

The effect of anterior chamber maintainer on anterior chamber contamination

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PURPOSE. *To evaluate the effect of anterior chamber continuous infusion maintainer system on the contamination of anterior chamber in phacoemulsification surgery.*

METHODS. *Clear corneal phacoemulsification surgery was performed in 132 eyes of 132 randomly selected patients with cataract who were divided into two groups of 66 eyes according to the use of an anterior chamber maintainer (ACM) system. The fluid specimens were taken from anterior chamber in the beginning and at the end of the surgery. They were transferred under anaerobic conditions and investigated by culturing onto blood agar and thiogluconate broth media. Differences between the two groups with respect to contamination of the specimens were investigated.*

RESULTS. *The mean age of the group undergoing surgery without a maintainer system (Group A) was 63±10 years (min = 41, max = 80) versus 59±10 years (min = 33, max = 80) in the other group (Group B) in which the maintainer was used during surgery. In the postoperative specimen, Micrococcus species were isolated from one eye (1.5%) in Group A and S. pyogenes in one eye (1.5%) from Group B. Mean follow-up interval was 12±6 (min = 4, max = 28) months.*

CONCLUSIONS. *The use of ACM system in clear corneal phacoemulsification surgery carries no additional risks as far as contamination is concerned. (Eur J Ophthalmol 2003; 13: 770-2)*

KEY WORDS. *Phacoemulsification, Anterior chamber contamination, Anterior chamber maintainer*

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INTRODUCTION

Phacoemulsification techniques with small incisions have made cataract surgery much safer. Additionally, the ease with which foldable intraocular lenses can be placed through small incisions has stimulated a further progression in cataract surgery. At present, sutureless cataract surgery with small incision has become popular in many countries (1). After the description of scleral tunnel in 1980, manual extracapsular extraction through the scleral tunnel, called the mini nucleus technique, was proposed by Blumenthal et al (2, 3). This surgical technique has been performed in

extensive series in many countries. Anterior chamber maintainer (ACM) maintaining continuous positive anterior chamber is indispensable for mini nucleus surgery. ACM use has been reported with standard extracapsular cataract surgery, manual phacofragmentation, phacoemulsification, anterior chamber reconstruction, and intraocular lens reposition in addition to mini nucleus surgery, with studies indicating its safety in relation to the continuous maintenance of the anterior chamber (4). The postoperative complications related to this technique are infrequent and include uveal inflammation, endothelial loss, corneal decompensation, corneal ulcer, and endophthalmitis. Although rare, post-

operative endophthalmitis has been an important factor preventing improved visual outcome after cataract surgery. Christy and Lall (5) and Kattan et al (6) reported acute postoperative endophthalmitis rates of 0.5 % and 0.072% in 1973 and 1991 in their extensive series. Although the rates have decreased, they have not been nullified (7).

We investigated the effect of ACM use on contamination of the anterior chamber at the time of phacoemulsification surgery.

PATIENTS AND METHODS

A total of 132 eyes operated on for cataract between October 2001 and September 2002 were divided into two groups. In Group A (66 eyes), ACM was not used; in Group B (66 eyes), ACM was used during surgery. Patients with a history of eye surgery, eye trauma, or lacrimal drainage problems were excluded from the study. Povidone iodine (5%) was instilled into all eyes an hour before the surgery. The eyelids and appendages in all cases were wiped with 10% povidone iodine and covered with a sterile drape. All cases were operated by the same surgeon (M.B.) under topical (2% lidocaine) anesthesia. The surgical instruments were sterilized with ethylene oxide at 55 °C for 210 minutes. There were no differences in relation to sterilization procedures of the surgical instruments between the two groups.

In the 132 eyes, 3.2 mm superior nasal or superior temporal corneal incision was provided for the standard clear corneal phacoemulsification. ACM was placed through the inferior temporal quadrant and kept open throughout the surgery in Group B. Approximately 0.1 ml of anterior chamber fluid was aspirated by a 30-G anterior chamber cannula (1273, Rycroft, Steriseal, Maersk Ltd, UK). The fluid specimen was numbered for culturing and preserved under anaerobic conditions. Continuous curvilinear capsulorrhexis (CCC) was performed with the aid of a viscoelastic substance (sodium hyaluronate 1% Healon, Pharmacia, Sweden). After the hydrodissection and hydrodelineation using balanced salt solution (BSS plus, Alcon, TX), phacoemulsification was performed by bimanual divide and conquer technique. Following the removal of cortical remnants, the capsular sac was refilled by the same viscoelastic substance. Afterwards, a hy-

drophilic acrylic intraocular lens was folded by forceps (E-30-663, PMS, Germany) and placed into the capsular bag. The viscoelastic substance was removed and approximately 0.1 ml of anterior chamber fluid was aspirated. The new specimen preserved under anaerobic conditions was numbered in the order to be cultured. Afterwards, ACM was removed in Group B. The corneal side ports were closed by hydration. Twenty milligrams of gentamycin and 4 mg of dexamethasone were injected subconjunctivally before the cessation of surgery.

All patients were evaluated for best-corrected visual acuity, biomicroscopic findings, and intraocular pressure on the first postoperative day. The patients received topical 0.3% gentamycin and 1% prednisolone acetate treatment for 1 week postoperatively. The eyes were examined at the first, second, third, sixth, and twelfth months.

The specimens under anaerobic conditions (in an injector with no means of air leakage) were transferred immediately to the laboratory. The microbiologists were masked to the specimens, including which number belonged to which patient and whether specimens were preoperative or postoperative samples. A part of the material was transferred to blood agar containing 5% sheep blood as well as thiogluconate broth. They were incubated at 35 °C for 72 hours for inspection of bacterial growth. From the remainder, slides were prepared for direct staining. The slides were stained with Gram stain procedures and were evaluated independently of the cultured material. The thiogluconate broth in which bacteria were identified was passed onto 5% blood agar. Identification of the organisms was performed by the BBL crystal bacterial identification system (Becton Dickinson).

The culture results of the two groups were compared with the Wilcoxon–Mann-Whitney U test. A *p* value less than 1% was considered as statistically significant.

RESULTS

Group A consisted of 26 women (40%) and 40 men (60%). The mean age of the 66 patients was 63±10 (min = 41, max = 80) years. The patients were followed up for 12±6 (min = 4, max = 28) months. Twenty-six (40%) patients underwent operation for the right

and 40 (60%) for the left eye. There were 24 women (36%) and 42 (64%) men in Group B. The mean age was 59 ± 10 (min = 33, max = 80) years and the mean follow-up time was 12 ± 6 (min = 4, max = 28) months. Twenty-four (60%) of the patients had right and 8 (40%) had left eye operations. We did not encounter significant differences in postoperative corneal edema, inflammation, or mean final visual acuity between the two groups. *Micrococcus* species were isolated from one patient (1.5%) in the postoperative culture of Group A. *S. pyogenes* was isolated from one case (1.5%) from Group B. At the end of the mean follow-up time, none of the eyes developed endophthalmitis.

DISCUSSION

Anterior chamber contamination was reported to occur in 37.5% of patients after classic extracapsular cataract surgery and intraocular lens implantation (8). In the study by Koc et al (9), in which classic cataract surgery and phacoemulsification were compared, the

contamination rate was approximately 23%, whereas it was much less in a similar study carried out by Feys et al (4.54%) (10). In these studies, bacterial growth mainly consisted of alpha streptococci, micrococci, saprophytic mold, alpha viridans streptococci, coagulase-negative *Staphylococcus* species, and anaerobic positive cocci (8, 10). None of the studies reported postoperative endophthalmitis. After a thorough Pub Med search, we did not find any published study on the effect of an ACM on contamination of the anterior chamber. The observations made during this preliminary study employing ACM should be confirmed by studies using larger patient groups, different surgical techniques, and different culture media.

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