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
  - Tractional (TRD)
  - Exudative (ERD)

Two categories
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. 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
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

Any differences in their respective trauma histories?
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

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 like a tin roof, like a belly dancer
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
What are the classic ophthalmoscopical 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
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: something-shaped, something-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**: Dome-shaped, gravity-dependent
Bilateral exudative RD
Bilateral exudative RD brings what diagnosis immediately to mind?
Bilateral exudative RD brings what diagnosis immediately to mind? Vogt-Koyanagi-Harada dz (see slide-set U6)
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

Tractional (TRD)

Exudative (ERD)

What does the prefix rhegma mean?
Retinal Detachment Overview

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
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**...

**What are the three types of retinal breaks?**
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**...

Tears  Holes  Dialyses
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**...

- Tears
- Holes
- Dialyses

*Which of these is most commonly implicated in RRD?*
Retinal Detachment Overview

Rhegmatogenous (RRD)

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

Tears

Non-rhegmatogenous

Tractional (TRD)

Exudative (ERD)

Which of these is most commonly implicated in RRD?
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)

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

Retinal Detachment

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

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.

Why are they called ‘horseshoe’ tears?

- Tears
- Holes
- Dialyses

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)

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)

Non-rhegmatogenous

Exudative (ERD)

Tractional (TRD)

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...

Tractional (TRD)

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.
Retinal Detachment Overview

**Rhegmatogenous (RRD)**

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

**Tears**

Which of these is most commonly implicated in RRD?

Specifically, these are known as **horseshoe tears**

**Non-rhegmatogenous**

- **Exudative (ERD)**
- **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
The essential difference is that RRD is associated with a full-thickness retinal break…

Rhegmatogenous (RRD)

Holes

Tears

Holes

Dialyses

Tractional (TRD)

Non-rhegmatogenous (ERD)

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

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
- 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

Non-rhegmatogenous (Exudative, Tractional)
- 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
Pars plana of ciliary body

Ora serrata
Retinal Detachment Overview

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.

Specifically, these are known as horseshoe tears.

Tears
Holes
Dialyses

Which of these is most commonly implicated in RRD?

Retinal Detachment Non-

Rhegmatogenous
( RR D )

Tractional
( TR D )
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)

Which of these is most commonly implicated in RRD?

Specifically, these are known as **horseshoe tears**

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

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

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 flap

(The black part is the tear itself)

Anterior

Posterior

Rhegmatogenous
(RRD)

Retinal Detachment

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

The flap

Horseshoe tears

Retina

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 ophthalmologists, the term retina here will mean the neurosensory portion unless otherwise specified.
Retinal Detachment Overview

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

The neurosensory retina

(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 ophthos, the term retina here will mean the neurosensory portion unless otherwise specified.)

Specifically, these are known as horseshoe tears.

Which of these is most commonly implicated in RRD?

Horseshoe tears

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

The neurosensory retina

(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 ophthos, the term retina here will mean the neurosensory portion unless otherwise specified.)

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)

Anterior

Posterior
The essential difference is that RRD is associated with a full-thickness retinal break. 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. Technically, this is incorrect. What is the correct name of the structure that gets torn? The neurosensory retina. Why are retina and neurosensory retina not 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 ophthos, the term retina here will mean the neurosensory portion unless otherwise specified.
The essential difference is that RRD is associated with a full-thickness retinal break...

Rhegmatogenous (RRD)

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

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.

Holes

Dialyses

Which of these is most commonly implicated in RRD?

Specifically, these are known as horseshoe tears
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

Rhegmatogenous (RRD)

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, most ophthos most of the time are referring to the neurosensory portion when they say ‘retina,’ and the same is true in this slide-set.

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

Anterior  Posterior

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

U
Retinal Detachment

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**

Non-rhegmatogenous Exudative (ERD)

Tractional (TRD)

Retinal Detachment Overview

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

Where are they typically found?

**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.
Retinal Detachment Overview

**Rhegmatogenous (RRD)**

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

**Tears**

Which of these is most commonly implicated in RRD?

Specifically, these are known as **horseshoe tears**

**Non-rhegmatogenous**

Exudative (ERD)

Tractional (TRD)

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

**Tears**, **Holes**, **Dialyses**

What event most commonly precipitates this tension?

A posterior vitreous detachment

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.

Anterior

‘The flap’

Posterior

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

Rhegmatogenous (RRD)

Retinal Detachment Tractional (TRD)

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

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

Behind 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.

Much more on PVDs later in the slide-set

‘The flap’

(The black part is the tear itself)

Anterior
Posterior

Which of these is most commonly implicated in RRD?

Specifically, these are known as horseshoe tears.

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

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

Retinal Detachment

Rhegmatogenous (RRD)

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

RRD is

Non-rhegmatogenous

Holes

Tears

Dialyses

Tractional (TRD)

‘The flap’

(The black part is the tear itself)

U

Anterior

Posterior

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

Rhegmatogenous (RRD)

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

Non-rhegmatogenous (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 other location is a common site of retinal tears leading to RRD?

At the edge of **lattice degeneration**

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

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

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

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

What are they called ‘horseshoe’ tears? Because of their shape (see above)
Where are they typically found?
In the far periphery, near the ora serrata

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

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

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous Exudative (ERD)

Tractional (TRD)

Tears
Holes
Dialyses

Anterior
Posterior

‘The flap’
(The black part is the tear itself)
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?
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**...

A **Giant Tear** is a circumferential tear extending at least 90° (3 clock-hours).

**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

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

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.
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…

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

The mechanism underlying giant retinal tears is essentially the same as that of horseshoe tears: Tension causes the posterior attachment of the vitreous base to tear the peripheral retina anteriorly. The main difference is simply the extent of retina involved.
Giant retinal 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

Non-rhegmatogenous

- Tractional (TRD)
- Exudative (ERD)

What are the two types of retinal holes?
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**...

Tears

Holes

Dialyses

- Atrophic
- Operculated

What are the two types of retinal holes?
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)

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?

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).
Retinal Detachment Overview

Rhegmatogenous (RRD)

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

Tears

Holes
- Atrophic
- Operculated

Non-rhegmatogenous

Tractional (TRD)

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

Dialyses
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…

Tears

Holes

Dialysis

Atrophic

Operculated

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

OK, so what’s an operculum?
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.

Tears

Holes

Dialyses

Atrophic

Operculated
Retinal Detachment Overview

Operculated retinal hole
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?*

- Atrophic
- Operculated

**Tears**

**Holes**

**Dialysis**
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)
Retinal Detachment Overview

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

Rhegmatogenous (RRD)

Non-rhegmatogenous

Tractional

Exudative

Tears

Holes

Atrophic

Operculated

The Retina book say surprisingly little about atrophic holes, and what little is said is somewhat contradictory. One mention states atrophic holes have “not been linked to an increased risk of retinal detachment.”
Retinal Detachment Overview

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

The Retina book says surprisingly little about atrophic holes, and what little is said is somewhat contradictory. One mention states that atrophic holes have “not been linked to an increased risk of retinal detachment.” But another mention asserts that atrophic holes within an area of lattice degeneration are an ‘uncommon cause of retinal detachment.’ Caveat emptor.
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

Tractional

Exudative

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

What is a retinal dialysis?

Tears Holes Dialyses
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

Tractional

Exudative

Tears

Holes

Dialyses

What is a retinal dialysis?
A circumferential disinsertion of the peripheral retina from the ora serrata
Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

Tractional

Exudative

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

What is a retinal dialysis?
A circumferential disinsertion of the peripheral retina from the ora serrata

What is the inciting event?

Tears  Holes  Dialyses
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

Tractional

Exudative

What is a retinal dialysis?
A circumferential disinsertion of the peripheral retina from the ora serrata

What is the inciting event?
Usually blunt trauma (although it can occur spontaneously in predisposed eyes)
The essential difference is that RRD is associated with a full-thickness retinal break…

‘A circumferential disinsertion of the 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?

What is a retinal dialysis? A circumferential disinsertion of the peripheral retina from the ora serrata
What is the inciting event? Usually blunt trauma (although it can occur spontaneously in predisposed eyes)

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.
Retinal Detachment Overview

Retinal Detachment

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 disinsertion of the peripheral retina from the ora serrata.

What is the inciting event?
Usually blunt trauma (although it can occur spontaneously in predisposed eyes).
Retinal Detachment Overview

Retinal Detachment

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 in the far periphery due to blunt trauma, ’ie, a giant retinal tear. Are these simply two names for the same thing?

Definitely not. Recall that in a giant retinal tear, tension produced by the vitreous causes a rent in the retina as the posterior attachment of the vitreous ‘peels’ anteriorly. In contrast, in retinal dialysis the tension applied by the vitreous causes the retina at the ora to peel posteriorly.

What is a retinal dialysis?
A circumferential disinsertion of the peripheral retina from the ora serrata

What is the inciting event?
Usually blunt trauma (although it can occur spontaneously in predisposed eyes)

Giant Tears Holes Dialyses

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.
Retinal Detachment Overview

Retinal dialysis: Retina peels *away* from vitreous base

Horseshoe tear: Retina peels *toward* vitreous base
Retinal Detachment Overview

Retinal Detachment

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

A circumferential disinsertion of the peripheral retina due to blunt trauma sounds an awful lot like 'a circumferential tear in the far periphery due to blunt trauma,' i.e., a giant retinal tear. Are these simply two names for the same thing?

Definitely not. Recall that in a giant retinal tear, tension produced by the vitreous causes a rent in the retina as the posterior attachment of the vitreous 'peels' anteriorly. In contrast, in retinal dialysis the tension applied by the vitreous causes the retina at the ora to peel posteriorly.

Uncertain about the anatomy of the vitreous? No worries—it will be covered in detail shortly.

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 disinsertion of the peripheral retina from the ora serrata

What is the inciting event?
Usually blunt trauma (although it can occur spontaneously in predisposed eyes)
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
- History of RRD in fellow eye
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
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?
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 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

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

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

In what manner (configuration) is the vitreous attached to the lens capsule?
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
--Major 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
Retinal Detachment Overview

Retinal Detachment

- Rhegmatogenous (RRD)
- Non-rhegmatogenous

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

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

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
Retinal Detachment Overview

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

Vitreous attachments
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 fellow eye

Other major locations of vitreous attachment in the eye include:

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

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

The vitreous base is attached 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).
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

The five major locations of vitreous attachment in the eye are:
- The posterior lens capsule
- The ora serrata
- Major 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 a # mm anteriorly (ie, onto the pars plana of the ciliary body) and a # mm posteriorly (ie, onto the peripheral retina).
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
- Major 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 (i.e., onto the pars plana of the ciliary body) and 3 mm posteriorly (i.e., 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
- Major 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 ora serrata
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
- Major 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

The vitreous base
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
- Major 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
--Major retinal vessels
--The macula (perifoveal first)
--The optic nerve head

How does a PVD begin, and how does it proceed?
The vitreous first detaches from the perifoveal macula, followed by the vessels. It next detaches from the fovea. Finally, once it has peeled loose from the mid-peripheral retina, it comes off the ONH.
Evolution of a PVD. Arrows indicate the location of the posterior vitreous face.
Evolution of a PVD. Arrows indicate the location of the posterior vitreous face.
Retinal Detachment Overview

Retinal Detachment

How does a PVD begin, and how does it proceed?
The vitreous first detaches from the perifoveal macula, followed by the vessels.

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
- Major retinal vessels
- The macula (perifoveal first)
- The optic nerve head
Retinal Detachment Overview

How does a PVD begin, and how does it proceed?
The vitreous first detaches from the perifoveal macula, followed by the vessels. It next detaches from the fovea.

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
--Major retinal vessels
--The macula (perifoveal first, fovea later)
--The optic nerve head
Evolution of a PVD. Arrows indicate the location of the posterior vitreous face.

Pre-PVD

Perifoveal detachment

Foveal detachment
Retinal Detachment Overview

**Retinal Detachment**

*How does a PVD begin, and how does it proceed?*

The vitreous first detaches from the perifoveal macula, followed by the vessels. It next detaches from the fovea. Finally, once it has peeled loose from the mid-peripheral retina, it comes off the ONH.

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
-- Major retinal vessels
-- The macula (perifoveal first)
-- The optic nerve head
Evolution of a PVD. Arrows indicate the location of the posterior vitreous face.

Pre-PVD

Perifoveal detachment

Foveal detachment

ONH detachment (completed PVD)
Pre-PVD

Hol up—this (red arrow) sure looks like a PVD. What’s going on here?

Completed PVD

Arrows indicate the posterior vitreous face.
Hol up—this (red arrow) sure looks like a PVD. What’s going on here? The image is labeled correctly, ie, the white arrows are indicating the location of the vitreous face. The optically empty space between the formed vitreous and the macula is the premacular bursa (aka the precortical vitreous pocket).

Liquefied vitreous

What purpose does the bursa serve? The absence of formed vitreous in this region means that torsional forces in the vitreous will not be transmitted directly to the macula, thus reducing traction on it.
Hol up—this (red arrow) sure looks like a PVD. What’s going on here? The image is labeled correctly, ie, the white arrows are indicating the location of the vitreous face. The optically empty space between the formed vitreous and the macula is the *premacular bursa* (aka the *precortical vitreous pocket*).

**Pre-PVD**

**Completed PVD**
**A**, Anatomical features of the vitreous. A prominent area of liquefaction of the premacular vitreous gel is called the **premacular bursa**. **B**, SS-OCT image of posterior vitreous and macula region demonstrates the signal void in the vitreous cavity in front of the macula that represents the premacular bursa (arrowheads).
Hol up—this (red arrow) sure looks like a PVD. What’s going on here? The image is labeled correctly, i.e., the white arrows are indicating the location of the vitreous face. The optically empty space between the formed vitreous and the macula is the *premacular bursa* (aka the *precortical vitreous pocket*).

*What material occupies the bursa?*
Hol up—this (red arrow) sure looks like a PVD. What’s going on here? The image is labeled correctly, ie, the white arrows are indicating the location of the vitreous face. The optically empty space between the formed vitreous and the macula is the \textit{premacular bursa} (aka the \textit{prechromatic vitreous pocket}).

\textit{What material occupies the bursa?}
Liquefied vitreous

\textit{Completed PVD. Arrows indicate the posterior vitreous face}
Hol up—this (red arrow) sure looks like a PVD. What’s going on here? The image is labeled correctly, i.e., the white arrows are indicating the location of the vitreous face. The optically empty space between the formed vitreous and the macula is the *premacular bursa* (aka the *precortical vitreous pocket*).

*What material occupies the bursa?*
Liquefied vitreous

*What purpose does the bursa serve?*
Hol up—this (red arrow) sure looks like a PVD. What’s going on here? The image is labeled correctly, ie, the white arrows are indicating the location of the vitreous face. The optically empty space between the formed vitreous and the macula is the premacular bursa (aka the precortical vitreous pocket).

What material occupies the bursa?
Liquefied vitreous

What purpose does the bursa serve?
The absence of formed vitreous in this region means that torsional forces in the vitreous will not be transmitted directly to the macula, thus reducing traction on it.
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

How does a PVD begin, and how does it proceed?
The vitreous first detaches from the perifoveal macula, followed by the vessels. It next detaches from the fovea. Finally, once it has peeled loose from the mid-peripheral retina, it comes off the ONH.

What about Wieger’s ligament and the base? When do they detach in a PVD?

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

How does a PVD begin, and how does it proceed?
The vitreous first detaches from the perifoveal macula, followed by the vessels. It next detaches from the fovea. Finally, once it has peeled loose from the mid-peripheral retina, it comes off the ONH.

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).

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
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--The macula
--The optic nerve head
Retinal Detachment Overview

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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--- 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
--- Major retinal vessels
--- The macula
--- The optic nerve head

Retinal Detachment

How does a PVD begin, and how does it proceed?
The vitreous first detaches from the perifoveal macula, followed by the vessels. It next detaches from the fovea. Finally, once it has peeled loose from the mid-peripheral retina, it comes off the ONH.

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.
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?
--Major 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

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
--Major retinal vessels
--The macula
--The optic nerve head
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. However, there are occasions when Wieger’s lets go, and this is the definition of an anterior detachment.

Rhegmatogenous (RRD)
Non-rhegmatogenous
Exudative (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
--Major retinal vessels
--The macula
--The optic nerve head
Ophthalmology

Retinal Detachment Overview

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?
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- The macula
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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?
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. 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.

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

1. The posterior lens capsule
2. The ora serrata
3. Major retinal vessels
4. The macula
5. The optic nerve head

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

Rhegmatogenous (RRD)

Non-rhegmatogenous

Exudative (ERD)

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

1. Posterior vitreous detachment (PVD)
2. Myopia
3. Lattice degeneration
4. Cataract surgery
5. Trauma
6. Hx RRD in fellow eye
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

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

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

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?
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)
--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?  
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
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)
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**Photopsias**

**Symptomatic**

--- *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?*
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Photopsias

Symptomatic
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When pts report seeing floaters, are they actually seeing floaters?
No—floaters are located within the vitreous, there is no incident light reflected from them toward the macula.

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.
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Retinal Detachment Overview

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

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--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.

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

A Weiss ring
Retinal Detachment Overview

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

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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.

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

- Non-rhegmatogenous (ERD)
- Exudative
- 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

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.
- Symptomatic
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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 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.

PVDs typically occur in 45-65 year olds.

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

Myopic eyes
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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
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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?

Myopic

Is it sporadic, or familial?

While not inevitable, a familial predisposition is often found.
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Retinal Detachment

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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?
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How prevalent is lattice in the population?
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- Hx RRD in fellow eye

How prevalent is lattice in the population?
Quite—it is found in 5-10% 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

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

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

Rhegmatogenous (RRD)

Non-rhegmatogenous

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Retinal Detachment

Rhegmatogenous

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

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Retinal tear at the posterior edge of lattice
Retinal Detachment Overview

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Rupture of the posterior capsule
Retinal Detachment Overview

Are we talking about blunt, or penetrating trauma?

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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
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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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Retinal Detachment

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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?
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What is the underlying pathophysiology in TRD?

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

Retinal Detachment Overview

Retinal Detachment

- Rhegmatogenous (RRD)
- Non-rhegmatogenous
  - Tractional (TRD)
  - Exudative (ERD)
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
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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 the most common cause of these vitreoretinal membrane?
Proliferative retinopathy (eg, PDR; CRVO; BRVO)

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

Does penetrating trauma lead to proliferative vitreo retinopathy?
No, it leads to proliferative vitreo retinopathy
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No, it leads to proliferative vitreoretinopathy (PVR).

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

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.

What is the most common cause of these vitreoretinal membrane?
**Proliferative retinopathy**
(PDR; CRVO; BRVO)

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

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

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

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

What is the underlying pathophysiology in TRD?

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So, contraction of these fibrovascular elements leads to TRD?

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

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

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It contributes, but is not the main source of traction

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Rhegmatogenous (RRD)

Exudative (ERD)

Tractional (TRD)
Retinal Detachment Overview

TRD. Note the vessels crawling up on and into the vitreous
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Penetrating trauma

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No, it leads to proliferative vitreoretinopathy

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
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?
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Non-rhegmatogenous

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

Tractional (TRD)

Exudative (ERD)
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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 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; ie, cause a TRD.

Non-rhegmatogenous

Rhegmatogenous (RRD)

Exudative (ERD)

Tractional (TRD)
**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

---

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**What is another, completely different sort of common cause?**

Penetrating trauma

**Does penetrating trauma lead to proliferative retinopathy?**

No, it leads to *proliferative vitreoretinopathy*.

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**Non-rhegmatogenous**

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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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**What is another, completely different sort of common cause?**

Penetrating trauma

**Does penetrating trauma lead to proliferative vitreoretinopathy?**

No, it leads to proliferative vitreoretinopathy

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**Non-rhegmatogenous**

**Tractional (TRD)**

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Such a break provides a pathway for certain cells (i.e., 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 cavity. The 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; i.e., cause a TRD.

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

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

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

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How does a break in the NS retina lead to the formation of PVR and TRD?

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, they migrate 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.

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Rhegmatogenous (RRD)

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Tractional (TRD)

Exudative (ERD)
In a nutshell, what is going on in ERD?

Retinal Detachment Overview

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Retinal Detachment Overview

In a nutshell, what is going on in ERD?
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;
-- a failure of RPE pumping function (or a combo of both).
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**Retinal Detachment Overview**

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What two broad categories of dz are commonly associated with hyperexudation?
--
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Retinal Detachment Overview

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--Inflammatory
--Neoplastic

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What inflammatory conditions are associated with ERD?

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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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--Inflammatory

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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--Posterior scleritis
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--Inflamatory
--Neoplastic

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Which broad categories of neoplasms are associated with ERD?
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**Retinal Detachment Overview**

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

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The pumping action of the RPE.

**What two broad categories of dz are commonly associated with hyperexudation?**
--Inflammatory
--Neoplastic

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

**Which broad categories of neoplasms are associated with ERD?**
--Choroidal
--Metastases

**Exudative (ERD)**

**Hyper-exudation**

**RPE dysfunction**

**Neoplasm**

**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 ?
In a nutshell, what is going on in ERD?
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--Inflammatory
--Neoplastic

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

Which broad categories of neoplasms are associated with ERD?
What are the two most common causes for each?
--Choroidal, especially hemangioma and melanoma
--Metastases, especially breast and lung
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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?

--a failure of RPE pumping function
(or a combo of both)
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Central serous chorioretinopathy (CSC)

--a failure of RPE pumping function
(or a combo of both)
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Central serous chorioretinopathy (CSC)

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

(Note: ERD in CSC is not due solely to RPE dysfunction—choroidal hyperpermeability is a component as well)
Retinal Detachment Overview

We can't talk about ERD without mentioning an extremely OKAP-worthy condition associated with it...Questions about this condition could be Retina-based or Peds-based...That condition is...

Coats disease

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

Retinal Detachment

Rhegmatogenous

Exudative (ERD)
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Coats disease: ERD
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--Gender?
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--Age of presentation? **5 years**
--Gender? **Male**
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--Gender? Male
--Laterality?
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--Age of presentation? **5 years**
--Gender? **Male**
--Laterality? **Unilateral**
--Presenting sign? **Leukocoria**
Retinal Detachment Overview

Coats disease: Leukocoria
We can’t talk about ERD without mentioning an extremely OKAP-worthy condition associated with it…Questions about this condition could be Retina-based or Peds-based…That condition is…Coats disease. In that regard:

--Age of presentation? **5 years**
--Gender? **Can Coats present in adulthood?**
--Laterality? **Unilateral**
--Presenting sign? **Leukocoria**
We can’t talk about ERD without mentioning an extremely OKAP-worthy condition associated with it…Questions about this condition could be Retina-based or Peds-based…That condition is…Coats disease. In that regard:

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

*Can Coats present in adulthood? Yes*
Retinal Detachment Overview

Retinal Detachment

We can't talk about ERD without mentioning an extremely OKAP-worthy condition associated with it…Questions about this condition could be Retina-based or Peds-based…That condition is…Coats disease. In that regard:

--Age of presentation? 5 years
--Gender? Male
--What percent of cases are male? 70-80%
--Presenting sign? Leukocoria

Exudative (ERD)
We can't talk about ERD without mentioning an extremely OKAP-worthy condition associated with it...Questions about this condition could be Retina-based or Peds-based...That condition is...Coats disease. In that regard:

--Age of presentation? 5 years
--Gender? Male
--What percent of cases are male? About 70-80%
--Presenting sign? Leukocoria
Retinal Detachment Overview

Retinal Detachment

We can't talk about ERD without mentioning an extremely OKAP-worthy condition associated with it…Questions about this condition could be Retina-based or Peds-based…That condition is…Coats disease. In that regard:

--Age of presentation? 5 years
--Gender? Male
--Laterality? Unilateral

What percent of cases are unilateral?
We can’t talk about ERD without mentioning an extremely OKAP-worthy condition associated with it…Questions about this condition could be Retina-based or Peds-based…That condition is…Coats disease. In that regard:

--Age of presentation? 5 years
--Gender? Male
--Laterality? Unilateral

What percent of cases are unilateral? About 70-80%
We can’t talk about ERD without mentioning an extremely OKAP-worthy condition associated with it...Questions about this condition could be Retina-based or Peds-based...That condition is...**Coats disease**. In that regard:

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

**What feared condition is Coats on the DDx for?**
We can't talk about ERD without mentioning an extremely OKAP-worthy condition associated with it…Questions about this condition could be Retina-based or Peds-based…That condition is…Coats disease. In that regard:
--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.