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One-Year Results Favorable for the Tromb Tip

We feel that a flat tip shape better fits the anatomy of the cornea.

BY GIUSEPPE MIGLIORATI, MD; PAOLO BRUSINI, MD; AND MARIA LETIZIA SALVETAT, MD

When a circular-shaped phaco tip is inserted through a linear incision during phacoemulsification, a considerable amount of friction may be produced at the superior and inferior points of contact, between the corneal tissue and phaco tip. The circular-shaped tip could lead to corneal stretching and may increase the possibility of burning at these contact points. We believe that placing a round tip through a flat corneal incision may increase friction. Therefore, it is more logical to use a flat phaco tip through a flat linear incision.

The Tromb Tip^{1,2} (Optikon 2000 Industrie, Rome) is a phacoemulsification tip designed by Giuseppe Migliorati, MD. It is characterized by its flat shape and large size (Figure 1). A 1.5-mm, 17-gauge, circular-shaped tip is flattened to create the Tromb Tip, which has a 2-mm horizontal diameter, a 0.9-mm vertical diameter tip, and a 30° angle (Figure 2). This tip is inserted through a flat linear incision distributing friction energy along a wider contact surface, thus reducing the friction energy per surface unit, heat production, and incision stretching. For these reasons, we feel that the Tromb Tip is a better fit for the anatomy of the cornea.

In a 1-year study of 40 eyes (40 patients) receiving cataract extraction with phacoemulsification, we found no intra- or postoperative complications and no signs of corneal burn. The Tromb Tip and irrigating chopper were both easy and safe to use for every variety of cataract.³ Additionally, we found that the phacoemulsification phase of surgery appeared to be relatively fast, especially in patients with soft cataracts.

SURGICAL METHOD

All patients underwent preoperative, 3-month postoperative, and 1-year postoperative ophthalmic examinations. Dr. Migliorati performed a biaxial phacoemulsification technique using the Optikon Assistant phaco machine (Optikon 2000 Industrie) on all patients. The

surgical technique included a 2- to 2.1-mm clear corneal incision, capsulorrhexis with microcoaxial forceps, and hydrodissection. Dr. Migliorati then performed biaxial phacoemulsification using a venturi pump and the Tromb Tip (Figure 2). A phaco-chop or stop-and-chop technique



Figure 1. The Tromb Tip is flat, which better fits the anatomy of the cornea.

was used for hard cataracts greater than +3, while a phacoaspiration was used for softer cataracts. After Dr. Migliorati performed cortical material aspiration, the clear corneal incision

was enlarged to approximately 2.5 mm, allowing for IOL insertion. A short-chain hyaluronic acid was used as viscoelastic during the procedure.⁴

RESULTS

Three months postoperatively, BCVA increased from 0.60 to 0.90, mean surgically induced astigmatism was 0.50 ± 0.50 D, and mean central corneal endothelial cell loss was relatively low after surgery ($7 \pm 5 \mu\text{m}$). Additionally, surgical time ranged from 3 minutes to 12 minutes, and phacoemulsification time ranged from 45 seconds to a maximum of 3 minutes.

We have found that the larger 17-gauge aspiration tip diameter aids in shortening surgical time and allows for lower ultrasound percent settings. Even with hard and dark cataracts, the maximum ultrasound level used on our patients was 40%. Considering that a greater aspiration rate comes with using a larger tip, an increased infusion flux is needed to prevent the anterior chamber from collapsing. We used a large irrigating chopper with a maximum irrigating flux of 96 cc/min.



Figure 2. Biaxial phacoemulsification using a venturi pump and the Tromb Tip.

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LEARNING CURVE

There will most likely be a learning curve for surgeons. They must become accustomed to the irrigating chopper and wider tip. Additionally, we suggest using an adhesive or short-chain cohesive viscoelastic substance to minimize endothelial damage.

We do not want to assert that the Tromb Tip is superior to other tips, especially since we know that there are many techniques for performing cataract surgery. We would, however, like to propose the idea that a flat tip may work better with the ocular anatomy. It is a good alternative phaco tip because of its ability to offer better friction distribution, lower heat production, and create less corneal incision stretching. ■

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