

# Lens Surgery for Particularly Soft Lenses



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Many forms of cataract, e.g. a dense subcapsular cataract, a cortically accentuated cataract, a contusion rosette, etc., can significantly reduce visual acuity despite containing a soft lens core. In addition, the number of patients who do not have a cataract but who wish to have a surgical solution such as refractive lens exchange to achieve freedom from glasses due to presbyopia is constantly increasing. These soft lenses can usually be removed with very little use of ultrasound energy and surgery is therefore less harmful to the intraocular tissue. Nevertheless, there are a few points to consider in order to achieve an optimal result. The standard chopping or “divide and conquer” approaches rely on a firm lens to generate the vacuum and resistance for the required chop or groove formation. This is not typically possible in soft lenses.

The incision and capsulorhexis are performed in the same way as for standard cataracts. Two options are possible for hydrodissection.

Option 1: Hydrodissection is performed in the same way as for standard cataracts. The lens is carefully detached from the capsular bag using liquid. The surgeon presses the lens gently and repeatedly so that the fluid does not collect between the capsular bag and the lens. This loosens the lens but retains it in the capsular bag. Hydrodelineation is then carried out and a free rotation of the lens in the capsular bag is checked.

Option 2: During hydrodissection the lens is no longer pressed down. The fluid thus accumulates as a bolus between the lens and the lens capsule until the lens is prolapsed out of the capsular bag into the anterior chamber. In this scenario it is important that the rhexis is large enough so that the pressure on the anterior capsule stays at a low level.

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The advantage of option 2 is that the lens is located in the anterior chamber, which means that the risk of a posterior capsule rupture during lens aspiration is very low. The disadvantage is that increased pressure is exerted on the anterior capsule sheet during lens extraction and any contact between the lens and endothelium could lead to minor endothelial damage.

### **Author's recommendation**

Since the risk of a posterior capsule rupture is very low with soft lenses, we generally prefer the first option.

Aspiration is usually completely sufficient for removing the lens and therefore the application of ultrasonic energy should be avoided if possible. When aspirating the lens, the phaco handpiece can be inserted centrally and, if hydrodelineation is well carried out, the lens core can be aspirated first and then the epinucleus. This two-stage procedure has the advantage that the epinucleus acts as an additional protective barrier in front of the lens capsule when the nucleus is removed. Another approach to aspirating the lens is the so-called carousel technique. For this, the phaco handpiece is guided into the periphery of the lens and the handpiece is rotated by 90° so that the opening faces the lens core. Next, the tip of the Nagahara chopper is inserted into the center of the lens. By careful aspiration, the lens rotates around the chopper and can be slowly aspirated from the periphery to the center. This has the advantage that both instruments hardly need to be moved during lens removal.

The subsequent cortex removal and lens implantation does not differ from the standard cataract.