

Video Article

# A Novel Capsulorhexis Technique Using Shearing Forces with Cystotome

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## Abstract

**Purpose:**

To demonstrate a capsulorhexis technique using predominantly shearing forces with a cystotome on a virtual reality simulator and on a human eye.

**Method:**

Our technique involves creating the initial anterior capsular tear with a cystotome to raise a flap. The flap left unfolded on the lens surface. The cystotome tip is tilted horizontally and is engaged on the flap near the leading edge of the tear. The cystotome is moved in a circular fashion to direct the vector forces. The loose flap is constantly swept towards the centre so that it does not obscure the view on the tearing edge.

**Results:**

Our technique has the advantage of reducing corneal wound distortion and subsequent anterior chamber collapse. The capsulorhexis flap is moved away from the tear leading edge allowing better visualisation of the direction of tear. This technique offers superior control of the capsulorhexis by allowing the surgeon to change the direction of the tear to achieve the desired capsulorhexis size.

**Conclusions:**

The EYESI Surgical Simulator is a realistic training platform for surgeons to practice complex capsulorhexis techniques. The shearing forces technique is a suitable alternative and in some cases a far better technique in achieving the desired capsulorhexis.

## Video Link

The video component of this article can be found at <https://www.jove.com/video/1962/>

## Protocol

### Part 1 : Purpose:

To demonstrate a capsulorhexis technique using predominantly shearing forces with a cystotome on a virtual reality simulator and on a human eye.

### Part 2 : Method:

**Steps:**

1. Our technique involves creating the initial anterior capsular tear with a cystotome to raise a flap.
2. The flap is then left unfolded on the lens surface.
3. The cystotome tip is tilted horizontally and is engaged on the flap near the leading edge of the tear.
4. The cystotome is moved in a circular fashion to direct the vector forces.
5. The loose flap is constantly swept towards the centre so that it does not obscure the view on the tearing edge.
6. Re-engage the needle to the tearing edge frequently to create a suitably sized continuous curvilinear capsulorhexis.

## Part 3 : Results:

Our technique has the advantage of reducing corneal wound distortion and subsequent anterior chamber collapse. The capsulorhexis flap is moved away from the tear leading edge allowing better visualisation of the direction of tear. This technique offers superior control of the capsulorhexis by allowing the surgeon to change the direction of the tear to achieve the desired capsulorhexis size.

## Discussion

The EYESI Surgical Simulator is a realistic training platform for surgeons to practice complex capsulorhexis techniques. Capsulorhexis is the most important and complex part of phacoemulsification procedure. A successful cataract surgery mostly depends on a good capsulorhexis. The shearing forces technique is a suitable alternative and in some cases a far better technique in achieving the desired capsulorhexis.

## Disclosures

No conflicts of interest declared.

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