

Refractive Surgery in Eyes With Congested Anterior Chambers

Which procedure is appropriate in eyes with diminished anterior segment dimensions?

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Ophthalmic surgeons who offer laser vision correction know that their reputations grow by word of mouth, as an effect of the miraculous results of the services they provide. Patients sometimes have a sense that the laser can correct anything. Soon, older patients will seek solutions for presbyopia and other visual conditions through laser vision correction.

DECREASE IN DISTANCE VISION

Among patients aged 45 to 60 years, a disproportionate number of hyperopes have experienced a decrease in distance vision. Most of these individuals have taken pride in their excellent distance vision in years gone by. They are looking for the freedom that laser vision correction promises and desire a life free of spectacles.

Many of these patients are ideal LASIK candidates, provided they have excellent corneal topographies and pachymetries. Aside from the hyperopia, their eyes are otherwise healthy, and LASIK monovision can provide an excellent outcome if they are suited to this treatment. In addition to LASIK monovision, other forms of treatment, including mini-monovision and blended monovision, can be performed depending on the patient's needs.

RISK OF ANGLE CLOSURE

I want to discuss the patient group in which the Pentacam (Oculus Optikgeräte) reveals the presence of diminished anterior segment dimensions. Surgeons routinely use the Pentacam to evaluate the anterior chamber dimensions of volume, depth, and angles. Values are typically around 200 mm³ or more for volume, approximately 2.8 mm or more for depth, and greater than

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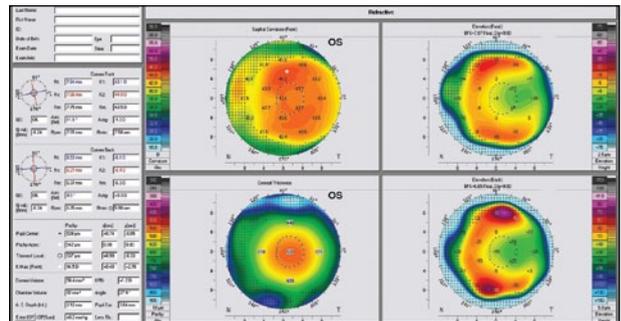


Figure 1. Anterior chamber dimensions are located on the bottom left of this Pentacam screen.

Cornea Volume:	64.9 mm ³	KPD:	+1.6 D
Chamber Volume:	66 mm ³	Angle:	20.0°
A. C. Depth (Int.):	1.94 mm	Pupil Dia:	2.45 mm
Enter IOP	IOP(Sum):	-0.3 mmHg	Lens Th.:

Figure 2. In this eye, all three anterior chamber dimensions (yellow) are below the critical levels. Surgical options are peripheral iridotomy followed by laser vision correction or a lens exchange. In the author's view, lens extraction is the superior option.

Cornea Volume:	58.4 mm ³	KPD:	+1.2 D
Chamber Volume:	92 mm ³	Angle:	27.9°
A. C. Depth (Int.):	2.12 mm	Pupil Dia:	3.04 mm

Figure 3. Anterior chamber dimensions (yellow) in this eye are: volume 92 mm³, angle 27.9°, and depth 2.12 mm. Only one of the three critical values (volume) has been breached, but the other parameters are close to the critical values.

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30° to 35° for angles. In this group of low to moderate hyperopes, however, the dimensions sometimes tell a different story. The volume quite often approaches the 100-mm³ mark, the depth is around 2.2 mm, and the angle is about 28° or less (Figures 1 through 3). The literature informs us that, with a volume of 100 mm³ or less, depth of 2.1 mm or less, and angles of less than 26°, the risk of angle closure in the next 6 to 12 months is 50%.¹

The lens has its embryologic background from surface ectoderm, and that implies that the natural lens never stops growing, both in thickness and in equato-

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1. With regard to anterior chamber dimensions, at what values do you opt for lens replacement rather than LASIK?

- Volume, 100 mm³; depth, <2.1 mm; angles, <26°
 Volume, 110 mm³; depth, 2 mm; angles, 28°
 Volume, 100 mm³; depth, 2.5 mm; angles, 26°

2. Is refractive lens exchange a viable solution in eyes with congested anterior chambers?

- Yes
 No
 Unsure

3. Would you perform a peripheral iridotomy before LASIK instead of a lens replacement procedure in these types of eyes?

- Yes
 No
 Unsure

4. Would you perform laser vision correction in an eye in which future anterior chamber congestion is anticipated?

- Yes
 No
 Unsure

With the thinner lens in place, decongestion of the anterior chamber is relieved and the issue of narrow angles is permanently resolved.

rial dimensions. We can therefore expect in ensuing years that the anterior chamber dimensions in eyes like these will further diminish. LASIK does not significantly alter these dimensions, although, if there is some latent hyperopia that is corrected by LASIK, the lens thickness may temporarily decrease due to reduced accommodative effort.

In these eyes with reduced dimensions, lens replacement surgery achieves a number of targets in one swoop: refractive correction, the management of presbyopia by monovision or multifocality, the prevention of future cataracts, and the decongestion of the anterior chamber. Lenstar (Haag-Streit) measurements show that the average crystalline lens in patients 45 to 55 years of age is approximately 4 mm thick, whereas a replacement IOL is typically less than 1 mm thick. With the thinner lens in place, decongestion of the anterior chamber is relieved and the issue of narrow angles is permanently resolved.

QUESTIONS

The questions I pose are these:

- With regard to anterior chamber dimensions, at what values do you opt for lens replacement rather than LASIK?
- Would refractive lens exchange be a viable solution eyes with congested anterior chambers?
- Would you perform a peripheral iridotomy before LASIK instead of a lens replacement procedure?
- Would you perform laser vision correction in an eye in which future anterior chamber congestion is anticipated? ■

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1. Pakravan M, Sharifpour F, Yazdani S, et al. Scheimpflug imaging criteria for identifying eyes at high risk of acute angle closure. *J Ophthalmic Vis Res.* 2012;7(2):111-117.