

PEDIATRICS

Refractive Surgery in Children: Narrow Indications and Improved Quality of Life

BY MARIANNE DORAN, CONTRIBUTING WRITER

INTERVIEWING AMY K. HUTCHINSON, MD, PAUL J. RYCHWALSKI, MD, AND ERIN STAHL, MD

Most children with refractive errors can be treated successfully with glasses or even contact lenses. But for those who cannot wear corrective lenses, refractive surgery may be an alternative. Fortunately, the population of children who might require refractive surgery is quite small. For instance, refractive surgery can be a reasonable option for children with anisometropic amblyopia that does not respond to standard treatment. And surgical correction of significant refractive errors may substantially improve quality of life for children who have behavioral or developmental problems that make it difficult to wear glasses or contact lenses. However, the decision to undertake refractive surgery in children should be given careful thought—both the procedure itself and follow-up require special considerations.

Which Children May Benefit?

Most young candidates for refractive surgery fall into one of two groups: children with anisometropic amblyopia who have failed conventional treatment and children with bilateral high refractive error who cannot or will not wear glasses or contact lenses.

“These children may have developmental delays or sensory issues that make it difficult for them to tolerate glasses on their face,” said Erin Stahl, MD, at the University of Missouri–Kansas City. “Children with congenital facial deformities also may not be able

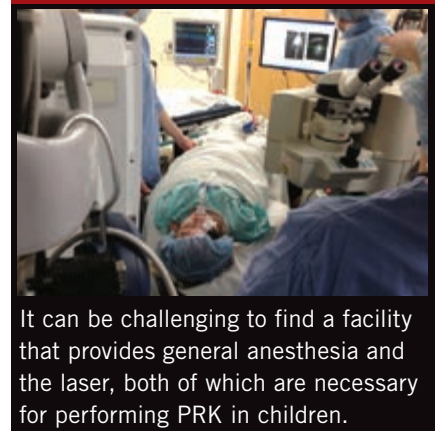
to wear glasses.” Other potential beneficiaries include children who have cerebral palsy or autism. Many of these patients were born prematurely and develop significant refractive errors, along with behavioral problems that make wearing glasses difficult.

“It’s reasonably well accepted that refractive surgery may be a good option for some of these children,” said Amy K. Hutchinson, MD, at Emory University School of Medicine. “For children with very high bilateral myopia, PRK [photorefractive keratectomy] may not completely correct their refractive error but may reduce it to a point where the child can now function and not live in visual isolation. In children, we do not necessarily expect the perfect refractive result you hope for in a healthy adult.”

Glasses First, Whenever Possible

Eyeglasses are the first step for a child who is anisometropic. Glasses serve two purposes, said Paul J. Rychwalski, MD, at the Cleveland Clinic. “Glasses balance the prescription so that the retinal images from both eyes are equally in focus, and, as a result, the brain does not pick a favorite. Polycarbonate glasses protect the eyes, which is especially important for the sound eye. We always want the child to go into glasses first, and if amblyopia develops, we start patching.” Dr. Rychwalski added that contact lenses are another option, but they may be difficult for some patients to tolerate and for some families to manage.

A Logistical Issue



It can be challenging to find a facility that provides general anesthesia and the laser, both of which are necessary for performing PRK in children.

Dr. Stahl said that some families with an anisometropic child come to see her because, for one reason or another, their child does not want to wear glasses or contacts, and the parents want to know why the child cannot just have the surgery. “I tell parents that their child is not a good candidate because the eyes are still changing and have more growing to do and that refractive surgery might be appropriate when their eyes stop growing.”

Taking time to educate parents is critical, especially when they do not want their child to wear glasses because of social or cosmetic concerns or because the child is resistant to wearing them. Some of this resistance arises when a child who is put into glasses appears to be seeing just fine but in reality is simply closing the bad eye and using the good eye. At this point, parents often inquire about a surgical solution. Dr. Rychwalski’s practice is

to take the child through the available nonsurgical interventions, including contact lenses, before he considers refractive surgery.

The important thing to remember is that the indications for pediatric refractive surgery are quite narrow, Dr. Rychwalski said. “Only a small number of children will be candidates for the procedure because most kids respond beautifully to conventional care. But some patients simply do not respond or are noncompliant with standard treatments. If these children are found to be good candidates, we shouldn’t deny them a procedure that is so effective in adults.”

Timing and Technique

Once the decision is made to proceed with surgery, the questions of when and how are relatively easy to answer.

Timing. Age 10 is often cited as the upper age limit for performing refractive surgery on a child with anisometropic amblyopia. “In general, you want to have the refractive error balanced and the eyes rehabilitated by age 10,” Dr. Rychwalski said. However, children as young as age 2, as well as preteens and teenagers, have undergone successful procedures.

Technique. In the United States, PRK is the most commonly performed refractive procedure in children. The main reason for choosing PRK over LASIK is safety. PRK poses no risk of flap dislocation, and children who undergo the procedure heal more rapidly and experience less pain than do adults who are treated with PRK. In addition, slit-lamp examination can be very difficult in some children, making it challenging to check a child’s flap for striae or dislocation.

Surgery: Considerations

The logistics of performing refractive surgery in young children can present challenges.

Preop exam. Dr. Stahl said the examination can be performed separately from the surgery, but it is often done immediately before the procedure with the child under sedation. The anesthesia allows the surgeon to examine the

retina and check refractive error; such tests are often difficult to perform on young patients in the clinic.

Anesthesia. “For children in this amblyopic age group, general anesthesia is required, which adds some risk and is a significant logistical barrier to the procedure,” said Dr. Rychwalski. The reason that this is problematic, Dr. Stahl said, is that most refractive surgery centers are not set up for it, and most lasers are located where providing general anesthesia is not possible. “The biggest hurdle in performing pediatric refractive surgery is getting the logistics in place and having to bring a laser to a site where pediatric general anesthesia can be provided during the procedure.”

Another downside to using general anesthesia is that the child cannot fixate during the surgery. “We go to great lengths during the surgery to fixate the eye for the child,” Dr. Stahl said, “with an observer posted at the side and the surgeon viewing from the top to make sure that the treatment is being centered correctly.” Dr. Rychwalski noted that a major criticism of pediatric refractive surgery is the need to perform the surgery on an anesthetized patient. He added, however, that a slightly decentered treatment in a child with dense amblyopia will not have the same relative impact on the outcome because the goals and expectations are clearly different from those of refractive surgery performed on an adult with good preoperative corrected visual acuity.

Steroids. Another difference between pediatric and adult refractive surgery is that topical steroids are used more aggressively and for a longer duration in children. Without stepped-up steroid use, haze forms and will lead to regression. Dr. Stahl prescribes up to six months of topical steroids for her young patients.

Counseling Parents Is Crucial

Pediatric refractive surgeons should counsel parents about the potential complications as well as what to expect as their child gets older.

Scarring. Dr. Stahl is careful to

emphasize to parents that haze may develop and that applying the prescribed steroids is critical to preventing corneal scarring.

Keratoconus. It’s important to rule out keratoconus (or any ectatic disorder) in children and adults who are preparing to undergo refractive surgery. But even though pediatric refractive surgeons test for keratoconus with the same methods used in adults, a child may not manifest the early signs that suggest a potential problem. “We discuss this with the parents and explain that although we are screening for keratoconus, it may not have manifested yet and that the child may go on to develop some type of ectatic disorder in the future,” Dr. Stahl said.

As children age. “Kids are going to continue to grow, and their refractive error will continue to change,” Dr. Stahl added. “Parents need to understand that when refractive surgery is performed at an early age, we are trying to develop good vision in that eye now. Typically, we will aim for a plano refractive error with the knowledge that when the child has finished growing, they are going to be myopic. This surgery is not intended to keep a child out of glasses forever. Its purpose is to help the child develop good vision in one or both eyes and then to deal with any residual effects with refractive lenses or glasses as the child grows. There is a huge difference between performing refractive surgery to get a child out of glasses and performing surgery to develop a child’s vision.” ■

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