

## Perfecting hydrodissection – innovation is the key

Faust coined the term “hydrodissection” in 1984<sup>[1]</sup> and Fine described “cortical cleaving hydrodissection” in 1992.<sup>[2]</sup> It is a critical step of cataract surgery, which involves separating the lens capsule from the lens cortex using a balanced salt solution (BSS). When done correctly, the lens will be easily movable and freed from its enclosing capsule, making removal more straightforward during phacoemulsification. Furthermore, an efficient hydrodissection will facilitate cortical cleaning, lowering the danger of capsular tears during cortical removal.

The cannula is generally linked to a syringe loaded with a BSS, introduced into the anterior chamber, and then steered 180° from the primary wound, under the anterior capsulorhexis margin stopping just short of the equator. In the current issue of the Indian Journal of Ophthalmology, the authors of the article titled “Modified hydrodissection as a safe and effective treatment modality for rotating lens in cataract surgery” have beautifully described a novel technique of modified hydrodissection in which they have inserted the cannula tip just adjacent to the primary incision (instead of the conventional 180°), depressing the posterior lip and thus facilitating viscoelastic and excess fluid egress simultaneously. It is rational to begin the hydrodissection wave from under the subincisional anterior capsular rim that predominantly loosens the subincisional cortex, which is the toughest to remove. This technique is safe and effective, as demonstrated in 56 age-related cataract surgeries by the authors. It not only allows complete corticocapsular adhesions, but also substantially reduces the occurrence of posterior capsular rupture (PCR).

Few novel techniques of hydrodissection deserve a mention here. Too much fluid collection during hydrodissection might result in PCR. A single-quadrant hydrodissection is adequate to remove the nucleus and cortex, compared to a multi-quadrant hydrodissection.<sup>[3]</sup> Lin *et al.*<sup>[4]</sup> described a unique minimal fluid hydrodissection approach in 100 consecutive cataract surgery study participants. This approach uses a tiny volume (about 0.2 ml) of BSS to remove the cortex from the capsule without raising the intracapsular pressure (ICP) and thus obviating any risk of intraoperative capsular block syndrome (CBS)<sup>[5]</sup> and PCR. This method is appropriate for various conditions, including femtosecond laser-assisted and posterior subcapsular cataract surgery.<sup>[4]</sup> Masuda *et al.*<sup>[6]</sup> have described the phaco sleeve irrigation-assisted hydrodissection (iH) approach in which the phaco tip is utilized to furrow/divide the lens and evacuate intracapsular gas (in femtosecond laser-assisted cataract surgery cases) to lower the intracapsular volume and subsequently carry out hydrodissection using the phaco sleeve side holes to prevent disproportionately elevated ICPs during cortical-capsular hydrodissection. All five principles suggested by Roberts *et al.*<sup>[7]</sup> to avoid CBS, like preventing overinflating the anterior chamber with viscoelastic fill, decompressing the anterior chamber and the lens capsule, slow injection of the hydrodissection fluid, and cracking open the hemispheres to permit the gas to come anteriorly, may be handled utilizing the iH approach.

Elevated irrigation pressures or large amounts of fluid used in hydrodissection procedures can lead to an intraoperative capsular block. In such conditions, the lens is pushed anteriorly toward the capsulorhexis boundaries, resulting in intraoperative CBS. The buildup of fluids between the posterior capsule of the bag and the posterior lens nucleus characterizes CBS. This can result in posterior capsular disruption and lens dislocation into the vitreous cavity. Excessive quantities of viscoelastic inside the anterior chamber are also a contributing factor for CBS because they enhance resistance to fluid egress through the capsulorhexis boundaries, increasing the pressure between the nucleus and the posterior capsule. To circumvent this issue, a cautious and gentle hydrodissection procedure is required. Choosing a thicker cannula to gently decompress the anterior chamber during and before irrigation is advisable. A larger capsulorhexis can also help to decrease the incidence of this problem.<sup>[6]</sup> Minimal water-jet hydrodissection is a technique in which hydrodissection can be made more effective and without difficulties by rapidly injecting a tiny volume of fluid (0.1 ml) to loosen up the equatorial corticocapsular connections.<sup>[8]</sup>

Hydrodissection is one of the highly underrated steps in cataract surgery, and the authors (accepted article IJO\_2809 “Modified hydrodissection as a safe and effective treatment modality for rotating lens in cataract surgery”) have developed a safe technique of hydrodissection, which is easy to replicate. This step annexes minimum attention compared to phacoemulsification and intraocular lens insertion. However, a meticulously done hydrodissection is imperative for an uneventful and quick surgery.

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**DOI:**

10.4103/IJO.IJO\_1715\_23

**Cite this article as:** Gupta PC, Saini M, Morya AK. Perfecting hydrodissection – Innovation is the key. Indian J Ophthalmol 2023;71:3415-6.