Incidence of Endophthalmitis after 20 - and 25 - Gauge Vitrectomy

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Ophthalmology 2007; 114: 2133-2137

Ophthalmology is a continually evolving surgical subspeciality. Just like the cataract surgery techniques that have advanced dramatically in last few decades, the retinal surgery has also undergone an equal advancement in techniques and surgical instrumentations. This has broadened dramatically the spectrum of diseases that could be treated effectively with vitrectomy. It has also resulted in improved postoperative visual functions. In particular, 25 gauge vitrectomy has improved significantly the operative process for surgeons and patients. 25 guage surgeries permit the use of smaller wounds, which may allow patients to recover more quickly and theoretically may avoid the discomfort sometimes associated with sutures.

The purpose of this study was to assess the incidence rate of endophthalmitis after 25 gauge pars plana vitrectomy and to compare it with the endophthalmitis rate after 20 gauge pars plana vitrectomy. It was designed as a retrospective, interventional, comparative cohort study.

Participants consisted of 8601 consecutive pars plana vitrectomy surgery patients. Surgeries performed at a single institution (Wills Eye Retina Service) between January 1, 2004, and September 1, 2006, were reviewed. Endophthalmitis developed in 1 of 5498 eyes after 20 gauge viterctomy (0.018 %) and in 7 of 3103 eyes after 25 gauge viterctomy cases (0.23 %; P=0.004). Median final visual acuity was counting fingers or hand movements (range, 20/50-no light perception), with comparable results between 20 gauge and 25 gauge endophthalmitis cases.

The authors try to figure out the possible causes for the high incidence of endophthalmitis following 25 gauge vitrectomy surgeries.

According to them the simple fact that 25 gauge wounds are not sutured at the end of the case may contribute to the higher endophthalmitis rates. Ultrasound biomicroscopy studies have demonstrated that it takes up to 2 weeks for complete 25 gauge wound closure to occur.

Another possible explanation for the higher rate of infection relates to the amount of vitreous removed in a standard 25 gauge case compared with a 20 gauge case. Typically, a larger vitreous skirt is left in a 25 gauge case. The extra vitreous may facilitate bacterial adherence, resulting in a potentially larger bacterial load and endophthalmitis.

Lower infusion rates are a feature of 25 gauge vitrectomy, which also may contribute to increased rates of endophthalmitis.

A final potential cause for the increased incidence of 25-gauge endophthalmitis is the substance filling the vitreous cavity at the conclusion of the case. A common feature between all the cases of endophthalmitis reported in this study is that all had a fluid-filled vitreous cavity at the end of the surgery; none had a silicone oil, gas, or air-filled vitreous cavity. It is possible that an air or gas-filled vitreous cavity allows superior wound integrity.

The results of the current study suggest that surgeons should make changes in the current 25 gauge
vitrectomy techniques to reduce the endophthalmitis rate. Potential modifications include altering the wound construction and closure. Second, wounds can be beveled to improve the self-sealing nature of the wound. Third, at the end of the case surgeons can spend a few extra moments checking for wound leaks at various intraocular pressures, in much the same way that cataract surgeons inspect their clear corneal incisions.

Although results reported here suggest a potential difference in this dreaded postoperative complication, the results must be kept in perspective and need to be validated.

If these findings are replicated, the authors hope that further research will attempt to identify causes of the increased risk.

Comparative Clinical Trial of Topical Anaesthetic Agents for Cataract Surgery with Phacoemulsification: Lidocaine 2 % drops, Levobupivacaine 0.75 % drops, and Ropivacaine 1 % drops

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Eye 2008, 22:425-429

Topical anaesthesia for cataract surgery is now a widely accepted and well-established technique in phacoemulsification surgeries as an alternative to retro bulbar and peri bulbar blocks. Because it is less invasive, and eliminates the complications from needle and systemic toxicity, topical anaesthesia has gained popularity among surgeons.

Unpreserved lidocaine is the most frequently used and safest agent in topical anaesthesia. It is short acting and it may be associated with intraoperative/postoperative pain and discomfort. Ropivocaine is a monoamide local anaesthetic agent with a long acting effect and a great margin of safety. Levobupivacaine is less cardio toxic than racemic bupivacaine.

Purpose of this study which was conducted at department of Ophthalmology, Baskent University School of Medicine, Anakara, Turkey was to assess the safety and efficacy of topical lidocaine, levobupivacaine, and ropivacaine in cataract surgery with phacoemulsification. 105 patients scheduled for cataract surgery with topical anaesthesia were randomly allocated into 3 groups of 35 patients each to receive eye drops of lidocaine 2 %, levobupivacaine 0.75 %, or ropivacaine 1 % every 5 minutes starting 30 minutes before surgery.

The exclusion criteria were as follows: axial length > 26 mm or < 22 mm, hypermature cataract, pseudoexfoliation syndrome, iris-lens synechiae, previous use of miotics and/or small pupil, nystagmus, reported allergy to topical anaesthetics, unwillingness to receive topical anaesthesia, and or poor patient cooperation, i.e., those with dementia or hearing impairment.

No systemic sedatives were given to the patients preoperatively or postoperatively.

Hemodynamic variables including the noninvasive blood pressure (NIBP) value, the results of an electrocardiogram (ECG), and heart rate (HR) were recorded every 5 minutes until the completion of surgery. To assess the pain score, a 10-point scale VPS (verbal pain score) was used. Patients were asked to
evaluate and grade the level of their pain and discomfort during surgery, at the end of the procedure, and 1 h and 24 h after surgery. The patient’s pain score, the level of patient and surgeon satisfaction (from 0 to 10), the duration of surgery, the need for supplemental anaesthesia, and surgical complications were recorded.

An ophthalmologist who was blind to which anaesthetic agents were used performed clinical evaluations of every patient’s VPS score. Patients were discharged 1 h after the procedure following VPS evaluations and these pain scores were repeated at 24 h postoperatively.

According to the results, there was no significant difference in duration of surgery and demographic variables among the groups. At the intraoperative period, end of surgery, and postoperative first hour the mean VPS in the lidocaine group was significantly higher than the others (P<0.01), but no significant difference was found between the levobupivacaine and ropivacaine groups. At incision and 24 h after surgery, it was not significantly different among the groups. Surgeon and patient satisfaction scores were significantly better in the levobupivacaine and ropivacaine groups than in the lidocaine group (P<0.01).

To conclude, topical anaesthesia with levobupivacaine and ropivacaine were safe, feasible and more effective than lidocaine in cataract surgery. Levobupivacaine and ropivacaine provided sufficient and long-lasting analgesia without the need of supplemental anaesthesia for each patient.

Long-term Efficacy and Visual Acuity following Transscleral Diode Laser Photocoagulation in Cases of Refractory and Non-refractory Glaucoma

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Eye 2007, 21:936-934

Transscleral diode laser cyclophotocoagulation (TSCP) plays an important role in the paradigm of glaucoma treatment especially for uncontrolled or refractory cases with poor visual acuity. Recently it has gained good attention as a modality for treatment of glaucoma cases with good vision and even as a primary surgical treatment in some situation, thereby establishing a broader role for TSCP.

The aim of this study, which was done at Eye department, Royal Glamorgan Hospital UK was to evaluate the long-term efficacy and safety of TSCP for a range of glaucoma conditions with particular emphasis on the long-term preservation of VA in those with ambulatory vision (6/36 or better).

The study was designed as a single center retrospective study where a single practitioner performed all the TSCP procedures. Treatment success was defined as IOP reduction of greater than 30 %, with or without topical antiglaucoma medications.

Indications of treatment were inadequate control of IOP despite maximum tolerated medical therapy, allergy to antiglaucoma medications /inability to tolerate medication, patients unwilling to have drainage surgery, and painful, blind eye.

TSCP was performed with OcuLight SLx semiconductor diode 810 nm laser and contact probe G (360 degree, except at 3 and 9 o’clock).

Postoperatively patients were treated with topical Dexamethasone and were reviewed at regular intervals.

74 eyes underwent treatment over a period of 4-30 months. NVG accounted for 54 % of patients followed by POAG (31 %), CACG and secondary glaucoma (15 %). Mean age was 76 years. Each patient received
an average of 30 burns and mean laser power was 2069 mw. Duration of laser was 2 seconds in all the cases.

All together, mean IOP was reduced by 43 % from 40.3 to 21.1 mmHg at final index visit. Of all patients, 58 % had a reduction in glaucoma medications and all patients discontinued oral Azetozolomide. More than 30 % reduction was noticed in 75.7 % of NVG cases and in 91.3 % of POAG cases. Complications like phthisis bulbi and hyphema were noticed in 13 % of patients.

In the subgroups with good pre laser vision - the mean visual acuity post TSCP was no worse than the pre-laser level. In fact mean visual acuity was slightly better in case of POAG patients, although 3/23 (13 %) patients with POAG lost vision due to cataract and glaucoma progression.

To conclude TSCP can be used safely and successfully in seeing eye, therefore extending the role of TSCP in glaucoma management.

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... Ophthalmic History (Contd. from pg. 161)

eclipse of July 10, 1945. He noticed that the retinal scars caused by this exposure to intense sunlight were similar to those he was trying to induce by applying heat to the surface of the eye.

“The idea came during a night when I could not sleep. I was afraid I would forget the idea, so I made a note of only two words: ‘light’ and ‘coagulation’”, Meyer-Schwickerath was to write about his revolutionary invention.

Over the next several years, Meyer-Schwickerath carried out extensive experiments in an effort to perfect a technique of using light to coagulate retinal tissue, without damaging unacceptably large areas of the retina. He found that wavelengths of light between 400 and 900 nanometers could pass through to the retina without losing energy through absorption or scattering by proteins in the cornea and lens. When this light energy was absorbed by the adjacent pigment epithelium it raised the temperature of the normally transparent retina and turned it white. The area then began reflecting rather than absorbing the light, and coagulation stopped.

He first tried using natural sunlight and developed a complex system of mirrors, lenses and a heliostat, which kept the sun in the optical axis of his instrument despite the earth’s rotation. Apart from the fact that the patient had to be brought to the roof of the Hamburg hospital for treatment, this technique was weather dependent and there was often not enough early morning light in Hamburg.

He therefore turned to other sources of light. At first he tried a high intensity carbon arc lamp but this was far from perfect. The lamp smoked and dropped soot all over the place. Every seven minutes, this hot machine had to be unplugged and opened up to replace the carbon rod.

When he moved to Essen in 1952 he took his invention along and continued to work on his idea. The powerful xenon arc lamp had already been developed in the U.S for cinematography. Meyer-Schwickerath worked with Dr. Hans Littmann of Carl Zeiss Laboratories to develop the very first photocoagulator in 1956. It was a heavy, bulky instrument with a 50,000-watt xenon bulb as illumination and a large projection like an elephant’s trunk that hung over the patient’s face!

**Xenon Arc Photocoagulator**

However by 1961 quite a few of these were in use all over the world. The xenon photocoagulator was in time replaced by the first ophthalmic lasers but it was Meyer-Schwickerath’s invention of photocoagulation that revolutionised the treatment of retinal holes including those at the macula and of diabetic retinopathy.

In 1959, he published a book on the uses of photocoagulation.

Apart from photocoagulation, his electronic flash photographs of the retina laid the foundation for retinal angiography.

He was an inspiring professor, a gifted lecturer and teacher. In 1985, he retired, having received many laurels including the Gonin and Graefe medals, an honorary member of many ophthalmologic societies internationally. He passed away in 1992.