

## Innovative intraocular lens loading magnified

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Cataract surgery continues to evolve and advance in terms of new technology and improved techniques, offering a final result of better visual quality and faster visual recovery for our patients. Intraocular lens (IOL) delivery into the eye is a critical step in cataract surgery. Currently, eye surgeons load the IOL into the cartridge under the operating microscope or ophthalmic assistants load the IOL under their own direct vision. Because ophthalmic assistants load the IOL unaided, the IOL may be mishandled and lead to challenges such as IOL slippage, breakage, or incorrect orientation. In order to overcome these challenges and facilitate the surgical process, here we describe a novel technique by introducing a magnifier to the surgical table to aid ophthalmic assistants during this crucial step in cataract surgery. This not only saves time but also improves precision while loading IOL into the cartridge during cataract surgery.

**Key words:** Cataract surgery, innovative, intraocular lens, magnifier

Cataract surgery continues to evolve and advance in terms of new technology and improved techniques, offering a final result of better visual quality and faster visual recovery for our patients. Femtosecond laser technology helps to soften and break the nucleus along with facilitating a reproducible, precise capsulorhexis and corneal incisions. More accurate lens calculation formulas, better intraocular lens (IOL) materials, and premium IOLs that address presbyopia and astigmatism have improved vision quality and refractive outcomes.<sup>[1]</sup> An array of intraoperative devices and techniques have addressed complex cataracts and reduced postoperative complications. All of these modalities have significantly improved the continually changing field of cataract surgery.

IOL loading and delivery into the eye is a critical step in cataract surgery. This step is consistently required regardless of surgeon technique or intraoperative technology. The method of IOL deployment has continued to advance and now offers the surgeon both manual IOL loading into the cartridge and preloaded IOL injector systems that are micro incision-friendly.<sup>[2,3]</sup>

Time and precision are key elements of high-quality and high-volume patient care in the operation theater. Depending on the practice and surgical staff training, IOL loading may be done either by the operating surgeon or the surgical ophthalmic assistant. If done by the surgeon, he or she may utilize the operating microscope to magnify their view while loading the IOL. If done by the assistant, he or she usually loads the IOL at the surgical table without any visual aid. The

challenges faced in both scenarios are described here. With these challenges in mind, we describe a simple, yet innovative solution that can be easily incorporated into any ophthalmic operating theater.

### Challenges faced if the IOL is loaded by the ophthalmic surgeons

1. The flow of the surgery will be interrupted to accommodate the change in focus from surgery to IOL loading
2. The flow of surgery will also be hampered if the surgeon wishes to load the IOL on the surgical trolley, shifting the microscope focus from patient to surgical trolley
3. The surgeon has to adjust the focal point of the microscope from the setting that is best for surgery to the setting that is best for loading IOL and back again
4. The microscope has a small field of view and poor contrast; thus, making the IOL more difficult to load
5. The IOL gets engaged in the cartridge sometimes, making loading and unloading of IOL very difficult and can add up to the stress while performing cataract surgery
6. If in case the IOL breaks, slips, or stuck in the cartridge, the surgery has to be discontinued as most of the operating theater may not have a back-up IOL with the same power which can also lead to delay or postponement of surgery
7. While performing high-volume cataract surgery, it adds to extra time during cataract surgery.

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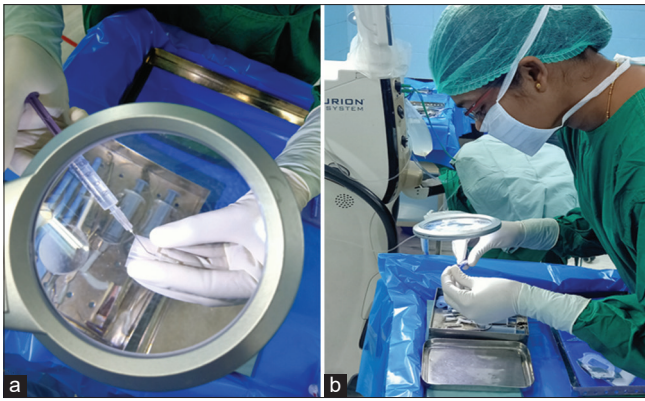
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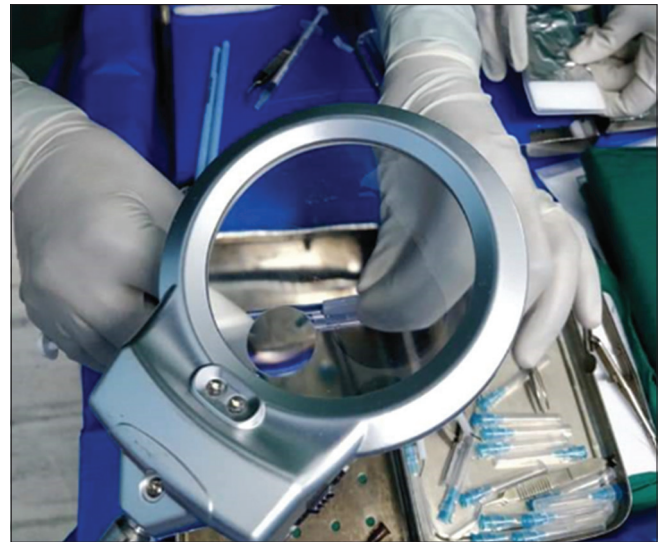
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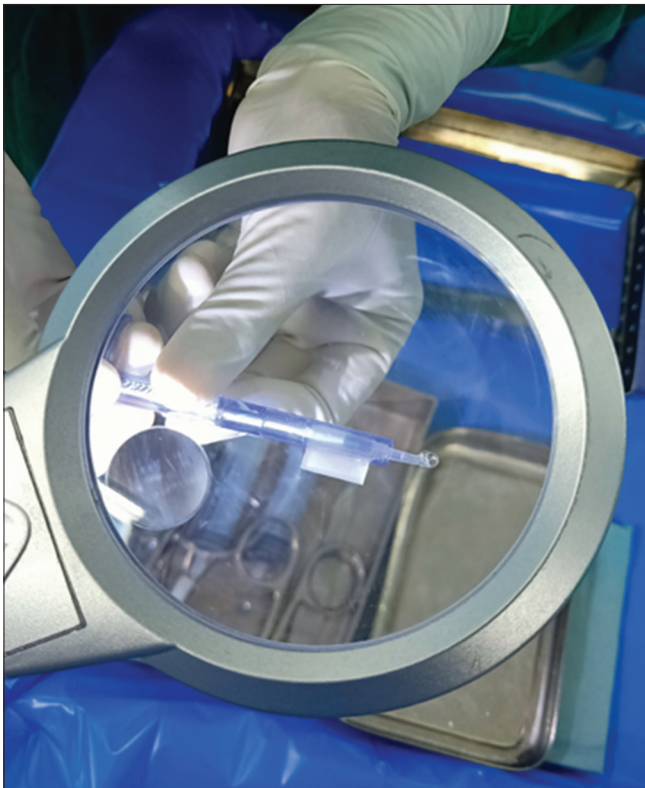
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**Figure 1:** (a) Image depicting the Mid-Level Ophthalmic Personnel (MLOP) putting the viscoelastic on the cartridge before loading foldable intraocular lens under the magnifier in the operating room. (b) Image depicting the MLOP loading the foldable intraocular lens under the magnifier in the operating room



**Figure 2:** Image depicting a closer look of foldable intraocular lens being loaded under the magnifier to facilitate the surgical process



**Figure 3:** Image depicting a foldable intraocular lens after being loaded in the cartridge with the help of viscoelastic and magnifier



**Figure 4:** Image depicting a magnifier wrapped with a sterile plastic surgical drape attached at one end of the surgical trolley, a light source for illumination, and a small black button at right bottom end for switching on and off the light

**Challenges faced if the IOL is loaded by the ophthalmic assistants**

There are few problems faced by an ophthalmic assistant while loading the IOL under his/her direct view:

1. Because ophthalmic assistants do not have a microscope, they must rely solely on their own unaided vision in order to load an IOL. In an often dimly lit operating theater with time constraints, IOL loading is prone to several pitfalls and may even dissuade some assistants from performing this step
2. There is a chance of loading the IOL in improper position, which can result in sudden extrusion of IOL into the eye during injection or the trailing haptic getting jammed and damaged
3. Sudden extrusion of IOL can add up to complications during cataract surgery like Descemet’s membrane detachment, posterior capsular rupture, or zonular dialysis

4. There is a chance to drop the IOL on the table or onto the floor
5. There is also a chance of loading the IOL upside down, which can result in the flipping of IOL inside the capsular bag
6. As all the ophthalmic assistants are loading the IOL with naked eyes, minor details like broken haptic or the optic can be overlooked and missed while loading the IOL.

As a result, this can cause a lot of anxiety and also affect the surgical flow and sometimes lead to unwarranted complication.

### Technique

In order to overcome these challenges and facilitate the surgical process, here we describe a novel and an economical solution to aid the ophthalmic assistant in loading the IOL cartridge during cataract surgery. By mounting a simple magnifying lens with a flexible handle to the sterile surgical table, the IOL and its respective cartridge become clearly visible for both the young and presbyopic ophthalmic assistant. The above pitfalls for IOL loading can be drastically reduced as the surgeon can now focus on operating while the assistant loads the lens with enhanced magnification [Figs. 1-3].

Because the magnifying lens has a flexible arm that can fasten to the surgical table, it can be easily adjusted depending on the surgical table configuration and to a comfortable distance for the assistant. As shown in Fig. 4, the magnifier can be attached to the surgical trolley in such a way so that it does not need to be sterile. This would allow it to be a permanent fixture in the operating theater and circumvent the need to change or autoclave it after each case. In addition, the magnifier contains an additional small light source that can be utilized in dark operating theaters to provide enhanced visualization [Fig. 4].

To our knowledge, this solution for aiding ophthalmic assistants has not been previously described in the literature. We have incorporated this magnifier into all of our surgical tables and it was adapted effortlessly by the ophthalmic assistants for facilitating IOL loading. Importantly, simple yet sturdy magnifiers can be reasonably priced and therefore economical for any operating theater.

### Additional advantages of the magnifier

This simple innovative technique is an important surgical aid for all ophthalmic surgeons that will help to minimize errors while IOL loading during cataract surgery. Moreover, it will

save time and prevent complications like lens slippage and breakage. The magnifier can also be used for inspecting the quality of surgical instruments and consumables like phaco tip, phaco sleeve, sharp surgical instruments like crescent, keratome, and side port blade. The magnifier can also be used to hold the needle correctly at the anterior 1/3 and posterior 2/3 junction of needle holder while applying sutures during the surgery.

### Sterilization of the magnifier

Since the whole assembly cannot be sterilized, the magnifier is wrapped with a sterile surgical plastic drape on the flexible handle in order to flex or extend it, while loading the IOL. In this way, the sterility is maintained [Fig. 4].

### Conclusion

Intraocular lens loading is a critical step in cataract surgery and carries with it several possible complications. In order to circumvent such challenges, we describe a simple magnifier that can be easily incorporated into the surgical table to aid ophthalmic assistants in loading an IOL. This economical and effective solution has not been previously described in the literature but has been seamlessly incorporated into our operating theaters. This simple innovative and reproducible technique may help maximize surgical output and subsequently minimize complications during ophthalmic surgery.

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### Conflicts of interest

There are no conflicts of interest.

### References

1. Masket S, Wang L, Belani S. Induced astigmatism with 2.2- and 3.0-mm coaxial phacoemulsification incisions. *J Refract Surg* 2009;25:21-4.
2. Mencucci R, Dei R, Danielli D, Susini M, Menchini U. Folding procedure for acrylic intraocular lenses. *J Cataract Refract Surg* 2004;30:457-63.
3. Shimizu K, Kobayashi K, Takayama S, Zhaobin G. Preloaded injector for intraocular lens implantation without the use of ophthalmic viscosurgical devices. *J Cataract Refract Surg* 2008;34:1157-60.