

One-Year Results with the Akreos Adapt: A Single-Piece Hydrophilic Acrylic IOL

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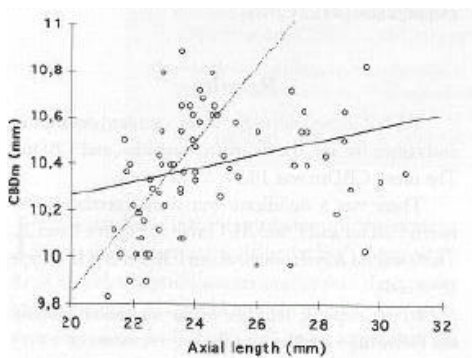
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The Akreos Adapt is a new single-piece posterior chamber lens from Bausch & Lomb made of hydrophilic acrylic material with a 26 % water content. The lens is designed with an equiconvex 6 mm optic and 4 flexible haptics. The edges of the optic as well as the haptics are square.

We know that diameter of the capsular bag varies with the axial length of the eye. This positive correlation has been demonstrated by Vass and co-authors as shown below.



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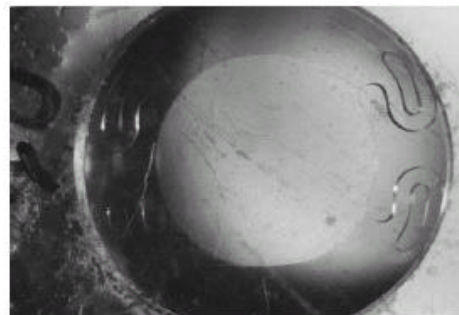
With this in mind, Bausch & Lomb designed a lens with 3 different diameters to fit the 3 categories of capsular bag size.

Each lens diameter is available in a range of diopters for myopic, emmetropic, or hyperopic eyes. Use of a lens with proper dimensions makes it possible to optimize the contact angle of the 4 fixation points with the bag equator of any eye and to exert uniform tension on the posterior capsule.

Lens Diameter	Diopter Range
11 mm	10 to 15 D
10.7 mm	15.5 to 22 D
10.5 mm	22.5 to 30 D

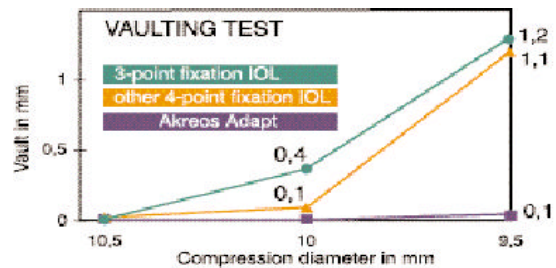
The haptics of the Akreos lens are designed to maximize the filling of the capsular bag and adapt to contraction forces.

This has been first confirmed by laboratory testing. Following picture is a 10.5 mm lens in a 9.5 mm template which shows the good compressibility of the lens.



Akreos Adapt in a 9.5 mm sizing gauge

Testing was also conducted comparing the vaulting of Akreos Adapt and 2 other hydrophilic acrylic lenses (3 and 4 point fixation) with various amounts of compression. The results below show the minimal vaulting of the Akreos Adapt under compression.



We report the one-year follow-up of 101 patients operated by three surgeons. All patients underwent phaco surgery and were implanted through a 3.2 to 3.5 mm incision. Visual acuity, refraction, lens stability and capsular opacification were evaluated.

Next chart shows the pre-operative characteristics of the patients included in our study: mean age 76 years, 75 females, 26 males, with a mean best corrected visual acuity of around 20/63.

Patient Characteristics Pre-op

Mean Age	76 years (SD 7.5, range 57 to 92)
Sex	26% male / 74% female
Mean UCVA	0.17 (~ 20/125) (SD 0.1, range 0.005 to 0.4)
Mean BCVA	0.31 (~ 20/63) (SD 0.13, range 0.005 to 0.6)
Mean IOP	14.8 mmHg (SD 2.2, range 9-20)
Pre-existing Pathology	1% dystrophy, 9% glaucoma 12% retinopathy

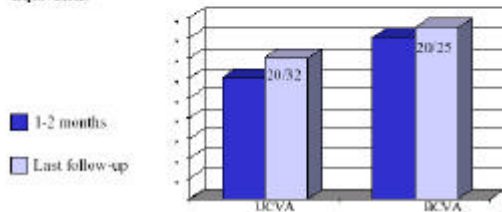
In all cases, the rhexis diameter was superior to 5 mm but it was larger than the optic diameter in 27 % of cases. 73 lenses were injected. Personally, I prefer using the Akreos Fold delivery system which allows to fold the lens easily and quickly.

At the end of the surgery, the Akreos Adapt lens was always well centred in the capsular bag.

At the last follow-up, which ranged from 7 to 18 months, the mean uncorrected vision was 20/32 and the mean corrected vision was 20/25. The mean spherical equivalent was slightly myopic but the refraction was stable with time.

Visual Acuity Results

	1-2 Months Post-op	Last Follow-up Best Cases* (N=79)
Mean UCVA	0.60 (0.26) [0.02 - 1.0]	0.70 (0.21) [0.2 - 1.0]
Mean BCVA	0.80 (SD 0.22) [0.10 - 1.0]	0.84 (0.14) [0.5 - 1.0]
Mean Spherical Equivalent	-0.61 D (0.75) [-2.75 + 1.50]	-0.55 D (0.76) [-3.0 + 1.50]



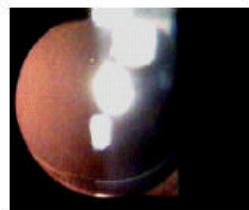
During the follow-up, no decentration was observed.

Pictures below show stability of the lens at one month and one year after implantation.

1 month post-op



1 year post-op



Photos courtesy of J. P. Lumbroso, M.D.

In order to evaluate to which extent the lens diameter was a factor of stability, the lenses were divided into two groups. Group one consists of 67 lenses of 10.7 mm diameter and group two of 34 lenses of 10.5 mm diameter. Next chart shows the biometric characteristics of each group.

Comparison of Groups with Different IOL Diameters Inserted

	Group 1 Diameter 10.7 mm n = 67/101 (66%)	Group 2 Diameter 10.5 mm n = 34/101 (34%)	P-Value
Axial Length	23.3 (0.74 SD)	22.3 (0.76 SD)	0.001
Keratometry	43.53 D (1.7)	43.34 D (1.9)	0.6
IOL Power	20.7 D (1.17)	23.6 D (1.28)	0.001

P = values by Student's t-test

As expected from laboratory testing, no statistically significant differences were found between the two groups in terms of best corrected vision, refraction and stability.

31 cases of anterior fibrosis were reported. Almost 70 % of them occurred when the rhexis was larger than the optic diameter. Although the PCO incidence seems high, most cases were light and only 4 YAG procedures were performed.

Capsular Opacifications

Anterior Fibrosis	31/101
Light Grade	77.4% (n=24)
Peripheral	74.2% (n=23)
Rhexis > than optic diameter	67.7 % (n=21)
Posterior Capsular Opacification	31/101
Light Grade	83.9% (n=26)
Peripheral, paracentral	58.1% (n=18)
Nd:YAG Procedures	4/101
Mean time to YAG 12.6 M (SD 3.9)	

The PCO that was observed was of no consequence to visual acuity.

BCVA without PCO was 0.80 (mean SD 0.21) and BCVA with PCO was 0.78 (mean SD 0.21). There was no statistically significant difference between the eyes with PCO and the eyes without PCO. (p = 0.74).

CONCLUSION

The Akreos Adapt IOL is easy and safe to implant with injector or forceps. No lens related complications were observed in the study. The lens stability and reliability in the bag seem to confirm the interest of proposing a lens with different diameters according to the dioptr range.