

# IOL EXCHANGE OR PIGGYBACK IOL?

TWO SURGEONS SHARE THEIR PREFERENCES REGARDING THESE ENHANCEMENT METHODS AND THE REASONS FOR THEIR CHOICES.

BY ASIM R. PIRACHA, MD; AND DAVID A. GOLDMAN, MD



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## IOL Exchange

Although I perform both IOL exchange and piggyback IOL procedures in eyes with refractive error after premium IOL implantation, an IOL exchange is generally my preference. This article explains why.

### MY PREFERENCE: IOL EXCHANGE

An IOL exchange is my strong preference for patients who have toric IOLs with compound spherical and cylinder refractive errors. Exchanging the lens for the ideal lens is more predicable than implanting a piggyback IOL combined with an astigmatic keratotomy (AK) or limbal relaxing incisions (LRIs). An IOL exchange will be better tolerated in the long term and will achieve a better refractive outcome than adding a second lens and treating the residual astigmatism, especially if the amount of cylinder is high (> 2.00 D). Piggyback IOLs can reduce the spherical component, and AKs or LRIs can reduce the cylinder component, but both treatments are based on nomograms with variability in outcomes. I prefer to address the root cause of the refractive error, which is the preexisting IOL.

In some cases, of course, neither an IOL exchange nor a piggyback IOL will be required. If the spherical equivalent is close to zero, it may

be possible to rotate the toric IOL to the correct axis and correct the residual refractive error. The OPD-Scan III (Nidek) and iTrace (Tracey Technologies) can provide useful information in these cases. There are also online calculators that can analyze the toric IOL results and determine if repositioning of the toric lens will correct the residual astigmatism. I use the iTrace at the 1- to 2-week postoperative visit to show the axis of the toric IOL and to calculate both the current astigmatism (preoperative entire eye astigmatism) and the residual astigmatism (postoperative entire eye astigmatism) that would be present if the IOL were rotated to the ideal position. If rotation of the IOL would not fully correct the refractive error, I perform either an IOL exchange or a laser vision correction enhancement.

### PIGGYBACK IOLS: WHY AND WHY NOT?

Generally speaking, I prefer to implant a piggyback IOL in the sulcus in eyes in which the primary IOL was a one-piece acrylic IOL implanted over 2 years before presentation. This is because there is a greater risk for capsular fibrosis and the potential for increased difficulty removing such an IOL without causing capsular bag or zonular damage. Piggyback IOL

implantation is also safer than an exchange if the posterior capsule is not intact as there would be more risk for vitreous loss or prolapse and the exchanged IOL would have to be placed in the sulcus with or without optic capture in the anterior capsule. The primary reasons why I prefer to exchange a premium IOL in most cases is to limit the number of IOLs in the eye to one and to place the IOL where it is designed to be positioned—in the capsular bag.

### POTENTIAL COMPLICATIONS

The anterior segment tolerates a single IOL better in the long term, whereas piggyback IOLs are associated with several potential complications, including intralenticular opacification, (most commonly when there is more than one acrylic IOL in the capsular bag), uveitis-glaucoma-hyphema syndrome, pigment dispersion, and optic capture.<sup>1-3</sup> Theoretically, a haptic of a piggyback IOL could migrate behind weak zonules and move into the vitreous space, causing the lens to shift significantly and leading to removal or suturing of the lens to the iris. Implanting a piggyback lens leaves the eye with two optics that may not be perfectly aligned, which could

induce higher-order aberrations or astigmatic error.

### CONCLUSION

There are many options to enhance residual refractive errors in premium IOL patients. Depending on the refractive error and clinical findings, the surgeon could opt for cornea- or IOL-based surgery. Premium IOL surgeons should be

comfortable rotating toric lenses, exchanging IOLs, and placing piggyback IOLs to correct their patients' refractive errors. Depending on the refraction, style of lens, and condition of the capsule, the surgeon should choose the surgical option that will address the refractive error with the safest and most effective short- and long-term solution. I typically prefer an IOL exchange over

a piggyback IOL for better refractive outcomes, better safety, and better long-term stability.

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BY DAVID A. GOLDMAN, MD

## Piggyback IOL

Multiple factors must be taken into consideration when deciding among premium IOL enhancement methods. For example, if a patient with astigmatism has had any kind of toric IOL implanted—whether monofocal, multifocal, or extended depth of focus—the easiest early intervention for residual astigmatism is to simply rotate the lens to the proper axis. If too much time has passed, the astigmatism was unanticipated, or the implanted IOL is not a toric lens, the physician may feel more comfortable performing laser vision correction instead.

The home-run for piggyback IOLs is in patients with large hyperopic errors. Small errors can be corrected with a piggyback IOL, but it's not an ideal approach. Those patients may be better suited to laser vision correction, unless they've had LASIK or are not candidates for laser vision correction. If you have a patient who has a significant hyperopic refractive error (+5.00 D, for example) hyperopic LASIK or PRK are not necessarily going to yield ideal outcomes. For these patients, a piggyback IOL or IOL exchange will be a better enhancement method.

### EXCELLENT OPTION

Piggyback IOL implantation is an excellent option when spherical error is present. Not only are these IOLs effective for treating residual refractive error, but they can also improve symptoms of negative dysphotopsia in some patients. Although reverse optic capture is one of the top choices for resolving the symptoms of negative dysphotopsia, placing a piggyback lens in the sulcus can also ameliorate the symptoms in many cases. Additionally, because piggyback lenses have a refractive power, in many cases the lens can further improve the patient's UCVA.

### NOT AN OPTION

If the refractive error is myopic, a piggyback IOL is not an option because there are no longer commercially available negative-powered lenses that are suitable for sulcus implantation. Piggyback lenses today are useful only for the treatment of hyperopic refractive errors. These errors are typically refractive surprises in patients who previously underwent myopic LASIK. Because these eyes tend to be longer than average, there

is usually more than sufficient space in the sulcus for an IOL.

### PIGGYBACK IOL OR IOL EXCHANGE?

The choice between piggyback IOL and IOL exchange really depends on the patient. For a very hyperopic small eye, an IOL exchange may be the better choice because there may not be enough space in the sulcus to accommodate a piggyback lens. For the vast majority of patients, however—especially patients whose original surgery was a long time ago—a piggyback IOL is the better option, in my opinion.

Here's a case example. Let's say you are treating a highly hyperopic patient who had cataract surgery in one eye. The original surgeon decided to leave the patient hyperopic because of a monocular cataract. Now, the patient presents for surgery on the second eye and wants to see better at distance without glasses. A good strategy could be to target plano in the second eye and then implant a piggyback lens in the first eye to reduce the hyperopia and address any ametropia.

A piggyback IOL offers many advantages over an IOL exchange in

appropriate cases. First, the former is often less invasive. Typically, the original incision is reopened, or a new incision is created and then the piggyback lens is implanted after the eye has been stabilized with an OVD. The OVD is then removed, and surgery is done.

The recovery after a piggyback IOL procedure also tends to be quick. With a lens exchange procedure, depending on the position of the original lens implant, there can be significant scarring in the capsular bag around the IOL, particularly around the haptics. Without careful dissection, there is a risk of damage to the zonules or rupturing of the posterior capsule, which would prevent the implantation of another IOL in the capsular bag.

#### **POSSIBLE COMPLICATIONS**

There are a few potential complications associated with piggyback IOLs. The main one is chafing of the iris caused by too little space in the sulcus. Iris transillumination defects and

uveitis-hyphema-glaucoma syndrome can also occur. In such cases, the best option is to remove the sulcus lens. Fortunately, because the lens is within the sulcus and there's no adhesion to the IOL, explanting a piggyback lens is simple.

Generally, it is wise to use a silicone lens for piggybacking, especially if you don't know the material of the lens within the capsular bag. If an acrylic lens is piggybacked on top of another acrylic lens, for example, you run the risk of interlenticular opacification. Implanting a silicone piggyback IOL when either a silicone or acrylic IOL is in the capsular bag carries almost no risk of interlenticular opacification.

#### **CONCLUSION**

Knowing how to identify suitable candidates for IOL exchange versus a piggyback IOL is key. If a patient is a good candidate for a piggyback IOL, I have no hesitation in choosing that enhancement method. In my experience, results are very

predictable. This is particularly advantageous when patients with a history of refractive surgery experience a myopic refractive surprise after cataract surgery. In my experience, there is less chance of another refractive surprise with a piggyback IOL than with an IOL exchange. ■

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