Retinal Detachment Overview

Retinal Detachment

Two broad categories

? ?
Retinal Detachment Overview

Retinal Detachment

Two broad categories

Rhegmatogenous (RRD)  Non-rhegmatogenous
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)  Non-rhegmatogenous

?  ?

Two categories
Retinal Detachment Overview

Retinal Detachment

- Rhegmatogenous (RRD)
- Non-rhegmatogenous (Two categories: Tractional (TRD) and Exudative (ERD))
Which of these is/are associated with trauma?

- Rhegmatogenous (RRD)
- Non-rhegmatogenous
  - Tractional (TRD)
  - Exudative (ERD)

Both RRD and TRD are associated with a history of trauma. Any differences in their respective trauma tendencies? Yes—RRD is associated with blunt trauma, whereas TRD is associated with penetrating trauma.
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)  Non-rhegmatogenous

Tractional (TRD)  Exudative (ERD)

Which of these is/are associated with trauma?
Both RRD and TRD are associated with a history of trauma.
Which of these is/are associated with trauma?
Both RRD and TRD are associated with a history of trauma

Any differences in their respective trauma histories?
Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

Tractional (TRD)

Exudative (ERD)

Which of these is/are associated with trauma?
Both RRD and TRD are associated with a history of trauma

Any differences in their respective trauma histories?
Yes—RRD is associated with **blunt** trauma, whereas TRD is associated with **penetrating** trauma
What are the classic ophthalmoscopic descriptors of each RD type?

RRD: Corrugated, undulating
TRD: Concave, taut
ERD: Dome-shaped, gravity-dependent
What are the classic ophthalmoscopic descriptors of each RD type?

**RRD**: Corrugated, undulating

**TRD**: Concave, taut

**ERD**: Dome-shaped, gravity-dependent
Retinal Detachment Overview

Rhegmatogenous RD
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

Tractional (TRD)

Exudative (ERD)

What are the classic ophthalmoscopic descriptors of each RD type?

RRD: Corrugated, undulating
TRD: Convex vs. concave
ERD: Dome-shaped, gravity-dependent
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

Tractional (TRD)

Exudative (ERD)

What are the classic ophthalmoscopic descriptors of each RD type?

RRD: Corrugated, undulating
TRD: Concave, taut
ERD:
Retinal Detachment Overview

Tractional RD
What are the classic ophthalmoscopic descriptors of each RD type?

**RRD:** Corrugated, undulating

**TRD:** Concave, taut

**ERD:** something-shaped, something-dependent
What are the classic ophthalmoscopic descriptors of each RD type?

**RRD**: Corrugated, undulating

**TRD**: Concave, taut

**ERD**: Dome-shaped, gravity-dependent
Retinal Detachment Overview

Exudative RD
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

Tractional (TRD)

Exudative (ERD)

What does the prefix rhegma mean?
Retinal Detachment

- **Rhegmatogenous** (RRD)
- **Non-rhegmatogenous**
  - Tractional (TRD)
  - Exudative (ERD)

**What does the prefix rhegma mean?**
It translates as *break* or *tear*
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

Tractional (TRD)

Exudative (ERD)

The essential difference is that RRD is associated with a full-thickness retinal break...
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

Tractional (TRD)

Exudative (ERD)

The essential difference is that RRD is associated with a full-thickness retinal break…

…and TRD/ERD aren’t
The essential difference is that RRD is associated with a **full-thickness retinal break**…

What are the three types of retinal breaks?
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

The essential difference is that RRD is associated with a full-thickness retinal break...

Tears  Holes  Dialyses

Non-rhegmatogenous

Tractional (TRD)

Exudative (ERD)
Retinal Detachment Overview

The essential difference is that RRD is associated with a full-thickness retinal break...

Rhegmatogenous (RRD)

Non-rhegmatogenous
  - Tractional (TRD)
  - Exudative (ERD)

Which of these is most commonly implicated in RRD?
The essential difference is that RRD is associated with a full-thickness retinal break...

Which of these is most commonly implicated in RRD?

Tears  Holes  Dialyses
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

Tractional (TRD)

Exudative (ERD)

The essential difference is that RRD is associated with a **full-thickness retinal break**...

Which of these is most commonly implicated in RRD?

Specifically, these are known as **Tears**
Retinal Detachment Overview

Retinal Detachment

- Rhegmatogenous (RRD)
- Non-rhegmatogenous
  - Tractional (TRD)
  - Exudative (ERD)

The essential difference is that RRD is associated with a full-thickness retinal break...

Which of these is most commonly implicated in RRD?

Specifically, these are known as horseshoe tears.
The essential difference is that RRD is associated with a full-thickness retinal break...

Why are they called ‘horseshoe’ tears?

Because of their shape (see above)

Where are they typically found?

In the far periphery, near the ora serrata

How do they develop?

A tongue of attached vitreous extends beyond the normal limit of the vitreous base, onto the peripheral retina. Tension on the vitreous gets focused at this site, and the tongue of vitreous tears the retina anteriorly, producing the flap.

Which of these is most commonly implicated in RRD?

Specifically, these are known as horseshoe tears.
The essential difference is that RRD is associated with a full-thickness retinal break...

Which of these is most commonly implicated in RRD?

Specifically, these are known as *horseshoe tears*.
Retinal Detachment Overview

Rhegmatogenous (RRD)

The essential difference is that RRD is associated with a full-thickness retinal break...

Tears  Holes  Dialyses

Which of these is most commonly implicated in RRD?

Specifically, these are known as horseshoe tears.

Why are they called ‘horseshoe’ tears?
Because of their shape (see above)

Where are they typically found?
In the far periphery, near the ora serrata

How do they develop?
A tongue of attached vitreous extends beyond the normal limit of the vitreous base, onto the peripheral retina. Tension on the vitreous gets focused at this site, and the tongue of vitreous tears the retina anteriorly, producing the flap.

Non-rhegmatogenous (Exudative)

Tractional (TRD)
Retinal Detachment Overview

Rhegmatogenous (RRD)

The essential difference is that RRD is associated with a full-thickness retinal break...

Non-rhegmatogenous

Exudative (ERD)

Tractional (TRD)

Tears

Holes

Dialyses

Which of these is most commonly implicated in RRD?

Specifically, these are known as horseshoe tears

Why are they called ‘horseshoe’ tears?
Because of their shape (see above)

Where are they typically found?
In the far periphery, near the ora serrata

‘The flap’

(The black part is the tear itself)
The essential difference is that RRD is associated with a full-thickness retinal break...

**Rhegmatogenous (RRD)**

The location where the peripheral retina and the pars plana meet

**Non-rhegmatogenous**

Which of these is most commonly implicated in RRD?

Specifically, these are known as *horseshoe tears*.

Why are they called ‘horseshoe’ tears?
Because of their shape (see above)

Where are they typically found?
In the far periphery, near the **ora serrata**

**Retinal Detachment Overview**

Retinal Detachment

‘The flap’

(The black part is the tear itself)

Anterior

U

Posterior

Rhegmatogenous (RRD)

Holes

Dialyses

**Tractional (TRD)**

Why are they called ‘horseshoe’ tears?
Because of their shape (see above)

Where are they typically found?
In the far periphery, near the **ora serrata**

What is the **ora serrata**?

The location where the peripheral retina and the pars plana meet
Retinal Detachment Overview

Rhegmatogenous (RRD)

The essential difference is that RRD is associated with a full-thickness retinal break...

Tears

Holes

Dialyses

Which of these is most commonly implicated in RRD?

Specifically, these are known as horseshoe tears

Why are they called 'horseshoe' tears?
Because of their shape (see above)

Where are they typically found?
In the far periphery, near the ora serrata

What is the ora serrata?
The location where the peripheral retina and the pars plana meet

Non-rhegmatogenous (ERD)

Exudative

Tractional (TRD)

U

‘The flap’

(The black part is the tear itself)

Anterior

Posterior

‘The flap’

Why are they called ‘horseshoe’ tears?
Because of their shape (see above)
Retinal Detachment Overview

Ora serrata

Ciliary body

Ciliary zonule (suspensory ligament)

Cornea

Iris

Pupil
Retinal Detachment Overview

Rhegmatogenous (RRD)

The essential difference is that RRD is associated with a full-thickness retinal break...

Non-rhegmatogenous

Exudative (ERD)

Tractional (TRD)

The flap

Why are they called ‘horseshoe’ tears? Because of their shape (see above)

Where are they typically found? In the far periphery, near the ora serrata

How do they develop?

A tongue of attached vitreous extends beyond the normal limit of the vitreous base, onto the peripheral retina. Tension on the vitreous gets focused at this site, and the tongue of vitreous tears the retina anteriorly, producing the flap.

Tears

Holes

Dialyses

Which of these is most commonly implicated in RRD?

Specifically, these are known as horseshoe tears.
Retinal Detachment Overview

Rhegmatogenous (RRD)

The essential difference is that RRD is associated with a full-thickness retinal break...

Non-rhegmatogenous (ERD)

Exudative (TRD)

Tears

Holes

Dialyses

Which of these is most commonly implicated in RRD?

Specifically, these are known as horseshoe tears

Why are they called ‘horseshoe’ tears?
Because of their shape (see above)

Where are they typically found?
In the far periphery, near the ora serrata

How do they develop?
A tongue of attached vitreous extends beyond the normal limit of the vitreous base, onto the peripheral retina. Tension on the vitreous gets focused at this site, and the tongue of vitreous tears the retina anteriorly, producing the flap.
Horseshoe tear
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

The essential difference is that RRD is associated with a full-thickness retinal break...

Tears Holes Dialyses

Technically, this is incorrect. What is the correct name of the structure that gets torn?

Specifically, these are known as horseshoe tears

and the tongue of vitreous tears the retina anteriorly, producing the flap.

‘The flap’
(The black part is the tear itself)
Retinal Detachment Overview

The essential difference is that RRD is associated with a full-thickness retinal break.

Tears | Holes | Dialysis

Which of these is most commonly implicated in RRD? Specifically, these are known as horseshoe tears.

The flap

(The black part is the tear itself)

Technically, this is incorrect. What is the correct name of the structure that gets torn? The neurosensory retina

The flap

and the tongue of vitreous tears the retina anteriorly, producing the flap.

Rhegmatogenous (RRD)

Retinal Detachment Overview

The essential difference is that RRD is associated with a full-thickness retinal break.
The essential difference is that RRD is associated with a full-thickness retinal break. Which of these is most commonly implicated in RRD? Specifically, these are known as horseshoe tears.

'\textit{The flap}': (The black part is the tear itself)

Technically, this is incorrect. \textbf{What is the correct name of the structure that gets torn?} The \textit{neurosensor}y retina

\textbf{What? Aren't the terms retina and neurosensor}y retina \textit{interchangeable}? and the tongue of vitreous \textit{tears the retina} anteriorly, producing the flap.
Rhegmatogenous (RRD) Retinal Detachment

The essential difference is that RRD is associated with a full-thickness retinal break...

Tears | Holes | Dialyses

Which of these is most commonly implicated in RRD?

Specifically, these are known as horseshoe tears.

Technically, this is incorrect. What is the correct name of the structure that gets torn?
The neurosensory retina

What? Aren't the terms retina and neurosensory retina interchangeable? Again, technically no. Neurosensory retina refers to the multilayered structure from the photoreceptors inward, whereas the retina is composed of the neurosensory retina and the RPE.

And the tongue of vitreous tears the retina anteriorly, producing the flap.
Retinal Detachment Overview

The essential difference is that RRD is associated with a full-thickness retinal break...

Tears

Holes

Dialyses

Which of these is most commonly implicated in RRD?

Specifically, these are known as horseshoe tears.

Technically, this is incorrect. What is the correct name of the structure that gets torn?
The neurosensory retina

What? Aren’t the terms retina and neurosensory retina interchangeable?
Again, technically no. Neurosensory retina refers to the multilayered structure from the photoreceptors inward, whereas the retina is composed of the neurosensory retina and the RPE.

That said, like most ophthalmos, the term retina here will mean the neurosensory portion unless otherwise specified.

and the tongue of vitreous tears the retina anteriorly, producing the flap.
The essential difference is that RRD is associated with a full-thickness retinal break...

Which of these is most commonly implicated in RRD?
Specifically, these are known as **horseshoe tears**.

What event most commonly precipitates this tension?
Beyond the normal limit of the vitreous base, onto the peripheral retina. **Tension on the vitreous gets focused at this site** and the tongue of vitreous tears the retina anteriorly, producing the flap.

Why are they called ‘horseshoe’ tears?
Because of their shape (see above)

Where are they typically found?
In the far periphery, near the ora serrata

How do they develop?
A tongue of attached vitreous extends beyond the normal limit of the vitreous base, onto the peripheral retina. **Tension on the vitreous gets focused at this site**, and the tongue of vitreous tears the retina anteriorly, producing the flap.

Retinal Detachment Overview

Rhegmatogenous (RRD)

Non-rhegmatogenous

Exudative (ERD)

Tractional (TRD)
Retinal Detachment Overview

Rhegmatogenous (RRD)

The essential difference is that RRD is associated with a full-thickness retinal break...

Non-rhegmatogenous

Exudative (ERD)

Tractional (TRD)

Tears

Holes

Dialyses

Which of these is most commonly implicated in RRD?

Specifically, these are known as horseshoe tears.

Why are they called ‘horseshoe’ tears?
Because of their shape (see above)

Where are they typically found?
In the far periphery, near the ora serrata

What event most commonly precipitates this tension?
A posterior vitreous detachment

beyond the normal limit of the vitreous base, onto the peripheral retina. Tension on the vitreous gets focused at this site and the tongue of vitreous tears the retina anteriorly, producing the flap.
Retinal Detachment Overview

- Rhegmatogenous (RRD)
  - The essential difference is that RRD is associated with a full-thickness retinal break...
- Tractional (TRD)
  - What event most commonly precipitates this tension?
    - A posterior vitreous detachment

Much more on PVDs later in the slide-set

- Tears
- Holes
- Dialyses

Which of these is most commonly implicated in RRD?

Specifically, these are known as horseshoe tears

Why are they called ‘horseshoe’ tears?
Because of their shape (see above)

Where are they typically found?
In the far periphery, near the ora serrata

How do they develop?
A tongue of attached vitreous extends beyond the normal limit of the vitreous base, onto the peripheral retina. Tension on the vitreous gets focused at this site, and the tongue of vitreous tears the retina anteriorly, producing the flap.

‘The flap’ (The black part is the tear itself)
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

The essential difference is that RRD is associated with a full-thickness retinal break...

Tears

Holes

Dialyses

Why are they called 'horseshoe' tears? Because of their shape (see above)

Where are they typically found? In the far periphery, near the ora serrata

What other location is a common site of retinal tears leading to RRD? At the edge of lattice degeneration

Which of these is most commonly implicated in RRD? Specifically, these are known as horseshoe tears
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

Exudative

(Tractional (TRD)

The essential difference is that RRD is associated with a full-thickness retinal break...

Tears

Holes

Dialysis

What other location is a common site of retinal tears leading to RRD? At the edge of lattice degeneration.

Why are they called ‘horseshoe’ tears?
Because of their shape (see above)

Where are they typically found?
In the far periphery, near the ora serrata

Which of these is most commonly implicated in RRD?
Specifically, these are known as horseshoe tears.

Anterior

Posterior

‘The flap’

(The black part is the tear itself)
Retinal Detachment Overview

The essential difference is that RRD is associated with a full-thickness retinal break...

What other location is a common site of retinal tears leading to RRD?
At the edge of lattice degeneration

Why are they called ‘horseshoe’ tears?
Because of their shape (see above)

Where are they typically found?
In the far periphery, near the ora serrata

Lattice will also be covered in detail later in the slide-set

Retinal Detachment

Rhegmatogenous (RRD)

Tractional (TRD)

Tears

Holes

Dialyses

Which of these is most commonly implicated in RRD?
Specifically, these are known as horseshoe tears
The essential difference is that RRD is associated with a **full-thickness retinal break**...
The essential difference is that RRD is associated with a **full-thickness retinal break**…

**Giant Tears**

What is a **giant** retinal tear?
A circumferential tear extending at least 90° (3 clock-hours).
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD) Non-rhegmatogenous

Non-rhegmatogenous: Tractional (TRD) Exudative (ERD)

The essential difference is that RRD is associated with a full-thickness retinal break...

Giant Tears

What is a giant retinal tear? Where are they located? A circumferential tear extending at least 90° (3 clock-hours).
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

Tractional (TRD)

Exudative (ERD)

The essential difference is that RRD is associated with a full-thickness retinal break...

Giant Tears

What is a giant retinal tear? Where are they located?
A circumferential tear extending at least 90° (3 clock-hours). In the far periphery.
The essential difference is that RRD is associated with a full-thickness retinal break…

What is a giant retinal tear? Where are they located? What is the cause? A circumferential tear extending at least 90° (3 clock-hours). In the far periphery.
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

Tractional (TRD)

Exudative (ERD)

The essential difference is that RRD is associated with a full-thickness retinal break...

Giant Tears

What is a giant retinal tear? Where are they located? What is the cause? A circumferential tear extending at least 90° (3 clock-hours). In the far periphery. Blunt trauma, usually.
Giant retinal tear
Retinal Detachment Overview

- Rhegmatogenous (RRD)
- Non-rhegmatogenous
  - Tractional (TRD)
  - Exudative (ERD)

The essential difference is that RRD is associated with a **full-thickness retinal break**...

**What are the two types of retinal holes?**
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

Tractional (TRD)

Exudative (ERD)

Tears

Holes

Dialyses

The essential difference is that RRD is associated with a full-thickness retinal break...

What are the two types of retinal holes?

- Atrophic
- Operculated
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

Tractional (TRD)

The essential difference is that RRD is associated with a **full-thickness retinal break**...

What does operculated mean?

It means, 'covered by an operculum'

OK, so what's an operculum?

An operculum is a lid, or a cover. Thus, an operculated retinal hole is a full-thickness break in the retina with the missing piece of retina suspended within the vitreous above the break.

How do operculated holes come about?

They often (but not always) start as horseshoe tears, with subsequent amputation of the flap (i.e., the operculum is the amputated flap; see above)

Tears

Holes

Dialyses

Atrophic

Operculated
Retinal Detachment

**Rhegmatogenous** (RRD)

The essential difference is that RRD is associated with a **full-thickness retinal break**...

**Non-rhegmatogenous**

- **Tractional** (TRD)

What does operculated mean? It means, ‘covered by an operculum’

- **Tears**
- **Holes**
- **Dialyses**

  - Atrophic
  - Operculated
Retinal Detachment Overview

Rhegmatogenous (RRD)

The essential difference is that RRD is associated with a full-thickness retinal break...

Non-rhegmatogenous

Tractional (TRD)

What does operculated mean? It means, ‘covered by an operculum’

OK, so what’s an operculum?

Atrophic

Operculated

Tears

Holes

Dialysis
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

The essential difference is that RRD is associated with a **full-thickness retinal break**...

Tears

Holes

- Atrophic
- Operculated

Non-rhegmatogenous

Tractional (TRD)

Operculated

What does operculated mean?
It means, ‘covered by an operculum’

OK, so what’s an operculum?
An operculum is a lid, or a cover. Thus, an operculated retinal hole is a full-thickness break in the retina with the missing piece of retina suspended within the vitreous above the break.
Retinal Detachment Overview

Operculated retinal hole
Retinal Detachment Overview

The essential difference is that RRD is associated with a **full-thickness retinal break**...

**Rhegmatogenous (RRD)**

**Non-rhegmatogenous**

**Tractional (TRD)**

- **Tears**
- **Holes**
  - Atrophic
  - Operculated

**What does operculated mean?**
It means, ‘covered by an operculum’

**OK, so what’s an operculum?**
An operculum is a lid, or a cover. Thus, an operculated retinal hole is a full-thickness break in the retina with the missing piece of retina suspended within the vitreous above the break.

**How do operculated holes come about?**
Retinal Detachment Overview

Rhegmatogenous (RRD)

The essential difference is that RRD is associated with a full-thickness retinal break...

Non-rhegmatogenous

Tractional (TRD)

What does operculated mean?
It means, ‘covered by an operculum’

OK, so what’s an operculum?
An operculum is a lid, or a cover. Thus, an operculated retinal hole is a full-thickness break in the retina with the missing piece of retina suspended within the vitreous above the break.

How do operculated holes come about?
They often (but not always) start as horseshoe tears, with subsequent amputation of the flap (i.e., the operculum is the amputated flap; see above)

Tears
Holes
Dialysis

Atrophic
Operculated

‘The operculum’
(float in the vitreous just above the hole)

(The black part is the hole itself)
Retinal Detachment Overview

Atrophic retinal hole
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

Tractional

Exudative

What is a retinal dialysis?

The essential difference is that RRD is associated with a full-thickness retinal break...
Retinal Detachment Overview

Rhegmatogenous (RRD)

The essential difference is that RRD is associated with a full-thickness retinal break.

What is a retinal dialysis?

A circumferential break at the far-peripheral retina.
Retinal Detachment Overview

Rhegmatogenous (RRD)

- The essential difference is that RRD is associated with a **full-thickness** retinal break...

Non-rhegmatogenous

Tractional

Exudative

What is a retinal dialysis?
A circumferential break at the far-peripheral retina

What is the inciting event?

Tears

Holes

Dialyses
The essential difference is that RRD is associated with a full-thickness retinal break.

**What is a retinal dialysis?**
A circumferential break at the far-peripheral retina

**What is the inciting event?**
Usually blunt trauma
Retinal Detachment Overview

Retinal Detachment

`A circumferential break at the far-peripheral retina due to blunt trauma’ sounds an awful lot like ‘a circumferential tear in the far periphery due to blunt trauma,’ ie, a giant retinal tear. Are these simply two names for the same thing?

The essential difference is that RRD is associated with a full-thickness retinal break…

Giant Tears

What is a giant retinal tear? Where are they located? What is the cause? A circumferential tear extending at least 90° (3 clock-hours). In the far periphery. Blunt trauma, usually.

Holes

Dialyses

What is a retinal dialysis? A circumferential break at the far-peripheral retina. What is the inciting event? Usually blunt trauma.
Retinal Detachment Overview

Retinal dialysis
Retinal Detachment Overview

What is a giant retinal tear? Where are they located? What is the cause?

- **Giant Tears**
  - A circumferential tear extending at least 90° (3 clock-hours).
  - *In the far periphery.*
  - Usually **blunt trauma**

- **Holes**
- **Dialyses**

A circumferential break at the far-peripheral retina due to blunt trauma’ sounds an awful lot like ‘a circumferential tear in the far periphery due to blunt trauma,’ ie, a giant retinal tear. Are these simply two names for the same thing?

Definitely not. The key difference is, in a retinal dialysis the vitreous base tears away from the ora serrata on the pars plana side, but remains attached to the retina on the retina side. The vitreous then ‘peels away’ the ora-adjacent retina. Note that this means the retina remains attached to the vitreous. In contrast, a giant retinal tear occurs within the retina itself, usually just posterior (ie, the side away from the pars plana) to the vitreous base. Thus, in a giant retinal tear the vitreous isn’t attached to the torn-away retina.
Retinal Detachment Overview

The essential difference is that RRD is associated with a full-thickness retinal break…

Retinal Detachment

‘A circumferential break at the far-peripheral retina due to blunt trauma’ sounds an awful lot like ‘a circumferential tear in the far periphery due to blunt trauma,’ ie, a giant retinal tear. Are these simply two names for the same thing?

Definitely not. The vitreous tears away from the ora serrata on the pars plana side. The vitreous then ‘peels away’ the ora-adjacent retina. Thus, in a giant retinal tear the vitreous isn’t attached to the torn-away retina.

The anatomy of the vitreous will be covered in detail later in the slide-set.

The essential difference is that RRD is associated with a full-thickness retinal break…

What is a giant retinal tear? Where are they located? What is the cause?

A circumferential tear extending at least 90° (3 clock-hours) in the far periphery. Blunt trauma, usually.

What is a retinal dialysis?

A circumferential break at the far-peripheral retina attached to the vitreous base.

What is the inciting event?

Usually blunt trauma.

Giant Tears   Holes   Dialyses

A circumferential tear extending at least 90° (3 clock-hours) in the far periphery. Blunt trauma, usually.
The AAO Preferred Practice Pattern for RRD lists five risk factors--what are they?

- Posterior vitreous detachment (PVD)
- Myopia
- Lattice degeneration
- Cataract surgery
- Trauma
- Hx RRD in fellow eye
The AAO Preferred Practice Pattern for RRD lists five risk factors--what are they?
--Posterior vitreous detachment (PVD)
--Myopia
--Lattice degeneration
--Cataract surgery
--Trauma
--Hx RRD in fellow eye
The AAO Preferred Practice Pattern for RRD lists five risk factors—what are they?

--Posterior vitreous detachment (PVD)?
--Myopia?
--Lattice degeneration?
--Cataract surgery?
--Trauma?
--Hx RRD in fellow eye?

Of these, which is the biggest risk factor?
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

The AAO Preferred Practice Pattern for RRD lists five risk factors--what are they?
--Posterior vitreous detachment (PVD)
--Myopia
--Lattice degeneration
--Cataract surgery
--Trauma
--Hx RRD in fellow eye

Of these, which is the biggest risk factor? PVD
The AAO Preferred Practice Pattern for RRD lists five risk factors—what are they?

- Posterior vitreous detachment (PVD)
- Myopia
- Lattice degeneration
- Cataract surgery
- Trauma
- Hx RRD in fellow eye

What are the five major locations of vitreous attachment in the eye?
Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

The AAO Preferred Practice Pattern for RRD lists five risk factors--what are they?
--Posterior vitreous detachment (PVD)
--Myopia
--Lattice degeneration
--Cataract surgery
--Trauma
--Hx RRD in fellow eye

What are the five major locations of vitreous attachment in the eye?
--The posterior lens capsule
--The ora serrata
--Retinal vessels
--The macula
--The optic nerve head
The AAO Preferred Practice Pattern for RRD lists five risk factors--what are they?
--Posterior vitreous detachment (PVD)
--Myopia
--Lattice degeneration
--Cataract surgery
--Trauma
--Hx RRD in fellow eye

What are the five major locations of vitreous attachment in the eye?
--The posterior lens capsule
--The ora serrata

In what manner (configuration) is the vitreous attached to the lens capsule?
The AAO Preferred Practice Pattern for RRD lists five risk factors—what are they?

- Posterior vitreous detachment (PVD)
- Myopia
- Lattice degeneration
- Cataract surgery
- Trauma
- Hx RRD in fellow eye

What are the five major locations of vitreous attachment in the eye?

- The posterior lens capsule
- The ora serrata

In what manner (configuration) is the vitreous attached to the lens capsule?

In the form of a ring
Retinal Detachment Overview

The AAO Preferred Practice Pattern for RRD lists five risk factors--what are they?

--Posterior vitreous detachment (PVD)
--Myopia
--Lattice degeneration
--Cataract surgery
--Trauma
--Hx RRD in fellow eye

What are the five major locations of vitreous attachment in the eye?

--The posterior lens capsule
--The ora serrata
--Retinal vessels
--The macula
--The optic nerve head

In what manner (configuration) is the vitreous attached to the lens capsule?

In the form of a ring

What is the eponymous name for this ring-shaped attachment?
The AAO Preferred Practice Pattern for RRD lists five risk factors—what are they?

--Posterior vitreous detachment (PVD)
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--Trauma
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What are the five major locations of vitreous attachment in the eye?

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--The ora serrata
--Retinal vessels
--The macula
--The optic nerve head

In what manner (configuration) is the vitreous attached to the lens capsule?

In the form of a ring

What is the eponymous name for this ring-shaped attachment?

Wieger’s ligament
Vitreous attachments

- Vitreous base
- Weigert's ligament
- Berger's space
- Cloquet's canal
- Space of Martegiani
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

In what manner (configuration) is the vitreous attached to the ora serrata?

Posterior vitreous detachment

--Myopia
--Lattice degeneration
--Cataract surgery
--Trauma
--Hx RRD in fellow eye

The AAO Preferred Practice Pattern

--Posterior vitreous detachment

Retinal Detachment Overview

The ora serrata

--Retinal vessels
--The macula
--The optic nerve head

In what manner (configuration) is the vitreous attached to the ora serrata?
Retinal Detachment Overview

Rhegmatogenous (RRD)

Non-rhegmatogenous

The AAO Preferred Practice Pattern for RRD lists five risk factors:
- Posterior vitreous detachment (PVD)
- Myopia
- Lattice degeneration
- Cataract surgery
- Trauma
- Hx RRD in fellow eye

What are the five major locations of vitreous attachment in the eye?
- The posterior lens capsule
- The ora serrata
- Retinal vessels
- The macula
- The optic nerve head

In what manner (configuration) is the vitreous attached to the ora serrata?
In a band-like manner extending # mm anteriorly (ie, onto the pars plana of the ciliary body) and # mm posteriorly (ie, onto the peripheral retina).
The AAO Preferred Practice Pattern for RRD lists five risk factors:

- Posterior vitreous detachment (PVD)
- Myopia
- Lattice degeneration
- Cataract surgery
- Trauma
- History of RRD in the fellow eye

The five major locations of vitreous attachment in the eye are:

- The posterior lens capsule
- The ora serrata
- Retinal vessels
- The macula
- The optic nerve head

In what manner (configuration) is the vitreous attached to the ora serrata?
In a band-like manner extending 2 mm anteriorly (ie, onto the pars plana of the ciliary body) and 3 mm posteriorly (ie, onto the peripheral retina).
Retinal Detachment Overview

Rhegmatogenous (RRD)

Non-rhegmatogenous

The AAO Preferred Practice Pattern for RRD lists five risk factors—what are they?

-- Posterior vitreous detachment (PVD)
-- Myopia
-- Lattice degeneration
-- Cataract surgery
-- Trauma
-- Hx RRD in fellow eye

What are the five major locations of vitreous attachment in the eye?

-- The posterior lens capsule
-- The ora serrata
-- Retinal vessels
-- The macula
-- The optic nerve head

In what manner (configuration) is the vitreous attached to the ora serrata?

In a band-like manner extending 2 mm anteriorly (ie, onto the pars plana of the ciliary body) and 3 mm posteriorly (ie, onto the peripheral retina).

What is the name for this band-shaped attachment?

The vitreous base
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

The AAO Preferred Practice Patterns include five risk factors:

- Posterior vitreous detachment (PVD)
- Myopia
- Lattice degeneration
- Cataract surgery
- Trauma
- History of RRD in the fellow eye

What are the five major locations of vitreous attachment in the eye?

- Posterior lens capsule
- Ora serrata
- Retinal vessels
- Macula
- Optic nerve head

In what manner (configuration) is the vitreous attached to the ora serrata?
In a band-like manner extending 2 mm anteriorly (i.e., onto the pars plana of the ciliary body) and 3 mm posteriorly (i.e., onto the peripheral retina).

What is the name for this band-shaped attachment?
The vitreous base

The ora serrata

- Retinal vessels
- Macula
- Optic nerve head
Retinal Detachment Overview

The vitreous base
Retinal Detachment Overview

In what order do these sites detach in a typical PVD?

The AAO Preferred Practice Pattern for RRD lists five risk factors—what are they?

- Posterior vitreous detachment (PVD)
- Myopia
- Lattice degeneration
- Cataract surgery
- Trauma
- Hx RRD in fellow eye

What are the five major locations of vitreous attachment in the eye?

- The posterior lens capsule?
- The ora serrata?
- Retinal vessels?
- The macula?
- The optic nerve head?
The AAO Preferred Practice Pattern for RRD lists five risk factors--what are they?

- Posterior vitreous detachment (PVD)
- Myopia
- Lattice degeneration
- Cataract surgery
- Trauma
- Hx RRD in fellow eye

What are the five major locations of vitreous attachment in the eye?

- The posterior lens capsule
- The ora serrata
- Retinal vessels: 1st
- The macula: 2nd
- The optic nerve head: 3rd

In what order do these sites detach in a typical PVD?

Rhegmatogenous (RRD)
Non-rhegmatogenous (ERD)
Tractional (TRD)
The AAO Preferred Practice Pattern for RRD lists five risk factors--what are they?
--Posterior vitreous detachment (PVD)
--Myopia
--Lattice degeneration
--Cataract surgery
--Trauma
--Hx RRD in fellow eye

What are the five major locations of vitreous attachment in the eye?
--The posterior lens capsule?
--The ora serrata?
--Retinal vessels: 1\textsuperscript{st}
--The macula: 2\textsuperscript{nd}
--The optic nerve head: 3\textsuperscript{rd}

In what order do these sites detach in a typical PVD?

What about Wieger's ligament and the base? When do they detach in a PVD?
Rhegmatogenous (RRD)

The AAO Preferred Practice Pattern for RRD lists five risk factors—what are they?
-- Posterior vitreous detachment (PVD)
-- Myopia
-- Lattice degeneration
-- Cataract surgery
-- Trauma
-- Hx RRD in fellow eye

In what order do these sites detach in a typical PVD?

What about Wieger’s ligament and the base? When do they detach in a PVD?
They don’t. The base never detaches (except in cases of severe blunt trauma).

What are the five major locations of vitreous attachment in the eye?
-- The posterior lens capsule
-- The ora serrata
-- Retinal vessels: 1st
-- The macula: 2nd
-- The optic nerve head: 3rd

Retinal Detachment Overview
Retinal Detachment Overview

Retinal Detachment

In what order do these sites detach in a typical PVD?

What about Wieger's ligament and the base? When do they detach in a PVD? They don't. The base never detaches (except in cases of severe blunt trauma). As for Wieger's ligament: Given its extremely anterior location, it shouldn’t be surprising that it is spared in a posterior vitreous detachment.

The AAO Preferred Practice Pattern for RRD lists five risk factors--what are they?

--- Posterior vitreous detachment (PVD)
--- Myopia
--- Lattice degeneration
--- Cataract surgery
--- Trauma
--- Hx RRD in fellow eye

What are the five major locations of vitreous attachment in the eye?

--- The posterior lens capsule
--- The ora serrata
--- Retinal vessels: 1st
--- The macula: 2nd
--- The optic nerve head: 3rd
Vitreous body of a 9 month old child. The vitreous is very much a formed body early in life.
Retinal Detachment Overview

Early liquefaction

Extensive liquefaction

Acute posterior vitreous detachment

Complete posterior vitreous detachment

Posterior vitreous detachment process
Retinal Detachment Overview

**Retinal Detachment**

- Rhegmatogenous (RRD)
- Non-rhegmatogenous
  - Exudative (ERD)
  - Tractional (TRD)

**Rhegmatogenous (RRD)**

The AAO Preferred Practice Pattern for RRD lists five risk factors:
- Posterior vitreous detachment (PVD)
- Myopia
- Lattice degeneration
- Cataract surgery
- Trauma
- Hx RRD in fellow eye

**What are the five major locations of vitreous attachment in the eye?**
- The posterior lens capsule?
- The ora serrata?
- Retinal vessels
- The macula
- The optic nerve head

**OK then, is there such a thing as an anterior vitreous detachment?**

Yes. As noted above, the base never detaches. However, there are occasions when Wieger's lets go, and this is the definition of an anterior detachment.

Under what circumstances does such an anterior detachment occur?

Usually in the course of an intracapsular cataract extraction (ICCE), which has long fallen out of favor except under the most unusual of clinical circumstances.
Retinal Detachment Overview

Retinal Detachment

OK then, is there such a thing as an anterior vitreous detachment?
Yes. As noted above, the base never detaches.

What are the five major locations of vitreous attachment in the eye?
--The posterior lens capsule?
--The ora serrata
--Retinal vessels
--The macula
--The optic nerve head
Retinal Detachment

The American Academy of Ophthalmology (AAO) Preferred Practice Pattern for Retinal Detachment lists five risk factors:

1. Posterior vitreous detachment (PVD)
2. Myopia
3. Lattice degeneration
4. Cataract surgery
5. Trauma
6. History of previous retinal detachment (RRD) in the fellow eye

What are the five major locations of vitreous attachment in the eye?

1. Posterior lens capsule
2. Ora serrata
3. Retinal vessels
4. Macula
5. Optic nerve head

OK then, is there such a thing as an anterior vitreous detachment?
Yes. As noted above, the base never detaches. However, there are occasions when Wieger’s lets go, and this is the definition of an anterior detachment.
Retinal Detachment Overview

The AAO Preferred Practice Pattern for RRD lists five risk factors—what are they?

- Posterior vitreous detachment (PVD)
- Myopia
- Lattice degeneration
- Cataract surgery
- Trauma
- Hx RRD in fellow eye

What are the five major locations of vitreous attachment in the eye?

- The posterior lens capsule
- The ora serrata
- Retinal vessels
- The macula
- The optic nerve head

OK then, is there such a thing as an **anterior vitreous detachment**? Yes. As noted above, the base never detaches. However, there are occasions when Wieger’s lets go, and this is the definition of an anterior detachment.

Under what circumstances does such an anterior detachment occur?

Usually in the course of an intracapsular cataract extraction (ICCE), which has long fallen out of favor except under the most unusual of clinical circumstances.
OK then, is there such a thing as an anterior vitreous detachment?
Yes. As noted above, the base never detaches. However, there are occasions when Wieger’s lets go, and this is the definition of an anterior detachment.

Under what circumstances does such an anterior detachment occur?
Usually in the course of an intracapsular cataract extraction (ICCE), which has long fallen out of favor except under the most unusual of clinical circumstances.
The AAO Preferred Practice Pattern for RRD lists five risk factors--what are they?

---Posterior vitreous detachment (PVD)
--Myopia
--Lattice degeneration
--Cataract surgery
--Trauma
--Hx RRD in fellow eye
When (ie, in what age range) do PVDs typically occur?

45-65

The AAO Preferred Practice Pattern for RRD lists five risk factors--what are they?

--Posterior vitreous detachment (PVD)
--Myopia
--Lattice degeneration
--Cataract surgery
--Trauma
--Hx RRD in fellow eye
The AAO Preferred Practice Pattern for RRD lists five risk factors—what are they?

--Posterior vitreous detachment (PVD)
--Myopia
--Lattice degeneration
--Cataract surgery
--Trauma
--Hx RRD in fellow eye

When (ie, in what age range) do PVDs typically occur?
45-65

What group of otherwise normal eyes often detach at a younger age?
Retinal Detachment Overview

When (ie, in what age range) do PVDs typically occur?  
45-65

What group of otherwise normal eyes often detach at a younger age?  
Myopic eyes

The AAO Preferred Practice Pattern for RRD lists five risk factors--what are they?  
--Posterior vitreous detachment (PVD)  
--Myopia  
--Lattice degeneration  
--Cataract surgery  
--Trauma  
--Hx RRD in fellow eye
Retinal Detachment Overview

When (ie, in what age range) do PVDs typically occur?
45-65

What group of otherwise normal eyes often detach at a younger age?
Myopic eyes

PVDs can be divided into two groups based on an important clinical characteristic. What are these groups?

The AAO Preferred Practice Pattern for RRD lists five risk factors--what are they?
--Posterior vitreous detachment (PVD)
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--Hx RRD in fellow eye
When (ie, in what age range) do PVDs typically occur?
45-65

What group of otherwise normal eyes often detach at a younger age?
Myopic eyes

PVDs can be divided into two groups based on an important clinical characteristic.
What are these groups?
Symptomatic and asymptomatic

The AAO Preferred Practice Pattern for RRD lists five risk factors--what are they?

--Posterior vitreous detachment (PVD)
--Myopia
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--Cataract surgery
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--Hx RRD in fellow eye
Retinal Detachment Overview

Retinal Detachment

When (i.e., in what age range) do PVDs typically occur?
45-65

Why is the symptomatic/asymptomatic distinction clinically important?
Because symptomatic pts are at significantly higher risk of an RRD

What are these groups?
Symptomatic and asymptomatic

PVDs can be divided into two groups based on an important clinical characteristic.

The AAO Preferred Practice Pattern for RRD lists five risk factors--what are they?
--Posterior vitreous detachment (PVD)
--Myopia
--Lattice degeneration
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--Hx RRD in fellow eye
When (ie, in what age range) do PVDs typically occur? 45-65

Why is the symptomatic/asymptomatic distinction clinically important? Because symptomatic pts are at significantly higher risk of an RRD

PVDs can be divided into two groups based on an important clinical characteristic.

What are these groups? Symptomatic and asymptomatic

The AAO Preferred Practice Pattern for RRD lists five risk factors--what are they?
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The AAO Preferred Practice Pattern for RRD lists five risk factors--what are they?

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PVDs can be divided into two groups based on an important clinical characteristic. What are these groups?

Symptomatic and asymptomatic

Why is the symptomatic/asymptomatic distinction clinically important? Because symptomatic pts are at significantly higher risk of an RRD

What symptoms are being referenced here?

Photopsias and floaters

When (ie, in what age range) do PVDs typically occur?

45-65
Retinal Detachment Overview

When (ie, in what age range) do PVDs typically occur? 45-65

Why is the symptomatic/asymptomatic distinction clinically important? Because symptomatic pts are at significantly higher risk of an RRD

What symptoms are being referenced here? Photopsias and floaters

PVDs can be divided into two groups based on an important clinical characteristic. What are these groups? Symptomatic and asymptomatic

The AAO Preferred Practice Pattern for RRD lists five risk factors--what are they? --Posterior vitreous detachment (PVD) --Myopia --Lattice degeneration --Cataract surgery --Trauma --Hx RRD in fellow eye

Rhegmatogenous (RRD) Non-rhegmatogenous (ERD) Tractional (TRD)
The AAO Preferred Practice Pattern for RRD lists five risk factors—what are they?

--- Posterior vitreous detachment (PVD)
--- Myopia
--- Lattice degeneration
--- Cataract surgery
--- Trauma
--- Hx RRD in fellow eye

Photopsias and floaters can be divided into symptomatic and asymptomatic groups.

Because symptomatic pts are at significantly higher risk of an RRD

What symptoms are being referenced here?

Photopsias and floaters

What are photopsias?

Flashes of light

What causes photopsias?

Mechanical stimulation of the retina (this is why you 'see stars' if you bang your head or rub your eyes)

What is the source of mechanical stimulation in PVD?

Vitreous traction, ie, the vitreous tugging on the retina

Are photopsias more noticeable under bright, or low-light conditions?

Low light
The AAO Preferred Practice Pattern for RRD lists five risk factors--what are they?

---Posterior vitreous detachment (PVD)
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What are photopsias?
Flashes of light

Photopsias
Symptomatic

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45-65

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Symptomatic and asymptomatic

Retinal Detachment Overview
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45–65

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Photopsias

Symptomatic

Retinal Detachment Overview
Retinal Detachment Overview

When (ie, in what age range) do PVDs typically occur?
45-65

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Retinal Detachment Overview

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When (ie, in what age range) do PVDs typically occur?
45-65

Why is the symptomatic/asymptomatic distinction clinically important?
Because symptomatic pts are at significantly higher risk of an RRD

What symptoms are being referenced here?
Photopsias and floaters

When pts report seeing floaters, are they actually seeing floaters?

No—it is physically impossible to see floaters

Why is it impossible to see floaters?
For two reasons:
--As floaters are located within the vitreous, there is no incident light reflected from them toward the macula
--Even if incident light was present, there is no refractive apparatus between the floaters and the fovea to produce an image

OK then, what are pts seeing when they report floaters?
They are seeing the shadows floaters produce when they block light heading towards the macula
Retinal Detachment Overview

The AAO Preferred Practice Pattern for RRD lists five risk factors—what are they?

--- \textbf{Posterior vitreous detachment (PVD)}
--- Myopia
--- Lattice degeneration
--- Cataract surgery
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They are seeing the shadows floaters produce when they block light heading towards the macula
Retinal Detachment Overview

**When (i.e., in what age range) do PVDs typically occur?**

**45-65**

**Why is the symptomatic/asymptomatic distinction clinically important?**

Because symptomatic pts are at significantly higher risk of an RRD.

**What symptoms are being referenced here?**

Photopsias and floaters.

**When pts report seeing floaters, are they actually seeing floaters?**

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For two reasons:

- As floaters are located within the vitreous, there is no incident light reflected from them toward the macula.
- Even if incident light was present, there is no refractive apparatus between the floaters and the fovea to produce an image.

OK then, what are pts seeing when they report floaters?

They are seeing the shadows floaters produce when they block light heading towards the macula.

The AAO Preferred Practice Pattern for RRD lists five risk factors--what are they?

--- **Posterior vitreous detachment (PVD)**
--- Myopia
--- Lattice degeneration
--- Cataract surgery
--- Trauma
--- Hx RRD in fellow eye
Retinal Detachment Overview

The AAO Preferred Practice Pattern for RRD lists five risk factors--what are they?

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--Myopia
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--Cataract surgery
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No--it is physically impossible to see floaters

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Why is it impossible to see floaters? For two reasons:
--As floaters are located within the vitreous, there is no incident light reflected from them toward the macula
--Even if incident light was present, there is no refractive apparatus between the floaters and the fovea to produce an image

The AAO Preferred Practice Pattern for RRD lists five risk factors--what are they?
--Posterior vitreous detachment (PVD)
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Retinal Detachment Overview

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Why is the symptomatic/asymptomatic distinction clinically important?
Because symptomatic pts are at significantly higher risk of an RRD

What symptoms are being referred to?
Photopsias and floaters

PVDs can be divided into two groups based on an important clinical characteristic.
What are these groups?
Symptomatic and asymptomatic

OK then, what are pts seeing when they report floaters?
They are seeing the shadows floaters produce when they block light heading towards the macula
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- Heme
- Clumps of pigment/pigmented cells
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What is the eponymous name for this ring-shaped floater?

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Retinal Detachment Overview

Retinal Detachment

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132

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141

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The AAO Preferred Practice Pattern for RRD lists five risk factors:
- Posterior vitreous detachment (PVD)
- Myopia
- Lattice degeneration
- Cataract surgery
- Trauma
- Hx RRD in fellow eye

When (ie, in what age range) do PVDs typically occur?
- 45-65

What group of otherwise normal eyes often detach at a younger age?
- Myopic eyes

PVDs can be divided into two groups based on an important clinical characteristic. What are these groups?
- Symptomatic and asymptomatic

Why is the symptomatic/asymptomatic distinction clinically important?
- Because symptomatic pts are at significantly higher risk of an RRD

What symptoms are being referenced here?
- Photopsias and floaters

There are three main types of floaters. What are they?
- Heme
- Clumps of pigment/pigmented cells
- Epipapillary glial tissue

What is the source of the heme?
- Torn retinal vessels

Is there a relationship between the amount of vitreous heme and the risk of a retinal tear?
- Yes--the risk is directly proportional to it

What is the source of the pigment/pigmented cells?
- The RPE

How does a retinal tear result in pigment/pigmented cells floating in the vitreous cavity?
- The cells/pigment are liberated from their normal location by the tearing away of the retina

What is the colorful description for the appearance of pigment/pigmented cells in the anterior vitreous?
- ‘Tobacco dust’

What is the eponymous name for finding pigment/pigmented cells in the anterior vitreous?
- Shafer’s sign. It is very important to record the status of Shafer’s sign (positive or negative) on all acute PVD pts!

What does ‘epipapillary glial tissue’ refer to?
- The attachment of the posterior vitreous face to the retina encircling the optic disc. When it comes loose during a PVD, this tissue often forms a large ring-shaped floater.
Retinal Detachment Overview

Rhegmatogenous (RRD) vs. Non-rhegmatogenous (ERD, TRD)

The AAO Preferred Practice Pattern for RRD lists five risk factors:

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When (ie, in what age range) do PVDs typically occur?

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What is the eponymous name for this ring-shaped floater?
Retinal Detachment Overview

Retinal Detachment

Non-rhegmatogenous

Exudative (ERD)

Tractional (TRD)

Rhegmatogenous (RRD)

The AAO Preferred Practice Pattern for RRD lists five risk factors—what are they?

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The cells/pigment are liberated from their normal location by the tearing away of the retina

What are these cells/pigment?

--Torn retinal vessels
--The RPE

What symptoms are being referenced here?

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What does ‘epipapillary glial tissue’ refer to?

The attachment of the posterior vitreous face to the retina encircling the optic disc. When it comes loose during a PVD, this tissue often forms a large ring-shaped floater.

What is the eponymous name for this ring-shaped floater?

Weiss ring
Retinal Detachment Overview

1. Non-rhegmatogenous Detachment (ERD)
2. Tractional Detachment (TRD)
3. Rhegmatogenous Detachment (RRD)

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- Posterior vitreous detachment (PVD)
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Retinal Detachment Overview

Weiss ring
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

Is myopia a significant risk factor?

Yes

The AAO Preferred Practice Pattern for RRD lists five risk factors--what are they?

- Posterior vitreous detachment (PVD)
- Myopia
- Lattice degeneration
- Cataract surgery
- Trauma
- History of RRD in fellow eye

Is myopia a significant risk factor?

Yeah buddy. Over half of RRDs occur in myopic eyes!

Is RRD risk proportional to the degree of myopia?

Yes

Is RRD risk proportional to axial length (which is of course proportional to the degree of myopia)?

Yes
Retinal Detachment Overview

Rhegmatogenous (RRD)

Non-rhegmatogenous

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Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

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Retinal Detachment Overview

Rhegmatogenous (RRD)

Non-rhegmatogenous

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Retinal Detachment Overview

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Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

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How prevalent is lattice in the population?

How prevalent is lattice in pts with an RRD?

Is it more common in myopic, or hyperopic eyes?

While not inevitable, a familial predisposition is often found.

Retinal Detachment Overview
Retinal Detachment Overview

Rhegmatogenous (RRD)

Non-rhegmatogenous

The AAO Preferred Practice Pattern for RRD lists five risk factors—what are they?

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How prevalent is lattice in the population?
Quite—it is found in %-% of the population.

How prevalent is lattice in pts with an RRD?
It is found in 1/5 to 1/3 of eyes with an RRD.
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD) & Non-rhegmatogenous

The AAO Preferred Practice Pattern for RRD lists five risk factors—what are they?

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Is it more common in myopic, or hyperopic eyes?
Myopic

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Retinal Detachment Overview

Lattice degeneration
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)
非rhegmatogenous

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Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

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Familial
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Retinal Detachment Overview

**Rhegmatogenous (RRD)**

**Non-rhegmatogenous**

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Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

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Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

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Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous

Non-rhegmatogenous

There are three clinically important aspects to the structure of lattice degeneration--what are they?
1) A focal area of retina for which the internal limiting membrane is missing;
2) a pocket of liquefied vitreous overlying this retinal lesion; and
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Myopia
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Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous

Non-rhegmatogenous

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Retinal Detachment Overview

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Retinal Detachment

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Non-rhegmatogenous

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Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous
Non-rhegmatogenous

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Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous

Non-rhegmatogenous

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Retinal Detachment Overview

Retinal Detachment

- Rhegmatogenous
- Non-rhegmatogenous

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Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous

Non-rhegmatogenous

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--Myopia
--Lattice degeneration
--Cataract surgery
--Trauma
--Hx RRD in fellow eye

Retinal tears (with subsequent rhegmatogenous RD) result from traction on these abnormal vitreo-retinal adhesions

Is it more common in myopic, or hyperopic eyes?
Myopic

Is it sporadic, or familial?
While not inevitable, a familial predisposition is often found

The AAO Preferred Practice Pattern for RRD lists five risk factors—what are they?
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Retinal tear at the posterior edge of lattice
The AAO Preferred Practice Pattern for RRD lists five risk factors, what are they?
--Posterior vitreous detachment (PVD)
--Myopia
--Lattice degeneration
--Cataract surgery
--Trauma
--Hx RRD in fellow eye

Who is at greater risk for RRD after cataract surgery…
--Males, or females?
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

The AAO Preferred Practice Pattern for RRD lists five risk factors, what are they?
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--Hx RRD in fellow eye

Who is at greater risk for RRD after cataract surgery…
--Males, or females? **Males**
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

The AAO Preferred Practice Pattern for RPD lists five risk factors, what are they?
--Posterior vitreous detachment (PVD)
--Myopia
--Lattice degeneration
--Cataract surgery
--Trauma
--Hx RRD in fellow eye

Who is at greater risk for RRD after cataract surgery…
--Males, or females? **Males**
--Younger, or older individuals?
The AAO Preferred Practice Pattern for RRD lists five risk factors, what are they?
--Posterior vitreous detachment
--Myopia
--Lattice degeneration
--Cataract surgery
--Trauma
--Hx RRD in fellow eye

Who is at greater risk for RRD after cataract surgery…
--Males, or females? **Males**
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Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

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Who is at greater risk for RRD after cataract surgery…

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What intraop event significantly increases the risk of RRD?
The AAO Preferred Practice Pattern for RRD lists five risk factors, what are they?
-- Posterior vitreous detachment (PVD)
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Who is at greater risk for RRD after cataract surgery…
-- Males, or females? **Males**
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What intraop event significantly increases the risk of RRD?
Rupture of the posterior capsule
The AAO Preferred Practice Pattern for RRD lists five risk factors:

--Posterior vitreous detachment (PVD)
--Myopia
--Lattice degeneration
--Cataract surgery
--Trauma
--Hx RRD in fellow eye

Are we talking about blunt, or penetrating trauma?

Both

If blunt trauma causes a retinal break, it typically happens in one of two places relative to the site of the trauma. Where are those two places, and what terms are used to describe them?

--A break in the retina adjacent to the injury site is a coup injury
--A break in the retina opposite to the injury site is a contrecoup injury

Young people have a higher rate of eye trauma than do older individuals. If a young person sustains a break-producing injury, is it expected that they will have an RRD soon thereafter?

No, only about 10% present in the immediate post-injury period. Only about 50% will present within the first 8 months.

Why the delay?

Because young people’s vitreous is formed (ie, not yet liquefied), it is not able to flow through an open retinal break. Only later, if/when trauma-induced vitreous damage leads to liquefaction, will a young person experience an RRD.
The AAO Preferred Practice Pattern for RRD lists five risk factors—what are they?

--Posterior vitreous detachment (PVD)
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--Lattice degeneration
--Cataract surgery
--Trauma
--Hx RRD in fellow eye

Are we talking about blunt, or penetrating trauma?
Both

Young people have a higher rate of eye trauma than do older individuals. If a young person sustains a break-producing injury, is it expected that they will have an RRD soon thereafter?
No, only about 10% present in the immediate post-injury period. Only about 50% will present within the first 8 months.

Why the delay?
Because young people’s vitreous is formed (ie, not yet liquefied), it is not able to flow through an open retinal break. Only later, if/when trauma-induced vitreous damage leads to liquefaction, will a young person experience an RRD.
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If blunt trauma causes a retinal break, it typically happens in one of two places relative to the site of the trauma. Where are those two places, and what terms are used to describe them?

Retinal Detachment Overview

The AAO Preferred Practice Pattern for RRD lists five risk factors—what are they?

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Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

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What effect does a history of nontraumatic RRD in one eye have on the lifetime risk of experiencing a nontraumatic RRD in the fellow eye?
Retinal Detachment Overview

Rhegmatogenous (RRD) vs. Non-rhegmatogenous

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Vitreoretinal elements pulling hard enough on the neurosensory retina to distract it from its normal position apposing the RPE

What is the most common cause of these vitreoretinal membrane?

Proliferative retinopathy (eg, PDR; CRVO; BRVO)

Another, completely different sort of common cause?

Penetrating trauma

Does penetrating trauma lead to proliferative vitreoretinopathy?

No, it leads to proliferative vitreo-retinopathy

Retinal Detachment Overview

Retinal Detachment

Non-rhegmatogenous

Tractional (TRD)

Exudative (ERD)
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Exudative (ERD)

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Retinal Detachment Overview

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Retinal Detachment

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How does proliferative retinopathy lead to TRD?
Recall that, by definition, PDR vessels break through the internal limiting membrane (ILM), and thus are in contact with the posterior hyaloid face. Some vessels will use the posterior hyaloid as a 'scaffold' on which to grow. Further, remember that proliferative vessels don’t travel solo–they bring glial and other fibroblastic-type cells along. These fellow-travelers provide a contractile element to the neovascular fronds.

So, contraction of these fibrovascular elements leads to TRD?
It contributes, but is not the main source of traction.

What is the main source of traction?
Our old friend PVD—or more correctly, a partial PVD. New vessels crawling on the posterior hyaloid face induces a partial PVD. Some vessels prevent the PVD from propagating (hence its partial status); others are suspended between the contracting vitreous and the retina, resulting in traction on the retina.
Retinal Detachment Overview

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- Non-rhegmatogenous (ERD)
- Tractional (TRD)
- Rhegmatogenous (RRD)
Retinal Detachment Overview

TRD. Note the vessels crawling up on and into the vitreous
What is the underlying pathophysiology in TRD?

Vitreoretinal elements pulling hard enough on the neurosensory retina to distract it from its normal position apposing the RPE.

What is another, completely different sort of common cause?

**Penetrating trauma**

Does penetrating trauma lead to proliferative retinopathy?
No, it leads to proliferative vitreoretinopathy.

To be clear: When we refer to penetrating trauma, what structure specifically is being penetrated?

Non-rhegmatogenous

- **Rhegmatogenous** (RRD)
- **Exudative** (ERD)
- **Tractional** (TRD)

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To be clear: When we refer to penetrating trauma, what structure specifically is being penetrated? The neurosensory (NS) retina.

What is another, completely different sort of common cause? Penetrating trauma.

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The term can refer to the formation of vitreous membranes secondary to a break in the NS retina, or to the membranes themselves.

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How does a break in the NS retina lead to the formation of vitreous membranes?
Such a break provides a pathway for certain cells (e.g., RPE; glial) to enter the space internal to the NS retina. Once they find themselves in this space, these cells reproduce and migrate along the NS retina, across the face of the posterior hyaloid, and into the vitreous body itself. Once established on or in the vitreous, contraction of these membranes puts the NS retina under traction, which can be strong enough to distract the NS retina away from its position apposite the RPE; i.e., cause a TRD.

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Non-rhegmatogenous
Exudative (ERD)

Tractional (TRD)
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So you can see how penetrating (NS retina) trauma can lead to PVR and TRD—the traumatic break provides the pathway by which the contractile cells can access the vitreous.

What is another, completely different sort of common cause?

**Penetrating trauma**

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**Vitreoretinal elements** pulling hard enough on the neurosensory retina to distract it from its normal position apposing the RPE

RRD involves a break in the retina. Why doesn’t PVR develop after RRD?

In fact it does, frequently

What unhappy role does PVR play in the long-term outcome of surgery to repair RRD?

PVR is the most common cause of long-term RRD surgery failure
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Non-rhegmatogenous

Exudative (ERD)

Tractinal (TRD)

Proliferative vitreoretinopathy

Penetrating trauma

What is the most common cause of these vitreoretinal membrane?

Proliferative retinopathy (eg, PDR; CRVO; BRVO)

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Vitreoretinal elements

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To be clear: When we refer to penetrating trauma, what structure specifically is being penetrated?
The neurosensory (NS) retina

What is proliferative vitreoretinopathy?
The term can refer to the formation of vitreous membranes secondary to a break in the NS retina, or to the membranes themselves

How does a break in the NS retina lead to the formation of vitreous membranes?
Such a break provides a pathway for certain cells (ie, RPE; glial) to enter the space internal to the NS retina. Once they find themselves in this space, these cells reproduce and migrate along the NS retina, across the face of the posterior hyaloid, and into the vitreous, contraction of these membranes puts the NS retina under traction, which can be strong enough to distract the NS retina away from its position apposing the RPE; ie, cause a TRD.

So you can see how penetrating (NS retina) trauma can lead to PVR and TRD—the traumatic break provides the pathway by which the contractile cells can access the vitreous.

Wait—RRD involves a break in the retina. Why doesn't PVR develop after RRD?
In fact it does, frequently

What unhappy role does PVR play in the long-term outcome of surgery to repair RRD?
PVR is the most common cause of long-term RRD surgery failure

Rhegmatogenous (RRD)

Exudative (ERD)

Tractional (TRD)

Proliferative vitreoretinopathy
In a nutshell, what is going on in ERD?

The accumulation of fluid in the potential space between the NS retina and the RPE

Under normal circumstances, what prevents fluid from accumulating there?

The pumping action of the RPE

This implies what about the underlying pathophysiology of ERD?

That it is due to either:

-- a rate of fluid accumulation too high for the RPE to keep up; or

-- a failure of RPE pumping function (or a combo of both)
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--Neoplastic

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What inflammatory conditions are associated with ERD?
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RPE dysfunction

Exudative (ERD)

Hyper-exudation

Inflammation

Neoplasm
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What inflammatory conditions are associated with ERD?
--Vogt-Koyanagi-Harada (VKH)
--Posterior scleritis
--Malignant hypertension
--Toxemia of pregnancy
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And given VKH is in the DDx, what other condition must be considered as well?

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And given VKH is in the DDx, what other condition must be considered as well?
SO--sympathetic ophthalmia. (If you don’t understand why SO must be included, check out the VKH/SO slide-set.)

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Which broad categories of neoplasms are associated with ERD?
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--Choroidal, especially hemangioma and melanoma
--Metastases, especially breast and lung
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RPE dysfunction

Choroidal

Metastatic
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Which broad categories of neoplasms are associated with ERD? What are the two most common causes for each?
--Choroidal, especially and
--Metastases, especially and
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This implies what about the underlying pathophysiology of ERD?
What condition, often but not always associated with ERD, is a classic example of RPE dysfunction?

--a failure of RPE pumping function (or a combo of both)
In a nutshell, what is going on in ERD? The accumulation of fluid in the potential space between the NS retina and the RPE.

Under normal circumstances, what prevents fluid from accumulating there? The pumping action of the RPE.

This implies what about the underlying pathophysiology of ERD?
What condition, often but not always associated with ERD, is a classic example of RPE dysfunction? Central serous chorioretinopathy (CSC)

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Central serous chorioretinopathy (CSC)

--a failure of RPE pumping function
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(Note: ERD in CSC is not due solely to RPE dysfunction; choroidal hyperpermeability is a component as well)
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Coats disease: ERD
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--Age of presentation?
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--Laterality?
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--Presenting sign? **Leukocoria**
Retinal Detachment Overview

Coats disease: Leukocoria
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--Can Coats present in adulthood? **Yes**
--Laterality? **Unilateral**
--Presenting sign? **Leukocoria**
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--- What percent of cases are male? **About 70-80%**
--- Presenting sign? **Leukocoria**
Retinal Detachment Overview

Retinal Detachment

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- What percent of cases are unilateral?
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What feared condition is Coats on the DDx for?
Retinal Detachment Overview

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--Age of presentation? 5 years
--Gender? Male
--Laterality? Unilateral
--Presenting sign? Leukocoria

What feared condition is Coats on the DDx for? Retinoblastoma
Is it Coats, or exophytic Rb?
**Coats.** Note the vascular anomalies
In Coats, the retinal vessels are dilated, with microaneurysms and telangiectasias. (Note also the yellow hue.)

In Rb, the retinal vessels are normal in appearance.