



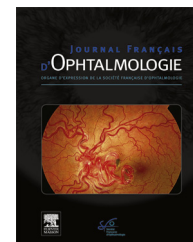
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ORIGINAL ARTICLE

Comparison between the prechopping method with a reverse chopper and the routine stop-and-chop method in treating cataract with grade IV hard nucleus[☆]

Comparaison entre la méthode de prechopping avec un hacheur inversé et la méthode de routine d'arrêt-et-coupe dans le traitement de la cataracte avec le noyau dur de la catégorie IV

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KEYWORDS

Prechopping;
Stop-and-chop
method;
Reverse chopper;
Cataract

Summary The aim of this study was to compare the safety and efficacy between the prechopping method using a Reverse Chopper (iHPC) and the routine stop-and-chop (RSC) method in phacoemulsification of cataracts with grade IV hard nuclei (HNC (\geq IV)). A total of 32 patients (32 eyes) scheduled for Phaco combined with intraocular lens (Phaco-IOL) for HNC (\geq IV) from March 2015 to January 2016 were enrolled and randomly divided into two groups (the iHPC group, $n=16$ and the RSC group, $n=16$) so as to compare the effective intraoperative Phaco time, corneal edema 1–3 days after surgery, best corrected visual acuity (BCVA), and rate of loss of corneal endothelial cells (CECs) 1 month after surgery. The effective intraoperative Phaco time in the iHPC group was shorter (42.56 s vs. 78.63 s, $P=0.000$), the degree of corneal edema 1–3 days after surgery was less ($P<0.01$), the ratio of cases with BCVA >0.6 was higher, and the CEC loss rate was lower ($13.36 \pm 2.85\%$ vs. $25.77 \pm 3.81\%$, $P=0.000$). Compared with RSC, iHPC can reduce CEC injury in Phaco surgery, and the patients can recover their vision faster.

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[☆] This study was conducted in accordance with the declaration of Helsinki. This study was conducted with approval from the Ethics Committee of Capital Medical University. Written informed consent was obtained from all participants.

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MOTS CLÉS

Prechopping ;
Méthode
stop-and-chop ;
Hachoir inversé ;
Cataracte

Résumé Le but de cette étude était de comparer l'efficacité et la sécurité entre la méthode de préchirurgie en utilisant une méthode Hachoir inversé (HHP) et la routine d'arrêt et de coupure (RSC) dans la phacoémulsification contre la cataracte avec noyau dur de grade IV (HNC [\geq IV]). Un total de 32 patients (32 yeux) planifiés pour Phaco combiné à une lentille intraoculaire (Phaco-IOL) pour HNC (\geq IV) de mars 2015 à janvier 2016 ont été recrutés et répartis aléatoirement en deux groupes (le groupe HHPC, $n=16$ et le groupe RSC, $n=16$) afin de comparer le temps de Phaco peropératoire efficace, l'œdème cornéen 1–3 jours après la chirurgie, la meilleure acuité visuelle corrigée (AVC) et le taux de perte des cellules endothéliales cornéennes (CEC) 1 mois après la chirurgie. Le temps de Phaco peropératoire efficace dans le groupe de l'iHPC était plus courte (42,56 s vs 78,63 s, $p=0,000$), le degré d'œdème cornéen 1–3 jours après l'intervention chirurgicale était plus léger ($p<0,01$), le rapport des cas 0,6 était plus élevé et le taux de perte des CEC était plus faible ($13,36 \pm 2,85$ % contre $25,77 \pm 3,81$ %, $p=0,000$). Comparé à la RSC, l'iHPC peut réduire les lésions CEC dans la chirurgie de Phaco et les patients peuvent récupérer leur vision plus rapidement.

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Introduction

Vision impairment is a common and potentially significant debility among the aged, afflicting 285 million people worldwide [1]. It has been estimated that over 68% of people over 79 years of age have some form of lens opacification or cataract [2]. In 2007, WHO estimated that cataract is responsible for blindness in 39% of the 37 million blind people worldwide [3].

Since cataract surgery leads to improvement in eye vision in up to 90% of patients and 80% maintained vision improvement in 7 years, surgery remains the conventional treatment for cataract [4,5].

Phacoemulsification combined with intraocular lens implantation (Phaco-IOL) in the main method in treating cataract, in which Phaco performed under local anesthesia has significantly better outcome than extracapsular cataract extraction [6], and the clouded human crystalline lens is replaced by an artificial intraocular lens implanted into the capsular bag [7]. The surgical key lies in the nucleus chopping operations, which as well as is the technical difficulty [8]. Manual prechopping can shorten the time for intraoperative phacoemulsification, thus reducing intraocular tissue injury [9]. However, the prechopping methods currently used have their own shortcomings, which together with bi-cystotome-assisted prechopping technique will generate a greater traction toward the suspensory ligament due to the downward pressure on the lens, so their treatment effects toward cataract with hard nuclear are poor [10]. The bi-chopper prechopping method needs to make additional incision, and femtosecond laser chopping can only help to reduce the loss of corneal endothelial cells (CECs) when applied in early postoperative stages [11]; meanwhile, their treatment effects toward cataract with hard nuclear are also poor [12,13].

In recent years, we applied a new manual prechopping method in phacoemulsification, namely using the shearing force generated by the relative movement of a patented

reverse chopper (the Hook) together with a conventional Nagahara nucleus chopper (the Chopper) to split the lens nuclear, which can not only simplify the horizontal emulsification chopping technique and retain its advantages, but also can have safer operation, excellent nuclear-fixing ability, and small traction toward the suspensory ligament, so it's suitable for the cataract patients with grade III~V hard core, mature strong nuclear activities, or abnormal lens suspensory ligament. However, it still lacks the evaluation toward its clinical efficacy. This study applied iHPC in Phaco against the patients with HNC (\geq IV), and compared it with ISC, aiming to evaluate its application values in treating cataract with hard core.

Materials and methods

Objects

A total of 32 cataract patients (32 eyes) treated in the Hetian People's Hospital of Xinjiang Uygur Autonomous Region from March 2015 to January 2016 were enrolled, aging 60 to 83 years old. These patients were randomly divided into two groups using the random table method: the iHPC group ($n=16$, including 8 males (8 eyes) and 8 females (8 eyes), aging 60 to 82 years old, with the average as 71.0 years old, preoperative BCVA 0.05~0.2) and the ISC group ($n=16$, including 9 males (9 eyes) and 7 females (7 eyes), aging 60 to 83 years old, with the average as 71.5 years old, preoperative BCVA 0.05~0.2).

Inclusion criteria:

- diagnosed as cataract with hard core according to Emery classification method [14];
- with aphakic subluxation, while no significant slit-lamp-microscopic phacodonesis;
- without a history of glaucoma and iritis;
- with good compliance, and can be followed up on schedule.

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