

Local anaesthesia for vitreoretinal surgery: an audit of patient and surgical experience

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PURPOSE. *Local anaesthesia for vitreoretinal surgery is little used as these procedures are deemed to be too long and uncomfortable for patients to tolerate. In this unit anterior intraconal local anaesthesia is used for most routine surgery. We undertook an audit to ensure that surgical standards and patient acceptability were not compromised.*

METHODS. *A prospective observational audit was performed. Audit data included: Grade of anaesthetist and surgeon; details of anaesthetic and operation; compliance of patient; operating conditions and pain scores. Anaesthesia was provided with a combined peribulbar and intraconal anaesthetic, using bicarbonate buffered lignocaine and bupivacaine 50:50 mixture.*

RESULTS. *135 (76%) had local anaesthesia alone, 13 (7%) had local anaesthesia with sedation and 29 (16%) had general anaesthesia. 96.4% of patients were compliant and 98.8% of operating conditions were good or excellent. The mean perioperative pain score was 0.1 (range of 0-1), 97% said they would choose local anaesthesia again.*

CONCLUSIONS. *LA for vitreoretinal surgery is a useful and flexible method of anaesthesia, which has been shown to have excellent patient tolerance. (Eur J Ophthalmol 2001; 11: 366-71)*

KEY WORDS. *Local anaesthesia, Peribulbar, Retrobulbar, Vitreoretinal surgery*

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INTRODUCTION

Knapp first described the use of local anaesthesia (LA) for ophthalmic surgery in 1884 (1). It is now used for the majority of cataract operations with high levels of patient acceptance and comfort (2). However LA is used far less for vitreoretinal (VR) surgery. In the UK the general feeling amongst most surgeons is that VR procedures are too long for local anaesthesia and that they are too uncomfortable for the patients to tolerate. Despite this several methods of LA for VR surgery have been described, including retrobulbar (3-6), peribulbar (5-8), subtenons (9, 10), and even topical anaesthesia (11, 12). For some countries LA is the norm. In the USA about 90% of VR procedures are carried out under LA and sedation with general anaesthesia (GA) only used for complex re-operations, young patients, detachments with

breaks close to the posterior pole and those who have recently undergone anterior segment surgery (13).

The number of GA's given for VR surgery in our unit is decreasing, 88% in 1994 down to 16% in 1999 and only 4% in the first 2 months of 2000 (Fig. 1).

An audit was set up to assess patient tolerance and surgical satisfaction with local anaesthesia.

METHODS

A prospective observational audit took place over a three-month period from Oct-Dec 1999 in the Southampton Eye Unit; data was collected for all VR operations.

A standard LA technique for VR surgery was used. This was performed via a peribulbar approach (extra or intra-conal). 0.5% proxymetacaine drops were given, followed by an infero-temporal injection of 1ml

TABLE I - ANAESTHETIC AUDIT DATA

1. Grade of anaesthetist
2. LA, LA with sedation, or GA
3. Type of block
4. LA mixture and volume used to establish block
5. Compliance of patient based on a scale of 1-4 where 1=noncompliant, 2=poorly compliant, 3=compliant and 4=very compliant
6. Reason for GA

TABLE II - SURGICAL AUDIT DATA

1. Operation
2. Grade of surgeon
3. Operating conditions based on a scale of 1-4 where 1=poor, 2=fair, 3=good and 4=excellent
4. Compliance of patient based on a Scale of 1-4 where 1=noncompliant, 2=poorly compliant, 3=compliant and 4=very compliant
5. Any limitation to surgery
6. Additional LA used during the procedure
7. Duration of operation

TABLE III - PATIENT AUDIT DATA

1. Previous eye surgery
2. Previous LA
3. How painful was the LA block? Marked on a 100 mm line where 0 mm = no pain and 100 mm = worst pain
4. How uncomfortable the trolley was to lie on? Marked on a 100mm line where 0 mm = comfortable and 100 mm = uncomfortable
5. How tolerable the length of the operation was? Marked on a 100mm line where 0 mm = tolerable and 100 mm = intolerable
6. How painful was the operation? Marked on a 100 mm line where 0 mm = no pain and 100 mm = very painful
7. Overall impression of their operation, anaesthetic and visit to theatre. Marked on a 100 mm line where 0 mm = poor and 100 mm = good
8. Would they have a LA again?
9. General comments that could help us improve their care

of 0.2% lignocaine using a 30g half-inch needle to anaesthetise the injection track. The main anaesthetic was given using a 25g one inch needle (14, 15), is with a 50:50 mixture of 2% lignocaine and 0.75% bupi-

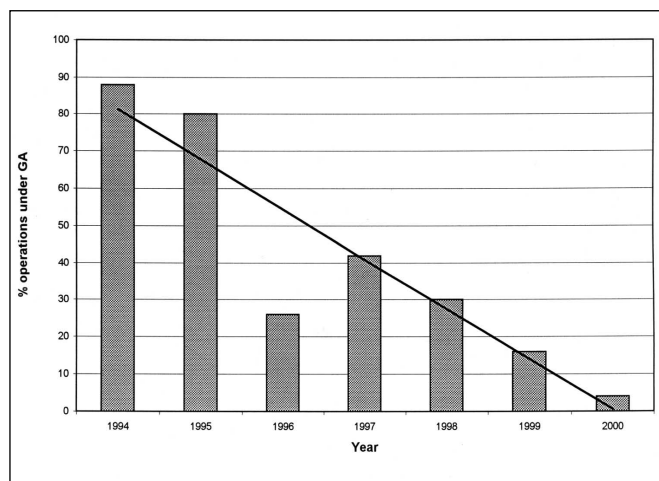


Fig. 1 - Percentage of VR surgery carried out under GA.

vacaine with 30 u/ml of hyalase (16). To 9ml of this solution 1ml of bicarbonate is added just prior to the injection (17). All patients received an infero-temporal and a medial injection regardless of the adequacy of akineses after the infero-temporal injection alone.

The audit data was divided into three sections: - anaesthetic audit, surgical audit and patient audit. (Tabs. I, II and III respectively).

Anaesthetic audit

The anaesthetists recorded their name, grade and the type of anaesthetic given. If a GA was given they were asked to state the reason. Details of the LA including the type of LA, the type of approach and the volume of LA used for each injection were recorded. The anaesthetists recorded any further LA injections required for an adequate block prior to surgery. The anaesthetist graded the patients compliance in the anaesthetic room on a scale of 1-4; where 1 = noncompliant and 4 = very compliant.

Surgical audit

The surgeons were asked to record name and grade and nature of the operation. They scored whether or not the patients were compliant in theatre on the same scale as the anaesthetists (1-4). They also graded the operating conditions on a scale of 1-4; where 1 = poor and 4 = excellent. Any limitation to surgery and its cause was documented. Finally any additional LA used during the procedure was recorded.

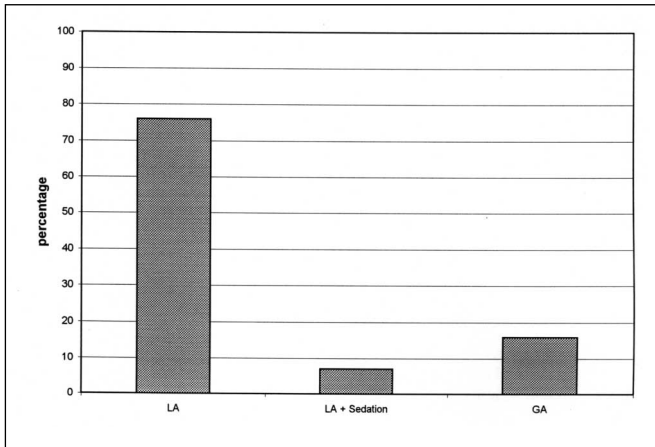


Fig. 2 - Breakdown of types of anaesthesia used for VR surgery.

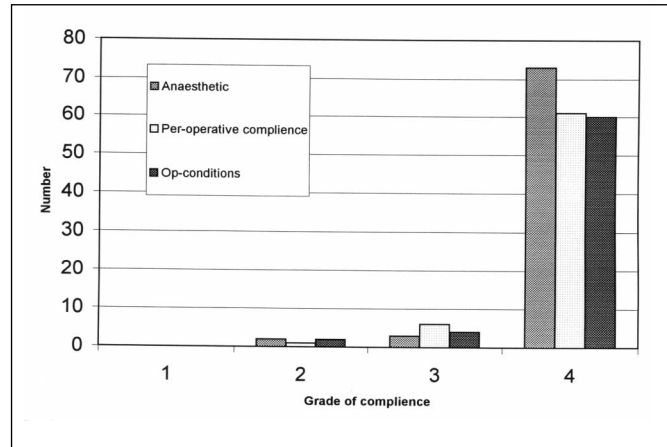


Fig. 3 - Patient compliance and operating conditions.

Patient data

Patients who had LA were asked to report on their experience of the anesthetic and the surgery. Specifically they were asked if they had had previous eye surgery and if so whether they had a LA. Using a visual analogue score the patients recorded the pain of LA block, pain of trolley, length of surgery and pain of surgery. They were also asked for an overall score for their impression of the operation, anaesthetic and their visit to theatre. The patient was asked to indicate if they would have a LA again should they require a similar operation in the future. Finally they were asked to give any general comments that might help to improve their care.

Statistical methods

Mean and standard deviation were used for age and pain scores. Median was used for compliance scores and operating conditions. Regression analysis was used for comparing pain scores with length of operation, pain scores with age and volume of LA with pain scores. T-test was used to compare buckling vs vitrectomy surgery and consultant vs non-consultant anaesthetist with significance at $P < 0.05$.

RESULTS

178 patients underwent VR surgery during the three-month period of October 1999 to December 1999. Of these patients 148 (84%) had LA, 13 (7%) of these

also had sedation. 29 (16%) had a GA (Fig. 2). The age range was 20 to 84 with a mean of 59 years (SD 16.4). Of the patients who had their operation under GA the mean age was 42 (SD 16.3) with a range of 20 to 75 years.

Of the 148 patients who underwent VR surgery with LA 88 completed audit forms, 38 men and 50 women with a mean age of 62 (SD 14.1) 62% said they had had previous eye surgery, of these 85% had had a previous LA block.

Anaesthetic data

The LA volume for the infra-lateral injection ranged from 4 ml – 7 ml (median = 5 ml) and the volume for the medial injection ranged from 2 ml – 5 ml (median = 4 ml). The total volume of LA for the main injection ranged from 7 ml – 10 ml (median = 9 ml).

The patients were compliant in the anaesthetic room. The median value was 4 (very compliant) and 97.3% scored 3 or 4 (compliant or very compliant) (Fig. 3).

No patient required conversion to a general anaesthetic after the surgery had commenced although one patient became claustrophobic after the drapes were positioned and was given a GA once in theatre. Of the 13 patients who had sedation all were given midazolam (1-2 mg).

The majority of GA's were given for patient preference. The most common reasons given were anxiety and claustrophobia. There were two cases in which the surgeon requested that the patient have a GA. One had multiple extensive VR operations in the past and the

other was for macular translocation where the surgeon was uncertain of the likely duration of the procedure but felt it might be unacceptably long for a LA.

Surgical data

All procedures were carried out by, or under direct supervision from, a consultant or a fellow in VR surgery.

57 patients underwent vitrectomy, 15 buckling surgery and 16 had operations including laser surgery, cryotherapy and removal or insertion of gas and oil. The operations are shown in Table IV. The surgeons felt that the patients were compliant during surgery with a median score of 4 (very compliant), 96.3% of patients were given a score of 3 or 4 (compliant or very compliant). The operating conditions were good with a median score of 4 (excellent), 98.4% scoring 3 or 4 (good or excellent) (Fig. 3).

There were 5 cases in which there was a limitation to the surgery; the most common reason was an inadequate view due to previous surgery. Of these patients one had a GA and the other four had LA. Additional LA was used in 26% of cases; 9% received topical LA (amethacaine 1% or proxymetacaine 0.5%) and 17% received 1% or 2% lignocaine given via the sub-Tenons route.

Patient satisfaction audit

All but 3 patients (96.6%) said they would have a LA again, 2 said they would not and 1 answered "maybe" (The latter patient scored a maximum for the discomfort of the trolley).

The pain of the LA block itself was minimal averaging 0.078 (0.0981 SD) on the scale of 0-1 where 0 = no pain and 1 = worst pain. The mean score for the pain of the operation was 0.103 (0.172 SD). The trolley gave the most discomfort to the patients giving a score of 0.126 (0.225SD). The score for the tolerability of the length of operation was 0.0867 (0.14 SD) on a scale of 0 (easily tolerable) to 1 (intolerable). All the above pain/tolerability scores were low (Fig. 4).

There was no correlation between any of the pain scores and the length of operation ($r < 0.03$), or between age of the patient and the pain scores ($r < 0.03$),

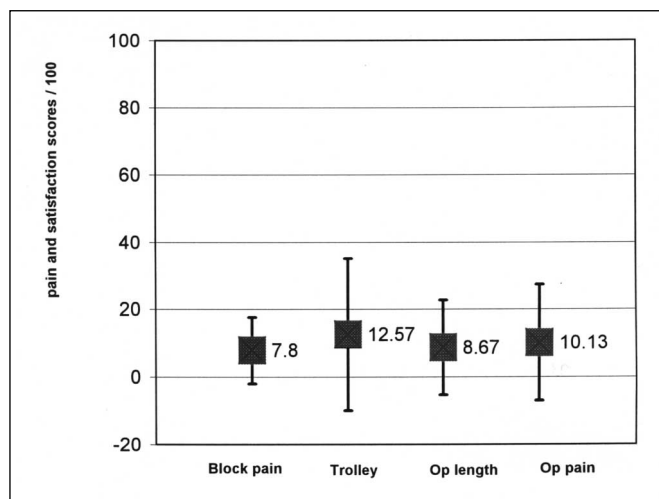


Fig. 4 - Patient pain scores.

or between the volume of LA used and the pain scores ($r < 0.03$).

Patients who underwent buckling surgery had more painful operations, buckle pain score = 0.17 (SD 0.29), vitrectomy pain score = 0.077 (SD 0.117) however this increase in pain did not reach statistical significance ($p > 0.05$).

The patients who had a consultant anaesthetist had lower mean scores for the block pain (0.076 v 0.083) $p > 0.5$ and also lower mean pain scores for the operation (0.094 v 0.146) $p > 0.5$. Neither of these differences was statistically significant.

Overall the patients rated their experience highly, the mean score being 0.968 (0.0571 SD) on a scale of 0 (poor) to 1 (excellent). Most of patients' comments were complimentary, particularly the staff who made them feel relaxed and involved. A few enjoyed the running commentary from the surgeon and were interested to hear about the surgery however others did not. The biggest complaint was "why did we have to be starved so long before the operation?"

TABLE IV - BREAKDOWN OF OPERATIONS WITH THEIR ANAESTHETIC TECHNIQUE

Operation	Number	% GA
Buckle	25	40
Vitrectomy	127	13
Other	25	12

DISCUSSION

LA for VR surgery has been widely reported (18-20). In our unit LA had been introduced slowly, initially for postoperative pain relief following a GA and for cases unfit for general anaesthesia.

We found in our series the pain of the LA block was minimal (0.078) which was significantly less than McLure et al who reported scores of 0.3 for both 1% ropivacaine and a mixture of 2% lignocaine and 0.75% bupivacaine (22). In our series patients who had a consultant anaesthetist had a lower pain score for the LA block and the surgery. Intraoperative pain scores were low average (0.103), and even the pain scores for those undergoing buckling surgery (0.17) still compare favourably with other studies (19). 97% of patients would choose a LA again if given the choice, which is comparable with Rao et al who found 92% would have LA again (19). The mixture of 2% lignocaine and 0.75% bupivacaine gives a solution with rapid onset and long duration. Patients did experience some discomfort during the procedure although this did not necessarily increase with a longer operation. The use of supplementary LA during the operation, usually via the sub-Tenons route, is now almost routine for some procedures such as buckling surgery and those redo cases where the spread of LA has been restricted.

Most patients had a worse score for the "comfort" of the trolley than the pain of the LA block or the surgery and this may be an area where improvement may be gained relatively easily. This is particularly important for the longer operations which may be technically more difficult and require the patient to keep absolutely still. A GA takes longer to recover from than a LA, it also carries a higher risk of nausea and vomiting which leads to a rise in intraocular pressure, this may affect the quality of the repair (13). After a LA the patient can be postured immediately if required. A list of GA's takes longer than LA's so it impacts less on hospital resources (19). Those patients who had a LA block had good early postoperative pain relief, which aided their recovery. In our series however all but four of the GA patients were also given a LA block. Despite the many benefits the risk of complications from a LA although rare can be very serious and even cause death. These include systemic complications, perforation of the globe, haemorrhage and intravascular or CSF injections (21).

Many patients commented on the duration of starvation prior to their operation. There are no evidence-based guidelines on starvation prior to ophthalmic surgery although a recent survey has shown that practice in the UK varies enormously from starving for a full 6 hours, to eating and drinking freely up to surgery even if sedation is given with a LA (23).

The surgeons were happy to operate on patients who had a LA as this provided good akinesia and analgesia. They did not feel that this inhibited their surgical technique or affected their results. They were keen to be able to increase the workload without compromising the results.

Children, confused patients, claustrophobic or anxious patients, those who have had multiple previous operations we found unsuitable for LA however.

In summary VR surgery was successfully and safely carried out, the majority being under LA. This proved to be to the satisfaction of the patient, the anaesthetist and the surgeon. We are unlikely to reach 100% LA rate for the reasons outlined above but there is still room for some improvement.

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