SAWA UNIVERSITY

RETINOPATHY OF PREMATURITY

جامعة ساوة

كلية التقنيات الصحية والطبية

قسم تقنيات البصريات

المرحلة الرابعة

الفصل الأول

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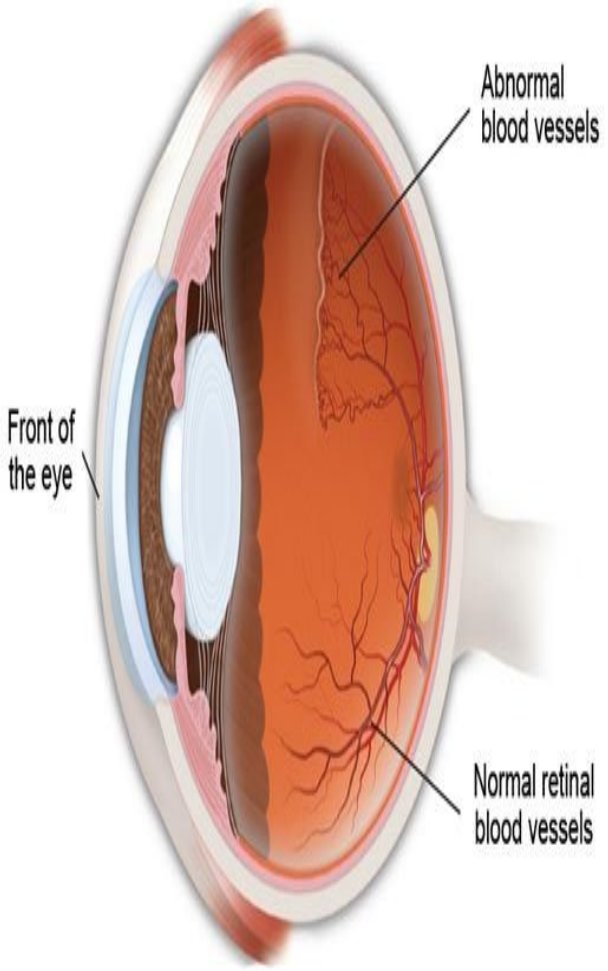
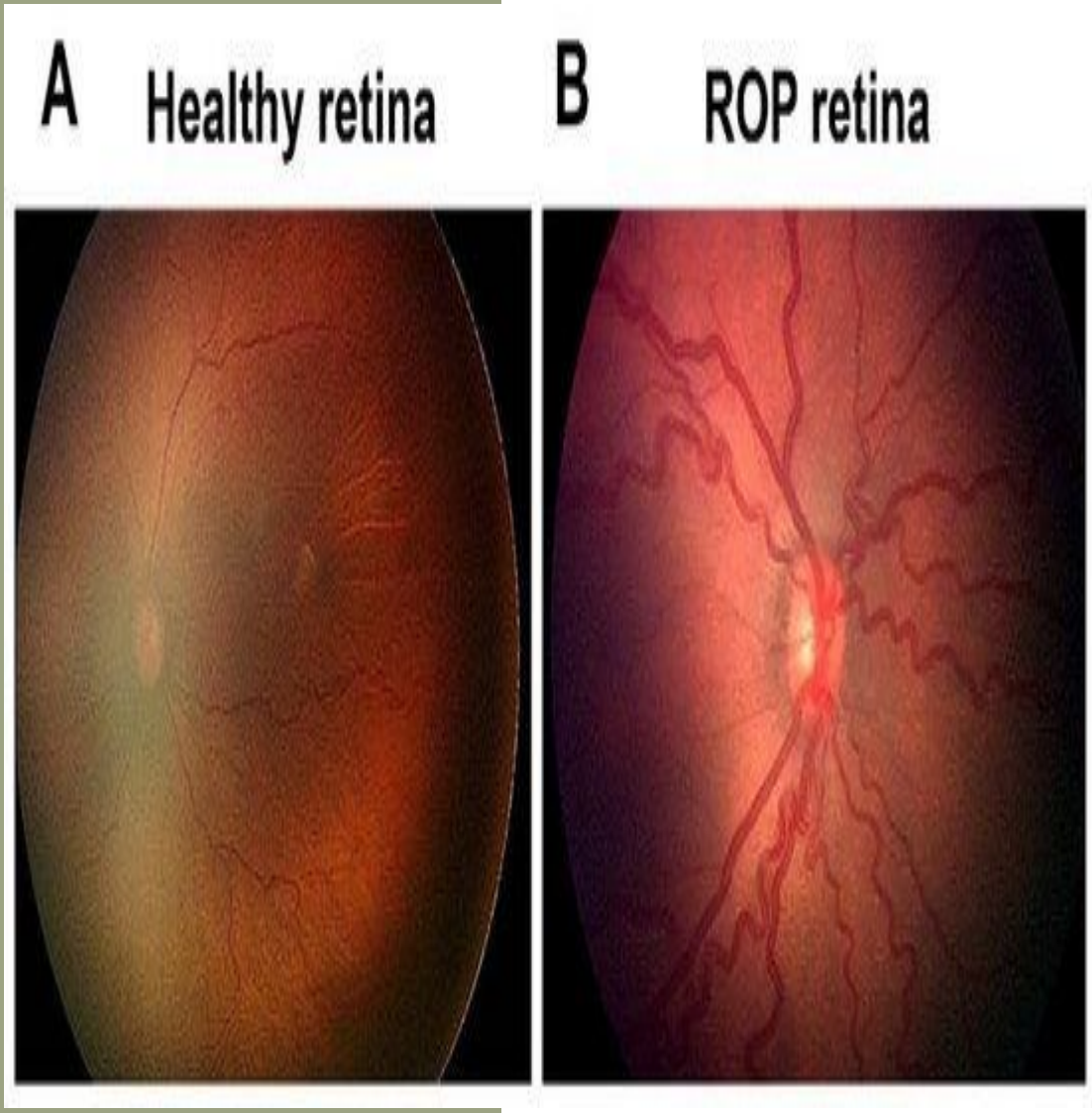
رقم المحاضرة: 6

PATHOPHYSIOLOGY



1. The environment of the womb is hypoxic
2. This activates and supports the normal growth of the retinal blood vessels
3. Premature birth puts the newborn suddenly in a hyperoxic environment
4. This stops the normal growth of retinal blood vessels (ROP Phase I)
5. The peripheral retina then becomes avascular
6. Without enough blood vessels it then becomes severely hypoxic
7. This triggers a massive surge of VEGF (Phase II)

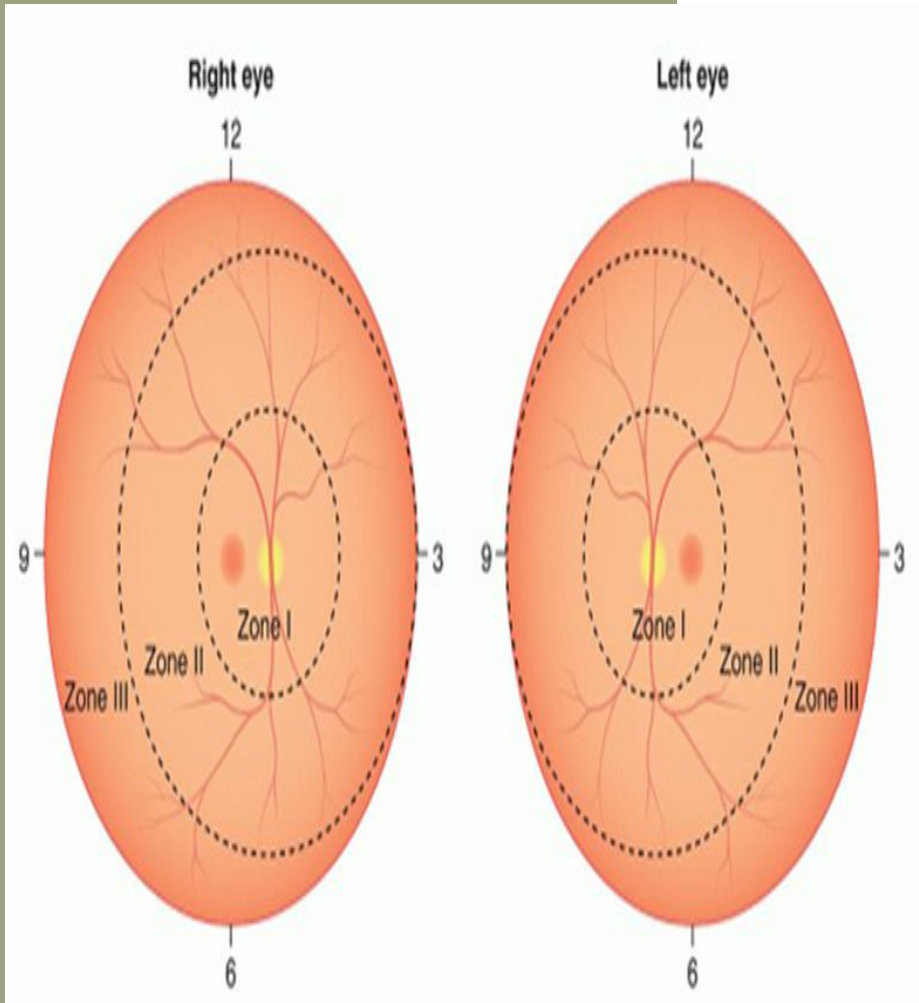


8. This leads to the abnormal, uncontrolled growth of new, fragile blood vessels (neovascularization) and this ROP phase III
9. These unstable vessels and associated scar tissue can exert tractional forces on the retina
10. If severe, this traction results in a sight-threatening tractional retinal detachment.

RISK FACTORS

- Gestational age of <30weeks.
- Low birth weight (<1500 g).
- unmonitored or excessively high postnatal oxygen administration
- fluctuations in oxygenation.
- Poor postnatal growth
- Systemic infections, sepsis, or chronic systemic inflammation
- Major perinatal illness (Respiratory distress syndrome, intraventricular hemorrhage)

ROP DIAGNOSTIC ZONES



ROP diagnosis relies on identifying the disease location within three zones centered on the optic nerve:

1. Zone I is the most critical central area; its radius extends from the optic disc to twice the distance to the macula
2. Zone II is the middle ring extending outward from the boundary of Zone I to the retina's edge on the nasal side
3. Zone III is the outermost temporal crescent, covering the last section of the retina anterior to Zone II.

The system acts as a standard map, where disease in Zone I or posterior Zone II indicates greater severity and urgency for treatment.

PRIMARY PREVENTION

- Screenings of infants at risk with appropriate timing of exams and follow up is essential to identify infants in need of treatment.

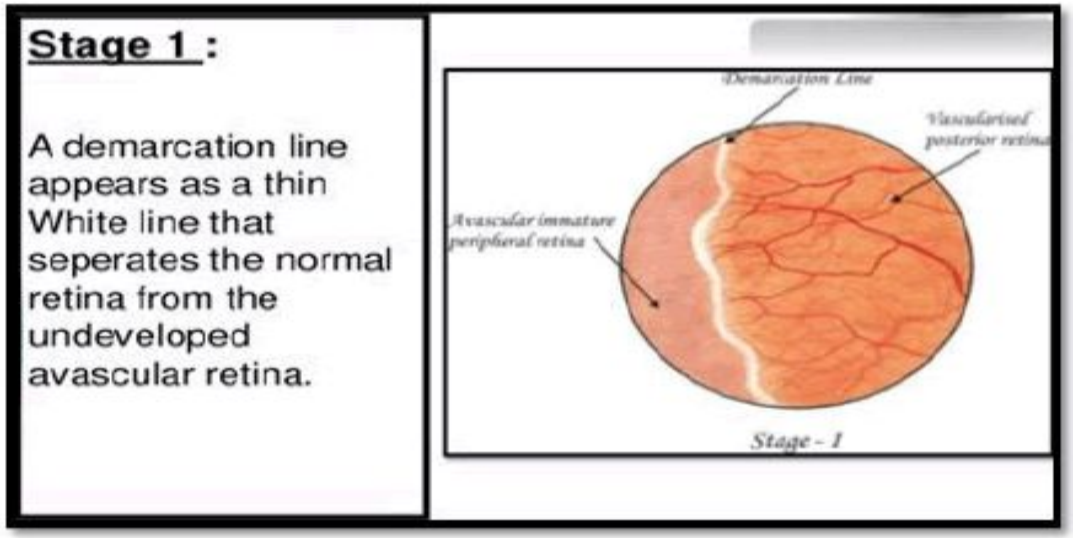


Figure 1. Stage 1 ROP.

ROP STAGES

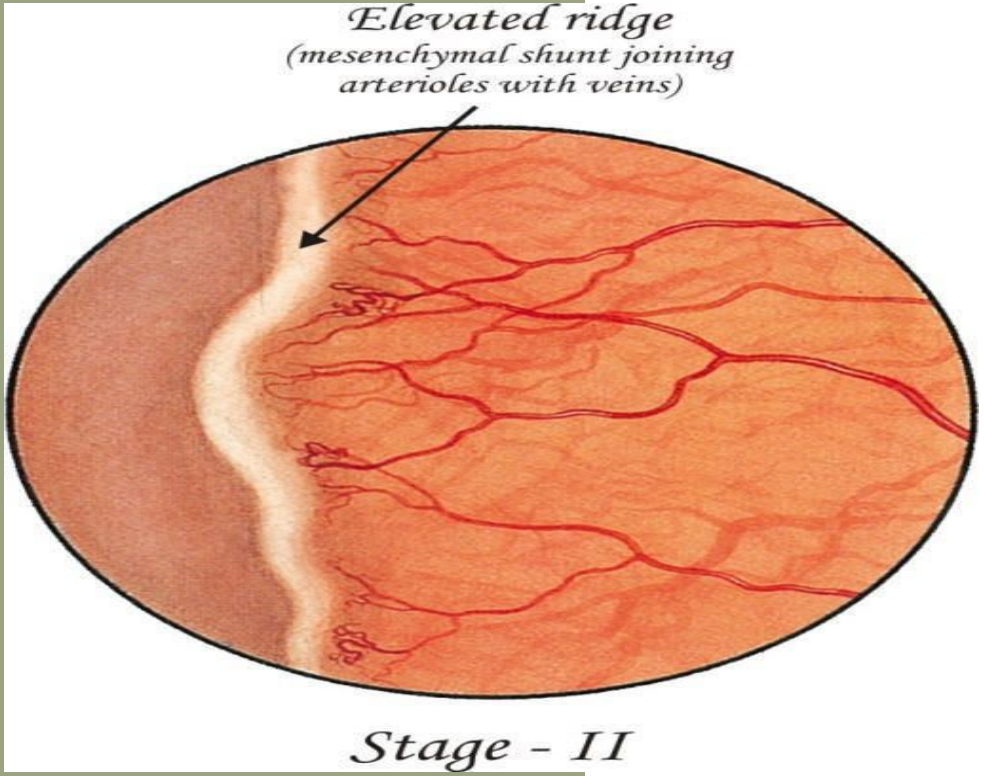
STAGE 1

Demarcation Line:

- This line is thin and flat (in the retina plane)
- and separates the avascular retina anteriorly from the vascularized retina posteriorly.

STAGE 2:

Ridge: arises from the demarcation line and has height and width.



STAGE 3:

Extraretinal Fibrovascular Proliferation:

Intravitreal neovascularization, or that which

extends from the ridge into the vitreous.

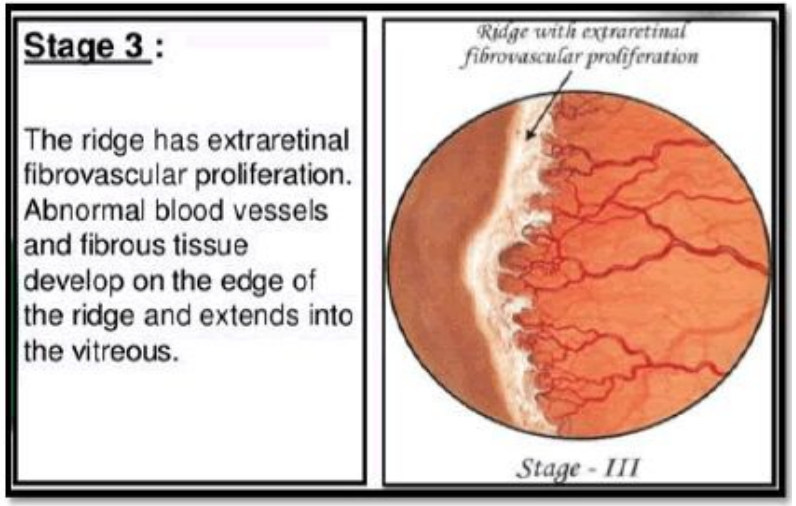


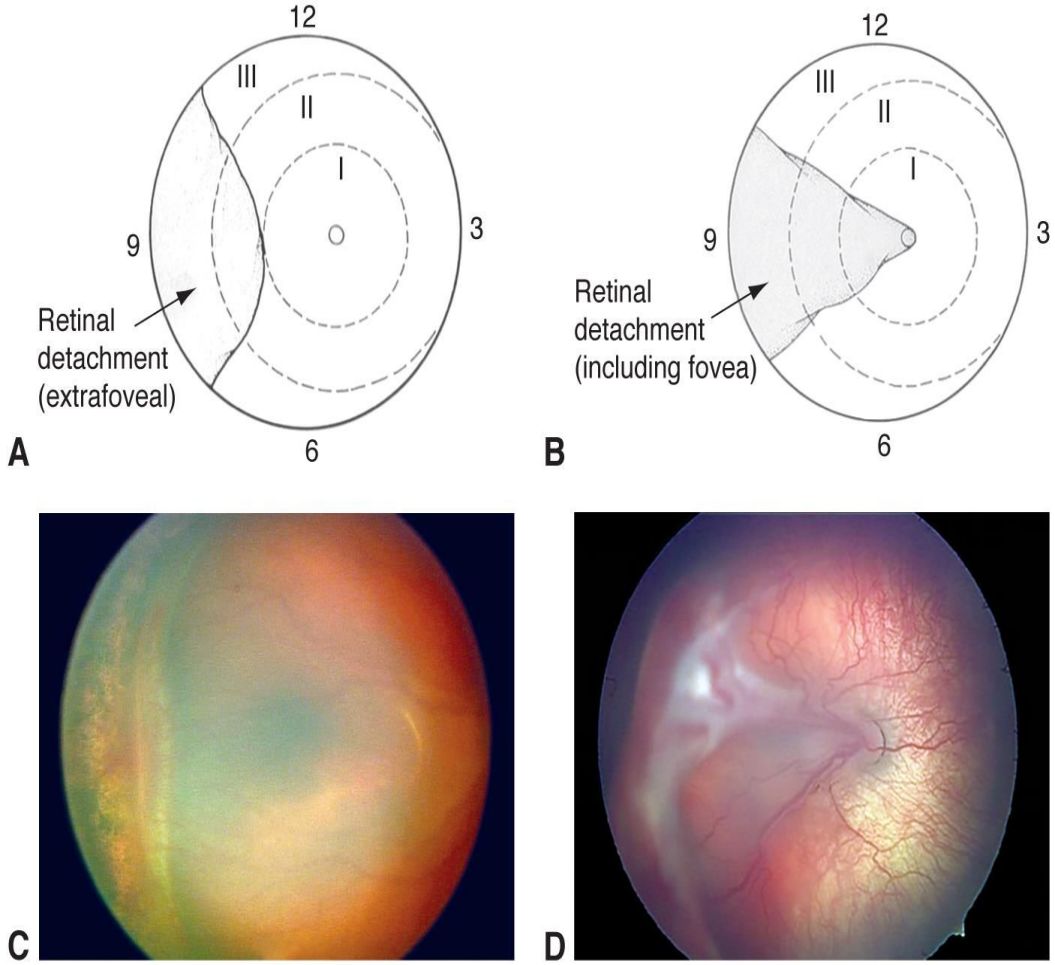
Figure 3. Stage 3 ROP.

STAGE 4:

Partial Retinal Detachment.

It was later divided into:

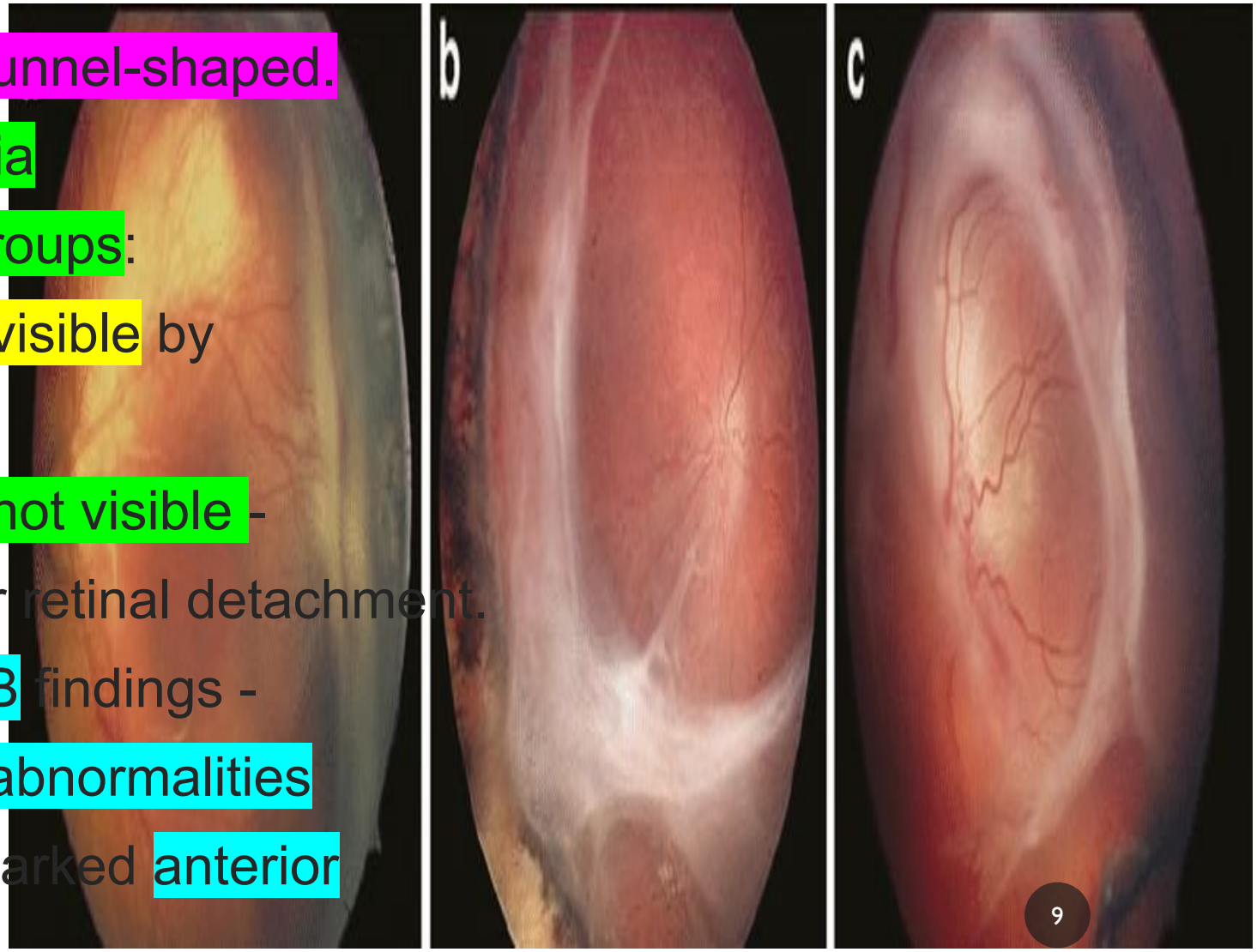
- stage 4A (extrafoveal partial retinal detachments)
- and stage 4B (foveal partial retinal detachments).



STAGE 5:

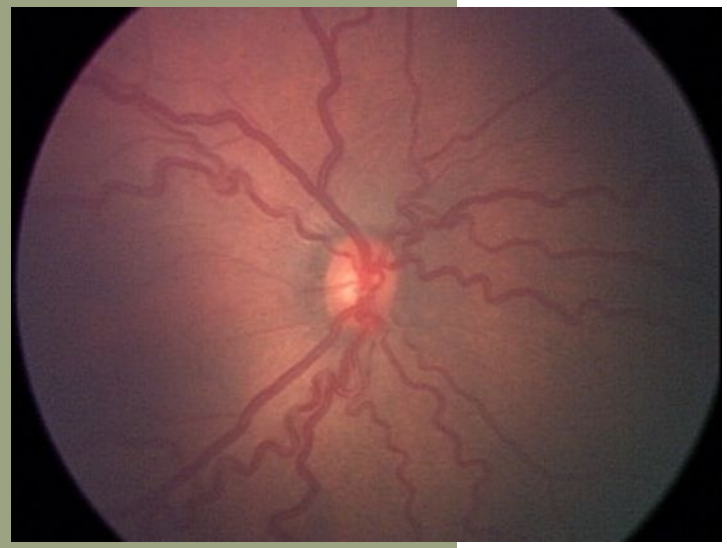
Total Retinal Detachment:

- generally tractional and usually funnel-shaped.
- Stage 5 can present as leukocoria
- This stage is subdivided into 3 groups:
- stage 5A, when the optic disc is visible by ophthalmoscopy.
- stage 5B, when the optic disc is not visible - secondary to fibrovascular tissue or retinal detachment.
- stage 5C: which contain stage 5B findings - accompanied by anterior segment abnormalities (e.g., anterior lens displacement, marked anterior chamber shallowing).



PLUS DISEASE

- the most severe form of abnormal vascularization
- needs urgent intervention



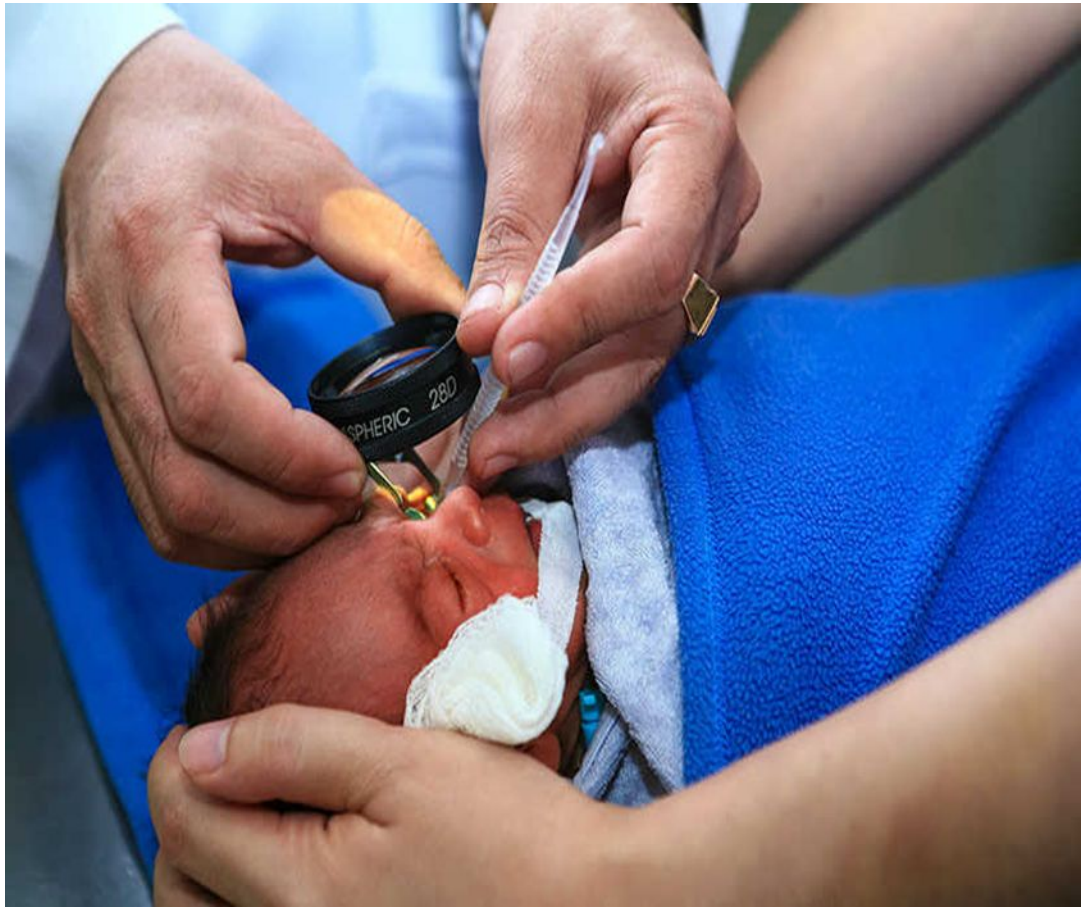
COMPLICATIONS

1. Myopia is a common finding in premature infants with or without ROP.
2. retinal detachment or macular folds are the most feared complications
3. strabismus, amblyopia, and anisometropia are possible

Long-term follow-up is needed in all cases of ROP.

DIAGNOSTIC PROCEDURE

1. pupillary dilation using eye drops
   - be aware of possible adverse effects to the cardiorespiratory and gastrointestinal system and use the lowest doses needed to minimize side effects.
2. retina is examined with an indirect ophthalmoscope.
3. The peripheral portions of the retina are pushed into view using scleral depression



TREATMENT INDICATIONS

Indicated in type 1 ROP:

1. Zone I: any-stage ROP with plus disease
2. Zone I: stage 3 ROP without plus disease
3. Zone II: stage 2 or 3 ROP with plus disease

Eyes meeting these criteria should be treated as soon as possible, ideally within 72 hours.

TREATMENT OPTIONS

1- antivascular endothelial growth factor (anti VEGF) injections.
2- laser photocoagulation.
3- cryotherapy.
4- vitrectomy (surgery) in cases of retinal detachment (stage 4 and 5).

KEY REFERENCES AND SOURCES

1. The International Classification of Retinopathy of Prematurity (ICROP)
2. The American Academy of Pediatrics (AAP)
3. The American Academy of Ophthalmology (AAO)