



Retinopathy of Prematurity

What is Retinopathy of Prematurity (ROP)

Retinopathy of prematurity (ROP) is a potentially blinding disease caused by abnormal development of retinal blood vessels in premature infants. The retina is the inner layer of the eye that receives light and turns it into visual messages that are sent to the brain. When a baby is born prematurely, the retinal blood vessels can grow abnormally. Most ROP resolves without causing damage to the retina. When ROP is severe, it can cause the retina to pull away or detach from the wall of the eye and possibly cause blindness. Babies 1250 grams or less and are born before 31 weeks gestation are at highest risk.

HOW DOES ROP AFFECT MY BABY?

Most babies with ROP see normally for their age. It is only when ROP progresses to the most severe stages that vision is threatened. Fortunately, most ROP resolves without vision loss. The trouble is, no one can predict which babies will do well and which will develop problems. Effective screening and timely treatment (when indicated – see below) are the most important factors in preventing ROP-associated vision loss.

HOW MANY INFANTS HAVE ROP?

There are approximately 3.9 million infants born in the U.S. each year. About 14,000 are affected by ROP and 90% of those affected have only mild disease. About 1,100- 1,500 develop disease severe enough to require medical treatment and 400-600 infants each year in the U.S. become legally blind from ROP.

WHAT DETERMINES THE SEVERITY OF ROP?

Birth weight and gestational age are the most important risk factors for development of severe ROP. Other factors that are associated with the presence of ROP include anemia, poor weight gain, blood transfusion, respiratory distress, breathing difficulties and the overall health of the infant. There is active research into the correlation of levels of growth factors in the blood and ROP. Close monitoring has decreased the impact of oxygen use as a risk factor for development of ROP. Light levels do not affect severity of ROP.

HOW IS ROP DIAGNOSED?

Ophthalmologists (Eye MD's) who are skilled in the evaluation of infant eyes make the diagnosis of ROP. They examine the eyes after the pupils are dilated with drops. There is active research evaluating the effectiveness of digital photography for diagnosing ROP. Infants less than 1500 grams (3.3 lbs) and with a gestational age less than 31 weeks undergo eye examinations to monitor for ROP [See figure 1]. Other infants who are deemed high risk by the neonatologist might also be screened.



Fig. 1: ROP is diagnosed by an ophthalmologist who examines the eye after the pupils are dilated with drops.

How do doctors describe ROP?

ROP is described by its location in the eye (the zone), by the severity of the disease (the stage) and by the appearance of the retinal vessels (plus disease). The first stage of ROP is a demarcation line that separates normal from premature retina. Stage 2 is a ridge which has height and width. Stage 3 is the growth of fragile new abnormal blood vessels [See figures 2 and 3]. As ROP progresses the blood vessels may engorge and become tortuous (plus disease).

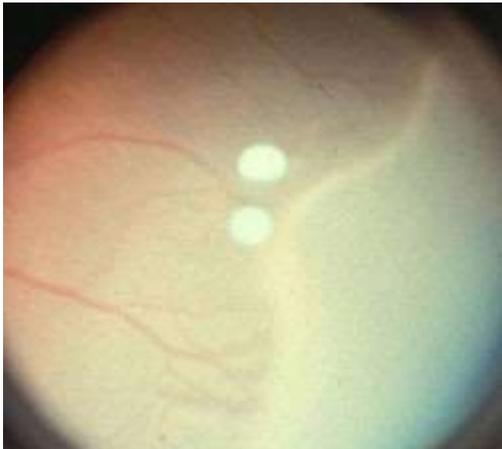


Fig. 2: Stage 2 of Retinopathy of Prematurity.

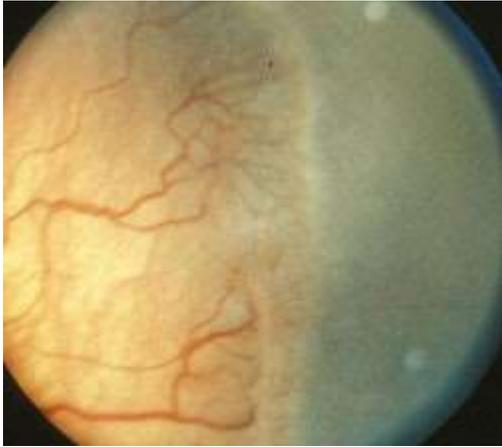


Fig. 3: Stage 3 of Retinopathy of Prematurity.

Who requires treatment?

When ROP reaches a certain level of severity, called type 1, the potential for retinal detachment (and possible permanent vision loss) becomes great enough to warrant consideration of eye surgery (see below)

WHAT DOES TREATMENT INVOLVE?

There are typically two options once it is determined that a child has reached Type I ROP. The first method is laser ablation which is applied to the immature portion of the retina (See figure 4). This method of treatment has been around for many years and is still the most common method of treatment. The second method of treatment involves an injection of medication (Avastin or Lucentis have both been used) into the eye that stops a signal that is causing the abnormal blood vessels to form. These medications may be used as an alternative to, or in addition to, laser treatment. The injection is a newer treatment. While results have been encouraging, further research is being done to help determine long term safety, optimal dosage, and rates of recurrence of ROP. The outcome of laser or medical treatment for ROP is usually favorable with the disappearance of abnormal blood vessels and resolution of plus disease. Despite accurate diagnosis and timely laser treatment, the ROP sometimes continues to worsen and the retina pulls away from the back of the eye. Eyes with retinal detachment caused by ROP generally have a poor visual prognosis. Retinal detachment can be treated with vitrectomy and/or a scleral buckling procedure. Despite optimal treatment, some eyes with ROP progress to permanent and severe vision loss.



Fig. 4: Typically, laser ablation is applied to the immature portion of the retina via a headset.

Why are eye exams recommended after discharge from the hospital?

It is VERY IMPORTANT to have eye exams after discharge from the hospital since ROP may not be resolved before discharge. The timing of these exams is critical because delays in treatment can increase the risk of vision loss. Also, even with successful treatment of ROP, prematurity may lead to other vision abnormalities. Prematurity is a risk factor for the development of [amblyopia \(lazy eye\)](#), eye misalignment ([strabismus](#)), the need for glasses (even at a young age), and [cortical visual impairment](#). Therefore, every premature infant needs the long-term attention of an ophthalmologist (Eye MD).

Where is there more information about retinopathy of prematurity?

- [National Eye Institute](#)
- [The Association for Retinopathy of Prematurity and Related Diseases \(ROPARD\)](#)
- [Parents' Guide to their Premature Baby's Eyes](#)

More technical information can be found on the [EyeWiki Site](#).

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