th>Paediatric Ophthalmic Anaesthesia</th>
<th>Ophthalmic Surgery For Anaesthetists</th>
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<tr>
<td>Free Papers</td>
<td>Workshops</td>
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<tr>
<td>Controversies in Ophthalmic Anaesthesia</td>
<td>Medico legal Aspects of Ophthalmic Anaesthesia</td>
</tr>
<tr>
<td>Guest Speaker</td>
<td>A lot More</td>
</tr>
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</table>

Last date for abstracts: Fri 17th May 2002

CONTACT:

Mrs Karen Scott

boasscott@aol.com
International Ophthalmic Anaesthesia Society Meeting

Thursday 15 & Friday 16th April 2004
Venue: Royal College of Physicians, London
Central London next to Regent’s Park

Paris World Congress of Anaesthesiologists
Sunday 18 to 24th April 2004
Hosted by B.O.A.S with other Ophthalmic Anaesthesia Organisations of the World
Faculty from all the Continents

Format
- Reception
- Dinner
- Entertainment

Meeting Contents
- Lectures
- Ophthalmic Anaesthesia - a World View
- Recent practices and Current Research
- Workshops
- Posters
- Free Papers

Information and Contact

Information when ready
- Websites
  - www.ioas.org.uk
  - www.boas.org
  - www.oas.amainc.com/oas_ophthalmic_anesthesia.html
  - www.anaesthetics.org.uk

- Contacts
  - Emails
    - Info@ioas.org.uk
    - secretary@boas.org
    - cmkumar@globalnet.co.uk

- Suggestions by email to cmkumar@globalnet.co.uk
Some Important Journal Abstracts

(It has not been possible to include all the recent articles published in various journals but an attempt has been made to include those abstracts which are relevant to the practice of ophthalmic anaesthesia)


Eye 2001 15: 306-308
Hughes E H, Forrest F, Diamond JP.

Purpose: To evaluate patient satisfaction with and effectiveness of the 'one-stop' cataract service at the Bristol Eye Hospital.

Methods One hundred and ninety patients referred with a view to cataract surgery were selected to attend 24 'one-stop' patients and 40 patients undergoing traditional surgery (three separate visits: initial clinic, pre-assessment and surgery) were surveyed by a questionnaire to determine their satisfaction with the service.

Results One hundred and fifty-six of 190 (82.1%) patients invited to one-stop clinics underwent surgery the same day. Questionnaires were returned by 72 patients (35 ‘one-stop’ and 37 control patients). Twenty-eight (80%) ‘one-stop’ patients were ‘very satisfied’ and 7 (20%) were ‘satisfied’ with the time allowed to decide upon undergoing surgery, compared with 21 (57%) and 16 (43%) respectively in the control group (p = 0.06, chi-square, not significant). Overall satisfaction with the service was similar between the groups, with 33 (94%) of ‘one-stop’ and 35 (95%) of control patients considering the service ‘very good’.

Conclusion There is a high level of patient satisfaction with a ‘one-stop’ cataract service which reduces hospital attendance from three visits to one. Potential problems include wasted theatre space when there is a shortfall of suitable cases on the day.

Needle local anaesthesia for cataract surgery - a chip off the old block?

Eye 2001;15: 439-440
Smerdon D L

The face of ophthalmic anaesthesia has changed enormously over recent years. Most of us grey-haired ones remember our first brush with ophthalmic blocks, often with a certain amount of horror, knowing now what we didn’t know then about orbital anatomy. But thankfully, long needles easily capable of reaching the orbital apex and the practice of “see one, do one, teach one” have receded into distant memory. Clinical governance and consultant appraisal should eliminate such unacceptable and dangerous practices. Our Royal Colleges define acceptable standards and promote good practice. The growth of ophthalmic anaesthesia workshops and organisations such as the British Ophthalmic Anaesthesia Society (BOAS) demonstrates the professions’ willingness to teach and learn new and safer techniques.

Eke and Thompson, under the auspices of the Royal College of Ophthalmologists, surveyed ophthalmic anaesthetic practice and demonstrated the relatively high rate of severe orbital complications such as perforation and significant retrobulbar haemorrhage associated with ophthalmic needle-local anaesthetic techniques. Rather surprisingly the severe complications were more common in the peribulbar group than in the less trendy retrobulbar group. The relative orbital safety of both sub-Tenon’s local anaesthesia (STLA) and topical anaesthesia (TA) was demonstrated, although no technique was devoid of systemic problems. The Royal College of Ophthalmologists and the Royal College of Anaesthetists are shortly to publish new evidence-based guidelines for the common ophthalmic local anaesthetic techniques.

In this issue, a team from Worcester Royal Infirmary present a large single centre study of one thousand consecutive peribulbar anaesthetics (PBA) with an impressively low rate of complications, most of which were minor. The authors are to be congratulated for a superb series. There were no sight- or life-threatening events. The authors conclude that peribulbar local anaesthesia is safe and...
effective provided that it is taught methodically and practised by experienced staff. It is within this last sentence, with which I agree wholeheartedly, that the problem arises. Where skill is required, experts will always get the best results. They will have lower complication rates than their more average colleagues. That is one reason that they are regarded as expert. The measure of a technique is its acceptability, in terms of ease of performance and low incidence of complications, in both expert, non-expert and novice hands. Is PBA a technique that you would be happy for a new locum consultant to administer on your behalf? Would you expect this to be performed effectively and without danger to the patient? In other words, can PBA tolerate poor technical performance and still be safe and effective? Is it acceptable under clinical governance to continue to advocate PBA when there are safer, less demanding alternatives which are at least as effective?

The ideal technique, which of course, does not exist, is safe (no complications), effective (full anaesthesia, and if required full akinesia) and tolerable (painless to administer and freely reversible after the procedure) in all hands. This is preferable to a technique which is safe, effective and tolerable only in expert hands. It is for this reason that I believe that needle local techniques for cataract surgery will fall out of favour with time. It is not because of their ineffectiveness, the Worcester paper attests to the safety, effectiveness and tolerability of this technique in their expert hands. It is for the applicability of the technique to the vast majority of practitioners. A high degree of skill is required to get these exceptional results. Even such an acknowledged world expert in ophthalmic anaesthesia as Roy Hamilton recently told of his first perforation in 18,000 cases (unpublished data). Unfortunately we know that, on occasions, sharp needle techniques in less able hands can lead to disastrous problems.

TA is adequate for some surgeons and some patients, but the high proportion of additional measures required per-operatively makes it an unpalatable choice for those who believe that we should eliminate pain before, not after it happens. A STLA of sufficient volume gives full and reliable anaesthesia with low per-operative visual analogue pain scores. In the national survey, neither was associated with globe perforation\(^1\) (although a STLA perforation has recently been reported during the initial dissection for a repeat detachment procedure, a contraindication for STLA in our unit). Both techniques are easy to teach and learn and very forgiving of poor technique. I am sure that I could teach not only my theatre porter, but a GNER porter to give a TA with complete safety. Most people with binocular vision, knowledge of the contraindications and the slightest bit of hand-eye co-ordination can give a STLA with a high margin of safety.

Peribulbar and retrobulbar techniques give good results in expert hands but are not forgiving of poor technique. This is why, I believe, with time, they will fall out of favour.

**A single-centre study of 1000 consecutive peribulbar blocks.**

*Eye 2001 15: 464-468*

Budd J, Hardwick M, Barber K, Prosser J.

Abstract

Purpose To assess the efficacy and safety of the peribulbar block as practised by anaesthetists in a District General Hospital and also to assess the effect of using the 'painless local' subconjunctival injection on the pain of the peribulbar block.

Methods Audit data collected from 1000 consecutive patients undergoing peribulbar blocks with 2% lignocaine were analysed. Efficacy was assessed by visual rating scores for operative pain, eye movement, intraocular pressure and reinjection rate, and safety by looking at complications. Comparison of pain of injection scores was used to assess the effect of the 'painless local' injection. Visual rating scores for pain were analysed using the Mann-Whitney \(U\)-test.

Results Akinesia was achieved in 79% of blocks and operative pain scores were very low (median = 0, IQR = 0). All complications recorded were minor and there were no sight- or life-threatening events. The 'painless local' injection given to 499 patients resulted in
significantly lower visual rating scores for pain of injection (p<0.05).

Conclusions: These data suggest that the peribulbar block is a safe and effective method of providing anaesthesia for eye surgery provided that it is taught methodically and practised by experienced staff. The 'painless local' injection reduces the pain experienced during administration of this block.

**Intraocular pressure and pulsatile ocular blood flow after retrobulbar and peribulbar anaesthesia.**

*Br J Ophthalmol 2001; 85: 796-798*


AIMS This study investigated the effect of peribulbar and retrobulbar local anaesthesia on intraocular pressure (IOP) and pulsatile ocular blood flow (POBF), as such anaesthetic techniques may adversely affect these parameters.

METHODS 20 eyes of 20 patients who were to undergo phacoemulsification cataract surgery were prospectively randomised to receive peribulbar or retrobulbar anaesthesia. The OBF tonometer (OBF Labs, Wiltshire, UK) was used to simultaneously measure IOP and POBF before anaesthesia and 1 minute and 10 minutes after anaesthesia. Between group comparisons of age, baseline IOP, and baseline POBF were performed using the non-parametric Mann-Whitney test. Within group comparisons of IOP and POBF measured pre anaesthesia and post-anaesthesia were performed using the non-parametric Wilcoxon signed ranks test for both groups.

RESULTS: There was no statistically significant IOP increase post-anaesthesia in either group. In the group receiving peribulbar anaesthesia, there was a significant reduction in POBF initially post-anaesthesia which recovered after 10 minutes. In the group receiving retrobulbar anaesthesia, there was a persistent statistically significant reduction in POBF.

CONCLUSIONS Retrobulbar and peribulbar injections have little effect on IOP. Ocular compression is not needed for IOP reduction when using local anaesthesia for cataract surgery. Conversely, POBF falls, at least for a short time, when anaesthesia for ophthalmic surgery is administered via a retrobulbar route or a peribulbar route. This reduction may be mediated by pharmacologically altered orbital vascular tone. It may be safer to use other anaesthetic techniques in patients with ocular vascular compromise.

**A decision analysis of anesthesia management for cataract surgery.**

*Am J Ophthalmol 2001; 132:4 : 537-543*

Reeves SW, Friedman DS, Fleisher LA et al.

PURPOSE: To compare the trade-offs in cost and preference of various anesthesia management strategies for cataract surgery.

METHODS: Six strategies, differing in sedation, local anesthetic, and monitoring approach, were chosen for comparison. For each strategy, potential complications, and conversions to different anesthesia approaches were modelled. A panel of physicians and anesthetists, well versed in the literature and practice of the anesthesia management of cataract surgery, assigned preference values to the strategies and potential outcomes (0 to 1 scale). Probability estimates were obtained from a study of 19,557 cataract surgeries and from the panel. Cost estimates were derived from several sources. The model was analyzed to determine the strategies associated with the highest expected preference and lowest expected cost.

RESULTS: The strategy associated with the highest net preference was intravenous sedation with block anesthesia and an anesthesiologist present throughout the case. The expected net preference for this strategy was 19% greater than the net preference for the next most preferred strategy, oral sedation with block anesthesia and an anesthesiologist on call (0.88 versus 0.74), but the expected anesthesia costs per case were much greater ($324 versus $42). Results were sensitive to plausible variation in the preference values assigned to the six initial management strategies and to the cost of topical versus block anesthesia.

CONCLUSION: This analysis emphasizes that cost and preference are important considerations when choosing an anesthesia management strategy for cataract surgery. For some surgeries, substantial cost savings may be available for a small change in preference.
Globe perforation associated with subtenons anesthesia.

(No abstract available)
Frieman BJ, Friedberg MA.

Pulmonary oedema after ophthalmic regional anaesthesia in an unfasted patient undergoing elective surgery.

Taylor I, Watters M.

Dept of Anaesthesia, Princess Margaret Hospital, Swindon, SN1 4JU, UK.

A 77-year-old lady presented for elective phacoemulsification and intra-ocular lens implant under local anaesthesia. She had a history of hypertension and ischaemic heart disease, but was symptomatically stable with mild exertional breathlessness and no orthopnoea. Drug therapy comprised bumetanide 2 mg, trandolopril 4 mg, aspirin 75 mg and GTN spray as required. Preoperative electrocardiogram (ECG) showed sinus rhythm with left bundle branch block and a normal axis.

On the morning of surgery the lady took all of her routine medications except bumetanide following advice of the pre-admission clinic. On arrival in hospital she had a light breakfast of tea and toast, as is accepted practice in our unit.

Two hours later she was transferred to the anaesthetic room where intravenous access and monitoring (ECG, pulse oximetry and blood pressure) were applied. Peribulbar block was performed using the inferotemporal route with a total of 8 ml of an equal mixture of lignocaine 2% and bupivacaine 0.5%. Good anaesthesia and akinesia were obtained after 10 minutes.

Surgery was uneventful, but near the end of the procedure the patient coughed briefly. All observations were stable throughout.

In the recovery room the patient became acutely short of breath, cyanosed, tachypnoeic and tachycardic. Pulse oximetry fell to 80% despite supplementary oxygen at 4 l.min⁻¹. Her condition deteriorated to the point of requiring intubation. This was performed using a standard pre-oxygenation and rapid sequence induction technique. Furosemide 80 mg was given intravenously and she was transferred to the intensive care unit.

A good diuresis followed and she was extubated two hours later. Her ECG showed no significant changes and cardiac enzymes were normal. A chest x-ray showed changes consistent with pulmonary oedema and a transthoracic echocardiogram revealed severely impaired left ventricular function. Thyroid function tests were abnormal with an elevated free T 4 level and low thyroid stimulating hormone level in keeping with thyrotoxicosis. The patient denied any symptoms suggestive of this diagnosis and after discussion with the endocrinologist she was commenced on carbimazole. She was discharged home 3 days after the event.

This case highlights the fact that although local anaesthesia is considered safer for the elderly and infirm, complications can still occur. The likely cause of pulmonary oedema in this case was probably the withholding of diuretic therapy on the morning of surgery. There may have been a contributing factor in the abnormal thyroid function tests, but she denied any recent deterioration in her condition.

It is common practice to withhold diuretic therapy on the day of surgery to avoid patient discomfort during the procedure. In most cases it does not cause any problems and thus seems reasonable practice to continue, especially as with modern techniques the procedure usually lasts <30 minutes.

There is no consensus as to ideal period of starvation before administration of local anaesthesia in the UK. Studies do show that many institutes adopt a similar approach to us in allowing patients to eat and drink freely. The perceived benefits include improved patient comfort and simpler diabetic control, but the increased risk of regurgitation and aspiration of gastric contents should a problem arise must not be forgotten.

Having an anaesthetist solely assigned to the eye list was of clear benefit in this case as they were immediately available to attend the patient and to manage her rapidly deteriorating state.
Evaluation of the Greenbaum sub-Tenon’s block

British Journal of Anaesthesia 2001;87:631-3
Kumar CM, Dodds C.

A prospective, randomised blind study was conducted in 40 patients undergoing phacoemulsification and posterior chamber intraocular lens implantation. They received anaesthetic infiltration of 2% lidocaine with 1:200000 epinephrine and hyaluronidase 150 U/ml in a volume of 2, 3, 4, or 5 ml into the sub-Tenon’s fascial space through a Greenbaum cannula after a conjunctival incision. Reduction of ocular movements, anaesthesia, pain on injection and any incidental complications were recorded. Akinesia and anaesthesia occurred within 5 minutes with 4 and 5 ml of local anaesthetic, and no supplementary injections were required. There were marked reductions in the frequency of forced eyelid movements with these volumes. Chemosis and conjunctival haemorrhage were noted in the majority of patients but caused no intraoperative problems. Approximately 10-15% of patients reported slight discomfort at the time of injection. Four to 5 ml of 2% lidocaine with 1:200 000 epinephrine and 150 U/ml of hyaluronidase is the optimum volume to achieve adequate akinesia, anaesthesia and reduction of lid movements during the Greenbaum sub-Tenon’s block.

Effect of sub-Tenon's and peribulbar anesthesia on intraocular pressure and ocular pulse amplitude.

Journal of Cataract and Refractive Surgery 2001 Aug;27(8):1221-6
Pianka P, Weintraub-Padova H, Lazar M, Geyer O.

Purpose: To compare the effect of peribulbar and sub-Tenon's anesthesia on intraocular pressure (IOP) and ocular pulse amplitude (OPA) in the injected eye and the fellow non injected (control) eye.

Setting: Tel Aviv Medical Center, TelAviv, Israel.

Methods: This prospective study measured IOP and OPA at baseline and 1 and 10 minutes after administration of lidocaine anesthesia in 40 consecutive adult patients having elective cataract surgery.

Results: The IOP remained stable throughout the study with both modes of anesthesia. One minute after injection of the anesthetic agent, the OPA was significantly decreased in the injected eyes in both the sub-Tenon's (24%; P <.05) and peribulbar (25%; P<.05) groups. The decrease in the OPA in the sub-Tenon's group (14%; P <.05) was detectable after 10 minutes in the control eyes. In the peribulbar anesthesia group, the OPA in the control eyes increased significantly (9%; P <.05) 1 minute after injection of the anesthetic agent, returning to preinjection levels 10 minutes after the injection.

Conclusions: The OPA in the eyes in which Lidocaine was injected decreased significantly in both the sub-Tenon's and peribulbar groups. These findings have implications for the management of patients whose ocular circulation may be compromised.

Topical plus intracameral lidocaine versus retrobulbar anesthesia in phacotrabeculectomy: prospective randomized study.

Journal of Cataract and Refractive Surgery 2001 Aug;27(8):1214-20
Rebolleda G, Munoz-Negrete FJ, Gutierrez-Ortiz C.

Purpose: To compare the efficacy and safety of topical and retrobulbar anesthesia for phacotrabeculectomy. Methods: This prospective study comprised 60 patients (60 eyes) having phacotrabeculectomy surgery. Patients were randomly assigned to 1 of 2 groups receiving topical anesthesia plus intracameral lidocaine 1% or retrobulbar anesthesia. Patients were asked to document the discomfort they experienced during the administration of the anesthetic agent, during surgery, and postoperatively using a numeric pain scale. Complications and surgical conditions were also evaluated.
Results: The retrobulbar group reported significantly more discomfort during administration of the anesthetic agent than the topical group (P < .001). The topical group reported significantly more discomfort intraoperatively (P < .01). Eyelid squeezing and eyeball movement were more common in the topical group; however, neither was a problem to the surgeon. There was no difference in surgical conditions (P = .38) or the postoperative pain scores between the 2 groups (P = .06). One patient receiving topical anesthesia developed a suprachoroidal hemorrhage intraoperatively.

Conclusions: Topical anesthesia supplemented with intracameral lidocaine was an effective alternative to retrobulbar anesthesia for phacotrabeculectomy. Although the degree of patient discomfort was significantly higher during surgery under topical anesthesia, the method avoids the pain and complications associated with a retrobulbar injection.

_Cataract surgery under topical anesthesia in patients with coexisting glaucoma._

_Journal of Cataract and Refractive Surgery_ 2001 Aug;27(8):1207-13
Jacobi PC, Dietlein TS, Jacobi FK.

Purpose: To evaluate and compare levels of patient discomfort and complications during phacoemulsification with implantation of a foldable intraocular lens (IOL) under topical lidocaine hydrochloride in patients with and without various forms of chronic open-angle and chronic angle-closure glaucoma.

Setting: Two university eye centers in Germany.

Methods: This prospective nonrandomized comparative study comprised 176 eyes of 176 patients with various forms of chronic open-angle glaucoma and chronic angle-closure glaucoma. Eyes with cataract and without a glaucoma diagnosis or history of intraocular surgery served as a control group (n = 212). All patients received a minimum of 5 doses (2 drops per dose) of topical lidocaine hydrochloride 2% before standard temporal clear corneal phacoemulsification and foldable IOL implantation. No intracameral anesthetic injection was given, and no systemic sedatives were used. The main outcome measures were the number of complications and adverse events.

Results: The intraoperative complication rate in all patients (n = 388) was capsule tear, 1.3%; zonule tear, 1.8%; vitreous loss, 1.0%; iris prolapse, 0.8%. No statistically significant differences in intraoperative or early postoperative complications were found between the glaucoma and control groups. The mean pain scores of patients were 0.38 ± 1.1 (SD) in the glaucoma group and 0.36 ± 0.8 in the control group (P = .21). Patient preference for cataract surgery under topical anesthesia was similar in both groups.

Conclusions: Surgery-related complications and patient discomfort were similar in patients with and without glaucoma who had phacoemulsification and IOL implantation under topical anesthesia. These results indicate that topical anesthesia is safe for routine phacoemulsification with foldable IOL implantation in patients with glaucoma and does not compromise patient comfort.

_Respiratory arrest and convulsions after peribulbar anesthesia._


We present a case in which a rare and serious complication with respiratory arrest and convulsions occurred after peribulbar anesthesia for cataract surgery. To our knowledge, respiratory arrest has been described as a complication only of retrobulbar, not peribulbar, anesthesia. Anesthesiologists trained in airway maintenance and ventilatory support should be available for immediate help when a peribulbar block is performed.

_Practice styles and preferences of ASCRS members–2000 survey. American Society of Cataract and Refractive Surgery._

_Journal of Cataract and Refractive Surgery_ 2001 Jun;27(6):948-55
Leaming DV.
A survey of the practice styles and preferences of members of the American Society of Cataract and Refractive Surgery with a United States ZIP code was performed in August 2000. Approximately 26% (1400) of 5342 questionnaires mailed were returned prior to the November cut off date. Three profile questions were used to cross-tabulate: age of the ophthalmologist, geographic location, and volume of cataract surgery per month. Current data were compared with data in previous surveys.

**Effects of hand massage on anxiety in cataract surgery using local anesthesia.**

*Journal of Cataract and Refractive Surgery* 2001 Jun;27(6):884-90
Kim MS, Cho KS, Woo H, Kim JH.

PURPOSE: To evaluate the effects of hand massage on patient anxiety during cataract surgery.

SETTING: Kangnam St. Mary's Hospital, Seoul, Korea.

METHODS: This study comprised 59 patients having cataract surgery from December 11, 1996, to February 12, 1997. The patients were divided into those having a hand massage 5 minutes before surgery (experimental group, n = 29) and those not receiving a hand massage (control group, n = 30). Patients' anxiety levels were measured using the Visual Analogue Scale and by assessing the systolic blood pressure, diastolic blood pressure, and pulse rate before and after the hand massage and 5 minutes before the end of surgery. Epinephrine, norepinephrine, cortisol, blood sugar levels, neutrophil, and lymphocyte percentages in white blood cells were also measured.

RESULTS: After the hand massage, the psychological anxiety levels, systolic and diastolic blood pressures, and pulse rate were significantly lower than before the massage. The hand massage significantly decreased epinephrine and norepinephrine levels in the experimental group. Epinephrine, norepinephrine, and cortisol levels increased in the control group. The differences between groups were significant. There were no significant between-group differences in blood sugar levels or neutrophil and lymphocyte percentages in white blood cells.

CONCLUSION: The findings indicate that hand massage decreases the psychological and physiological anxiety levels in patients having cataract surgery under local anesthesia.

**Patient pain during different stages of phacoemulsification using topical anesthesia.**

*Journal of Cataract and Refractive Surgery* 2001 Jun;27(6):880-3
O’Brien PD, Fulcher T, Wallace D, Power W.

PURPOSE: To assess the pain experienced by patients during the different stages of phacoemulsification cataract surgery performed under topical anesthesia.

SETTING: Ophthalmic teaching hospital, Dublin, Ireland.

METHODS: This prospective study comprised 100 consecutive patients having phacoemulsification under topical anesthesia. Patients were asked to grade the pain they experienced during the different stages of the procedure using a visual analogue pain scale from 0 to 10. The pain experienced during the procedure was compared with that experienced after the instillation of a drop of amethocaine.

RESULTS: The overall mean pain score was 1.46. The highest mean pain score, which was during the phacoemulsification stage of the procedure, was not significantly more than the score for the administration of the topical anesthetic agent. The duration of surgery was not related to the level of pain during the procedure.

CONCLUSIONS: Topical anesthesia was effective in phacoemulsification cataract surgery. Because the highest mean score was not significantly higher than that for the administration of the anesthetic agent, it is possible to counsel patients before surgery that the pain they experience during the procedure will be no worse than that during administration of the anesthetic drops.

**Topical versus sub-Tenon's anesthesia without sedation in cataract surgery.**

*Journal of Cataract and Refractive Surgery* 2001 Jun;27(6):873-9

PURPOSE: To compare pain control using topical anesthesia with that using sub-Tenon's anesthesia for clear corneal phacoemulsification cataract surgery and foldable intraocular lens (IOL) implantation.

SETTING: Departments of Ophthalmology, General Hospital Asklepeion Voulias and General Hospital of Athens, University of Athens, Athens, Greece.

METHODS: One hundred consecutive patients scheduled for bilateral cataract surgery 1 to 2 months apart were prospectively randomized to receive topical anesthesia (100 eyes) or sub-Tenon's anesthesia (100 eyes). The randomization was stratified so that one half of first-eye surgeries and one half of second-eye surgeries were assigned to each anesthesia group, with each patient receiving each type of anesthesia once. All patients had clear corneal phacoemulsification with foldable IOL implantation. Patients were asked to rate their pain level on a 10-point scale for 4 periods: during the administration of the anesthetic agent, during surgery, immediately after surgery, and 24 hours postoperatively. The surgeon recorded his subjective assessment of ease of surgery and surgical complications using a standardized template.

RESULTS: Eighty-one percent of patients who received topical anesthesia and 8% of patients who received sub-Tenon's anesthesia reported no pain during delivery of the anesthetic agent. The mean pain score was 0.19 0.39 (SD) in the topical group and 1.35 0.63 in the sub-Tenon's group. The difference between groups was statistically significant (P <.001). Seventy-two percent of patients in the topical anesthesia group and 86% in the sub-Tenon's anesthesia group reported no pain or slight discomfort during surgery (mean score 1.13 1.57 and 0.57 1.28, respectively) (P <.001). Ninety percent of topical anesthesia patients and 77% of sub-Tenon's anesthesia patients reported no pain or slight discomfort 30 minutes postoperatively (mean score 0.80 0.93 and 0.12 0.36, respectively) (P <.001). All patients in the topical anesthesia group and 77% in the sub-Tenon's group reported no pain 24 hours postoperatively (mean pain 0.00 0.00 and 0.23 0.40, respectively) (P <.001). Complications including prolonged akenesia of the globe, chemosis, and conjunctival hemorrhage occurred significantly more frequently in the sub-Tenon's than in the topical group (P <.001).

CONCLUSIONS: Patients having cataract surgery under topical anesthesia had more intraoperative and postoperative discomfort than patients receiving sub-Tenon's anesthesia. However, patients having topical anesthesia reported less pain during its administration and had fewer complications. Both anesthesia methods provided high levels of pain control without additional sedation.

Topical anesthesia for cataract surgery: a population-based perspective.

Monestam E, Kuusik M, Wachtmeister L.

PURPOSE: To analyze the anesthetic regimen and sedation in a population-based cohort of unselected cataract surgery cases operated on with the goal of maximizing the percentage of patients with topical anesthesia and no sedation.

SETTING: Department of Ophthalmology, Norrlands University Hospital, Umea, Sweden.

METHODS: This prospective observational population-based study comprised all patients having cataract surgery during a 1 year period at 1 institution. Data were collected from the patients' records, which were standardized. Outcome measures were use of preoperative sedation, type of anesthesia, intraoperative complications, and adverse events.

RESULTS: The study comprised 890 cases performed by 4 surgeons. Seventy-two percent of patients had no sedation and topical anesthesia only. All patients except 1 who had previous cataract surgery with topical anesthesia chose the same method for their second-eye surgery. The rate of posterior capsule rupture was in the expected range for a population with high incidences of pseudoexfoliation and mature cataract.

CONCLUSIONS: It is possible to achieve a high percentage of effective topical anesthesia for cataract surgery in a population-based...
setting. The findings have implications for cost-containment in health services.

**Painful regional anaesthesia induces an immunological stress reaction: the model of retrobulbar anaesthesia.**


Heine G, Gabriel H, Weindler J, Ruprecht KW, Kindermann W.

BACKGROUND AND OBJECTIVE: Laboratory stress studies found that acute psychological stresses may elicit changes in leukocyte numbers similar to those occurring in physical stresses. Both types of stress evoke - mainly by release of catecholamines - leukocytosis resulting from a release of natural killer cells (NK-cells), of CD8+ T-cells, of monocytes and of neutrophils. However, there is little proof that laboratory stress models can be applied to daily clinical routines. As a likely inductor of an immunological stress response the setting of retrobulbar anaesthesia prior to intraocular surgery permits the study of a short-term painful anaesthetic procedure under highly standardized conditions. This was examined in 16 female patients.

METHODS: Counts of leukocyte subsets, serum cortisol and cardiovascular variables were measured 30 min and 1 min prior to retrobulbar anaesthesia as well as 2, 15 and 45 min afterwards.

RESULTS: The setting of retrobulbar anaesthesia induced an increase in total leukocytes [+380 cells microL-1; P < 0.01 (means; significance level)] mainly due to rising counts of neutrophils (+241 cells microL-1, P < 0.01). Of all lymphocyte subpopulations, natural killer cells increased most markedly (+64 cells microL-1; P < 0.01). Furthermore, the retrobulbar block induced an increase in systolic arterial pressure (+15.2 mmHg; P < 0.01).

CONCLUSION: These changes in immunological and cardiovascular variables are considered to be elements of a sympatho-adrenal stress reaction; catecholamines are considered to induce a demargination of leukocytes by binding to beta2-adrenoceptors and by modifying the avidity state of adhesion molecules.

**General anaesthesia in a man with mitochondrial myopathy undergoing eye surgery.**


Wisely NA, Cook PR.

Mitochondrial myopathies are rare complex multisystem disorders, which can present several potential anaesthetic problems. A 49-year-old man with mitochondrial myopathy was anaesthetized successfully for cataract extraction using propofol and alfentanil infusions. Vecuronium sensitivity was apparent, with a prolonged duration of action, despite dosage reduction.

**Comparative analysis of costs of total intravenous anaesthesia with propofol and remifentanil vs. balanced anaesthesia with isoflurane and fentanyl.**


Epple J, Kubitz J, Schmidt H, Motsch J, Bottiger BW, Martin E, Bach A.

BACKGROUND AND AIM: We evaluated the costs and benefits of total intravenous anaesthesia compared with a balanced anaesthesia regimen.

METHODS: One-hundred and twenty-four patients undergoing cataract surgery were randomized to either a propofol/remifentanil or an isoflurane/fentanyl group. In the propofol/remifentanil group, both drugs were used for induction and maintenance of anaesthesia; in the isoflurane/fentanyl group, anaesthesia was induced with etomidate and fentanyl and maintained with isoflurane and fentanyl. All patients received mivacurium for muscle relaxation and the lungs were ventilated mechanically. The use of propofol and remifentanil resulted in a faster emergence and an overall savings per case of [symbol: see text] 12.25 due to a reduction in personnel costs.
costs which outweighs the higher drug acquisition costs.

RESULTS: In the propofol and remifentanil group, more patients were satisfied and would accept the same anaesthetic again.

CONCLUSION: We conclude that propofol and remifentanil is more cost-effective than isoflurane/fentanyl due to its better recovery profile, reduced total direct costs and higher patient satisfaction.

Fibrinolytic response to retinal detachment surgery under general or local anesthesia.


Malukiewicz-Wisniewska G, Kotschy M.

PURPOSE: To evaluate perioperative changes in fibrinolysis in patients undergoing retinal detachment surgery under general or local anesthesia.

PATIENTS: Prospective study of 81 patients (43 male, 38 female), aged from 15 to 82 (mean 50.7 SD = 17.8) years, undergoing retinal detachment surgery (encirclement with scleral buckling) under general anesthesia (group A), and 14 patients (6 male, 8 female) aged from 15 to 78 (mean 52.9, SD =19.8) years, operated under local anesthesia (group B). Excluded were patients with venous or arterial disease or other factors that could change the parameters investigated.

METHODS: Blood was sampled from a cubital vein one day before surgery, immediately after induction of anesthesia but before surgery, immediately after completion of the operation but before the termination of anesthesia and after the operation (on days 1 and 4). In patients' citrated plasma, tissue plasminogen activator antigen (t-PA-Ag), plasminogen activator inhibitor type 1 antigen (PAI-1 Ag) and activity (PAI-1), fibrin-fibrinogen degradation products (FDP) and euglobulin lysis time (ELT) were measured.

RESULTS. The pattern of changes in perioperative fibrinolytic activity was similar in both groups. Intraoperative levels of FDP were significantly higher and ELT shorter than preoperatively. In both groups t-PA Ag concentration was significantly increased on the first postoperative day. There were no changes in PAI-1 in both groups. Postoperatively, the FDP concentration was reduced and ELT prolonged.

CONCLUSIONS: Retinal detachment surgery induces intraoperative activation of fibrinolysis in the systemic circulation regardless of the type of anesthesia.

Fasting regimens for regional ophthalmic anaesthesia. A survey of members of the British Ophthalmic Anaesthesia Society.

Anaesthesia 2001 Jul;56(7):638-42
Steeds C, Mather SJ.

Members of the British Ophthalmic Anaesthesia Society were surveyed using a postal questionnaire. The response rate was 72.3%. Respondents were asked about starvation before regional anaesthesia for cataract surgery, the use of sedation in these patients, monitoring and if oxygen supplementation was given. The results show that most patients are not starved before this type of regional anaesthesia, and that the majority of patients receive no supplementary sedation or intravenous analgesia. Over 70% of patients received oxygen supplementation.

Peribulbar versus retrobulbar anesthesia for ophthalmic surgery: an anatomical comparison of extraconal and intraconal injections.

Anesthesiology 2001 Jan;94(1):56-62
Ripart J, Lefrant JY, de La Coussaye JE, Prat-Pradal D, Vivien B, Eledjam JJ.

BACKGROUND: Peribulbar and retrobulbar anesthesia have long been opposed on the basis of the existence of an intermuscular membrane, which is supposed to separate the intraconal from the extraconal spaces in a water-tight fashion. A local anesthetic injected outside the cone should spread through this septum to reach the nerves to be blocked. The existence of this septum is questioned. The aim of this study was to compare the spread of a colored latex dye injected extraconally or extraconally to simulate both retrobulbar and peribulbar anesthesia.
METHODS: The authors used 10 heads from human cadavers. For each head, one eye was injected intracranially, and the other eye was injected extracranially. The heads were then frozen and sectioned into thin slices following various planes. They were then photographed and observed.

RESULTS: There was no evidence of the existence of an intermuscular septum separating the intracranial and extracranial spaces. Those two spaces appeared to be part of a common spreading space, the corpus adiposum of the orbit.

CONCLUSIONS: These results are in accord with the fact that clinical studies were not able to clearly demonstrate that retrobulbar anesthesia is more efficient than peribulbar anesthesia. On the basis of a similar clinical efficacy of the two techniques as a result of similar spreading of the local anesthetic injected, and a potentially higher risk of introducing the needle into the muscular cone, the authors recommend replacing retrobulbar anesthesia with peribulbar anesthesia.

Safety and efficacy of peribulbar block as adjunct to general anaesthesia for paediatric ophthalmic surgery.

Paediatr Anaesth 2001 Mar;11(2):161-7
Deb K, Subramaniam R, Dehran M, Tandon R, Shende D.

METHODS: Fifty children (age 5-14 years, ASA I-II) undergoing elective ophthalmic surgery were chosen for the study. Of these, 25 received intravenous pethidine (control group) and 25 received a peribulbar block (block group) for perioperative analgesia, and were monitored intraoperatively and postoperatively by an investigator blinded to the analgesic technique.

RESULTS: Intraoperative values of haemodynamic variables were significantly higher in the control group (P<0.01). Requirement for intraoperative rescue analgesic and postoperative analgesia was higher in the control group (P<0.05 and P<0.001, respectively). Children in the block group had lower postoperative pain scores at all times. Incidence of oculocardiac reflex was significantly higher (P=0.001) in the control group. Seventy-six percent of children in the control group had postoperative nausea and vomiting compared to 20% children in the block group (P<0.01).

CONCLUSION: There were no complications related to the block. Peribulbar block appears to be a safe and useful analgesic technique for paediatric ophthalmic surgery.

Topical anesthesia with or without propofol sedation versus retrobulbar/peribulbar anesthesia for cataract extraction: Prospective randomized trial

J Cataract Refract Surg 2001; 27:1372-1379
Helena Kallio, MD, Risto J. Uusitalo, MD, PhD, Eeva-Liisa Maunuksela, MD, PhD

Purpose: To evaluate the feasibility of intravenous sedation in addition to topical anesthesia during cataract extraction.

Setting: Helsinki University Eye Hospital, Helsinki, Finland.

Methods: Three hundred seventeen eyes of 291 consecutive patients having cataract surgery were prospectively randomized to receive topical (oxybuprocaine 0.4%, n=96), combined (topical anesthesia and propofol sedation, n=107), or retrobulbar/peribulbar (prilocaine 1.5%, n=114) anesthesia. The intraoperative conditions were judged by the surgeon. A numerical scale (0 to 10) was used to assess the degree of pain during surgery. Outcome measures were the number of complications and adverse events registered perioperatively and 1 week postoperatively as well as Snellen visual acuity.

Results: The success of posterior chamber intraocular lens (IOL) implantation through a self-sealing clear corneal incision was 97.9%, 96.3%, and 98.2% in the topical, combined, and retrobulbar/peribulbar groups, respectively. There was no difference among the groups in pain during surgery, frequency of complications, or outcome measures. One week postoperatively, visual acuity was 20/40 or better in 81.7%, 78.5%, and 77.5% of eyes in the topical, combined, and retrobulbar/peribulbar groups, respectively. The surgeon reported significantly fewer complications in the block group.

Ophthalmic Anaesthesia News, Issue 5, October 2001
Email: secretary@boas.org Website: http://www.boas.org
difficulties in the retrobulbar/peribulbar group (9.8%) than in the topical (26.0%) ($P = .004$) or combined (21.0%) ($P = .036$) groups. Additional sedative/analgesic medication given intraoperatively was required significantly more often in the topical (15.6%) than in the retrobulbar/peribulbar group (2.6%) ($P = .002$). Patients with bilateral surgery preferred combined anesthesia over retrobulbar/peribulbar anesthesia; however, there was no significant difference in patient acceptance among groups in patients having unilateral surgery.

Conclusion: Intravenous propofol sedation added to topical anesthesia did not improve the operative conditions or surgical outcome. Retrobulbar/peribulbar anesthesia ensured the best surgical conditions. Patients in all anesthesia groups reported high satisfaction. However, patients having bilateral surgery seemed to prefer combined anesthesia over retrobulbar/peribulbar anesthesia.

Intracameral anesthesia: A report by the American Academy of Ophthalmology


Carol L. Karp, MD, Terry A. Cox, MD, PhD, Michael D. Wagoner, MD, Reginald G. Ariyasu, MD, PhD and Deborah S. Jacobs, MD

OBJECTIVE: This document describes the technique of intracameral anesthesia and examines the available evidence to address questions about its effectiveness, possible corneal endothelial and retinal toxicity, and the optimal and maximal dose.

METHODS: A literature search conducted for the years 1968 to 2000 retrieved over 180 citations that matched the search criteria. Panel members and a methodologist reviewed this information, and it was evaluated for the quality of the evidence presented.

RESULTS: Some studies report effectiveness of intracameral anesthesia while others report no effect. In those studies showing an effect, levels of pain in the groups that were compared were low. Short-term studies seem to indicate that preservative (methylparaben)-free lidocaine 1% is well tolerated by the corneal endothelium but that higher concentrations of lidocaine are toxic. There is some evidence of electroretinogram changes after exposure to lidocaine or bupivacaine.

CONCLUSIONS: The ideal timing and placement of intracameral anesthesia has not been determined. Because topical anesthesia alone is effective, surgeons may elect to use intracameral anesthesia for incremental pain control in patients who cannot be adequately managed with topical alone. Appropriate patient selection is important when using this method of anesthesia. While short-term studies seem to indicate safety, long-term effects are unknown. Patient preferences for anesthesia are not well studied.
A CME approved meeting for anaesthetists and ophthalmologists on Local Anaesthesia for Ophthalmic Surgery will be held in North Riding Infirmary, Middlesbrough on Friday, 8th February 2002. The meeting will include lectures and live demonstration of orbital blocks. Attendance is limited to 50 participants. Application form and information from Mrs Pat McSorley (Course Administrator 01642-854601 email: cmkumar@globalnet.co.uk). Registration fee is £225 (BOAS Members £200) (inclusive of catering). Cheque payable to Ophthalmic Anaesthesia Education Fund.

**PROGRAMME**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event Details</th>
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<tr>
<td>09.00-9.25</td>
<td>Registration &amp; Coffee (Staff Restaurant)</td>
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<tr>
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<td>Lectures Ward 56 (Day Centre)</td>
</tr>
<tr>
<td>9.25</td>
<td>Welcome: Dr Chris Dodds, Middlesbrough</td>
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<tr>
<td>9.30-10.15</td>
<td>Anatomy Relevant to Orbital Blocks</td>
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<tr>
<td>10.15-11.00</td>
<td>The evolution of an effective regional anaesthesia blocking technique</td>
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<td>for intraocular surgery</td>
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<td>Dr Roy Hamilton, Calgary, Canada</td>
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<tr>
<td>11.15-11.45</td>
<td>Coffee Break (Staff Restaurant)</td>
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<td>Dr A P Rubin, London</td>
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<tr>
<td>11.45-12.15</td>
<td>Sub-Tenon’s Block : What’s new</td>
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<tr>
<td>12.20-12.45</td>
<td>Local Anaesthesia for Posterior Segment Surgery</td>
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<tr>
<td>12.40-13.45</td>
<td>Lunch</td>
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<tr>
<td>13.45 -17.00</td>
<td>Live Demonstration of Orbital Blocks(Ward 56)</td>
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<td>Demonstration Co-ordinators: Drs Anthony Rubin, Chandra Kumar, Mr Tim Dowd,</td>
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<td>Mr Mamdoul El-Naggar and Mr David Smerdon</td>
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<tr>
<td>17.00</td>
<td>Closing remarks</td>
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**Retro and/ or peribulbar**
- Combined Retroperibulbar
- Hamilton’s Technique
- Other Needle Blocks
- Dr Chandra Kumar, Middlesbrough
- Dr Roy Hamilton, Calgary, Canada
- Dr Sean Williamson, Middlesbrough
- Dr Anthony Rubin, London
- Dr Sean Tighe, Chester

**Sub-Tenon’s**
- Metal Cannula
- Kumar-Dodds’s Cannula
- Short Cannula
- Greenbaum’s Cannula
- Dr Caroline Carr, London
- Dr Chris Dodds, Middlesbrough
- Mr Bartley McNeela, Middlesbrough
- Dr Chandra Kumar, Middlesbrough

Programme Director and meeting Organiser: Dr Chandra Kumar, Consultant Anaesthetist, Cleveland School of Anaesthesia, South Cleveland Hospital, Middlesbrough TS4 3BW.
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