Commentary

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Motorized versus Manual Injectors for Implantation of Intraocular Lenses after Phacoemulsification

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Commentary

Phacoemulsification is the preferred technique of cataract extraction worldwide in view of its undisputed advantages over other methods of lens removal such as intracapsular and extracapsular surgeries. With the newer foldable lenses, better instrumentation and novel injector systems, the incision size on the cornea required for a successful phacoemulsification has been reduced progressively with the current foldable intraocular lenses (IOL) being implanted through an incision as small as 2.2 mm. However, the reduction in incision size has its own disadvantages of greater wound distortion, descemet's membrane detachment (DMD), posterior wound retraction and wound gape at each step of phacoemulsification especially during IOL implantation. The use of motorized injectors has been proposed to reduce these complications. Autosert (Alcon Laboratories, Inc., Fort Worth, TX, USA) is a motorized injector system that is commonly used during phacoemulsification for insertion of IOLs. The hand piece contains a miniature motor that is driven by the software at a constant predetermined speed despite momentous changes in load caused by compression of the Acrysof IOL into the nozzle of the cartridge.

During phacoemulsification, the incision size can enlarge at several steps of the surgery [1,2]. However, the maximum increase in incision size has been shown to occur during IOL implantation. Various factors that have been described to increase the incision size during phacoemulsification include the dioptric power of IOL [3], type of IOL [4], type of keratome [5] and speed of IOL insertion [6]. However, the width of the injector has been deemed to be the most important factor affecting the incision enlargement significantly [7]. Various studies in literature have been conducted to evaluate the effect of IOL insertion on wound integrity. Osher et al. [8] recorded an increase in size of the 2.2 mm incision in 100% of the cases after IOL implantation. However, the cartridge used for IOL implantation was a 'C' cartridge, and thus the enlargement of the incision could not be solely attributed to the process of IOL implantation. Espiritu and Bernardo2 found incision enlargement in 93.5% of the eyes using a manual injector and a 'D' cartridge. Similarly, in our study conducted on sixty-two eyes, we found a 100% enlargement of incision size with the manual injector using a D cartridge [9]. The ideal size of the incision for IOL implantation with manual injectors has been set as 2.3 mm by Espiritu and Bernardo [2], confirmed by our findings wherein the final incision size was 2.3 mm after IOL implantation with manual injectors in 85% of the patients.

As opposed to these findings, the motorized injectors have been shown to cause a much lesser effect on incision configuration. In the study conducted by Allen et al. [10] Autosert when used at a fast speed (4.4 mm/s) caused significantly less incision enlargement than the manual injector for all pre-implantation incision sizes tested. In the study conducted at our centre [9], we found no enlargement of the incision in 94% of the cases with Autosert, thus 2.2 mm incision may be deemed to be sufficient for IOL implantation through motorized injectors. Further, we found significantly lower rates of DMD, posterior wound gape and retractions with motorized injectors as compared to manual injectors in the immediate post-operative period as demonstrated on Anterior Segment Optical Coherence Tomography (AS-OCT). Posterior wound gape has a potential risk of increasing

the chances of endophthalmitis [11], thus Autosert may offer to provide protection against this disastrous complication of cataract surgery. In view of its several advantages, motorized injectors definitely have an edge over the manual injectors for intraocular lens implantation during phacoemulsification in terms of preservation of wound integrity and ocular safety.

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