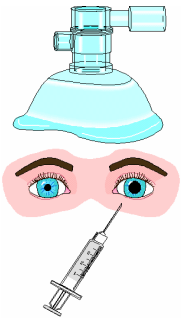

Ophthalmic Anaesthesia News

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The Assessment of Ophthalmic Regional Anaesthesia

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Introduction

In clinical practice the assessment of an ophthalmic regional anaesthetic usually involves a brief check on globe akinesia to decide whether to perform a supplemental injection, wait longer or transfer the patient to theatre. Although apparently simple, this decision is made in the light of the surgeon's experience and preferences, the operation to be performed, risk factors particular to that patient and the expected duration of the anaesthetic already administered. Although adequate for everday use with well-known anaesthetic techniques and a familiar surgeon, this is clearly inadequate for research. Formal comparisons between different local anaesthetic solutions or injection techniques require that appropriate outcome measures are chosen, data is collected meticulously then results carefully analysed and interpreted. To provide useful information outcomes must be relevant (measure something important), valid (measure what we think they measure), and consistent between subjects and observers. In ophthalmic regional anaesthesia popular outcome measures include globe akinesia, number of supplementary injections required, volume of local anaesthetic injected, pain and complication rates. Although apparently simple these are complex tasks with arguable relevance, validity and consistency.

Globe Akinesia

The assessment of motor blockade is found in virtually every study of ophthalmic regional anaesthesia. It's popularity stems from the belief that the majority of surgeons prefer to operate on an akinetic eye and because motor blockade is an easily measured surrogate marker for sensory blockade. As topical anaesthesia becomes popular for cataract surgery, the relevance of akinesia is questionable. However, until the majority of cataracts are extracted using topical anaesthesia it is likely that akinesia will remain relevant.

Akinesia is usually assessed during development of the regional block, at the completion of surgery and, occasionally, the day following surgery. Several outcomes of akinesia allow comparison between treatment groups:

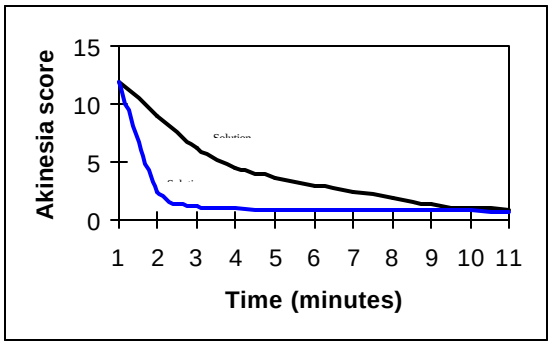
- Time to achieve a pre-determined akinesia score
- Akinesia score at pre-determined times
- Number in each group requiring a supplementary injection based on akinesia scores at a pre-determined time

Although measuring the same process, the choice from these outcomes will affect the power of the study. Data such as time to achieve a given akinesia score are continuous, so powerful parametric tests (t-test, ANOVA) can be employed, whereas assessment of akinesia score at a given time (ordinal data) or number requiring supplementation (nominal data) require the use of less sensitive non-parametric testing (Mann-Whitney and χ^2 tests respectively). All of these rely on valid and consistent methods of measurement of orbital akinesia.

Surprisingly, despite the vast array of studies, there is no accepted standard method, implying that finding a valid and consistent technique has not proved straightforward.

Akinesia Scoring Systems

Globe akinesia can be assessed by asking the patient to move their eyes in different directions. The action of the four recti are observed and the degree of movement scored. Patients may also be asked to open and close their eyes to assess orbicularis oculi and levator palpebrae superioris. The scoring scale may vary from simply recording that akinesia was adequate for surgery, to more detailed scoring of each muscle on a 2 to 5 point scale [1-3]. The former method is attractive in terms of speed and ease of use, but lacks sensitivity and will only detect vast differences between groups. The use of a 5 point scale to score each muscle provides more data, and is superficially more appealing [3 4]. However, in practice such a scale is often clumsy to use, particularly when assessments are done in quick succession, or where the patient responds slowly. In these circumstances rapid attempts to differentiate 'moderate akinesia' from 'almost full movement' or 'moderate movement' from 'almost full akinesia' are difficult, subjective and likely to lead to a degree of error. In addition, the movement of the oblique muscles in isolation may lead to a rotatory movement of the globe that may be confused with small movements of the recti muscles. The scoring scales not only differ in the number of points, but also on the direction of the scale. Most investigators score no movement (ie full block) as equaling zero, whereas others use the somewhat counterintuitive method of scoring full block with a maximal score (ranging from 8 to 24) [4-8]. Whether this makes a difference in terms of ease of use or error is unknown.



Timing of Assessments

Assessments may be performed every minute for the first 20 minutes or may be done at 10 or 15 minute intervals [3 7 9 10]. Frequent measurements are more demanding, but will enable the investigators to assess when a pre-determined akinesia score has occurred. Data can then be analysed using sensitive parametric tests and significant differences are more likely to be found. However, although knowing which local anaesthetic solution works a few minutes before another may be relevant to obstetric regional practice, there is little need to perform urgent ophthalmic surgery. It may be better to perform the first assessment accurately at 10 minutes and use non-parametric tests, rather than rush assessments at one minute interval and use parametric tests.

Supplementary Injections

The proportion of patients who require supplementation of their block is a commonly employed outcome. The timing of the assessment and the level of akinesia triggering supplementation must be chosen with care. It takes around 10 minutes for most peribulbar injections to exert their maximal effect, yet it is not unusual to see supplementary injections administered within this time [2 4 5 11-13]. Consider two local anaesthetic solutions (A and B). As figure 1 shows both have reached their maximal effect at 10 minutes after the injection, but they have differing onset profiles. If an assessment is performed at 10 minutes none of the patients would need to be exposed to the risks of a supplementary injection. If an assessment is performed at 5 minutes then, depending on the required score, a proportion of patients receiving local anaesthetic solution A would require supplementation. However, if we had waited a further 5 minutes no difference would have been seen. The relevance of this depends on whether greater emphasis is placed on detecting a statistical difference between groups or looking for clinical differences. If we wish to find a statistical difference between groups and are using proportion requiring supplementation as our endpoint, then an early assessment will serve its purpose, but it must be recognized that this will expose patients to the risks of unnecessary additional injections. Setting the level of akinesia necessary to trigger a supplemental injection raises similar problems. If too exacting a level is set then patients will be exposed to further injections. If too low a level is set then the study may fail to see a difference between groups. If supplementation rate is to be used as an endpoint then delaying supplementation until the maximal effect of the initial injection has already been seen would seem prudent.

Peribulbar anaesthesia poses an additional problem as it is often a two injection technique. Performing both injections in quick succession is unnecessarily uncomfortable for the patient. A delay to reduce the pain of the second injection is more acceptable. However, if the second injection is performed too quickly there will have been insufficient time to assess the effects of the first injection and some patients will receive an unnecessary injection. If second injections are performed irrespective of the degree of akinesia already achieved, then the onset profile of that test solution cannot be properly assessed. Waiting until there is no further progression of block following the first injection is probably ideal.

Adequacy for surgery

The score that is deemed adequate for surgery will vary from one surgeon to another. Investigators rarely record how the score has been decided upon, and I suspect it may not have been chosen by the surgeon. Akin to supplementation trigger scores, the adequacy for surgery score must be chosen with care. Too demanding a level runs the risks of unnecessary injections and too low a level may result in inadequate anaesthesia for the patient and would provide little useful data.

Volume of Local Anaesthetic

The volume of administered local anaesthetic depends upon the number of injections, the volume with each injection, the volume of the orbit, the volume of the non-compressible tissues within it and the indicators for limiting the amount injected (eg proptosis, lid filling, orbital pressure). Although investigators usually set a volume of local anaesthetic to be delivered with each injection, it may not be possible to administer the full amount as the lids fill or the orbital pressure rises quickly. Without knowing the volume the drug is being injected into, or the indicators limiting the injection, it is not possible to use volume of local anaesthetic delivered as a differentiating outcome.

Pain

The abolition of pain is the main purpose of ophthalmic regional anaesthesia, although pain is rarely the primary outcome measured. In obstetric anaesthesia painful, light touch or cold stimuli may be used to assess the extent of the sensory nerve block prior to surgery. However, the risks of damaging the cornea preclude a similar approach in ophthalmic patients. Instead, investigators have focused on pain caused by the injections or pain experienced during surgery. There are other potentially painful events during routine ophthalmic surgery including administration of dilating eye drops, placement of intravenous cannulae, administration of topical anaesthetic to the conjunctiva, positional aches during surgery, subconjunctival injection of antibiotic at the completion of surgery, and various irritations as the local anaesthetic effect recedes. It may be useful to calibrate each group by reporting pain scores for similar painful stimuli, such as administration of the dilating drops or placement of the intravenous cannula. Aside from the injections and surgery the additional painful experiences are well tolerated and consequently receive little attention in research.

Assessing pain is difficult as the expression of pain varies with age, culture, education, expectations, perceived control, personality, previous experience and personal support. Attempts to disentangle influences of these on the expression of pain is a sizeable task. The simplest assessment is to record whether or not pain was experienced during any given procedure. This method is certainly valid and reliable, but statistically insensitive. Other methods of assessment include observation of physiological and behavioural changes. Physiological parameters may be difficult to interpret as many of these patients have an anxiety-induced tachycardia exacerbated by sympathomimetic dilating drops or may be treated with medication that blunts their autonomic reflexes. Interestingly, Sarvella used electromyographic monitoring to quantify eyelid function during development of a peribulbar block, but found that there was excessive interference from other facial muscle activity [14]. A similar technique has been used in obstetrics where sensory evoked facial muscle electromyography was used to measure facial grimacing with each contraction [15]. Not surprisingly, increased grimacing correlated with higher pain scores. Perhaps the 'noise' detected by Sarvella may have been a detector of pain during insertion of the block and subsequent surgery. Detecting behavioural changes is labour intensive and requires specialist observers. In addition, patients are instructed to lie still during surgery masking any alterations.

Self-reporting scales such as a Verbal Rating Scale, Visual Analogue Scale or the McGill Pain Questionnaire (MPQ) are popular in pain research. Visual scales are less reliable in ophthalmic surgery as few of the patients have adequate vision. Verbal rating scales where the patient describes pain in terms of mild, moderate or severe are more suited to the visually impaired population. To improve sensitivity a scale of zero to 10 may be used. However, not all patients are able to comprehend these scales or have the language skills to use them. In addition, the 10 point scoring system represents pain as a linear scale, yet a score of 4 may not necessarily be half the pain of a score of 8, and a jump from 0 to 1 may not be the same as a jump from 9 to 10. Decisions regarding a clinically significant as opposed to a statistically significant difference in pain scores are also difficult. The MPQ represents a comprehensive measurement of pain. It scores pain on sensory, affective and evaluative scales. The major disadvantage is that it is lengthy to complete and requires linguistic skills not possessed by some.

Verbal reporting of pain is often performed at the completion of surgery when the patient has returned to the Recovery Unit. It is surprising to note that a proportion of these patients are asked to recall and score events that occurred around the time when they received a dose of anxiolytic, amnesic sedative medication. If these have been administered it would seem prudent to exclude those patients from the investigation into pain scores.

Vision

Visual acuity may be assessed, although the method is seldom detailed [16]. The majority of these patients have poor vision so relatively crude, insensitive methods must be used (eg light/dark perception, hand waving, finger counting). Amaurosis commonly occurs with retrobulbar and sub-Tenon's, and less frequently with peribulbar anaesthesia. With the latter technique visual acuity may be recorded as an indicator of spread of local anaesthetic. However, the value of visual acuity as an outcome is questionable as it is impossible to know whether this has occurred through diffusion of local anaesthetic, bulk transfer or a misplaced needle. .

Complications

Other than minor complications such as chemosis, conjunctival haemorrhage, raised pressure and diplopia the following day, few complications are recorded. Similarly, minor patient morbidity gets relatively little attention, even though these experiences are the ones that the patient is most likely to be aware of and remember. Serious complications such as those caused by local trauma (globe perforation, retrobulbar haemorrhage, muscle damage), or systemic effects of the local anaesthetic (overdose, intravascular injection,

subarachnoid spread) are sufficiently rare to play little role in the majority of studies. To investigate the incidence of these events in prospective trials would require prohibitively high numbers of subjects.

Conclusion

There is a wealth of data comparing techniques and local anaesthetic solutions for ophthalmic regional anaesthesia. Not infrequently studies looking at the same question appear to draw contrary conclusions from their work. This variation may be due to differences in methodology, statistical analysis or data interpretation. In writing this I hope to have shown, with a few examples, that investigators have a difficult task even when assessing what appear to be simple outcomes and this is likely to contribute to the confusion

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Block Technique for DCR

Gary Fanning, MD
Hauser-Ross Eye Institute
Sycamore, Illinois USA

Dacryocystorhinostomy is a common oculoplastic procedure that is frequently performed as a day surgery procedure. It can be performed comfortably under regional anaesthesia. The block described here has been most useful, as it provides excellent pain relief for the patient as well as good operating conditions for the surgeon.

The Procedure

The surgeon creates a new opening for the blocked nasolacrimal duct by first cutting a hole through the medial wall of the lacrimal canal into the nasal cavity just ahead of and below the tip of the middle turbinate. A plastic tube is threaded through the superior and inferior canaliculi, and the two ends are brought into the lacrimal duct and out through the new opening and left in place for several weeks whilst healing occurs.

The incision is made below the medial canthus near the angle formed by the nasal bone and the lacrimal bone. The operation is associated with significant stimulation of the lacrimal puncta and canaliculi, intranasal manipulation, and bone pain; therefore, it is important to produce solid anaesthesia intranasally as well as externally.

Anatomy[1,2]

The ophthalmic and maxillary divisions of the trigeminal nerve serve the operative area. Branches from the ophthalmic division include the infratrochlear nerve to the lower lid and medial canthus and the anterior ethmoidal nerve, which innervates the lateral wall and dorsum of the nose. The infraorbital nerve, the end branch of the maxillary division, sends branches to the lower lid and the area near the incision. The pterygopalatine ganglion receives sensory fibres from the nasal mucosa and lies submucosally behind the middle turbinate. In order to ensure solid anaesthesia for this procedure, all of these nerves must be blocked.

Sedation

The block can be performed with little discomfort if one uses anaesthetic solution warmed to 35^0C and injects very slowly[3]. I use small doses of midazolam (1-2 mg) intravenously combined with small doses of either thiopental (25-75 mg) or alfentanil (125-250 mcg). Other agents work equally well, but only very light sedation should be required.

Anaesthetic Mixtures

As the length of this procedure man vary from 45 minutes to two hours, it is advisable to use a long-lasting anaesthetic, such as 0.75% bupivacaine, 0.75% levobupivacaine, or 1% ropivacaine. Adding small amounts of epinephrine (1:300,000 – 1:400,000) and hyaluronidase (1 – 2 units/mL) is very useful.

Topical anaesthesia is required inside the nose. 4% cocaine solution works well and provides excellent vasoconstriction. In patients with significant cardiovascular disease, a possible alternative is a mixture of phenylephrine and lidocaine[4]. Adding 0.5 mL 2.5% phenylephrine solution to 4.75 mL 4% lidocaine solution results in a very satisfactory mixture containing 0.25% phenylephrine and just under 4% lidocaine. Do not use mixtures containing more than 0.25% phenylephrine, as higher concentrations have been associated with serious ill effects, including severe hypertension, pulmonary oedema, and death[5]. Other solutions have been described as well[6].

Infraorbital Nerve: Block Technique

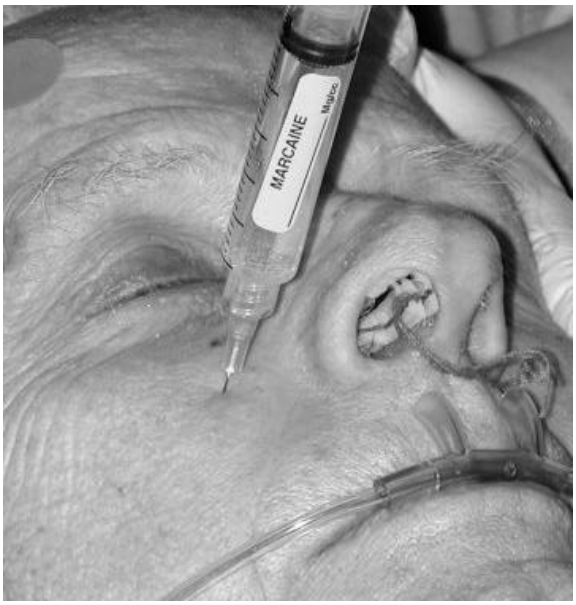

Figure 1

The infraorbital foramen lies at the superior aspect of the maxillary fossa, on a line connecting the supraorbital notch, pupil, and mental foramen. The infraorbital nerve exits the foramen and is easily blocked by depositing anaesthetic solution on the maxillary fossa. In order to prevent damage to vascular structures or to the nerve itself, do not inject directly into the foramen. A short (1/2-5/8"), fine needle (25-30G) is inserted perpendicularly through the skin at the level of the ala nasi on the line connecting the supraorbital notch and mental foramen. **(Figure 1.)** One should be safely below the foramen at this point. Touching the periosteum with the needle tip before injecting helps ensure maximal spreading of anaesthetic solution in the proper plane. After injection of about 2 mL, the needle is withdrawn to the skin, redirected toward the medial canthus, and reinserted to the periosteum, where an additional 1.5-2 mL is injected. One now removes the needle and reinserts it at the mid-point of a line connecting the original insertion site and the medial canthus. The needle is directed to point toward the medial canthus and is

inserted to the periosteum. Anaesthetic is injected until tumescence can be seen to approach and just go past the medial canthus. **(Figure 2.)** This normally requires 2-3 mL. Following this injection, the entire area is gently massaged for about a minute to spread the anaesthetic and disperse the tumescence.

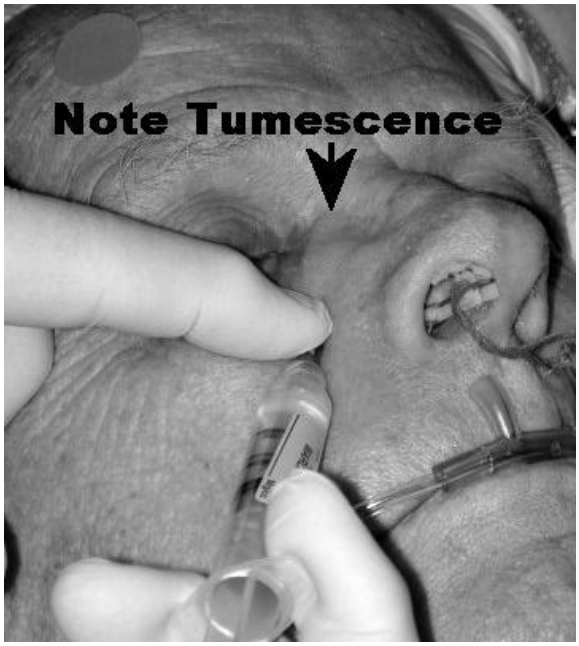

Figure 2

Medial Compartment: Block Technique

The medial canthal block has been well described by others[7]. Using a 1" 27G needle, one inserts the tip into the tunnel between the caruncle and the medial canthus, aiming toward the medial orbital wall. Do not insert the needle too far, as the bone here is extremely thin. Once the wall is touched, the needle tip is very slightly withdrawn (1-2 mm) and redirected so that the needle will enter the orbit parallel to both the medial orbital wall and the floor of the orbit. **(Figure 3.)** The needle tip now lies in the fat-filled compartment medial to the medial rectus muscle and very close to the medial wall. Never insert a needle longer than 1" into this compartment, as longer needles can easily reach the optic canal via this route. Advance the 1" needle only until the shoulder (where the shaft meets the hub) reaches the plane of the iris. Overly aggressive insertion can result in a 1" needle reaching the optic canal, also. Keep the bevel of the needle facing the medial orbital wall during insertion in order to prevent the needle tip from migrating through the wall.

In most patients 2-4 mL of anaesthetic injected into this compartment will provide very adequate blocking of the terminal branches of the nasociliary nerve, including the anterior and posterior ethmoidal nerves and infratrochlear nerve. It is wise to continually palpate the globe during injection to ensure that it doesn't become too tight. Occasionally an individual will only tolerate 1.5-2 mL injected into this compartment, but most individuals can easily accommodate 8-10 mL injected slowly. Partial akinesia of the extraocular muscles and orbicularis oculi are usually seen after this block, so the eye should be patched postoperatively until protective reflexes have returned.

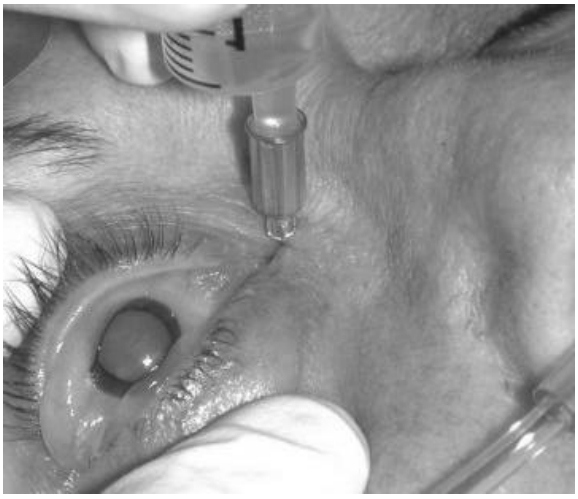

Figure 3

Lacrimal Canal: Block Technique

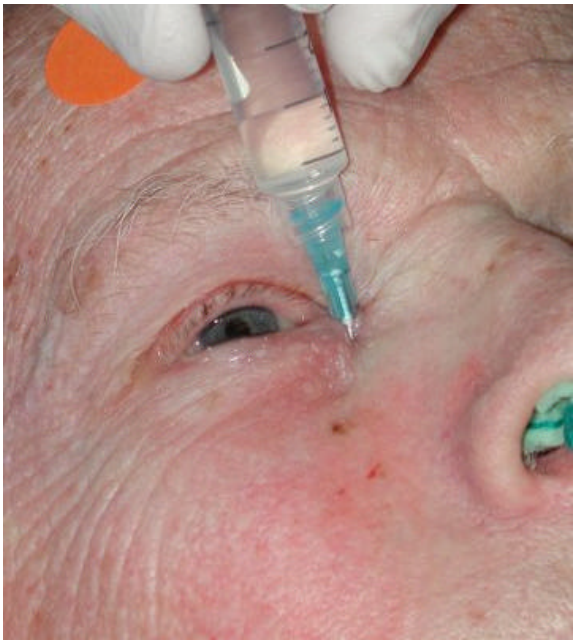

Figure 4

Although anaesthesia of the lacrimal canal should be achieved by the medial compartment block, an additional (and optional) block ensures good anaesthesia at the site of the neorhinostomy. Standing above the patient, one inserts a 25-30G 1/2-5/8" needle through the extreme medial aspect of the lower lid until it touches the periosteum of the inferior orbital rim. The shaft of the needle should be parallel with a sagittal plane. The needle tip is slowly and gentley walked posteriorly until it just falls off the posterior aspect of the orbital rim. **(Figure 4.)** The needle tip should be lying in the superior aspect of the lacrimal canal, where 2-3 mL

of anaesthetic are injected. If the tip of the needle lies within the lacrimal sac, one will see anaesthetic reflux out of the puncta. If this occurs, simply withdraw the needle slightly until it is no longer within the sac.

Intranasal Anaesthesia: Block Technique

One begins to anaesthetize the inside of the nose before doing any of the other blocks. To block the sensory fibres going to the pterygopalatine ganglion, the nose must be packed with sponges soaked in topical anaesthetic. The sponges should be packed under the middle turbinate and placed as far posteriorly as possible. It is helpful to use two sponges in order to achieve solid mucosal contact, thus ensuring both good anaesthesia and good vasoconstriction.

After performing the external blocks, the sponges are removed but not discarded. A 1" 27G needle is used to block the lateral nasal wall. The needle is inserted into the lateral nasal wall right at the tip of the middle turbinate and 2 mL of the long-acting local anaesthetic (i.e., not the topical anaesthetic) are slowly injected. During injection one can observe the anaesthetic spread posteriorly beneath the turbinate and then along the entire lateral wall. One now replaces the sponges beneath the middle turbinate and leaves them there to be removed by the surgeon during the intranasal part of the procedure.

Discussion

The anaesthetic technique described will provide excellent anaesthesia for dacryocystorhinostomy and other procedures on the lacrimal system. It also helps provide intranasal hemostasis and prolonged postoperative pain relief. The most common complaint by patients is the "crunching" sound produced during creation of the neorhinostomy. Slightly heavier sedation is provided during this period to increase patient satisfaction. In patients who prefer to be asleep during the surgery, this block permits one to use minimal amounts of general anaesthetic agents, allowing very rapid, pain-free recovery. It is an easy technique to learn and use, and it can be performed quickly once mastered with very little discomfort to the patient.

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Note: This block technique, with illustrations, can also be found online at www.eyetext.net. This site is an electronic ophthalmic text book and contains many interesting articles. You will need to sign on and receive a password, but there is no charge. It has been developed and maintained by Dr. Tony Wells at Moorfields Eye Hospital in London. Please log on and look it up

Regional anaesthesia in ophthalmology: the first three months

Mr Tom Eke
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Perhaps my favourite paper in the ophthalmic literature is 'On cocaine and its use in ophthalmic and general surgery'. Written by H. Knapp, the New York editor of *Archives of Ophthalmology*, it appeared in the journal in December 1884. A mere three months previously, regional anaesthesia for eye surgery had been described for the first time. Knapp's 47-page review documents the remarkable speed with which the news spread through the surgical community. It provides a intriguing insight into the medical world of the 1880's: the absence of ethics committees or formal peer review meant that surgeons were free to try out new techniques as they wished, and could publish their findings almost immediately. In just three months, the literature had grown to include descriptions of retrobulbar, sub-Tenon, sub-conjunctival, topical and topical-intracameral techniques.

On September 15th 1884, a Dr Carl Koller of Vienna had presented a paper to the meeting of German oculists 'on the use of cocaine to anaesthetise the eye'. The famous Dr Sigmund Freud is credited for drawing this drug to his attention. After some initial experiments on animals, Koller applied cocaine solution to his own eyes, then those of his friends, before trying it out on his patients. General anaesthesia had been used since the 1840's and was known to be potentially dangerous, so the concept of regional anaesthesia was an attractive one. Koller illustrates the advantages of cocaine anaesthesia by describing a patient who required bilateral iridectomy. For the first eye, cocaine drops were used, and the patient "did not react in the least to the operation, said that he had not felt at all the corneo-scleral section… he had felt the seizing and drawing out of the iris, but it had not given him any pain." A week later the same procedure was performed on the other eye, the cocaine this time being omitted. "He pressed and squeezed in such a way that he rendered the operation quite difficult…"

News of Koller's discovery appeared in the October 11th issue of the American *Medical Record*, and in the October issue of the London *Ophthalmic Review*. Knapp describes how U.S. physicians did not wait for Koller to formally publish his findings, but "they without delay tried the new anesthetic in every direction, finding for themselves a number of important facts before Dr Koller's or other European publications reached them". Koller's paper was published in an Austrian journal on October 25th, the same day that Knapp himself published a discourse on cocaine in the *Medical Record*. In the interests of advancement of science, Knapp had tested the anaesthetic effect of cocaine solution on various parts of his own body. He anaesthetised his own eye, then cauterised the conjunctiva using silver nitrate. He also describes the effect of cocaine on his mouth, nose, trachea, urethra and, "for the sake of completeness", his rectum.

The Americans did not hesitate to experiment with cocaine anaesthesia for eye surgery. Cocaine drops were used for a variety of operations, including squint surgery, cataract extraction and iridectomy. Other methods of applying cocaine were tried. Dr Samuel Theobald, of Baltimore, described a case of enucleation in which cocaine was 'instilled before and during the operation, getting, to some extent, under the conjunctiva'. Dr C.S. Turnbull of Philadelphia described the first sub-Tenon anaesthesia, again for enucleation. Cocaine was dropped into the wound, and encouraged to flow to the back of the globe alongside blunt scissors, which were placed between sclera and Tenon's capsule. The topical-intracameral technique was described by a Dr D.C. Cocks of New York, 'either by injecting the solution with a syringe, or [letting] it run along a spatula into the wound'. Knapp himself takes credit for the first retrobulbar injection. Following the instillation of cocaine drops, 'the globe was strongly drawn toward the nose by means of a forceps, and six minims of a 4% solution (painlessly) injected into the orbital tissue close to the posterior part of the globe.' The operation (an enucleation) commenced five minutes later, but no further detail is given.

Knapp notes that the British ophthalmic community were 'very cool at first, but more appreciative later'. He states that 'it is characteristic of conservative England that medical men were waked up to the remarkable advantages of a new remedy fully six weeks later than their American brethren, whereas with an equal spirit of receptiveness and progressiveness they ought to have been two weeks before them'. Such patriotic chauvinism is no longer considered appropriate by the current editors of *Archives* !

In addition to numerous reports of cocaine for ophthalmic anaesthesia, Knapp's article also reviews the use of cocaine in other surgical specialties, such as ENT, dentistry, gynaecology, genito-urinary and general surgery. Little attention is paid to any possible side-effects, though Knapp does caution that some patients experienced faintness, pallor, sweating and tachycardia. Reports of corneal ulceration and impaired healing did not appear until later.

Knapp's article was written at the dawn of a new era in medicine, that of regional anaesthesia. The dry scientific style cannot conceal the author's excitement for a technique that was already revolutionising surgery. Knapp states that "*almost all operations* on the eye can be performed under [regional] anesthesia… In children and frightened people, for obvious reasons, there will always be an indication for general anesthesia." These comments remain as true today as when they were first written, almost 120 years ago.

Reference:

Knapp H. On cocaine and its use in ophthalmic and general surgery. *Arch Ophthalmol* 1884;13:402-448.

Sub-Tenons, Cataract Surgery And Endophthalmitis

Dr Guri Thind
Consultant Anaesthetist and BOAS Council Member
Liverpool

Postoperative bacterial endophthalmitis is an uncommon but serious complication of cataract surgery. Considering the number of cataract operations done annually in the UK it is not an insignificant problem. Somewhat surprisingly it is most commonly encountered following cataract surgery. There is some evidence that incidence of culture proven endophthalmitis is higher in intracapsular lens (IOL) extraction followed by IOL implantation when compared to the incidence in extracapsular lens extraction with or without IOL implantation[1]. In UK practice developments in ophthalmic surgery over the last two decades have meant that the latter has almost completely replaced the former and therefore we should see a lower incidence of endophthalmitis in the future, all other things being equal.

Another relatively recent development in the UK practice is that Sub-tenon`s block is rapidly replacing retrobulbar and peribulbar blocks as the mode of anaesthesia for cataract surgery. This has come along at a time when local anaesthesia has made general anaesthesia for cataract surgery almost extinct. Surgical colleagues might say that one advantage of general anaesthesia for cataract surgery was that anaesthetists didn't stick needles or worse surgical instruments into the orbit and thereby introduce infection! Since sub-tenons block is seen as a pseudo-surgical procedure how much of a source of infection can it be and what precautions would be reasonable as a prophylaxis against any potential problem? What sources of infection should be targeted?

In the absence of signs of obvious infection the possible sources of infection include ocular tear film, the lids and the adenexae, anaesthetic and surgical instruments, irrigating fluids, respiratory and skin flora of anaesthetists and surgeons, and anaesthetic room and operating theatre air. Of all these, available evidence is that patient`s external tissues represent the most important source of infection and most frequently isolated organisms are staphylococcus epidermidis and staphylococcus aureus. These organisms are most commonly isolated from the patient`s eye lids. There is also evidence that surface flora does routinely gain entry to the anterior chamber during cataract surgery.

Given the ability of these organisms to enter the eye during surgery, surgical colleagues have traditionally taken several prophylactic measures to decrease their number and limit the growth of those that enter the eye. Some of these measures have little evidence to support them eg lash trimming, topical antibiotic, saline irrigation etc. Others eg pre-operative povidone-iodine and subconjunctival injection of antibiotic at the end of surgery have moderate evidence in their support. Most surgeons therefore do clean the skin with povidone-iodine and give sub-conjunctival injection of antibiotic at the end of surgery.

Should anaesthetists clean the skin with povidone-iodine and apply it topically to the conjunctiva before doing a sub-tenons block? Who is to say? Considering the variables involved and the incidence of endophthalmitis it is not something one would easily be able to show scientifically to have any benefit or otherwise. Learning from the evidence available from surgical colleagues one would have said yes. Many colleagues already do. It also means that if the anaesthetist has applied iodine in the anaesthetic room, by the time the patient goes into theatre and the surgeon repeats the surgical preparation the bacterial count must fall further with consequent benefit to the patient. **It would also reassure our surgical colleagues**! It is recommended that 5% solution is applied to the conjunctiva. The 10% solution commonly available in theatres is thought to be irritant to the conjunctiva.

Reference

1. Kattan HM, Flynn HW jr, Pflugfelder SC et al. Nosocomial endophthalmitis survey. Current incidence of infection after intraocular surgery. Ophthalmology 1991;98:227

An unusual complication of Sub-Tenon's Anaesthesia?

Prof Chris Dodds
Academic Department of Anaesthesia
James Cook University Hospital
Middlesbrough TS4 3BW, UK

Dear Colleagues,

I would be very grateful for any comments you have on this unusual complication. I am unaware of any other cases, and would like to know if anyone else has either seen a similar case, or who can explain how it could have been caused.

Dr Ed Charlton reported this lady to me with the following history:

"Today I had a lady in the pain clinic who has had a long-term painful sequelae after a sub-Tenon's block. She is a psychologically normal 63-year old. At the time of the block she became numb in the distribution of the ophthalmic division of her trigeminal nerve and since then has had abnormal sensations in that distribution. She also has radiation in a post auricular distribution that is more difficult to explain. She has no sensory change that can be detected to gross testing." This occurred two years ago and has shown no signs of resolution.

Please send any comments to me on
Chris.Dodds@stees.nhs.uk

News and information

International Ophthalmic Anaesthesia Society (IOAS)

Efforts are continuing to establish the International Ophthalmic Anaesthesia Society.

Progress on the Joint Colleges Working Party Report

The document Joint Colleges Guidelines of the Royal Colleges of Anaesthetists and Ophthalmology was published in 2001. The full document can be accessed by visiting www.rcoa.org or www.boas.org

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 charity application is progressing and we hope that the society will become a registered charity by the end of the year.

Contribution for the 7th issue

The next Newsletter will be published in October 2002. Please send your articles or any contributions for inclusion in the Newsletter by 15th October 2002 to Dr Chandra Kumar, Secretary BOAS, James Cook University Hospital, Middlesbrough TS4 3BW, UK 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, Director 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 Hospital, 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
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Middlesbrough
TS4 3BW, UK
Tel 01642 854601
Fax 01642 854246
Email cmkumar@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.

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British Ophthalmic Anaesthesia Society Member Registration Form

To The Branch Manager Midland Bank

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Postal Address……

Please Pay	Bank: **Midland Bank**	Branch Title (not address): **South Cleveland Hospital Branch**	Sorting Code Number
for the credit of	Beneficiary's Name: **British Ophthalmic Anaesthesia Society**	Account Number	Quoting Reference
the sum of	Amount: **£25.00**	Amount in words: **Twenty Five Pounds**	
commencing	Date of first payment	and thereafter every: **Yearly** (Due date and frequency)	until further notice in writing or: Date of last payment

and debit my/our account accordingly

PLEASE CANCEL ALL PREVIOUS STANDING ORDER/ DIRECT DEBIT MANDATES IN FAVOUR OF	UNDER REFERENCE NUMBER	Account to be debited	Account Number

Special instructions

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.
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d) request beneficiary's banker to advise beneficiary of receipt.
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code……..……..

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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

BOAS 2002
4TH ANNUAL SCIENTIFIC MEETING

BIRMINGHAM INTERNATIONAL CONFERENCE CENTRE

27TH AND 28TH JUNE 2002

Paediatric Ophthalmic Anaesthesia	***Ophthalmic Surgery For Anaesthetists***
Free Papers	***Workshops***
Controversies in Ophthalmic Anaesthesia	***Medico legal Aspects of Ophthalmic Anaesthesia***
Guest Speaker	***A lot More***

CONTACT:

Mrs Karen Scott
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07903 560 359

BOAS 2002
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OPHTHALMIC ANESTHESIA SOCIETY
16TH ANNUAL SCIENTIFIC MEETING

October 4-6, 2002 - Westin Michigan Avenue, Chicago

PROGRAM CO-CHAIRS: Marc Allan Feldman MD MHS, Scott Greenbaum MD

FRIDAY, OCTOBER 4

1:20 Welcome Remarks
Scott Greenbaum MD, President
Marc Allan Feldman MD MHS, Vice President
1:30 Anesthesia Needle Induced Muscle and Orbital Trauma
David G. Hunter MD PhD
2:15 Local Anesthesia Trends in Europe
Robert Johnson FRCA
3:00 A Study of the Safety of Continued Anticoagulation Therapy in Cataract Surgery Patients
Don R. Hirschman CRNA MHA ND
Lesa J. Morby CRNA ND
3:30 Questions and Answers
3:45 Break
4:00 The Diagnosis and Treatment of Head and Facial Pain
James Goodwin MD
4:45 Anesthesia Complications Survey
Marc Allan Feldman MD MHS
5:30 Questions and Answers
6:00 Adjourn
6:00 Reception

SATURDAY, OCTOBER 5

7:50 President's Welcome Remarks
Scott Greenbaum MD
8:00 The Evolution of a Safe and Effective Technique of Regional Eye Anesthesia
Roy C. Hamilton MB
8:45 SubTenon's Anesthesia for Vitreoretinal Surgery
Helen K. Li MD
9:30 Questions and Answers
9:45 Break
10:15 Sublingual Versed Sedation in Intraocular Surgery
Kent A. Kirk MD
11:00 Retinal Complications of Retro- and Peribulbar Anesthesia
Jonathan Sears MD
11:45 Questions and Answers
12:00 Lunch Break
1:30 Extraocular Muscle Trauma and Degeneration
Bruce M. Carlson MD PhD
2:00 Medical-Legal Issues: The New Crisis
Gary L. Fanning MD
2:45 Workshops (Participants may attend two of three workshops:
A. Peribulbar/Anatomy
Gary L. Fanning MD
B. Topical Anesthesia
Luther Fry MD & Lynn Dunford CRNA
C. Parabulbar Anesthesia
Scott Greenbaum MD
3:45 Break
4:00 Workshops Repeat
5:00 Adjourn
6:00 Dinner Cruise

SUNDAY, OCTOBER 6

8:00 Annual Meeting of the Membership
Scott Greenbaum MD
8:30 Parabulbar Anesthesia for Cataract Surgery
David Markoff MD
9:15 OSHA Blood Borne Pathogen Update
Dan Simonson CRNA
10:00 Questions and Answers
10:15 Break
10:30 Case Discussion Panel
Gary L. Fanning MD, Moderator
12:00 Adjourn

Additional information, please contact:

Ophthalmic Anesthesia Society
793-A Foothill Blvd., pmb 119
San Luis Obispo CA 93405
Phone: 877.220.3585

Website: www.eyeanesthesia.org

info@eyeanesthesia.org

LOCAL ANAESTHESIA FOR OPHTHALMIC SURGERY

11th Video-conference Meeting

A CME approved meeting for anaesthetists and ophthalmologists on Local Anaesthesia for Ophthalmic Surgery will be held in **North Riding Infirmary, Middlesbrough on Friday, 7th February 2003.** The meeting will include **lectures and live de monstration of orbital blocks.** Attendance is limited to 50 participants. Application form and information from Mrs Pat McSorley (**Course Administrator 01642-854601 email: cmkumar@boas.org**). Registration fee is £225 (BOAS Members £200) (inclusive of catering). **Cheque payable to Ophthalmic Anaesthesia Education Fund.**

PROGRAMME

09.00-9.25	**Registration & Coffee (Staff Restaurant)**
	Lectures Ward 56 (Day Centre)
9.25	**Welcome: Prof Chris Dodds, Middlesbrough**
Chairman:	**Dr Robert Johnson, Bristol**
9.30-10.15	Anatomical consideration for ophthalmic block
	Dr Gary Fanning, Sycamore, Illinois, USA
10.15-11.00	Sub-Tenon's / parabulbar block
	Dr Scott Greenbaum, New York, USA
11.15-11.45	**Coffee Break (Staff Restaurant)**
Chairman	**Dr A P Rubin, London**
11.45–12.15	Pharmacological considerations for ophthalmic block
	Prof J A W Wildsmith, Dundee, UK
12.20-12.45	Sedation and ophthalmic block
	Dr Gary Fanning, Sycamore, Illinois, USA
12.50-13.45	**Lunch**
13.45-17.00	**Live Demonstration of Orbital Blocks(Ward 56)**

Demonstration Co-ordinators: Drs Anthony Rubin, Chandra Kumar, Mr Tim Dowd, Mr Mamdoul El-Naggar and Mr David Smerdon

Retro and/ or peribulbar	
	Dr Chandra Kumar, Middlesbrough
	Dr Anthony Rubin, London
	Dr Sean Tighe, Chester
Recorded video	**Dr Gary Fanning, Sycamore, Illinois, US**
Sub-Tenon's	
Metal Cannula	**Dr Caroline Carr, London**
Kumar-Dodds's Cannula	**Dr Chris Dodds, Middlesbrough**
Short Cannula	**Mr Bartley McNeela, Middlesbrough**
Greenbaum's Cannula	**Dr Chandra Kumar, Middlesbrough**
Recorded video	**Dr Scott Greenbaum, New York, USA**
17.00 **Closing remarks**	**Prof Chris Dodds, Middlesbrough**

Course Director and meeting Organiser: Dr Chandra Kumar, Consultant Anaesthetist, Cleveland School of Anaesthesia, James Cook University Hospital, Middlesbrough TS4 3BW. Tel: 01642-854601, email: cmkumar@boas.org