Counter Phaco-Prechop Technique In Hard Cataract

Thesis

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Abstract

Patients and methods:

This is a prospective comparative non-randomized clinical trial evaluating the efficacy and complications of 2 phacoemulsification surgical techniques: Group A: 20 patients using Phaco Counter Prechopping technique; and Group B: 20 patients using Stop and Chop technique. Outcome measures are A) Intraoperative phaco (ultrasound) time, cumulative dissipative energy (CDE) and complications; and B) Post-operative changes in corneal endothelial cell loss, cornea thickness and BCVA at 3 months compared to baseline. We experienced difficulty in acquiring the necessary surgical skills for the Counter Prechopping technique with a high intraoperative complications, thus it was necessary to stop at 14 attempted eyes in group A.

Results and discussion:

In group A (14 eyes) the mean effective phaco time was 59.9±28.96 while in group B (20 eyes) it was 54.09±27.39 seconds, statistically insignificant (P-value 0.623). The mean CDE was 32.47 ±12.58 and 30.13 ±10.58 for group A (14 eyes) and B (17 eyes) respectively, (P value 0.616). The ultrasound time in relation to nuclear grading: nuclear grade III, 44.21 ±18.53 (24.6-78.9) and 41.07 ±8.11 (30.7-59.8) for group A (9 eyes) and B (15) respectively, (P value 1.00); and nuclear grade IV, 88.14±22.1 and 93.16±28.11 for group A (5) and B (5) respectively, (P value 1.00). The CDE in relation to nuclear grading: nuclear grade III 26.11±11 and 24.86±4.39 for group A and B respectively, (P value 1.00), and nuclear grading IV was 43.9±4.08 and 45.94±3.97 for Group A and B respectively, (P-value 1.00). In nuclear cataract grade III, mean postoperative percentage endothelial cell loss at 3 months was 10.88 ±3.33 and 11.86 ±2.29 % for group A and B respectively, (P-value 0.091). In nuclear grade IV, mean postoperative percentage endothelial cell

loss at 3 months was 17±2.23 and 18±2.12 % for group A and B respectively, (P-value 0.091). No significant differences were found between both groups in the postoperative (3 months) BCVA nor the increase in the mean corneal thickness with nuclear grade III or IV. Intraoperatively 6 eyes in group A had tears in the posterior capsule compared to 3 eyes in group B, this was statistically significant between groups in nuclear grade III (P value 0.027). Regarding the length of the procedure in the operative theatre, there was no recognized difference between two groups, except for cases in group A-3 and B-2, where there were complications, the whole lengh of the operation was 7 minutes more than other cases .

Conclusion:

In general our small experience with the counter prechop technique showed a high rate of complications with a difficultly in acquiring the necessary surgical skills with no beneficial outcomes. Caution for surgeons interested in adopting this technique, is adviceed.

Key Words: Phacoemulsification- Phaco Prechop- Combo Prechopper- -Counter Prechop- Akahoshi

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List of abbreviations

BCVA	Best corrected visual acuity
BSS	Balanced salt solution
CCC	Continuous curvilinear capsulorhexis
CDC	Crater divide and conquer
CDE	Cumulative Dissipated Energy
ECD	Endothelial Cell Density
MICS	Micro Incisional Cataract Surgery
IOL	Intraocular Lens
US	Ultrasound
MDC	Multidirectional divide and conquer
N I-IV	Nuclear hardness grade I Nuclear hardness grade II Nuclear hardness grade III Nuclear hardness grade IV
PCIOL	Posterior chamber intraocular lens
TDC	Trench divide and conquer
UCVA	Uncorrected visual acuity
OVD	Ophthalmic Viscosurgical Device

Introduction and aim of work

INTRODUCTION

Phacoemulsification yields successful outcomes in eyes with standard cataract. It is widely used for extraction of almost all kinds of cataractous lenses. **(Vasavada, 1999)**

The chances of intraoperative complications are high in the hands of surgeons who deal with hard cataracat occasionally. **(Gonglore and Smith,1998)**

Most complications of phacoemulsification result from ultrasonic power and time. Ocular tissue injury, especially irreversible corneal endothelial cell loss become prominent for hard cataracts. **(Walkow et al,2000)**

Many variations on phacoemulsification techniques have been described to decrease the total ultrasound time and energy used during nucleus emulsification. Though techniques have been improved, it is still challenging to perform phacoemulsification in cases of hard cataracts for difficulty in nuclear management and much more complications. **(Buratto,1998)**

Since the introduction of traditional phaco chop by Kunihiro Nagahara, many variations have been described. One of these variations is phaco prechop, or prephaco chop to be exact that was introduced by Takayuki Akahoshi. It is a nuclear fracture technique that is performed under viscoelastic material prior to phacoemulsification. Using this procedure, the surgeon can divide the nucleus without grooving or sculpting, which significantly facilitates phacoemulsification. For the nucleus harder than grade 3, a special prechopper forceps (Akahoshi hybrid combo prechopper) is used together with a nucleus manipulator to reduce the stress on the ciliary

zonules and lens capsule, a modification of karate prechop technique used for softer cataracts which is termed counter prechop technique. **(Akahoshi, 2002)**

AIM OF STUDY

This study is aimed at comparing the efficacy and safety of Phaco Counter Prechop technique versus Stop and Chop technique in removing hard cataracts.

Review of literature

Review of literature

Chapter (1): History and evolution

Chapter (2): Phacoemulsification techniques

Chapter (3): Pre-Chopping techniques