Rhegmatogenous Retinal detachment
RISK FACTORS & PROPHYLAXIS

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INTRODUCTION

- Rheg. RD affects 1:10000 of the population & both eyes are involved in about 10% of cases
- Rheg. RD is one of the common causes of:
  - Diminution of vision
  - Blindness
Initial surgical attempts to reattach the retina • Fail in 10-20% of cases

Reoperations • Fail in 5% of cases

In spite anatomical surgical success • V/A improves to 20/50 or better in only 50% of cases

Prevention of RD is a worthy goal

Variety of prophylactic methods have been investigated

Since GONIN first identified the pathogenesis & treatment of this previously incurable disorder
There are no optimal clinical trials to test the legitimate value of any form of any of these prophylactic measures.

RISK FACTORS FOR RD

Prerequisites for RD

- Dynamic vitreoretinal traction
- Retinal tears
- Precursors of retinal tears
**Dynamic vitreoretinal traction**

- **Pathogenesis:**
  - Vitreous liquefaction "Synchysis"
  - Hole in the PH
  - Synchytic fluid → sub-hyaloid space → PVD

- **Complications:**
  - No complications “weak vitreoretinal attachments”
  - Retinal tears “strong vitreoretinal attachments” 10-15%

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**Retinal tears**

Tears associated with PVD are:

- Symptomatic (Flashes & Floaters)
- Horseshoe-shaped
- Located in the upper fundus
- Associated with mild vitreous haemorrhage

*Unless treated the risk of RD is high*
Precursors of retinal tears

1. **Lattice degeneration**
   - Present in 8% of normal population & 30% of RD cases
   - Frequently associated with Marfan, Stickler, & Ehlers - Danlos syndromes
   - **Typical Lattice**
     - Bilateral & Upper/Temporal
     - Between equator & vitreous base
     - Retinal thinning showing arborizing network of tiny white lines
     - Vitreous overlying the lattice is synchitic & along the edges is firmly adherent
   - **Atypical lattice “Stickler syndrome”**
     - Radially oriented “along course of blood vessels”
     - Extending posterior to the equator
Lattice degeneration

Complications of lattice degeneration

- **No complications** occur in most cases

- **Retinal holes** within the lattice
  - Rarely cause RD unless associated with *high risk factors*
  - RD is *Not preceded* by symptoms of PVD

- **Tractional retinal tear** along the edge the lattice
  - Commonly cause RD
  - RD is *preceded* by symptoms of PVD
2. Snail-track degeneration

Similar to Lattice degeneration except for:

- Bands are formed of tightly packed “snow flakes” giving the retinal periphery a white frost-like appearance
- Bands are longer than those of Lattice degeneration

3. Degenerative retinoschisis

- **Types:**
  1. Typical → Split occurs at the level of outer plexiform layer
  2. Reticular → Split occurs at the level of NFL

- **Incidence:** Present in 5% of the population & 70% of patients are hyperopic

- **Sings:**
  - Bilateral & infero-temporal
  - Circumferential progression involving the entire periphery
    - Typical → remains anterior to the equator
    - Reticular → may extend posterior to the equator
  - Inner layer “Snow flakes” - Outer layer “Beaten metal appearance”
Degenerative retinoschisis

Complications of Degenerative retinoschisis

- No complications occur in most cases

- Retinal tears may develop:
  - Inner layer $\rightarrow$ small & rounded
  - Out layer $\rightarrow$ large with rolled edges

- RD is a rare complication that only happens when tears occur in BOTH LAYERS
4. Cystic retinal tufts

- It is a vitreoretinal abnormality associated with firm vitreoretinal adhesions
- It is located at the retinal periphery
- It can lead to tractional retinal tears at the time of an PVD
- The risk of RD is less than 1%

5. White without pressure

- Retinal WWOP is a common bilateral retinal condition that occurs in up to 30% of the general population
- It is frequently associated with myopia & lattice degeneration
- It appears as translucent greyish-white retinal patch that is often bounded posteriorly by a reddish-brown line
- It may have scalloped posterior border “sign of possible progression”
- It can mimic the appearance of a shallow RD
White without pressure

Complications of White without pressure

- No complications occur in most cases
- Horseshoe-shaped retinal tears or linear retinal tears can develop along the posterior border of WWOP in association with PVD that can be complicated by RD
PROPHYLAXIS OF RETINAL DETACHMENT

RD might be avoided by:

- Prevention of vitreous liquefaction & PVD
- Relief of vitreoretinal traction
- Creation of chorioretinal scar around retinal tears

**Prevention of vitreous liquefaction & PVD**

- No means are available to prevent vitreous liquefaction & PVD
- Although maintaining an intact posterior capsule following cataract surgery may **Reduce** or **Delay** these changes
Relief of vitreoretinal traction

Inside
“Vitrectomy”
- NOT performed
- Hazardous

Outside
“Scleral Buckle”
- Selected cases

Creation of chorioretinal scar

THE PRIMARY METHOD OF PREVENTING RD

Laser photocoagulation
Cryotherapy
INDICATIONS FOR PROPHYLACTIC THERAPY
“CREATION OF CHORIORETINAL SCAR”

1. Symptomatic tractional tears

2. Precursors of retinal tears associated with symptomatic tractional tears

3. Precursors of retinal tears associated with high risk factors

4. Degenerative retinoschisis "complicated by tear in the outer leaf"

I. SYMPTOMATIC RETINAL TEARS

► About 15% of symptomatic eyes “Photopsia & Floaters” develop retinal tears

► Retinal tears associated with vitreoretinal traction are likely to cause RD

► Symptomatic retinal tears are classified into:
  1. Tears with vitreoretinal traction
  2. Tears without vitreoretinal traction
1. **Tears with vitreoretinal traction**

   **Horseshoe-shaped tears**
   - The risk of RD is **HIGH** “33-55%”
   - Prophylactic therapy is **IMMEDIATELY RECOMMENDED**

   **Round tears with free operculum**
   - The risk of RD is **LOW**
   - Prophylactic therapy is **RECOMMENDED**

2. **Tears without vitreoretinal traction**

   Prophylactic therapy of these type of tears is **NOT recommended**
   - unless the possibility of vitreoretinal traction **cannot be excluded**
**II. Precursors of RD**

In absence of tractional retinal tears they **DO NOT require prophylactic therapy** unless they are associated with one or more of the

**RISK FACTORS**

<table>
<thead>
<tr>
<th>Hereditary</th>
<th>Prior ocular surgery</th>
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<tbody>
<tr>
<td>✓ High myopia</td>
<td>✓ Aphakia/Pseudophakia</td>
</tr>
<tr>
<td>✓ Systemic disease: Marfan, Stickler, &amp; Ehlers-Danlos syndromes</td>
<td>✓ ND:YAG posterior capsulotomy</td>
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<thead>
<tr>
<th>Inflammatory</th>
<th>Others</th>
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<tbody>
<tr>
<td>✓ Cytomegalovirus retinitis</td>
<td>✓ Fellow-eye non-traumatic RD</td>
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<tr>
<td>✓ Acute retinal necrosis</td>
<td>✓ Family history of RD</td>
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**TREATMENT MODALITIES**

- **Three modalities:**
  - Cryotherapy
  - Laser photocoagulation using slit-lamp delivery system
  - Laser photocoagulation using indirect ophthalmoscope delivery system

- **Choice of modality depends on:**
  - Surgeon’s preference & experience
  - Instrument availability
  - Clarity of the media "cryotherapy is preferred with hazy media"
  - Pupil size "cryotherapy is preferred with narrow pupils"
  - Location of the tear
Location of the retinal tear

- **Equatorial**
  - Laser photocoagulation using slit-lamp delivery system
  - Cryotherapy

- **Post-equatorial**
  - Laser photocoagulation using slit-lamp delivery system

- **Pre-equatorial**
  - Cryotherapy
  - Laser photocoagulation using indirect ophthalmoscope delivery system

1. **Laser photocoagulation**

- **Technique:**
  - The lesion is surrounded with 2 ROWS of confluent burns of moderate intensity
  - After treatment the patient is advised to avoid strenuous physical activities for about ONE WEEK

- **Complications:**
  - Maculopathy (Macular oedema & macular pucker)
  - Choroidal detachment
  - Exudative RD
  - Rheg. RD
2. **Cryotherapy**

- **Technique:**
  - The lesion is surrounded with 1 **ROW** of cryo applications
  - After treatment the patient is advised to avoid strenuous physical activities for about **ONE WEEK**

- **Complications:**
  - Lid oedema & chemosis
  - Transient diplopia
  - Vitritis
  - Maculopathy (Macular oedema & macular pucker)
Cryotherapy

FAILURE OF PROPHYLAXIS

- Inadequate treatment of the predisposing lesion

- Formation of new retinal tears secondary to excessive therapy
  - Retinal damage → Retinal tear at treatment site
  - Aggravation of vitreoretinal traction → Retinal tear elsewhere
Progression of symptomatic retinal tears to RD

<table>
<thead>
<tr>
<th>Type of tear</th>
<th>Percentage of RD</th>
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<tr>
<td>Treated horseshoe-shaped tears</td>
<td>1.5 - 8%</td>
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<tr>
<td>Untreated horseshoe-shaped tears</td>
<td>48 - 55%</td>
</tr>
<tr>
<td>Treated operculated tears</td>
<td>0%</td>
</tr>
<tr>
<td>Untreated operculated tears</td>
<td>4.5 - 17%</td>
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SUMMARY

Although prevention of RD is an important goal, the value of prophylactic therapy for vitreoretinal lesions remains unknown because of a lack of appropriate trials.

Treatment of symptomatic flap tears is an accepted method of preventing RD, as the natural course of these tears & the results of therapy are well documented.
Treatment of visible abnormal vitreoretinal lesions is of limited value, even in eyes with high risk factors.

Patients with high-risk features should be made aware of symptoms of PVD & loss of visual field, & any patient with such symptoms should be promptly evaluated.

Thank you.