Various techniques have been described for removal of soft cataracts. The principle behind the majority of these strategies is to achieve complete hydrodissection and hydrodelineation followed by in-the-bag or supracapsular emulsification of the endonucleus.

For average phaco surgeons and trainees, removal of soft cataracts is challenging. First, most are trained to perform divide-and-conquer nucleofractis, a technique that when used for soft cataract increases the risk of early capsular tear during groove sculpting and complicates rotation of the soft nucleus rim. Unless the surgeon begins with a definite strategy, soft cataract cases often result in piecemeal removal of the nucleus, which thankfully usually ends in successful removal of the nucleus—but only after wasted time and excessive stress. Second, supracapsular techniques are no longer a common practice.

We describe a new technique, the bowl-and-snail, which can be easily adopted for safe and effective removal of soft cataract.

**SURGICAL TECHNIQUE**

The surgeon should choose the incision technique according to his or her experience and preference, whether a clear corneal or a scleral tunnel incision. We use two sideports, one for the cystotome and the other for a second instrument. Each is 0.9 mm in diameter and approximately 2 clock hours from the main incision. The anterior chamber is inflated with a cohesive or dispersive ophthalmic viscosurgical device (OVD), and the capsulorrhexis is performed under cover of the OVD. Either bent needle or forceps are acceptable for this maneuver.

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**Figure 1. A Corydon cannula is used to perform hydrodissection.**

**Figure 2. A bowl is carved centrally down to the posterior capsule.**

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**BY AHMED GOMAA, FRCS, PhD; AND CHRISTOPHER LIU, FRCPHTH**
We use a Corydon cannula (BD Visitec/Becton, Dickinson and Company, Franklin Lakes, New Jersey; Figure 1) to perform the hydrodissection. The tip of the curved cannula is introduced through the main incision to dip under the capsular rim at the 12-o’clock position. Balanced saline solution is then injected. Complete

Figure 3. Vacuum is raised, and the phaco tip is used to break the peripheral nuclear rim into a C-shaped mass.

Figure 4. The phaco tip holds one end of the nuclear rim and drags it centrally.

Figure 5. (A-D) A second instrument rotates the nucleus, which is simultaneously emulsified and aspirated. This is continued until no nucleus remains.
hydrodissection can be affirmed by observing the propagating wave of fluid moving across the posterior capsule to the opposite pole. We use the phaco tip, with low power modulation, to sculpt a central bowl approximately 5 mm in diameter. Sculpting is continued down to either bare posterior capsule (Figure 2) or a thin epinuclear plate, so the nucleus is left as a centrally hollowed doughnut shape. Vacuum is then raised to 120 mm Hg while the phaco tip is placed at the 6-o’clock position to hold the nuclear rim and break it into a C-shaped mass (Figure 3). With the phaco tip holding one of the ends of the C (Figure 4), we use a Sinskey hook as a second instrument to rotate the nucleus to prolapse and emulsify the nuclear rim simultaneously (Figure 5). Aspiration of the residual cortex and IOL implantation are done as in standard phacoemulsification.

CHOOSING YOUR TECHNIQUE

Preoperative assessment of nuclear density is based on the patient’s age and nuclear color. Divide-and-conquer can be always attempted, and the surgeon can convert to the bowl-and-snail technique if the nucleus is too soft. Our technique uses an endocapsular approach to reduce the risk of endothelial damage, although damage is usually limited with soft cataracts.

The chip-and-flip technique described by Fine can also be used for removal of a soft cataract, but it involves tumbling of the residual epinuclear plate, which we think carries more risk of trauma to the posterior capsule, especially with incomplete hydrodissection. The hydro-chop technique, based on the Akahoshi pre-chopping principle, can also be used. We have no experience with the hydro-chop technique and thus cannot discuss its pros and cons.

CONCLUSION

Effective planning and choice of the proper surgical technique help the surgeon to avoid any unnecessary intraoperative complications when faced with a soft cataract. Our technique can be used successfully for removal of adult soft cataract with good reproducibility.

In this technique, we sculpt a central bowl, followed by delivery and removal of the residual nuclear rim. Our technique is reminiscent of the process of eating escargot—hence the name. The technique is done within the capsular bag and with minimal stress on the zonules.

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