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Non-retrobulbar anaesthesia for trabeculectomy

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Summary

A prospective clinical trial using sub-conjunctival (Sub-Tenon's) anaesthesia for trabeculectomy is reported. Forty-one eyes of 22 consecutive patients with glaucoma had trabeculectomy performed using the sub-conjunctival method of local anaesthesia. The effectiveness of the anaesthetic, intra-operative and post- operative complications were recorded.

Sub-conjunctival injection of local anaesthesia was found to be painless and free from the complications associated with retrobulbar injections. Surgery was also found to be easier as a conjunctival bleb was already raised allowing easy access to the sub-conjunctival space. Voluntary eye movements remained but did not interfere with surgery.

Résumé

Une étude clinique en perspective employant la méthode d'anaesthésie subconjonctivale (Sous-Tenon) pour le traitment de la trabeculectomie a été publiée 41 yeux de 22 malades consécutifs souffrant de glaucome ont subi un traitement par la méthode subconjonctivale d'anaesthésie locale. L'efficacité anaesthésique sur les complications intra-opérationnelles et post-opérationnelles a été relevé.

L'injection subconjonctivale d'anaesthésie locale a été indolore avec une absence de complications souvent associées injections retrobulbaires. On a aussi découvent que la chirugie est plus facile puisqué une bulbe conjonctivale a déjà été levée pour faciliter l'accés de la surface subconjonctivale. Les mouvements volontaires des yeux restent intacts mais ne gênent pas la chirugie.

Introduction

Local anaesthésia in place of general anaesthesia for ophthalmic surgery is becoming more popular[1,2]. Glaucoma patients have an already compromised optic nerve head and any added trauma to the nerve will severely affect visual prognosis. In view of the risk of optic nerve damage with the retrobulbar method, a new method of local anaesthesia for ophthalmic surgery namely sub-conjunctival anaesthesia was performed on some glaucoma patients.

Subjects and methods

Twenty two consecutive glaucoma patients, listed for trabeculectomy on a particular operation list were included in the study. A total of 41 eyes were operated upon, 19 patients undergoing bilateral and 3 patients undergoing unilateral trabeculectomy. Seventeen were males and 5 were females. The age range was 14-71 years, although only one patient was less than 20 years of age, a 14 year old boy. Out of the 41 eyes, 22 were right eyes and 19 were left.

The procedure was explained to the patients before surgery and a standard premedication of intramuscular pethidine (50-100mg) and phenergan (25mg) was given one hour pre-operatively. No additional premedication was required in any of the patients as they were all calm but not asleep. In theatre, topical anaesthetic drops (Oxybuprocaine hydrochloride) were instilled into the upper bulbar conjunctiva. 0.5-0.8ml of 2% Lignocaine hydrochloride with adrenalin was injected 4-6mm from the limbus superiorly to raise a bleb beyond the superior rectus insertion posteriorly and the limbus anteriorly. The adrenalin was used to reduce the amount of bleeding intra-operatively. In addition, a facial nerve block, the O'Brien method[3] was performed. A superior rectus fixation suture was inserted in all cases. Voluntary eye movements remained but did not interfere with surgery to any appreciable degree. A fornix based conjunctival flap was raised with the inclusion of Tenon's capsule in the dissection. A 5 x 6mm rectangular, limbal-based superficial scleral flap was raised and a deep corneo-scleral block of 3 x 2mm was excised. Thereafter, a peripheral iridectomy was done. The superficial scleral flap was sutured with 2 x 8/0 silk and the conjunctival was hooded slightly over the cornea by 2 x 8/0 silk sutures. Sub-conjunctival injections of Depomedrol and Gentamycin were given as well as topical

Chloromycetin and Homatropine before padding the eye. From the first day post-operatively, the patients were placed on topical Betamethasone, Homatropine and Chloromycetin.

Results

Forty one eyes of 22 patients were included in the study. The intra-operative problems are listed on Table 1. All the eyes operated upon had segmental dilation of the pupil superiorly which signified that the adrenalin in the lignocaine had permeated the iris, and presumably the lignocaine too because none of the patients experienced pain during the iridectomy.

Table 1: Intraoperative problems in 41 eyes

	No.	%
— Pain on conjunctival incision	0	0
— Pain on superficial scleral dissection	1	2.4
— Pain on peripheral iridectomy	0	0
— Restlessness or anxiety	0	0
— Persistent conjunctival oozing	5	12
— Difficult Tenon's dissection off sclera	4	9.8
— Inadvertent sector iridectomy	1	2.4

Table 2: Post-operative complications in 41 eyes

	No.	%
— Shallow anterior chamber	8	19.5
— Hyphaema	3	7.3
— Prolonged uveitis	5	12
— Raised intraocular pressure	11	27
— Cystic bleb	2	4.9
— Infection — Surface discharge	2	4.9
— Infected cystic bleb	1	2.4

There were persistent conjunctival oozing in 5 eyes (12%) which was controlled by diathermy. Four eyes (9.8%) had difficult dissection of Tenon's off sclera as some of the Tenon's were adherent to sclera and had to be removed piece-meal to leave bare sclera for the superficial scleral flap dissection. One patient had an inadvertent sector iridectomy as the pupil was fully dilated superiorly due to the adrenalin in the injection. All the patients were calm throughout the operation, none was restless or excessively anxious and none required further sedation.

The post-operative complications are listed on Table 2. Eight eyes (19.5%) developed shallow anterior chambers immediately post-operatively and all formed deep anterior chambers within 3 days post-operatively with the use of firm padding of the eyes. Three eyes (7.3%) developed post-operative hyphaema, all on the third day post-operatively, which completely cleared in the next 2 days. Five eyes (12%) had prolonged uveitis, necessitating the use of intensive steroids although all eyes were quiet by 3 months post-operatively. Post-operative increase in intraocular pressures occurred in 11 eyes (27%) and this ranged from 21mmHg- 44mmHg. These eyes were treated with Timoptol and only one patient required Diamox in addition. Final control of intraocular pressures was achieved in all 41 eyes although 10 of the eyes (24.4%) were on additional antiglaucoma therapy at the end of this study. One patient was placed on Timoptol which had to be stopped when the intraocular pressure crashed from 30mmHg to 6mmHg, the rise in intraocular pressure was presumably due to a trabeculitis. Cystic blebs developed in 2 eyes (4.9%), one of which got infected 3 months post-operatively. Surface discharge, denoting a conjunctivitis occurred in 2 patients and one other patient developed an infected cystic bleb with imminent endophthalmitis 3 months post-operatively. He was treated with topical and systemic antibiotics and got better, retaining his pre-operative visual acuity.

Discussion

Sub-conjunctival injection of local anaesthetic has been used in different parts of the world more commonly for cataract extractions[1,2] but recently for trabeculectomy[2]. Most of these centres initiated the procedure to avoid the complications of retrobulbar injections of local anaesthesia. It is well known that retrobulbar injections are one of the most commonly performed ophthalmic procedures used to obtain akinesia and anaesthesia as well as to administer periocular drugs. Retrobulbar haemorrhage[4], perforation of the globe[5,6], intraocular injection of lignocaine and corticosteroids[7,8], localised fat atrophy[9] have all been reported after retrobulbar and peribulbar injections. A variety of central

nervous system complications like ipsilateral and contralateral amaurosis and ophthalmoplegia, confusion, respiratory depression and seizures have occurred[10,12] and most likely result from injecting anaesthetic agents into the optic nerve, meninges or CSF[12]. Retrobulbar haemorrhage is probably the most common complication which in a glaucomatous eye further damages an already compromised optic nerve. Although the majority of retrobulbar haemorrhages are usually venous, mild and unnoticed[1], arterial haemorrhages with proptosis, ecchymosis and sub-conjunctival haemorrhages occur in 1 to 3% of retrobulbar injections[13,14].

From our study, sub-conjunctival injection of lignocaine is a much easier method of anaesthetising the eye for trabeculectomy, and most importantly, it avoids all the complications of the retrobulbar injection. All the patients found it a comfortable method and no adverse intraoperative complication was encountered. The post-operative complication rate fore each complication on Table 2 was found to be about the same as other studies using retrobulbar or general anaesthesia[15,16]. Thirty-one (75.6%) of the eyes had a good control of intraocular pressure 6 months post-operatively, without added help by antiglaucoma drugs and only 10 eyes (24.4%) required additional antiglaucoma therapy.

In conclusion, from this small study, it appears that sub-conjunctival anaesthesia is a good alternate to retrobulbar anaesthesia for trabeculectomy as it avoids the sight and life threatening complications of the latter and allows easier dissection of the conjunctiva which becomes ballooned by the sub-conjunctival injection. Although modified anaesthetic methods aimed at greater safety have been reported[4,17], they remain essentially blind procedures unlike the sub-conjunctival method which is done under direct visualization.

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