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)
    - Exudative (ERD)
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
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 \textbf{blunt} trauma, whereas TRD is associated with \textbf{penetrating} trauma.
What are the classic ophthalmoscopic descriptors of each RD type?

**RRD:** like a tin roof, like a belly dancer

**TRD:**

**ERD:**
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:
ERD:
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:
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:** Somewhere-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

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

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

*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**…

**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
Holes
Dialyses

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**
Retinal Detachment Overview

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

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

Why are they called ‘horseshoe’ tears?

Which of these is most commonly implicated in RRD?

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

- Tears
- Holes
- Dialyses
Retinal Detachment Overview

Rhegmatogenous (RRD)

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

Non-rhegmatogenous

Tractional (TRD)

Tears

Holes

Dialysis

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)
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

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 (ERD)

Tractional (TRD)

Retinal Detachment

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…

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

Non-rhegmatogenous (Exudative)

Tractional (TRD)

Retinal Detachment

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

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 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…

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

‘The flap’

(The black part is the tear itself)

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

Tears
Holes
Dialysis

Anterior

Posterior

36
Ora serrata

Pars plana of ciliary body

Peripheral retina
Retinal Detachment Overview

Rhegmatogenous (RRD)

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

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.
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?
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.
Retinal Detachment Overview

Rhegmatogenous (RRD)

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*.

Non-

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

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

Horseshoe tear
A, Gross photograph shows several retinal tears at the vitreous base.

Horseshoe tear
Retinal Detachment Overview

A, Gross photograph shows several retinal tears at the vitreous base. B, Photomicrograph demonstrating condensed vitreous (arrow) attached to the anterior flap of the retinal tear

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

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

Anterior
Posterior

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…

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.

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

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

Rhegmatogenous (RRD)

The 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.
Retinal Detachment Overview

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

Rhegmatogenous Retinal Detachment (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"

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.

Anterior

Posterior

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

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...

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, 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.

Anterior

Posterior

‘The flap’

(The black part is the tear itself)
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

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

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
Retinal Detachment Overview

Rhegmatogenous (RRD)

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

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

Tears

Holes

Dialyses

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

Rhegmatogenous (RRD)

Much more on PVDs later in the slide-set

Retinal Detachment

(Tears) (Holes) (Dialys)

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.

The flap

Anterior

Posterior

‘The flap’

(The black part is the tear itself)

Which of these is most commonly implicated in RRD?

Specifically, these are known as horseshoe tears

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

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.

51
**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 tears, holes, and dialyses in RRD are:

- **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
Retinal Detachment Overview

Rhegmatogenous (RRD)

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

Non-rhegmatogenous (Non-RRD)

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

The flap
(The black part is the tear itself)

Anterior
Posterior
Retinal Detachment Overview

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

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**...

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.

Retinal Detachment

Rhegmatogenous (RRD)

Tractional (TRD)

Tears

Holes

Dialyses

‘The flap’

(The black part is the tear itself)

Anterior

Posterior
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
- Holes
- Dialyses

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…

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

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.
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  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.
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

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

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)

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

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

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

- 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

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)

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

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?

Holes

Tears

Dialysis

Atrophic

Operculated
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)

...and TRD/ERD aren’t

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

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)

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)

Non-rhegmatogenous

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’

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

Retinal Detachment

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

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

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

Retinal Detachment

Rhegmatogenous (RRD)

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

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.” 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

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.

Tears

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

Rhegmatogenous (RRD)

Rhegmatogenous

Non-rhegmatogenous

Tractional

Exudative

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

Tears

Holes

Dialyses

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

Dialyses
Retinal Detachment Overview

Retinal Detachment Overview

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)

Tears
Holes

Dialyses
Retinal Detachment Overview

Retinal Detachment

‘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?

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 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

‘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?

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.

The essential difference associated with a full

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 Detachment

‘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?

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

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...

Retinal Detachment Overview

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).

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.

Giant Tears    Holes    Dialyses
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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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
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?
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?

--
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
--The ora serrata

In what manner (configuration) is the vitreous attached to the lens capsule?
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
- The macula
- The optic nerve head
- The posterior lens capsule

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

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
--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?
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

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 attachments

- Vitreous base
- Weiger’s ligament
- Berger’s space
- Cloquet’s canal
- Space of Martegiani
Retinal Detachment Overview

**Rhegmatogenous (RRD)**

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

**Non-rhegmatogenous**

- Exudative (ERD)
- Tractional (TRD)

**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)

**The vitreous base**
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
--History of 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 # mm anteriorly (ie, onto the pars plana of the ciliary body) and # mm posteriorly (ie, onto the peripheral retina).

The vitreous base

The ora serrata

--Major retinal vessels
--The macula
--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

The 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 2 mm anteriorly (ie, onto the pars plana of the ciliary body) and 3 mm posteriorly (ie, onto the peripheral retina).
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

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

--The ora serrata

- Major retinal vessels
- 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
--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

--The ora serrata

--Major retinal vessels
--The macula
--The optic nerve head
Retinal Detachment Overview

The vitreous base
Retinal Detachment Overview

Retinal Detachment

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

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

How does a PVD begin, and how does it proceed?
The vitreous first detaches from the perifoveal 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

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

Evolution of a PVD. Arrows indicate the location of the posterior vitreous face.
Retinal Detachment Overview

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
Retinal Detachment Overview

Pre-PVD

Perifoveal detachment

Evolution of a PVD. Arrows indicate the location of the posterior vitreous face

Foveal 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 (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.
Retinal Detachment Overview

Evolution of a PVD. Arrows indicate the location of the posterior vitreous face.

A. Pre-PVD

B. Perifoveal detachment

C. Foveal detachment

D. ONH detachment (completed PVD)
Gross photograph showing a posterior vitreous detachment. Retraction of the vitreous from the posterior retina is seen.
Hol up—this (red arrow) sure looks like a PVD. What’s going on here?

Pre-PVD

Completed PVD

Arrows indicate the posterior vitreous face

Retinal Detachment Overview

Evolution of a PVD

Arrows indicate the location of the posterior vitreous face

Perifoveal detachment

Foveal detachment

Completed PVD

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
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 precortical vitreous pocket (aka the premacular bursa).

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.
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*).
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, 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?*
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 posterior 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
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 posterior 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?

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*).

*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

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?
--Major retinal vessels
--The macula
--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.

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

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).
Retinal 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

How does a PVD begin, and how does it proceed?
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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
- The optic nerve head

OK then, is there such a thing as an anterior vitreous detachment?
Retinal Detachment Overview

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

- 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

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.

The 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**

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?*

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**The | Anterior | detachment** (PVD)

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**Posterior vitreous detachment (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*

---

**Rhegmatogenous (RRD)**

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**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
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

Retinal Detachment Overview

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

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 Overview**

*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
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?

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**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?**

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45-65

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Symptomatic and asymptomatic

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Retinal Detachment Overview

Retinal

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

Why is the symptomatic/asymptomatic distinction clinically important?

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When (ie, in what age range) do PVDs typically occur?
45-55

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

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

Retinal Detachment Overview
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45-65

**Why is the symptomatic/asymptomatic distinction clinically important?**
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**What symptoms are being referenced here?**
Photopsias and floaters

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**What are these groups?**
**Symptomatic** and asymptomatic

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Retinal Detachment Overview

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

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

Photopsias are flashes of light. They can be divided into symptomatic and asymptomatic.

Symptomatic photopsias are clinically important because symptomatic patients are at significantly higher risk of an RRD.

What are photopsias?

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

45-65

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What are these groups?

Symptomatic and asymptomatic

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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.
Retinal Detachment Overview

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

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What are photopsias?
Flashes of light

Photopsias

Symptomatic

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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?

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---Cataract surgery
---Trauma
---Hx RRD in fellow eye

Vitreous detachment (PVD) can be divided into two groups based on an important clinical characteristic.

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.

---Heme
---Clumps of pigment/pigmented cells
---Epipapillary glial tissue

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

45-65

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What are they?
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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 symptoms are being referenced here?

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

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)

Rhegmatogenous (RRD)

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

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Classifications:
- Non-rhegmatogenous (ERD)
- Tractional (TRD)
- Rhegmatogenous (RRD)

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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.

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#### Non-rhegmatogenous

- Exudative (ERD)
- Tractional (TRD)

#### Rhegmatogenous (RRD)

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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 is the eponymous name for this ring-shaped floater?

Weiss ring

PVDs can be divided into two groups based on the clinical characteristics of the vitreous

What are these groups?

- Symptomatic
- Asymptomatic

The AAO Preferred Practice Pattern also lists five risk factors:

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

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

The AAO Preferred Practice Pattern for RRD lists five risk factors:
- Posterior vitreous detachment (PVD)
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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 and asymptomatic

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

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Retinal Detachment Overview

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**floaters**
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Retinal Detachment

Rhegmatogenous (RRD)

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Is myopia a significant risk factor?

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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)?

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Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

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How prevalent is lattice in the population? About 5-10% of the population
How prevalent is lattice in pts with an RRD? About 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? Often a familial predisposition
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous (RRD)

Non-rhegmatogenous

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

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

--Posterior vitreous detachment
--Myopia
--Lattice degeneration
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--Trauma
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Myopic

While not inevitable, a familial predisposition is often found
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Myopic

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Retinal Detachment Overview

Lattice degeneration
Retinal Detachment Overview

Retinal Detachment

- Rhegmatogenous (RRD)
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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;
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Retinal Detachment Overview

**Rhegmatogenous**

Non-rhegmatogenous

196

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Lattice degeneration appears clinically as prominent sclerotic vessels (*arrows*) in a wicker or lattice pattern.
A, Lattice degeneration appears clinically as prominent sclerotic vessels (arrows) in a wicker or lattice pattern. B, The vitreous directly over the lattice degeneration is liquefied (asterisk), but formed vitreous remains adherent at the margins (arrowheads) of the degenerated area. The internal limiting membrane is discontinuous, and the inner retinal layers are atrophic.
Retinal Detachment Overview

Retinal Detachment

Rhegmatogenous

Non-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

Rhegmatogenous (RRD)

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

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Retinal Detachment

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Retinal Detachment

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What intraop event significantly increases the risk of RRD?
Retinal Detachment Overview

Retinal Detachment

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Rupture of the posterior capsule
Retinal Detachment Overview

Are we talking about blunt, or penetrating trauma?

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

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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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Because young people’s vitreous is formed (ie, not yet liquefied), it is not able to flow through an open retinal break
Retinal Detachment Overview

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? What term is used to refer to each sort of injury?
--A break in the retina adjacent to the injury site = a coup injury
--A break in the retina opposite to the injury site = 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)
--Myopia
--Lattice degeneration
--Cataract
--Trauma
--History of RRD in fellow eye

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?
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 effect does a history of nontraumatic RRD in one eye have on the lifetime risk of experiencing a nontraumatic RRD in the fellow eye? It increases it by about 10%.
What is the underlying pathophysiology in TRD?

- 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
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

Retinal Detachment Overview

Retinal Detachment

Non-rhegmatogenous

Tractional (TRD)

Exudative (ERD)

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.
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 retinopathy?
No, it leads to proliferative vitreoretinopathy

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
Retinal Detachment Overview

What is the most common cause of these vitreoretinal membrane?
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Pulling hard enough on the neurosensory retina to distract it from its normal position apposing the RPE.
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Vitreoretinal elements
Pulling hard enough on the neurosensory retina to distract it from its normal position apposing the RPE
Retinal Detachment Overview

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 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
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.

How does proliferative retinopathy lead to TRD?

**Proliferative retinopathy**

What is the most common vitreoretinal membrane?

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What is another, completely different sort of common cause?

Penetrating trauma

Does penetrating trauma lead to proliferative retinopathy?

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Tractional (TRD)

Exudative (ERD)
Retinal Detachment Overview

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

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

How does proliferative retinopathy lead to TRD?
Recall that, by definition, PDR vessels break through the internal limiting membrane (ILM), which means they are in contact with the posterior hyaloid face of the vitreous. Some vessels will use the posterior hyaloid as a ‘scaffold’ on which to grow.

Vitreoretinal elements

Tractional (TRD)

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

Tractional (TRD)
Exudative (ERD)
Retinal Detachment Overview

Non-rhegmatogenous
Exudative (ERD)
Tractional (TRD)

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So, contraction of these fibrovascular elements leads to 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

How does proliferative retinopathy lead to TRD?

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So, contraction of these fibrovascular elements leads to TRD?

It contributes, but is not the main source of traction

What is the most common cause of these vitreoretinal membrane?

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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

What is the most common cause of these vitreoretinal membrane?

- **Proliferative retinopathy** (e.g., PDR, CRVO, BRVO)
- **Penetrating trauma**

What is another, completely different sort of common cause?

- **Proliferative retinopathy** 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, and thus place traction on the retina.

How does proliferative retinopathy lead to TRD?

Recall that, by definition, PDR vessels break through the internal limiting membrane (ILM), which means they are in contact with the posterior hyaloid face of the vitreous. 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.

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Retinal Detachment Overview

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

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.

How does proliferative retinopathy lead to TRD?

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Retinal Detachment Overview

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What is the most common vitreoretinal membrane?
Proliferative retinopathy (PDR)

What is another, completely common cause?
Penetrating trauma

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

TRD. Note the vessels crawling up on and into the vitreous
Retinal Detachment

Non-rhegmatogenous

Exudative (ERD)

Rhegmatogenous (RRD)

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 retinopathy?

No, it leads to proliferative vitreoretinopathy

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

The neurosensory (NS) retina

To what does the term proliferative vitreoretinopathy refer?

It can refer to the process by which vitreous membranes form after 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 cells (ie, RPE; glial) to enter the space that is internal to the NS retina. Once they find themselves in this space, these cells reproduce and migrate, in the process forming membranes along the NS retina, across the face of the posterior hyaloid, and into the vitreous body itself. Once they are 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, to cause a TRD.

What is another, completely different sort of common cause?

Penetrating trauma

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**

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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.

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

What is the most common cause of these vitreoretinal membranes? **Proliferative retinopathy** (e.g., PDR; CRVO; BRVO).

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Retinal Detachment

Non-rhegmatogenous

Exudative (ERD)

Tractional (TRD)

246

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

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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.

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.
Preretinal membrane (*area between arrows*) on the surface of the retina, secondary to proliferative vitreoretinopathy.

**PVR**
**Non-rhegmatogenous**

**Exudative (ERD)**

**Tractional (TRD)**

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

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Such a break provides a pathway for cells (ie, RPE; glial) to enter the space that is internal to the NS retina. Once they find themselves in this space, these cells reproduce and migrate, in the process forming membranes along the NS retina, across the face of the posterior hyaloid, and into the vitreous body itself. Once they are 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, to cause a TRD.

**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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How does a break in the NS retina lead to the formation of vitreous membranes? Such a break provides a pathway for cells (i.e., RPE; glial) to enter the space internal to the NS retina. Once they find themselves in this space, the process forming membranes along the NS retina, and across the face of the posterior hyaloid, is initiated. As these membranes form, they put the NS retina under traction, which can be strong enough to distort the NS retina away from its position apposing the RPE—i.e., to cause tractional retinal detachment (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.

So you can see how penetrating (NS retina) trauma can lead to PVR and TRD—traumatic break provides the pathway by which the contractile cells can access 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.
To be clear: When we refer to penetrating trauma, what structure specifically is being penetrated?
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How does a break in the NS retina lead to the formation of PVR?
Such a break provides a pathway for cells (i.e., RPE; glial) to enter the space internal to the NS retina. Once they find themselves in this space, they can form membranes along the NS retina, across the face of the posterior hyaloid, and into the vitreous body itself. Once they are established, the membranes put the NS retina under traction, which can be strong enough to distract the NS retina away from its position apposing the RPE—i.e., 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

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?

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)

Tractional (TRD)

Exudative (ERD)
Retinal Detachment

What is the most common cause of these vitreoretinal membranes?

Proliferative retinopathy (e.g., 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)

Penetrating

Does penetrating trauma lead to proliferative vitreoretinopathy after RRD?

Wait--RRD involves a break in the retina. Why doesn't PVR develop after RRD?

In fact it does, frequently

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.
Retinal Detachment

Non-rhegmatogenous (ERD)  

Tractional (TRD)

Rhegmatogenous (RRD)

Penetrating trauma

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Does penetrating trauma lead to proliferative vitreoretinopathy?

No, it leads to proliferative vitreo-retinopathy

What is the underlying pathophysiology in TRD?

Vitreoretinal elements

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Retinal Detachment

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Rhegmatogenous (RRD)

Penetrating trauma

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 #1 cause of long-term RRD surgery failure
Retinal Detachment Overview

In a nutshell, what is going on in ERD?

Exudative (ERD)
Retinal Detachment Overview

In a nutshell, what is going on in ERD?
The accumulation of fluid in the potential space between the NS retina and the RPE
Retinal Detachment Overview

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?
Retinal Detachment Overview

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

Retinal

Rhegmatogenous

Exudative (ERD)
Retinal Detachment Overview

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This implies what about the underlying pathophysiology of ERD?
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This implies what about the underlying pathophysiology of ERD?
That it is due to either:
-- ?
-- ?
(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? 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).
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?

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

--a rate of fluid accumulation too high for the RPE to keep up; or
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(or a combo of both)
**Retinal Detachment Overview**

In a nutshell, what is going on in ERD?
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The pumping action of the RPE

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

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

In a nutshell, what is going on in ERD?
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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
Retinal Detachment Overview

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.

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

And given VKH is in the DDx, what other condition must be considered as well?
SO—sympathetic ophthalmia.

What inflammatory conditions are associated with ERD?
--Vogt-Koyanagi-Harada (VKH)
--Posterior scleritis
--Malignant hypertension
--Toxemia of pregnancy
Retinal Detachment Overview

**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

What two broad categories of dz are commonly associated with hyperexudation?

--- Inflammatory
--- Neoplastic

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.)

What inflammatory conditions are associated with ERD?

--- Vogt-Koyanagi-Harada (VKH)
--- Posterior scleritis
--- Malignant hypertension
--- Toxemia of pregnancy
**In a nutshell, what is going on in ERD?**
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

--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)

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

**Exudative (ERD)**

Hyperexudation

Neoplasm

Inflammation

RPE dysfunction
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?

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

--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)

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

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

--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)

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

Under normal circumstances, what prevents fluid from accumulating there?

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

--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)

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
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)

What condition, often but not always associated with ERD, is a classic example of RPE dysfunction?
**Retinal Detachment Overview**

*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)

*What condition, often but not always associated with ERD, is a classic example of RPE dysfunction?*
Central serous chorioretinopathy (CSC)
**Retinal Detachment Overview**

In a nutshell, what is going on in ERD?
The accumulation of fluid in the potential space between the NS retina and the RPE

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What condition, often but not always associated with ERD, is a classic example of RPE dysfunction?
Central serous chorioretinopathy (CSC)

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

two words
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.
Retinal Detachment Overview

Coats disease: 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?
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
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?
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
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?
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**
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. In that regard:

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

Coats disease
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**
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?
--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**
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
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**
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…\textbf{Coats disease}. In that regard:

--Age of presentation? \textbf{5 years}
--Gender? \textbf{Male}
--Laterality? \textbf{Unilateral}

\textbf{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 Rb, the retinal vessels are normal in appearance.

In Coats, the retinal vessels are dilated, with microaneurysms and telangiectasias. (Note also the yellow hue.)
In Coats, the retinal vessels are dilated, with microaneurysms and telangiectasias. (Note also the yellow hue.)

For more on Coats dz, see slide-set R13; on differentiating Coats from Rb, R1

In Rb, the retinal vessels are normal in appearance.