Current Practice

Retinopathy of prematurity

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History

Retinopathy of prematurity (ROP) was first noted in the 1940's when more and more oxygen was being administered to premature infants. This disease was called retrolental fibroplasia by Terry in 1941[1]. The term retinopathy of prematurity was coined by Heath in 1951[2].

Embryology

The vascular precursors of the retinal blood vessels enter the eye at 6 weeks of gestational age and slowly reach the nasal periphery at 36 weeks. The temporal periphery gets vascularized at 40 weeks. This process is susceptible to many external influences once the child is prematurely born.

Aetiology

Factors which can stop the normal vascularisation of a premature neonate are

1. Prematurity
2. Low birth weight
3. Post natal infections
4. Oxygen administration

Classification of ROP[3,4]

Three clinical parameters are considered when classifying ROP. They are:

1) Stage of vascular proliferation
2) Location of the disease
3) Extent of involvement in clock hours

Stage of vascular proliferation

Stage 1- Demarcation line
Stage 2- Ridge
Stage 3- Ridge + fibrovascular proliferation
Stage 4- Partial retinal detachment
Stage 5- Total retinal detachment

Location of the disease

Zone 1 - Circle around the disc with a radius of two disc diameters temporal to macula.
Zone 2- Between zone 1 and a circle concentric to zone 1.
Zone 3- An area of temporal crescent beyond zone 2.

Extent of involvement

This can be calculated by noting the extent of retinal involvement in clock hours involved.

Plus Disease

In addition to the above criteria for classification a separate disease entity named as "Plus Disease" is diagnosed in ROP with the following criteria:

- Enlarged venules and tortuous arteries in the posterior pole.
- Iris vascular engorgement.
- Vitreous haze.

Screening protocol

All newborns with the following criteria should be screened for ROP.

1. Neonates born before 32 weeks of gestation.
2. Neonates who had a stormy postnatal period.
3. Neonates with a birth weight less than 1500g.

First screening should be done in the neonate at 31 weeks of post conceptional age or at 4 weeks of chronological age after birth. At this screening the neonate may or may not found to be having ROP. If ROP is found it is classified into threshold, prethreshold or Rush disease by the following criteria (Figure 1).

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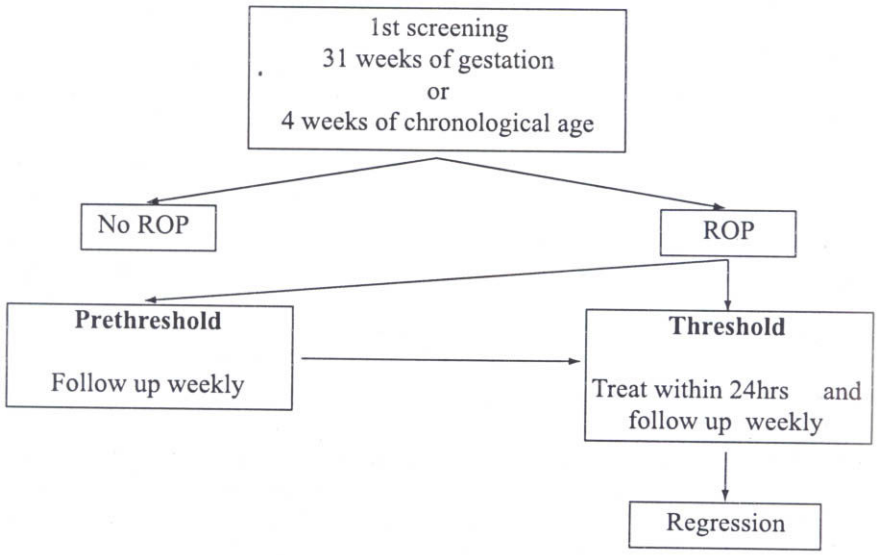

Figure 1 –Management protocol

Threshold ROP

- Disease in Zone 1 or 2.
- Stage with plus disease.
- 5 continuous or 8 cumulative clock hours of involvement.

Pre-threshold ROP

- Stage 1 or 2 disease.
- Disease in Zone 3.
- Less than 5 clock hours of involvement.

Rush disease

- Zone 1 or post zone 2 disease
- Plus disease

These patients have very low birth weight, presents within three weeks of chronological age and very rapidly progress to active threshold ROP.

Modalities of treatment

Laser Treatment

This modality of treatment does not need anaesthesia and does not leave any morbidity. However it is difficult to do in small pupils and needs more patience.

Cryo treatment

This procedure is done under anesthesia and may need conjunctiva incision to reach posteriorly.

Cryo ROP study[5]

This multicentre study showed that early treatment can reduce an unfavourable outcome in 48.5% of cases with active ROP. It also showed that zone 1 disease is associated with a poor outcome in 78% of cases in spite of prompt laser or cryo treatment.

Surgery in ROP

This modality of treatment is reserved for stages 4 and 5. There are two types of surgeries that could be done. Of these Scleral buckling is done for stage 4 disease without macular involvement. The results of this procedure are fairly good. Vitrectomy is reserved for stage 5 and the results of this procedure are poor.

Post treatment follow up

The patient needs to be followed up weekly and if inadequate regression is seen may need further treatment. The signs of regression are:

- Reduction in the tortuosity of blood vessels
- Regression of new vessels on the ridge
- Clearing of the vitreous haze
- Reduction in iris vascular engorgement

Spontaneous regression of ROP

ROP can regress in 80% of cases even without treatment and it is usually the prethreshold stage which may spontaneously regress.

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