

# MANUAL SMALL-INCISION CATARACT SURGERY



This technique can look deceptively simple in the hands of an experienced surgeon, but mastering the basics requires care.

BY ARUP CHAKRABARTI, MD

**M**anual small-incision cataract surgery (SICS) is necessary in a variety of scenarios, particularly when phacoemulsification is contraindicated or challenging due to intraoperative comorbidities. I would rather perform manual SICS than risk doing phacoemulsification and having to end up with complications. I also find conversion to manual SICS useful in certain circumstances. For example, if I have underestimated the difficulty of a given cataract procedure, and I realize in the midst of performing phacoemulsification that the nucleus is very hard, that the pupil has come down, or that there is a zonular issue making continuation of phacoemulsification unsafe, the option to convert to manual SICS comes in handy.

But the most important indication for manual SICS may be in the developing world—the area of the world that most needs cataract surgery. The developing world is home to 75% of those blind from cataracts. These countries have low gross domestic products and low health indices overall. The cataract surgery rate in many of these countries is also low, about 300 to 400 cataract surgeries per million population. Although the prices of phacoemulsification machines have decreased over time, surgeons living and working in developing countries may still not see those

prices as affordable. For surgeons in these countries to clear the backlog of cataract surgeries, they must be able to perform manual SICS in large numbers and in high volumes.

Manual SICS can also be useful for cataract surgeons who are just starting out in practice. A young practice may have only one phacoemulsification machine, and, if that machine were to fail during surgery, a surgeon well-versed in performing manual SICS would be able to complete that surgery using the manual technique without compromising the patient's outcome to a large extent.

Phacoemulsification is my go-to technique, but, in my opinion, to be a complete and well-rounded cataract surgeon, one must be effective and efficient with both phacoemulsification and manual SICS for cataract surgery. A well-rounded cataract surgeon should be able to perform either technique for cataract surgery based on the findings in a given patient, with the patient's best interest in mind.

Here are five fundamentals for those thinking of adding manual SICS to their surgical repertoire.

## THE FUNDAMENTALS

### FUNDAMENTAL 1 Preoperative Considerations

As with any surgical procedure, proper selection of surgical instruments is important. To make

the scleral tunnel, I use a crescent knife bevel up. To enter the anterior chamber, I use a 3.2-mm keratome. A cystotome or forceps can be used to make the capsulorhexis, and an irrigating vectis is used for nucleus removal.

Manual SICS should, preferably, be performed under peribulbar or sub-Tenon anesthesia, though some surgeons—not many, but some—perform it under topical anesthesia. The go-to technique for anesthesia is a peribulbar block.

### FUNDAMENTAL Vectis Expression

**2** One of most important maneuvers in manual SICS is vectis expression of the nucleus. In this technique, after the nucleus is prolapsed into the anterior chamber, an OVD is injected through the scleral tunnel. The nucleus is then captured in the concavity of the irrigating vectis and, as balanced saline solution is injected through the vectis, the nucleus is extracted. Because of the pressure that builds up in the anterior chamber as a result of the irrigating fluid, the nucleus prolapses out.

This maneuver requires an incision size of about 6 to 7 mm. Other techniques for manual SICS include using phacoemulsification, in which the nucleus is divided into multiple pieces inside the eye. For this technique, a smaller incision size can be used, about 3 to 4 mm.

### FUNDAMENTAL Important Skills

3

Proper construction of the incision is critical.

If a complication occurs at the incision stage or as a result of a mistake at the incision stage, other complications of varying types can subsequently occur, aggravating the situation.

It is also important that the surgeon be familiar with how to maneuver using hydrodissection to hydro-prolapse the nucleus into the anterior chamber. This step is not required during phacoemulsification.

### FUNDAMENTAL IOL Selection

4

In the developing world, a rigid lens can be implanted after manual SICS. Otherwise, I use a foldable IOL. Just because the surgery has been done with a 3- or 6-mm incision, that does not mean that we cannot provide the patient with the benefits of modern IOLs.

### FUNDAMENTAL Postoperative Considerations

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Postoperative

care is much the same for patients who have had manual SICS as it is for patients who have had phacoemulsification. However, full visual rehabilitation takes about 4 weeks, which is longer than with phacoemulsification. Many studies have found that postoperative results with manual SICS are similar to outcomes with phacoemulsification. A frequently cited study comparing the two techniques in patients with white cataract found that both techniques achieved “excellent visual outcomes with low complication rates.” Those authors noted that because “manual SICS is significantly faster, less expensive, and less technology-dependent than phacoemulsification, it may be a more appropriate technique in eyes with mature cataract in the developing world.”<sup>1</sup>

### CONCLUSION

When an experienced, senior surgeon performs manual SICS, it looks very simple. In fact, the procedure can look so simple that a junior surgeon watching an expert surgeon will probably think that manual SICS is easy to learn and easy to perform. However, performing this technique requires a significant learning curve. What looks simple in the hands of an expert must be carefully learned by surgeons in training. I hope the pointers in this article will help guide novice surgeons in adopting this valuable technique. ■

1. Venkatesh R, Tan CS, Sengupta S, Ravindran RD, Krishnan KT, Chang DF. Phacoemulsification versus manual small-incision cataract surgery for white cataract. *J Cataract Refract Surg.* 2010;36(11):1849-1854. doi: 10.1016/j.jcrs.2010.05.025.

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