

# Novel accommodating IOL offers benefits, but not ultimate solutions



Albert Galand

## Cheryl Guttman in Lisbon

EARLY clinical experience with the AccoRing (Physiol) accommodative IOL indicates this innovative implant affords enhanced reading vision compared with conventional pseudophakic IOLs.

The lens may also have the potential for minimising the development of posterior capsule opacification (PCO). However, it is not yet providing spectacle independence or eliminating the need for Nd:YAG laser capsulotomy, according to its designer, Albert Galand MD PhD, who spoke at the XXIII Annual Congress of the ESCRS.

Dr Galand, of the Centre D'Ophthalmologie, Rotheux-Rimiere, Belgium, explained that the AccoRing incorporates a number of features that would enhance forward movement of the optic in response to ciliary muscle contraction in order to achieve better accommodative amplitude. In addition, design elements were incorporated in the optic and haptics to reduce PCO.

To evaluate its performance, he performed a paired eye study involving 34 cataract surgery patients who received the AccoRing in one eye and a conventional IOL (MultiLink,

Corneal) contralaterally. Three months after surgery, the mean spherical add required to read Parinaud 2 was significantly lower among eyes implanted with the AccoRing compared with eyes that received the conventional IOL, +1.50 vs. +2.25 D, respectively ( $p < 0.0001$ , Student T).

### Variance of accommodation

Dr Galand acknowledged that the required spherical add in the AccoRing eyes showed a wide range between +0.75 D and +2.25 D, with only four patients requiring adds of 1.00 D or less. With the conventional IOL, all eyes required a spherical add of at least +1.50 D, with 60% of the 34 eyes requiring adds of at least +2.25.

"The AccoRing seems to provide a partial pseudo-accommodation that is better than a classic pseudophakic IOL and probably better than older accommodative implants. While, the amplitude of the optic movement is not sufficient to allow reading without add, there is a reduction in the addition needed for near vision and an improvement in intermediate distance vision, and so we can say to patients that the addition in the spectacles needed with implantation of the AccoRing will be less than with a conventional IOL," said Dr Galand.

Data on PCO development at one year were available from 28 patients and provided some indication that the AccoRing might reduce the need for Nd:YAG capsulotomy. Six eyes implanted with the conventional IOL and three AccoRing eyes had undergone Nd:YAG capsulotomy for visually significant PCO, Dr Galand reported.

"The difference in capsulotomy rates between groups is not significant, and thus we are unable so far to establish a true anti-PCO benefit of the features incorporated into the haptic and optic design of this new IOL," he

said.

### Special design features

The AccoRing is a biconvex, hydrophilic IOL with a 6.5-mm optic and an oval ring haptic that can be implanted through a 3.0-mm with a Monarch cartridge. It was designed to achieve accommodation by forward shift in response to ciliary muscle contraction. However, when Dr Galand began to develop this implant in 2003, he incorporated a number of features that he expected would enhance the magnitude of movement achieved.

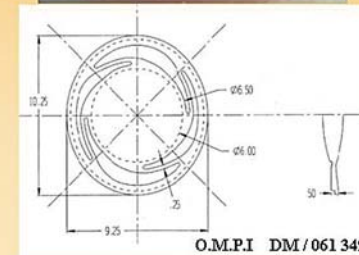
"Other accommodative implants are also based on the principle of achieving forward movement of the optic. However, the AT-45, which is mainly displaced forward as a result of pressure from the vitreous, and the I-CU, which shifts anteriorly primarily as a result of movement of the capsular equator, achieve very little movement. I believe in the importance of this anterior shift for providing accommodation, but it has to be greater in magnitude," Dr Galand said.

To achieve that goal, the AccoRing has several features intended to enhance force transmission from the vitreous and from the capsular fornix. Those include an oval ring haptic that could adapt to the size of the capsular bag, four cardinal connecting rods between the haptic and optic rather than just two, and a relatively large optic that provides more surface area. To minimise unwanted backward movement, Dr Galand designed the AccoRing to have no vaulting and to be hinge-free.

IOLMaster studies performed with pharmacological stimulation in four eyes to measure lens position showed that after treatment with tropicamide, the AccoRing optic moved backward by an average of 0.84 mm. In three eyes treated with pilocarpine,

## AccoRing design features

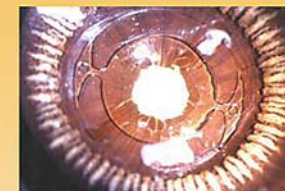
- Oval-ring haptic
- 4 cardinal connections
- No vaulting
- Stepped haptic-optic
- No hinges
- Large optic
- Overall diameter inferior to the bag



A.G. Liège, Belgium

## An overall diameter leaving some freedom of the implant in the bag is crucial for two reasons:

1. Excessive haptic size can impede capsular bag shift



2. Revolution of an IOL abrades LEC's



3 year post-op.



8 year post-op

there was a mean forward movement of 0.67 mm, which was almost double the distance measured in eyes with a conventional pseudophakic implant (mean, 0.38 mm).

### PCO prevention

To impede PCO development, which is thought to be critical for the long-term success of an accommodative implant, the AccoRing is designed with a square edge optic and with a patented textured haptic intended to provide an abrasive action within the capsule. In addition, the optic has an overall diameter that

is smaller than the bag to allow some freedom of movement.

"We have many observations of older IOLs implanted in the 1980s and 1990s that were too small for the bag and in some cases resulted in complete disappearance of lens epithelial cells as a result of abrasion. Therefore, we envisioned that revolving movement of the AccoRing IOL in the bag in the first weeks postoperatively could provide that effect. It probably does happen, but unfortunately not in all cases," Dr Galand said.

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