

NCCU CLINICAL GUIDELINES
SECTION: 13

SURGICAL CONDITIONS

Section 13 Surgical Conditions
Retinopathy of Prematurity: Operative Management of
Laser Treatment
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Neonatology Clinical Guidelines
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RETINOPATHY OF PREMATUREITY (ROP): OPERATIVE MANAGEMENT OF LASER TREATMENT

The eye starts to develop at about 16 weeks gestation when the blood vessels of the retina begin to form at the optic nerve. The blood vessels grow gradually towards the edges of the developing retina supplying oxygen and nutrients. During the last 12 weeks of pregnancy the eye develops rapidly. When an infant is born full term, the retinal blood vessel growth is mostly complete but if born prematurely before these blood vessels have reached the edges of the retina, normal vessel growth may stop and the periphery of the retina may not get enough oxygen and nutrients.

It is believed that the periphery then sends out signals to other areas of the retina for nourishment. As a result of this new abnormal vessels begin to grow. These new blood vessels are fragile and weak and can bleed leading to retinal scarring. When these scars shrink they pull on the retina causing it to detach. ROP occurs when abnormal blood vessels grow and spread throughout the retina. These abnormal blood vessels are fragile and can leak, scarring the retina and pulling it out of position. This causes retinal detachment which is the main cause of visual impairment and blindness in ROP.

DEFINITION

There are five different stages of ROP:

Stage I – Mildly abnormal blood vessel growth. Many infants who develop stage 1 improve with no treatment and develop normal vision. The disease resolves spontaneously without further progression.

Stage II – Moderately abnormal blood vessel growth. Many infants who develop stage II improve without treatment and develop normal vision. The disease resolves spontaneously without further progression.

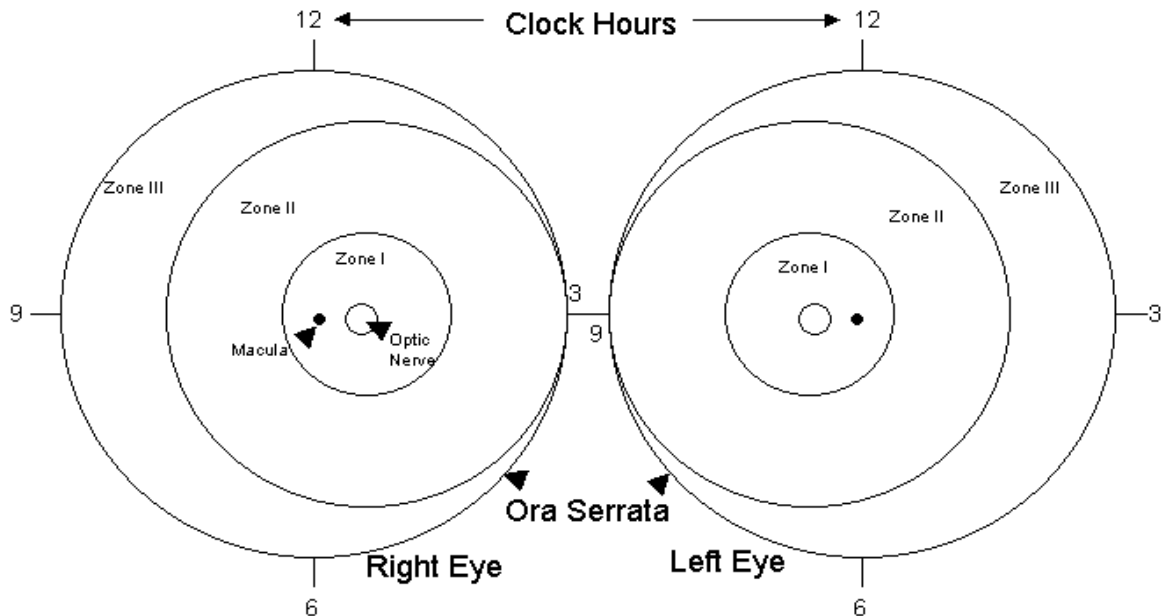
Stage III – Severely abnormal blood vessel growth. The abnormal blood vessels grow towards the centre of the eye instead of following their normal growth pattern along the surface of the retina. Some infants who develop stage III improve without treatment and will develop normal vision. However when infants have a certain degree of stage III and “plus disease” develops, treatment is considered. “Plus Disease” means that the blood vessels of the retina have become enlarged and twisted indicating a worsening of the disease. Treatment at this point has a good chance of preventing retinal detachment.

Stage IV – Partially detached retina. Traction from the scar produced by bleeding abnormal vessels pulls the retina away from the wall of the eye.

Stage V – Complete detachment of the retina and end stage of the disease. If the eye is not treated at this stage the infant will have severe visual impairment and even blindness.

Most infants who develop ROP will have stage I or II but in a small number will worsen, sometimes very rapidly and untreated ROP can destroy vision.

Infants with ROP are also at increased risk of developing other eye problems later in life i.e. retinal detachment, myopia, strabismus, amblyopia and glaucoma. In many cases these problems can be treated or controlled.



American Academy of Paediatrics, Ophthalmology. American Association for Paediatric Ophthalmology and Strabismus. Screening examination of premature infants for retinopathy of prematurity. Paediatrics 2006

RISK FACTORS FOR DEVELOPING ROP

- Prematurity <30weeks
- Low birth weight <1500 grams
- Anaemia
- Blood transfusions
- Multiple infections
- RDS and prolonged ventilation
- High levels of oxygen given to preterm infants used to be an important risk factor but with newer technologies and monitoring of oxygen levels, this risk factor has diminished.

SCREENING

[See Section 19 \(Transfer and Discharge\):Retinopathy of Prematurity Screening](#)

LASER TREATMENT

The most effective treatment for ROP is laser therapy; this burns away the periphery of the retina which has no normal blood vessels. This slows or reverses the abnormal growth of blood vessels.

Unfortunately the treatment also destroys some side vision. This is done to save the most important part of sight; the sharp central vision needed for straight ahead activities. Laser is only performed with advanced ROP particularly stage III with “plus disease”

ROP treatment decreases the chance of vision loss but does not always prevent it. Not all infants respond to treatment and the disease may worsen. If treatment does not work retinal detachment may develop.

PRE OPERATIVE CARE

- Follow the general pre operative care guidelines. Pre operative bloods are not a routine requirement for this procedure. An IV is usually inserted on the ward prior to theatre.
- Fast for 3 hours (EBM/BF) or 4 hours Formula
- Instil one drop of Dilacaine into each eye every 30 minutes for two hours prior to time of surgery to dilate the pupil.

POST OPERATIVE CARE

- Routine Post Operative Care. Connect to a cardio respiratory monitor on return from theatre Hourly observations TPR and BP for 4 hours then 4 hourly for 24 hours.
- Check MR 842 operation summary for specific post operative orders.
- Feeds can be recommenced once the infant is awake following the anaesthetic
- Commence eye drops approximately 4 hours post operatively. Chloramphenacol 0.5% and Fluorometholone 1mg/ml (FML) 1 drop to each eye 6 hourly for 7 days as ordered.
- The Ophthalmologist will review at his next ward round (Thursdays PMH or Monday KEMH). Dilacaine dilation will be required for this.
- Continued Ophthalmology follow up as an outpatient will be required on discharge home.

REFERENCES

Dr Geoff Lam: Clinical Associate Professor UWA School of Ophthalmology & Visual Science/UWA School of Paediatrics and Child Health. Consultant Ophthalmologist: Head of Ophthalmology Princess Margaret Hospital for Children. National Eye Institute & National Institute of Health.