

New IOL performs well in eyes without zonular support

Stefanie Petrou Binder MD
in Berlin

A NOVEL posterior chamber IOL intended for implantation in aphakic eyes without capsular or zonular support offers an alternative to anterior chamber lenses, report German researchers.

“The sutureless ‘iris fixation’ of this posterior chamber IOL produced fewer complications compared to scleral fixation. All of the lenses we implanted so far are centrally and securely fixated and the procedure is reproducible,” Peter Rieck MD PhD, Charite, Berlin, Germany, reported at the Congress of the German Ophthalmologic Society.

Dr Rieck implanted a specialised sutureless sulcus-fixed iris-stabilised IOL (BinderIOL, IOLution) in 18 eyes lacking capsular support. In all 18 implantations, the device was well centred and stable in all spatial planes.



Helmut Binder

The crux of the specialised implantation lies in fastening two t-shaped anchors (mounted at an angle of 45 degrees from the optic plane) through peripheral iridotomies, like buttons through a buttonhole, without the need of additional sutures. The t-shaped anchors are found at the ends of



Peter Rieck

very long C-shaped haptics that connect to a 6.0 mm optic zone.

To ensure stability, Dr Rieck inserted the haptics from behind the iris through the iridotomies and positioned the t-shaped ends on the surface of the iris. To hold the device in place, he lodged the long, C-shaped haptics securely in the ciliary sulcus.

The implantation procedure involves two preoperative basal iridotomies (diameter 0.5 mm) at 3 and 9 o'clock made with ND:YAG laser, or performed intraoperatively with a vitrectomy cutter, placed at approximately 0.5 mm from the anterior chamber angle. An extensive anterior vitrectomy through two corneal paracenteses at the 3 and 9 o'clock positions helped avoid vitreous incarceration or prolapse.

The surgeon performed a 6.0 mm limbal cut through which he inserted the leading haptic. While doing so, he folded the anchor of the leading haptic under the optic to prevent it from getting caught at the edge of the incision. He placed the leading haptic in the sulcus at 6 o'clock, while temporarily hooking the iris anchor onto the pupil.

The surgeon then placed the second haptic in the sulcus at 12 o'clock with its anchor tentatively hooked onto the pupil at 9 o'clock. He rotated the lens 90° clockwise. He completed the IOL implantation by positioning the iris anchors in the iridotomies from behind the iris, through the corneal paracenteses, using a special haptic-forceps.

The t-shaped anchors serve not only to protect the lens from rotation and dislocation, but they also enable the surgeon to know the exact position of the haptic region lying in the sulcus.

Dr Rieck said that in his experience with the device and the implantation technique thus far, hooking the iris anchor onto the pupil while manoeuvring the rest of the device into the eye was a secure way to introduce and implant the IOL. He explained that the pressure of merely bringing the optic and second haptic into the eye was enough to secure the iris anchor from dislodging from its temporary position on the pupil.

Surgeons in the audience were interested to learn whether the iridotomies were likely to enlarge through the movement of the anchor neck, since the basal iris is quite thin and atrophy of the tissue would make it more brittle with time. Dr Rieck confirmed a slight enlargement of the basal iridotomies in his series. He explained however that in spite of the slight widening he observed postoperatively, previous implantations of this IOL using the same technique revealed stable lens fixation after over three years.

Dr Rieck reported that complications following lens implantation included hyperaemia of the iris vessels around the haptic anchor in the early pre-operative course, and slightly enlarged iridotomies postoperatively.

He noted that the scleral fixation procedure widely used to secure posterior chamber IOLs in aphakic eyes is quite laborious and associated with potential

complications that include macular oedema, IOL tilting and decentration, suture erosion, and vitreous haemorrhage. By contrast, this sutureless, sulcus-fixed iris-stabilised device seems to be associated with less potential complications and therefore offers a good alternative.

“The methods of iris fixation so far (suture fixation or enclavation of an inversely implanted ‘phakic’ lens) come along with marked anterior-posterior mobility of the IOL due to the loosened iris diaphragm in aphakic eyes. This complication has not been observed with the technique presented here,” he said.

Helmut Binder MD, the IOL developer, confirmed that certain elements he incorporated into the lens design accounted for its success. He explained that the two IOL haptics are designed to run along and become embedded within almost the entire length of the ciliary sulcus, providing increased stability in all planes, including the anterior/posterior. The haptics end in two peripheral iris anchors that ‘button’ onto the iris surface through peripheral iridotomies to prevent backward sliding.

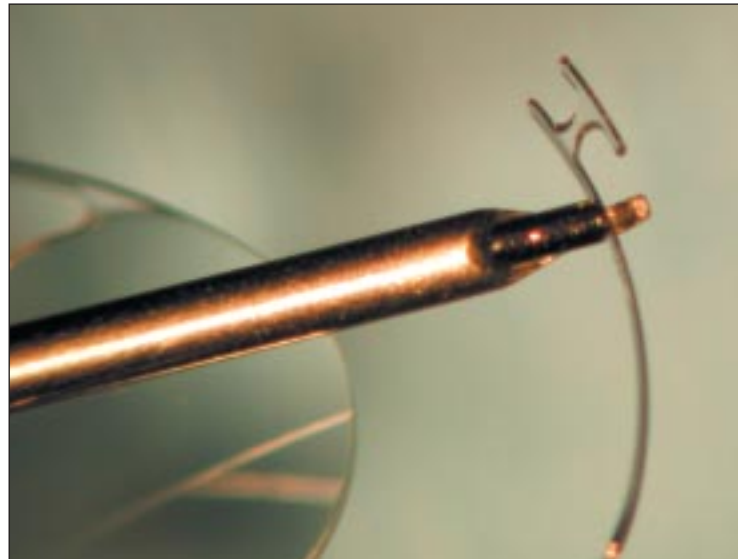
The lens tilting and decentration frequently associated with sutured scleral fixation is due chiefly to IOL fixation at two opposite points, which may allow movement. Embedding the haptics along an extended length of the sulcus provides a much larger contact surface and a better hold, Dr Binder said.

While iris fixation using iris claw lenses and anterior chamber lenses represent other options for aphakic eyes, they also have some drawbacks. Implantation with iris claw lenses can result in insufficient or over-incarceration of tissue in the lens claws, causing lens decentration, endothelial damage, or pupil ovalisation and iris atrophy, respectively. The lack of compartmentalisation allows increased lens mobility of the iris-IOL diaphragm.

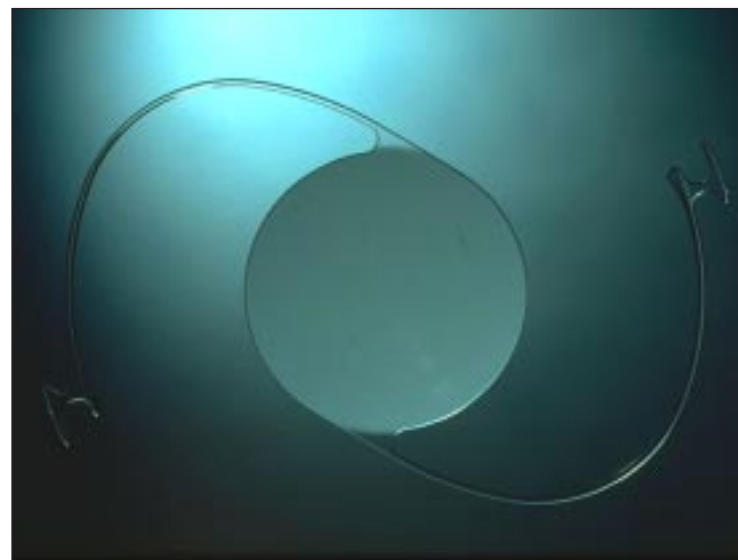
“This lens should not be confused with a conventional iris-fixed lens that relies chiefly on the iris diaphragm for its hold. This is a ciliary sulcus-fixed device, held in place by over-long C-shaped haptics embedded in the sulcus. The iris portion of the device fulfils the essential role of providing spatial stability against tilting and decentration,” Dr Binder pointed out.

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Lens haptic is grasped by Guerin-type forceps.



IOL overview with long C-shaped haptics and anchors



Perfectly centered IOL after implantation