

# Expanding options with supplementary IOLs

Get a full understanding of the **duet procedure combined with trifocal supplementary intraocular lenses** implantation

**VIENNA** Supplementary IOLs designed for the sulcus ciliaris for the pseudophakic eye have expanded the options available to the patients. With these new IOLs it is possible to correct post-operative pseudophakic refractive errors, presbyopia and residual astigmatism.<sup>1</sup>

Trifocal multifocal IOLs provide useful near and intermediate vision without spectacles and without adversely affecting distance vision.<sup>2</sup> However, multifocal IOLs also have drawbacks, the most prominent of which are halos and other photic phenomena. Although most patients adapt to halos, by their nature even the best diffractive multifocal IOLs are only about 80 to 82 percent efficient, resulting in a significant loss of incident light to higher-order aberrations. In most cases, the same lens model is implanted in both eyes of a patient so that his or her brain can adapt to the new visual system. Patient satisfaction and spectacle independence with these lenses is high, but still well below 100 percent.

In many cases, explantation of multifocal IOLs is related to visual disturbances such as glare or halos. For these reasons, patients need to be carefully advised before the decision for a multifocal IOL is made, and many surgeons still hesitate to recommend multifocal IOLs, especially since explantation of a capsular bag IOL is a laborious procedure that is often stressful to the eye and associated with a significant risk of complications.<sup>3</sup>

We defined the Duet procedure as the implantation of monofocal IOL into the capsular bag and a supplementary multifocal IOL into the sulcus ciliaris. The capsular bag IOL can be of



Michael Amon

any material and design, utilising aspheric and toric IOLs. If the patient is dissatisfied after surgery or notices the presence any dysphotopias, this supplementary multifocal IOL can be removed or exchanged without trauma. Sulcus placement of a multifocal IOL sequential with implantation of the primary IOL within the capsular bag can be a successful strategy for correcting presbyopia. The main advantage of this approach is its reversibility: A supplementary IOL can easily be explanted from the sulcus if necessary, for example if the patient is not satisfied with the multifocal solution or wants to change their refraction again. But the main argument is, that we never know what happens to an eye in the future. If the patient develops an AMD, a diabetic macular edema, glaucoma or any other eye disease which is reducing contrast sensitivity the supplementary implant can be explanted at any time with only a minimal trauma.

The diffractive trifocal profile of the Sulcoflex Trifocal supplementary IOL is a construct of two profiles (asymmetrical and symmetrical) with

16 diffractive rings in a 4.5 mm zone on a 6.0 mm optic providing a near addition of +3.50 D, an intermediate addition of +1.75 D, and an outer distance zone between 4.5 mm and 6.0 mm. A capsular bag-fixated IOL with the same patented diffractive design (RayOne Trifocal) has been investigated in several studies, and good visual outcomes as well as high patient satisfaction were reported.<sup>4,5</sup>

The Sulcoflex Trifocal supplementary lens can be employed to add trifocality in patients who had previous-



Rayner Sulcoflex trifocal 2

ly undergone cataract surgery, or in new patients via implantation of a primary monofocal or monofocal/toric capsular bag IOL followed by implantation of the supplementary sulcus-fixated IOL in the same procedure.<sup>6,7</sup>

**Surgery:** After mydriasis the supplementary intraocular lens is usually implanted under topical anesthesia. A clear corneal incision of appropriate size (2.2 mm) is made and the ciliary sulcus is filled with an ophthalmic

viscoelastic device (OVD). Finally, the supplementary intraocular lens is implanted and positioned in the ciliary sulcus using injector or forceps. OVD has to be removed completely behind the capsular bag IOL and between the IOLs. An upside-down implantation has to be avoided and can result in an iris capture.

Removal of the supplementary IOL is also made under topical anesthesia. After filling the anterior chamber with OVD the lens can be pulled out with forceps. Usually it is not necessary to

cut the supplementary IOL in the anterior chamber since the IOL is thinner and more flexible compared to a capsular bag IOL and is folding itself during explanation along the corneal wound.

Sequential implantation of a monofocal IOL in the capsular bag and a supplementary trifocal IOL in the sulcus provides a safe and effective choice for patients who desire spectacle independence after cataract surgery.

## References:

1. Kahraman G, Amon M. New supplementary intraocular lens for refractive enhancement in pseudophakic patients. *J Cataract Refract Surg* 2010;36(7):1090-1094.
2. Brydon KW, Tokarewicz AC, Nichols BD. AMO array multifocal lens versus monofocal correction in cataract surgery. *J Cataract Refract Surg* 2000;26:96-100.
3. Fernández-Buenaga R, Alió JL. Intraocular Lens Explantation After Cataract Surgery: Indications, Results, and Explantation Techniques. *Asia Pac J Ophthalmol (Phila)* 2017;6(4):372-380.
4. Ferreira TB, Ribeiro FJ. Prospective Comparison of Clinical Performance and Subjective Outcomes Between Two Diffractive Trifocal Intraocular Lenses in Bilateral Cataract Surgery. *J Refract Surg* 2019;35(7):418-425.
5. Imburgia A, Gaudenzi F, Mularoni K et al. Comparison of clinical performance and subjective outcomes between two diffractive trifocal intraocular lenses (IOLs) and one monofocal IOL in bilateral cataract surgery. *Front Biosci (Landmark Ed)* 2022;27(2):41.
6. Kahraman G, Dragostinoff N, Brezna W et al. Visual Outcomes and Patient Satisfaction After Bilateral Sequential Implantation of a Capsular Bag IOL and a Supplementary Sulcus-Fixated Trifocal IOL. *J Refract Surg* 2021;37(2):105-111.
7. Baur ID, Labuz G, Yildirim TM et al. Reversible Multifocality Achieved Through Polypseudophakia. *Klin Monbl Augenheilkd* 2023 Jun 30. Epub ahead of print.

► **Authors:** Michael Amon, MD  
Guenal Kahraman, MD

Corresponding author: Michael Amon, MD  
Sigmund Freud University, Medical Faculty  
Vienna Austria, Academic Teaching Hospital  
of St. John's Vienna, Department of Ophthalmology, Vienna; e-mail:  
amon@augenchirurg.com

Getting to the roots of ... or Get a full understanding of ...

12.09.2023

9:45-9:57, Room: A2