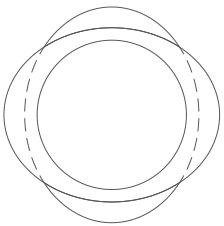
BAG-IN-THE-LENS
IOL AND TECHNIQUE

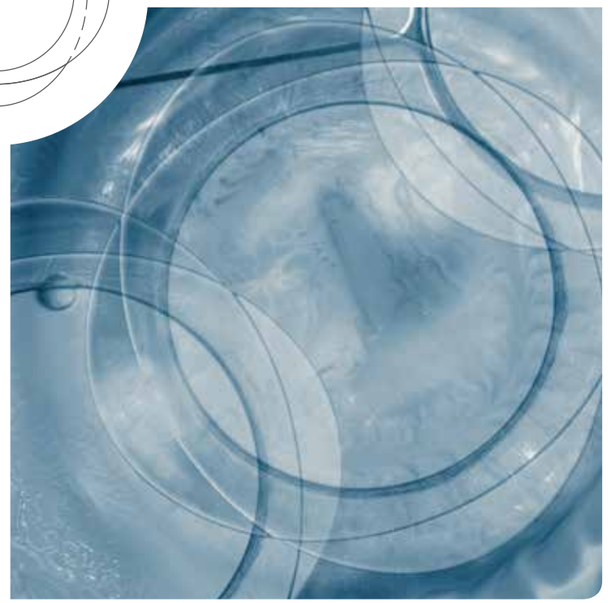


MADE IN GERMANY

BIL

BAG-IN-THE-LENS

Prof. Dr. Marie-José Tassignon



Modern intraocular lens implantation was introduced
by Sir Harold Ridley in 1948.

"The cure of cataracts was established within perhaps one and one-half hours in Cavendish Square in 1948".

Harold Ridley, 1952, BJO

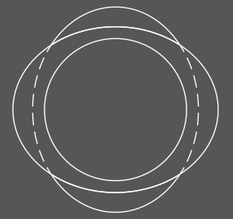
From that very same moment, research in the field of cataract
aimed at finding the solution for two major
complications which were already described by H. Ridley:

"Two surgery-related problems triggered criticism for decades after Harold's initial implant. ***The discussion of decentration and posterior capsule opacification*** *(PCO) … Harold himself noted these complications of extracapsular cataract extraction with IOL implantation in his earliest patients."*

David Apple, 2006

The **BAG-IN-THE-LENS**
was initially designed and patented as

"INTRAOCULAR LENS AND METHOD FOR PREVENTING SECONDARY OPACIFICATION".



US Patent Number 6,027,531
EP Patent Number 0916320A2

The first surgical case using the BIL technique was in December 1999,
a few months after having met H. Ridley in Stockholm at the
SOE meeting where he was an invited guest and before he was knighted
by Queen Elisabeth II in 2000.

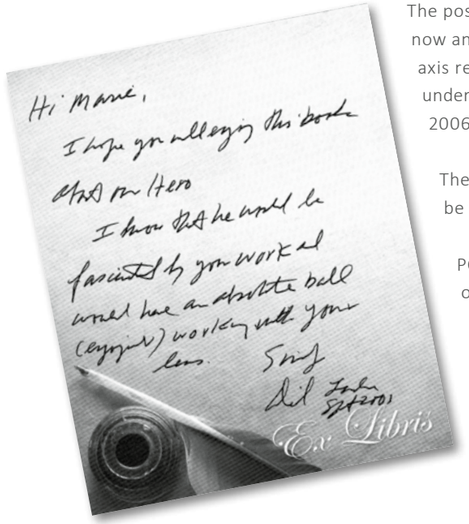
Harold Ridley with his wife Elisabeth (left) at the SOE 1999 in Stockholm

BACKGROUND OF THE BIL

The clinical study on the Bag-In-the-Lens started in 2000 after approval by the ethical committee of the Antwerp University Hospital (1/47/136) and got the approval of the Belgian Social Security in 2004.

In 2006, David Apple wrote the following dedication in his book *"Sir Harold Ridley and his Fight for Sight"* edited by Slack and published in 2006.

"I know that he (H. Ridley) would be fascinated by your work and would have an absolute ball (enjoyed) working with your lens." David Apple

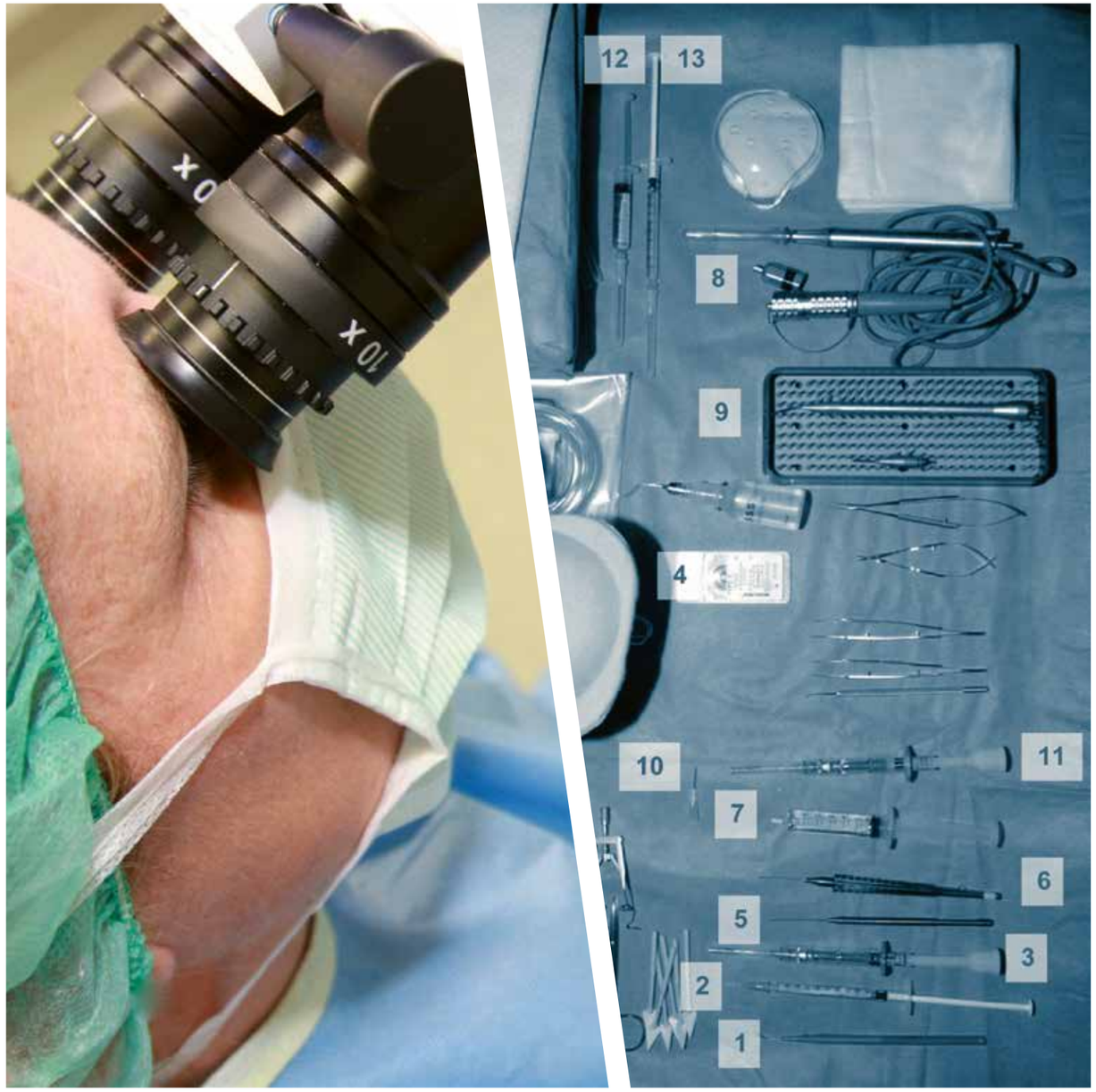


The postoperative follow-up of the Bag-In-the-Lens implantation has reached ten years now and no PCO, or in absence of capsular bag, we should rather speak about visual axis reproliferation (VAR), did occur. It is, as a consequence, very likely that PCO is under control (De Groot V. et al., 2005; Tassignon M.J. et al., 2006; De Groot V. et al., 2006; Leysen I. et al. 2006; Tassignon M.J. et al., 2011).

The centration stability of this new approach was also studied and turned out to be very stable over time (Verbruggen K. et al., 2007; Rozema J. et al., 2009).

PCO and centration are indeed two prerequisites before starting the implantation of more complex optics like toric and multifocal IOLs.

Implementation of toricity in the Bag-In-the-Lens is finalized as well as the preloaded version. The challenges will be to introduce the diffractive BIL.



SURGICAL PROTOCOL / CATARACT PROCEDURE

SURGICAL PROTOCOL

- temporal position of the surgeon
- opening of the limbus with a knife 2.8 mm (eventually 2.5 mm) [1]
- injection of 1.0 ml adrenalin solution (see procedure medication) [2]
- injection of Healon GV for corneal protection [3]
- insertion of the Caliper Ring Type 5 [4] using the Ring Caliper Inserter [5] and stabilising it with Healon GV [3]
- opening of the anterior capsule with the capsulorhexis forceps [6] (Ikeda 30° forceps)
- removing the Caliper Ring
- injection of BSS between the lens and the capsule, hydrodissection [7]
- phaco-emulsion of the lens content [8]
- removing lens remnants with the IA mode [9]
- cleaning the capsule with BSS using the Helsinki needle
- injection of Healon GV on top of the anterior capsule [3] (never fill the capsular bag!)
- puncturing of the posterior capsule by using the tuberculin needle or 36G needle [10]
- injection of Healon through the puncture hole within the space of BERGER until the size of the blister is slightly larger than the anterior capsulorhexis [11]
- attention not to overfill the space of BERGER
- performing the capsulorhexis with the Ikeda forceps [6]
- insertion of the lens with the injector
- injection of miostat (see procedure medication) [12]
- removing of the Healon with the IA mode
- refilling the anterior chamber with BSS and hydration of the corneal wound [9]
- control of the water tightness of the wound
- injection of Zinacef solution or Apracam (Théa Pharma) (see procedure medication) [13]

In paediatric cataract the procedure is slightly different:

- Ring Caliper 4.5 mm is used
- centration of Caliper Ring on anterior face of the lens capsule. After insertion of the Caliper Ring and stabilisation by means of Healon GV, the Eye Cage (ECT100) is positioned on the cornea and centered based on the limbus. Alignment of the inner ring of the Eye Cage and the Caliper Ring allows centration of the BIL based on the architectural centre of the cornea."
- two sight ports of 1.0 mm are used for lens removal
- injection of Healon into the space of BERGER by means of a 41G needle

SURGICAL PROTOCOL / CATARACT PROCEDURE

PROCEDURE FOR MEDICATION

Procedure zinacef solution fittings in case Aprocam® is not available

- 1 syringe 10.0 ml
- 1 syringe 1.0 ml
- NaCl bottle of 100.0 ml
- 2 aspiration needles (pink)
- Zinacef 250.0 mg powder (sterile)

Procedure (in OR)

- take 2.5 ml NaCl in the 10.0 ml syringe
- inject these 2.5 ml NaCl into the bottle filled with Zinacef 250.0 mg powder
- shake thoroughly until the Zinacef powder is properly diluted
- using the 10.0 ml syringe, take 1.0 ml out of this solution
- fill the additional 9.0 ml of the syringe with NaCl

Procedure on surgical tray

- the instrumentist takes a 1.0 ml syringe mounted with a pink aspiration needle
- aspiration of 1.0 ml from the Zinacef solution as explained
- use 0.1 ml in the anterior chamber, the remaining solution can be used to rinse the operated eye

Procedure adrenaline/preservative-free Xylocaine solution fittings in case Mydrane® is not available

- 1.0 ml syringe
- 1 aspiration needle (pink)
- adrenaline ampoula 1.0 ml (1:1000)
- xylocard ampoula

Procedure

- take 0.9 ml xylocard in a 1.0 ml syringe
- add 0.1 ml of 1:1000 solution adrenaline

Procedure miostat solution fittings

- syringe of 2.0 ml
- aspiration needle (pink)
- miostat ampoula (inside only is sterile!)
- BSS 15.0 ml

Procedure

- take 0.5 ml miostat in a 2.0 ml syringe
- add 1.5 ml BSS

Ocular viscoleastic devices (OVD)

- Healon
- Healon GV

INSTRUMENTATION LIST

DESCRIPTION	COMMENTS	REF. NO	MANUFACTURER
Bag-In-the-Lens foldable IOL	28 % hydrophilic acrylic	Type 89A, 89D, 89F	MORCHER®
Caliper Ring	To caliper the position of the anterior capsulorhexis	Type 4L, Type 5	MORCHER®
Ring Caliper Positioner	To position the Caliper Ring in the eye	SH-7017	EyeTechnology
Ikeda angled 30° capsulorhexis 23.0g forceps	To perform anterior and posterior capsulorhexis	FR 2268	EyeTechnology
Straight scissors in curved shaft	To adjust the capsulorhexis if needed	FR 2295C	EyeTechnology
ACCUJECT™ 2.2-BL Injector Set **ACCUJECT™ 2.6-BL Injector Set**	**Up to +23.0 diopters** Wound assisted injection: 1.9 – 2.2 mm Wound injection: 2.2 mm **For all diopters** Wound assisted injection: 2.2 mm Wound injection: 2.6 mm	LP604535 LP604505	Medicel
Hydrodissection Cannula, Helsinki, 27 G	To inject dispersive viscoelastic behind the posterior capsule	1273E	Steriseal
Dual Bore Subretinal BSS Injection Needle 20-23 Gauge	To be used in babies and children	20-1100	EyeTechnology
Eye Cage alignment device	Based on limbal centration and corneal Purkinje of the light of the microscope	ECT100	Technop

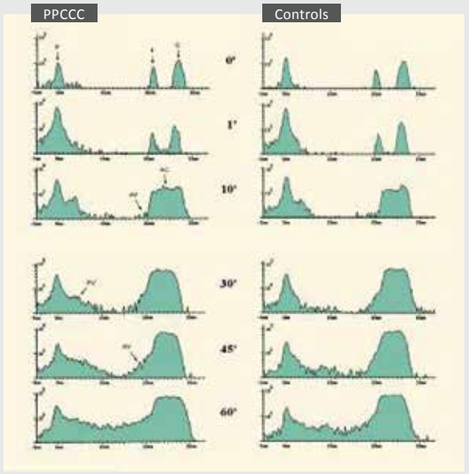
FREQUENTLY ASKED QUESTIONS

IS IT SAFE TO PERFORM A PPCCC?

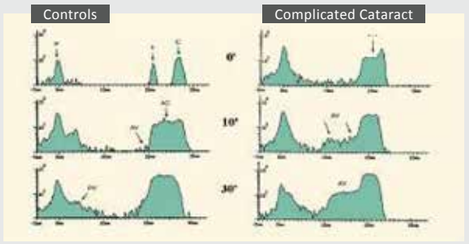
This question has been answered in the literature by many authors and research groups. However, we conducted a clinical study by measuring the fluorescein concentration in the anterior vitreous by means of fluorophotometry after cataract surgery, with and without PPCCC. The results of this study showed no increase in fluorescein in the anterior vitreous provided the anterior hyaloid remained intact.

Literature

- Lack of fluorophotometric evidence of aqueous-vitreous barrier disruption after posterior capsulorhexis.
  V. De Groot, M. Hubert, J.A. Van Best, S. Engelen, S. Van Aelst, M.J. Tassignon (2003). J. Cataract Refract. Surg. 29, 2330-2338
- Posterior capsulorhexis in adult eyes with intact and clear capsules.
  A. Galand, F. van Cauwenberge, J. Moosavi (1996). J. Cataract Refract. Surg. 22, 458-461
- Effect of primary posterior continuous curvilinear capsulorhexis with and without posterior optic buttonholing on postoperative anterior chamber flare.
  E. Stifter, R. Menapace, K. Kriechbaum, L. Vock, A. Luksch (2009).



Identical fluorescein concentration in the anterior vitreous in the eyes with PPCCC than without PPCCC (Control) (0' – 1' – 10' – 30' – 45' – 60').



Highly increased fluorescein concentrations in the anterior vitreous in the eys with complicated cataract cases compared to the controls.

FREQUENTLY ASKED QUESTIONS

HOW CAN ONE EASILY DEFINE THE ANTERIOR FROM THE POSTERIOR HAPTIC?

If the **posterior haptic** is positioned **vertically in the cartridge,** this haptic will be horizontal once inserted and unfolded in the anterior segment of the eye.

The opposite will happen in case the posterior haptic is positioned horizontally.

In the future, preloaded cartridges will be available in order to avoid any confusion. To inject the BIL in the correct orientation will be particularly important when dealing with toric lenses since the toric component is located at one side of the Bag-In-The-Lens optic and preferentially oriented facing the cornea.

Video No. 9

POSTOPERATIVE WOBBLING OF THE LENS. DOES IT MATTER?

In some very few cases the patients may complaint of wobbling images immediately after implantation. This optical phenomenon is due to the fact that the patient's capsular bag is quite big providing less stability of the BIL immediately after surgery.

However, the patient should be informed that most likely this symptom will disappear after a few weeks postoperatively as soon as the capsular bag has been refilled by fibrils procuded by Lens Epithelial Cell activity.. This takes typically 5 weeks to two months to occur.

HOW STABLE DOES THE CALIPER RING REMAIN ON TOP OF THE ANTERIOR CAPSULE?

In the Bag-In-the-Lens technique, the **balance** in pressure between anterior and posterior segment is crucial. The **caliper ring** is stabilised simply by **pressurising** the anterior chamber by means of OVD. The OVD which I prefer for this purpose is Healon GV (Abbott Medical Optics). I do not use Healon V, even not in children or babies.

The OVD in the anterior chamber has two functions:

- **protection** of the endothelium
- **counteracting** the positive vitreous pressure after having performed the corneal incision and before starting any manipulation in the anterior segment

Because in the BIL procedure, the balance of the eye is optimally respected throughout surgery, inflammation will also be very low.

The next question could be:
When is the anterior chamber properly filled with OVD? The answer is: As soon as you observe a **reflux** of OVD from the incision wound.

Video No. 8

You will find all listed videos on our website www.morcher.com

WHY IS IT NOT ADVISED TO FILL THE CAPSULAR BAG PRIOR TO PERFORM A PPCCC?

When performing a PPCCC, it is again very important to respect the **pressure balance** between anterior and posterior capsule. In case of overpressuring the anterior chamber, the posterior capsule will be pushed in close contact to the anterior hyaloid. This will increase the risk of puncturing the anterior hyaloid. In addition, the risk for capsule zipping while performing a PPCCC is much higher in the presence of a **concave** positioned posterior capsule compared to a **horizontally** positioned capsule.

In case of underpressure of the anterior chamber, the vitreous will move forward and the posterior capsule will be slightly convex. This situation is extremely **dangerous** for uncontrolled enlargement of the posterior capsule puncture performed for the injection of OVD in the space of BERGER.

What you have to remember, is:

- as soon as the capsular bag has been emptied from any lens material: refill the anterior chamber by injecting the OVD on top of the anterior capsule
- keep both anterior capsules close to each other
- puncture the posterior capsule in the middle of the area of the overlying anterior capsulorhexis
- use a microforceps to perform a well-controlled PCCC

Video No. 8

After having emptied the capsular bag of all lens material …

… NEVER re-fill the capsular bag with OVD !!

… on the contrary ONLY fill the anterior chamber with OVD on top of the anterior capsule and bring the capsule in a horizontal plane.

… after puncturing the posterior capsule inject the OVD through the hole until the blister is slightly larger than …

… the ACCC. Perform then the PPCCC of the same size than the ACCC.

FREQUENTLY ASKED QUESTIONS

HOW CAN THE BAG-IN-THE-LENS BE STABILISED ONCE INJECTED IN THE ANTERIOR CHAMBER?

Stabilisation of the lens once injected in the anterior chamber is again crucial and will allow a smooth and easy implantation.

By using the OVD needle (Healon regular or GV), the lens can be positioned so that the posterior haptic is acceptably horizontal, facing both capsulorhexis openings. It then can be pushed in close contact to the anterior capsule by injecting some more OVD on top of the anterior face of the lens optic.

By using the OVD needle, the lens is then displayed slightly to the right in order to position the posterior left haptic under the posterior capsule at the left side and by pushing very smoothly at the superior and inferior border of the optic, the capsules will automatically glide into the lens groove.

Video No. 2/3

WHICH ARE THE INDICATIONS FOR CTR IMPLANTATION USING THE BIL TECHNIQUE?

There are two indications for CTR use:
a. in case of weak zonules
b. in case of axial length ≥ 26.0 mm

Video No. 1/14

WHAT IS THE DEGREE OF TOLERANCE FOR THE SIZE OF THE ACCC AND PPCCC?

In adult eyes, the degree of tolerance is larger than in children or in babies. At least one of both rhexes should have the correct sizing which is between 4.5 to 5.0 mm. The bag-in-the-lens can still be implanted in case one capsulorhexis, whether it is the anterior or the posterior one, is too large, provided the other one has the proper sizing.

Improper sizing may occur in case of:

- inadvertent oversizing
- IOL exchange in which case the anterior capsulorhexis is oversized. It is then mandatory to carefully size the posterior capsulorhexis.
- IOL exchange in the presence of a large YAG laser capsulotomy. In this case the anterior capsulorhexis, measured by means of the caliper ring, should be of the proper sizing.

Too small anterior and posterior capsulorhexes should be avoided. This will make the implantation very difficult. The pressure needed to implant the lens will be too high causing an enormous stress on the zonular fibers.

The sizing of both capsulorhexis has been made much more tolerant for proper BIL implantation since the design of the bean-shaped ring segments.

Video No. 29

CAN THE LENS BE IMPLANTED IN CASE OF WEAK ZONULAR FIBERS?

Yes, the lens can be implanted in case of weak zonular fibers, taking the following points into account:

1. The use of a capsular tension ring, which should be positioned after the I/A of the cortex remnants.
2. A bimanual implantation technique is used: one hand retracts both capsules while the other hand keeps the lens in place.

While in the normal BIL implantation the capsule remains stable and the lens is manipulated to be properly positioned, in case of weak zonular fibers, the capsule is manipulated using a bimanual technique in order to glide the capsule into a stabilised BIL. With the advent of the bean-shaped rings, zonules can be overcome easily.

Video No. 10/11

IS IT SAFE TO PERFORM A PPCCC IN A HIGH MYOPIC EYE?

Our clinical experience allows to conclude that it is safe to perform a PPCCC in a high myopic eye. The rate of retinal detachment is the same in our series than in the literature. However, we always insert a capsular tension ring (CTR) in eyes presenting an axial length of 26.0 mm or more. The rationale behind this relies on the clinical evidence that these eyes often present an anterior vitreous schisis with a very large Berger's space and as a consequence a very weak anterior vitreous support. We believe that by stabilising the capsule with a CTR, this will be beneficial for the stability of the anterior vitreo-capsular interface.

Video No. 1

HOW EASY CAN THE BIL BE REMOVED?

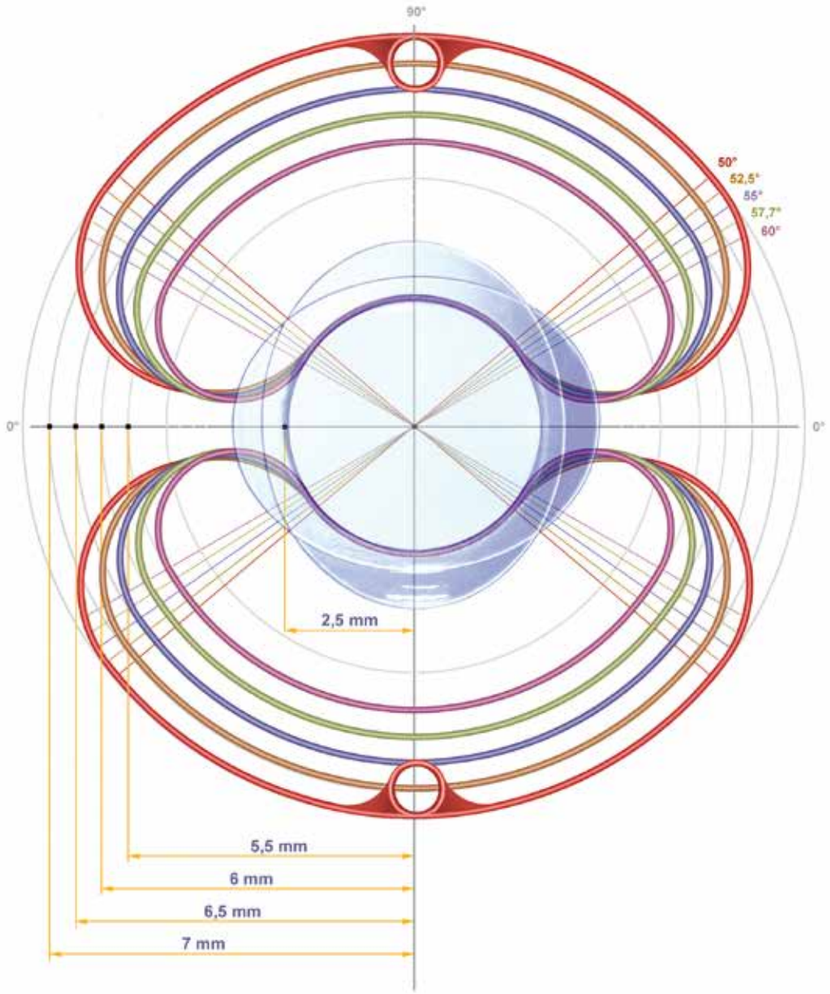
The BIL has the unique property to be easily removed at any postopertaive time and exchanged by another BIL. The reason for exchange can be because of changes in the refractive power as it can be expected in pediatric cataract or to correct corneal astigmatism.

After having filled the anterior chamber with visco elastic material in order to control the pressure between anterior and posterior chambers, the posterior haptic can be pushed down with a blunt instrument. My prefered instrument is with the needle of the visco-elastic syringe. The capsular Soemering will then separate from the lens groove and the needle can be positioned behind the posterior haptic while viscoelastic material is injected in order to immediately push bach the anterior vitreous face. The BIL can then be luxated anteriorly and freeded from its capsular support. It can then be approached like any other IOL (cut in peaces or cut off a triangular piece) in order to get it out from the anterior chamber and be replaced by the appopriate BIL.

IS THE SURGICAL TIME INCREASED DUE TO THE SUPPLEMENTARY STEP OF PPCCC?

Once the **learning curve** is terminated, surgical time is increased of about half a minute compared to a procedure without PPCCC.

A **routined** surgeon will perform a routine BIL case in 11 to 12 minutes. My fellows perform the surgery in 16 to 17 minutes.

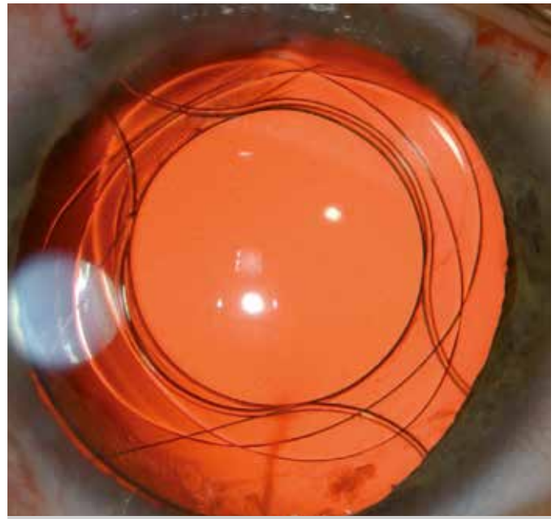


BEAN RINGS

In the absence of sufficient capsular bag or in case of weak zonular support the BIL can be stabilised and centered by means of beans positioned within the lens groove at the optical side and in the siliary sulcus at the peripheral side. The BIl will then be fixated in between both beans. In case of complete absence of capsular support or in case of extremely damaged zonules, the BIL will be fixated at the sclera by means of two prolene 10/0 threads following the previously described “lassooing” technique.

Literature

- Bean-shaped ring segments (beans) as a capsule enhancement tool in complex bag-in-the-lens (BIL) IOL implantation.
  Manuscript of “‘Altenburg et al.” which will be published in 2017 in the Journal of Refractive Surgery (accepted for publication in 2017: JRS 2016-034)



Postoperative picture of a BIL fixated by means of lassooing and beans

TORIC BIL

- The toric BIL implantation is currently also possible for astigmatism powers up to 8.0 D.
- The first 52 eyes have been implanted with excellent clinical results (see literature Bag-In-the-Lens).
- An adapted version taking the posterior corneal astigmatism into account will be available soon.
- The toric IOLs can be ordered by using the dedicated order form
- Please look at the Video Library, section “Toric BIL”, to learn about the implantation technique.

SPECIAL ADVICE

If the posterior curvature does not exceed 0.4 D., the regular BIL toric order form can be used. Always compare the result of at least two out of the following calculation methods: SRK/T or Haigis or Hoffor Q or Olson Use Haigis-Hoffer Q or Olson for hypermetropic outliers < 21.0 mm). Use Haigis Hoffer Q or Olson for myopic outliers > 26.0 mm. Compare the proposed monofocal BIL power with the SE of the calculated toric BIL power.
If the posterior curvature of the cornea is > 0.4 D., you must use the newly developed toric BIL calculation form.

LITERATURE

All articles can be downloaded surfing on the UZA website www.uza.be/cataractBIL

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Manuscript of "'Altenburg et al." which will be published in 2017 in the Journal of Refractive Surgery (accepted for publication in 2017: JRS 2016-034)

VIDEO LIBRARY

BIL SURGICAL TECHNIQUES

NO	INDICATION	PARTICULARITIES	DURATION
1	**Bag-In-The-Lens foldable IOL**	Capsular Tension Ring	2.26
2	**Uveitis Anterior**		1.11
3	**Uveitis Anterior**		1.06
4	**Uveitis Anterior**	Stick-Caliper	3.43
5	**BIL Implant Only**	Forceps Implantation	25.0
6	**Pigment Anterior Vitreum**	ACCC + BIL Insert	57.0
7	**BIL Implantation**	IOL rotation	51.0
8	**Metabolic Cataract**	Full Procedure	2.02
9	**89F IOL**	Longer Anterior Haptic	1.15

BIL SPECIAL CASES

NO	INDICATION	PARTICULARITIES	DURATION
10	**Weak Zonular Fibres**	Prolene Lasso Scleral Fixation	1.56
11	**Traumatic Lens Luxation**	Prolene Lasso Scleral Fixation	3.44
40	**Secondary BIL Implantation After Capsule Pealing**	Capsule Streching and BIL centration by means of beans	18.33

COMBINED BIL SURGERY

NO	INDICATION	PARTICULARITIES	DURATION
12	**BIL + PKP**	Open-Sky-BIL	2.20
13	**BIL + DSAEK**	Anterior Chamber	2.18
14	**Anterior Phakic IOL Exchange**	Capsular Tension Ring	4.52

BIL EXCHANGE

NO	INDICATION	PARTICULARITIES	DURATION
15	**Refractive Error**	Post Penetrating Keratoplasty	1.36
16	**Refractive Error**	Post Radial Keratomy + Intacs	1.37

CONGENITAL CATARACT

NO	INDICATION	PARTICULARITIES	DURATION
17	**Child Eye**	Posterior Capsule Plaque	4.13
18	**Child Eye**	Posterior Capsule Plaque	3.59
19	**Young Adult**	Anterior Capsule Plaque	4.36
20	**Child Eye**	Vitreous Interface/41G Needle	3.00
21	**Marfan**	Dislocated Lens	5.55
22	**Anterior PHPV**	Interface Dissection	6.02

IOL EXCHANGE

NO	INDICATION	PARTICULARITIES	DURATION
23	**Multifocal IOL**	Capsular Peeling	2.45
24	**Acrysof**	Posterior Capsule	1.50
25	**Multifocal IOL**	Capsular Peeling	3.41
26	**Decentrated Silicone IOL**	Posterior Continuous Curvilinear Capsulorhexis Rupture	1.38
27	**Decentrated IOL**	Damaged IOL	1.43
28	**Opaque H 60 M**	Capsular Peeling	2.31
29	**Yellow IOL**	ACCC/PCCC	4.00
30	**Traumatic Cataract**	Capsular Tension Ring	4.24
31	**Capsular Contraction Syndrome**	Capsular Peeling	6.56

TORIC BIL

NO	INDICATION	PARTICULARITIES	DURATION
32	**Secund Implant**	Cleaning Interface	3.21
33	**Congential Astigmatism**	Pukinje Centration	1.24
34	**Congential Astigmatism**	Pukinje Centration	2.59
35	**Trilogy**	Pukinje Centration	3.03
36	**Adult Cataract**	Corneal Astigmatism	3.32

EDITED VIDEOS WITH SOUND

NO	INDICATION	PARTICULARITIES	DURATION
37	**3 cases**	Implantation in child eye	7.52
38	**2 cases**	Mysteries of the Anterior Hyaloïd	7.58

HOW TO BECOME A BIL USER

Those surgeons who are interested to implant the BIL can become certified after having performed the following training:

1. Wetlab and instructional course at the Annual ESCRS meeting on PPCCC, which is a prerequisite course to be allowed at the wetlab.

2. Observership at the Antwerp University Hospital, Department Ophthalmology
Director: Prof. Dr. Marie-José Tassignon
Faculty BIL users: Prof. Dr. Marie-José Tassignon, Prof. Dr. Veva De Groot, Dr. Jan Van Looveren, Dr. Stefan Kiekens, Dr. Sorcha Ní Dhubhghaill
Scientific coordinator: Danny Mathysen

3. Observership at any centers with certified instructors

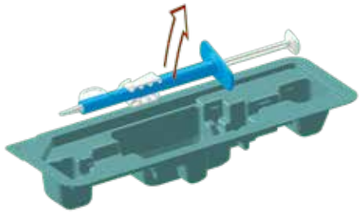
SECURITY ADVICE

- Before beginning a procedure, be sure you fully understand the nature of the device and its proper implantation. Always view the DVD provided for a more complete understanding.
- It is advisable to participate with an experienced surgeon before attempting to perform the procedure on your own.
- It is recommended to insert a capsular tension ring (CTR) in all eyes with unstable capsule. Its insertion should be done once the crystalline material has been removed completely and before performing the PPCCC. Both the anterior and posterior capsule MUST be kept in close contact while injecting the CTR in order to allow proper insertion of both capsules in the lens groove during the lens positioning.
- Due to the possibility of Iris capture it is recommended to keep the Iris in miosis for three days.

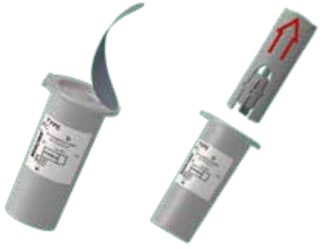
EyeJet® BIL

SINGLE-USE PRELOADED BAG-IN-THE-LENS

The appropriate surgical techniques are the responsibility of the respective surgeon. He or she must assess the appropriateness of the relevant procedure based on his or her education and experience.



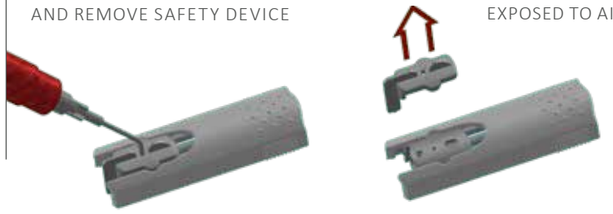
01 OPEN THE INNER BLISTER AND REMOVE INJECTOR

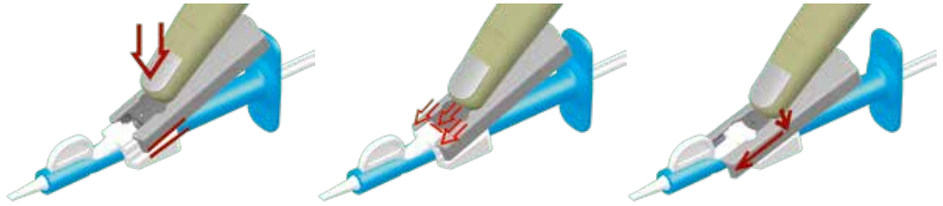


02 OPEN IOL-CONTAINER AND REMOVE IOL-CARRIER

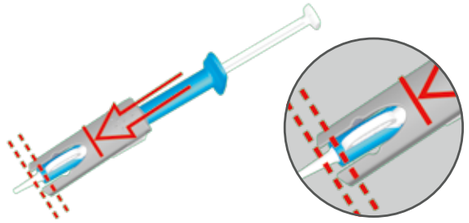
03 FILL OPENING OF IOL-CARRIER SLOWLY WITH SUFFICIENTLY VISCOELASTIC SOLUTION AND REMOVE SAFETY DEVICE

IMPORTANT: VISCOELASTIC MATERIALS MAY LOSE THEIR LUBRICATING PROPERTIES WHEN EXPOSED TO AIR FOR A LONGER PERIOD OF TIME!

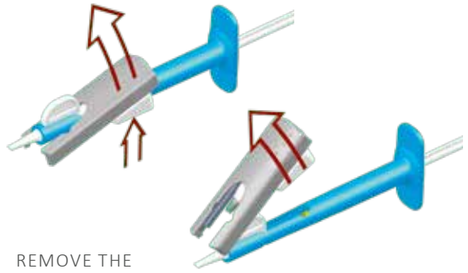




04 SECURE IOL-CARRIER ONTO THE LOADING DEVICE



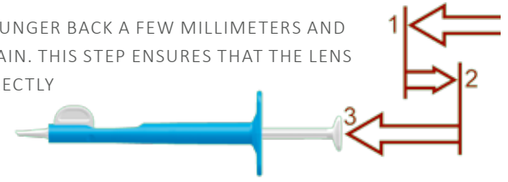
05 GENTLY SLIDE THE FOLDING DEVICE **COMPLETELY** TO THE FRONT



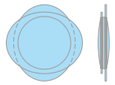
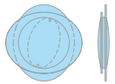
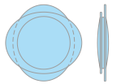
06 REMOVE THE FOLDING DEVICE

07 **SLOWLY** PUSH THE PLUNGER FORWARD IN ORDER TO PROCEED WITH THE IMPLANTATION (GENTLY IN ORDER TO AVOID DAMAGE TO THE IOL)

IMPORTANT: PULL THE PLUNGER BACK A FEW MILLIMETERS AND THEN PUSH FORWARD AGAIN. THIS STEP ENSURES THAT THE LENS IS ALWAYS GRASPED CORRECTLY



TECHNICAL DATA


BAG-IN-THE-LENS SERIES	TYPE 89A/PRELOADED	TYPE 89A TORIC	TYPE 89D	TYPE 89F
Indication	Adults/Pediatrics	Adults/Pediatrics Regular Astigmatism	For small eyes (< 18.0 mm) and/or small white to white < 10.0 mm.	Combined cataract and vitrectomy procedures or in eyes with large pupils.
Total Diameter	7.5 mm	7.5 mm	6.5 mm	8.5/7.5 mm
Optic Diameter	5.0 mm	5.0 mm | toric	4.5 mm	5.0 mm
Standard-Diopter-Range	10.0 – 30.0 D. (0.5 inc.)	10.0 – 30.0 D. (0.5 inc.)	10.0 – 30.0 D. (0.5 inc.)	10.0 – 30.0 D. (0.5 inc.)
Preloaded Diopter-Range	10.0 – 28.0 D. (0.5 inc.)	-	-	-
On-Request-Range*[1]	8.5 – 9.5 D. (0.5 inc.) 30.5 – 35.0 D. (0.5 inc.)	8.5 – 9.5 D. (0.5 inc.)	8.5 – 9.5 D. (0.5 inc.) 30.5 – 35.0 D. (0.5 inc.)	8.5 – 9.5 D. (0.5 inc.)
Theoretical Standard Power	23.0 D.	23.0 D.	23.0 D.	23.0 D.
Cylindrical Power	-	0.5 – 8.0 D. (0.5 inc.)	-	-
Theoretical A-Con. (optical)	118.2	118.2	118.2	118.2
Theoretical ACD (optical)	5.08 mm	5.08 mm	5.08 mm	5.08 mm
Material	Hydrophilic Acrylic			
Water Content	28.0 %			
Filter	UV-Filter			
Refractive Index	1.46			
Incision (preloaded)	> 2.4 mm	-	-	-
Injector (recommendation)	**Up to +23.0 diopters:** Medicel ACCUJECT™ 2.2-BL (LP604535) Wound assisted injection: 1.9 – 2.2 mm, Wound injection: 2.2 mm **For all diopters:** Medicel ACCUJECT™ 2.6-BL (LP604505) Wound assisted injection: 2.2 mm, Wound injection: 2.6 mm			
Recommended Caliper Ring*[3] for ACCC*[2]	TYPE 5 TYPE 4L (PED)	TYPE 5 TYPE 4L (PED)	TYPE 4L	TYPE 5
Feature	No PCO in visual field!			
Note	Surgeons must partake in prerequiste course before implantation!			
Security Advice	Due to the possibility of Iris capture it is recommended to keep the Iris in miosis for three days!			

*[1] Other D. on request | *[2] Anterior Continuous Curvilinear Capsulorhexis | *[3] Gauge for Capsulorhexis




CALIPER RINGS	TYPE 4	TYPE 4L	TYPE 5	TYPE 6
Total Diameter	4.3 mm	4.8 mm	5.3 mm	6.3 mm
Capsulorhexis Ø (Inner Diameter)	4.0 mm	4.5 mm	5.0 mm	6.0 mm
Material	BLACK PEMA			
Bag-In-The-Lens Type		89D	89A/89A TORIC/89F	
Note	For proper positioning, we recommend the „Caliper Ring Positioner“ of company Eye Technology SH-7017			





CALIPER RINGS	TYPE 80	TYPE 80A	TYPE 80B	TYPE 80C	TYPE 80F
Total Diameter	11.0 mm	12.0 mm	13.0 mm	14.0 mm	15.0 mm
Angle	60°	57.7°	55.0°	52.5°	53.1°
Inner Diameter	5.0 mm				
Suturable arms	one				
Material	PMMA (Compression molded)				

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