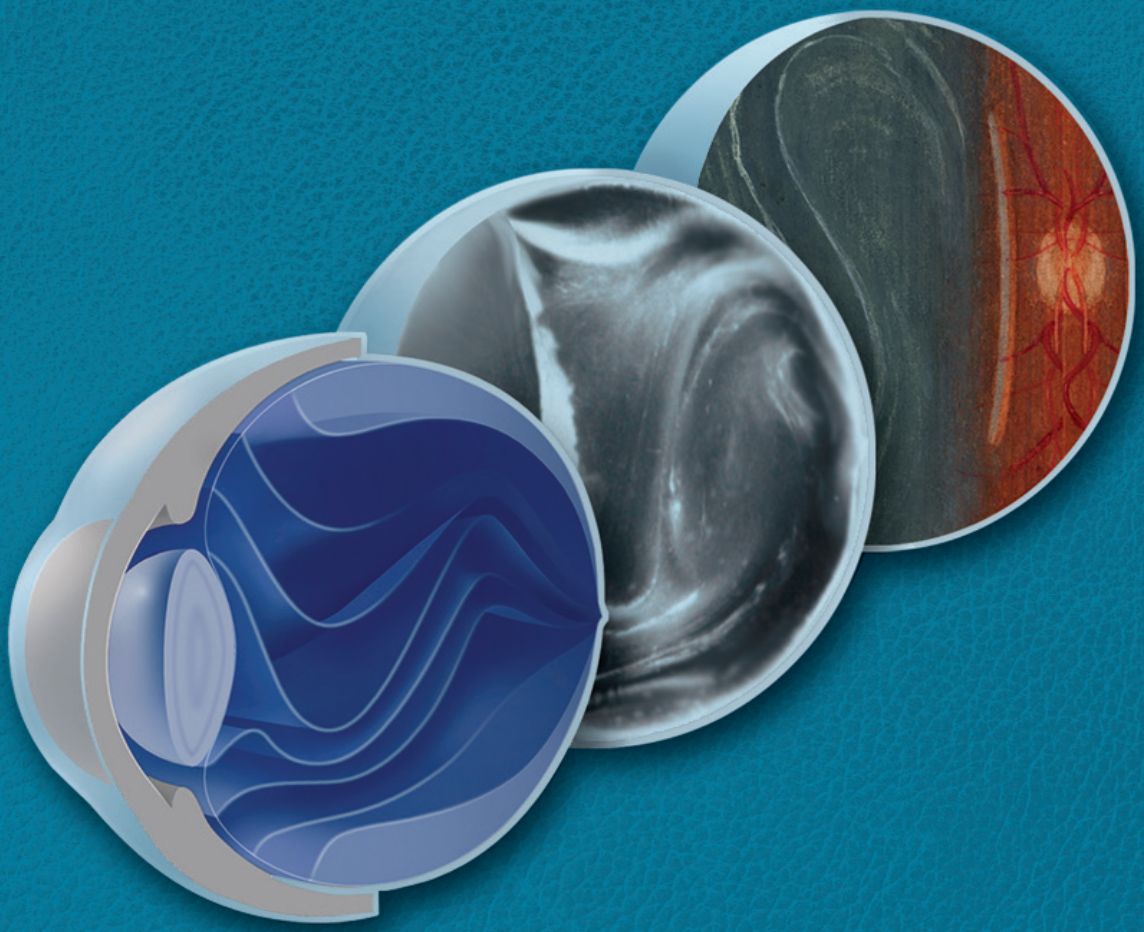
Georg Eisner

DR. SHERLOCK'S COLLECTION OF PRINTOUTS

An Introduction to Biomicroscopy in the Clinical Examination of the Vitreous



Printouts from the Following Chapters

Printouts from the Following Chapters

The Normal Anatomy of the Vitreous (DVD 1)

Pathology of the Vitreous (DVD 2)

Acknowledgements

AMBULANTE AUGENCHIRURGIE ZÜRICH

Alcon SWITZERLAND

Werner H. Spross-Stiftung

SSO SOG 100

DVD VIDEO

You can order the Video-DVD for free at:
Schweizerische Ophthalmologische Gesellschaft,
Berneckerstrasse 26
Postfach 95
CH-9435 Heerbrugg
Email: sog@erlaw.ch

For each figure there is a corresponding jpg image in high resolution in the picture folder on the DVD. Feel free to use these pictures in your presentations, provided that the source is mentioned as follows „Eisner Georg, Dr. Sherlock's Vitreous, SOG 2008".

The Normal Anatomy of the Vitreous (DVD 1)

1. Schematic Description

The anatomical landmarks of the vitreous are:

- the **central vitreous** with the funnel shaped **vitreous tracts** inserting at their corresponding zonular ligaments and at the ora serrata;
- the **preretinal zone** with the **lacunae** correlated with specific locations at the retinal surface.

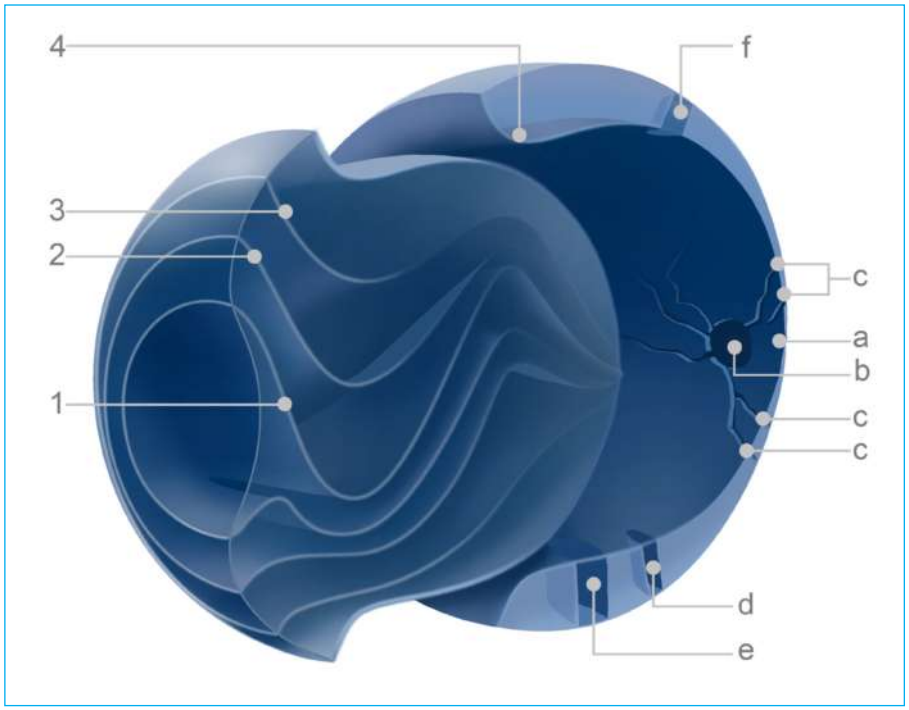


Figure 1:
Tractus and lacunae of the vitreous

Central Vitreous
- 1 retrolental tract
- 2 anterior ciliary tract
- 3 posterior ciliary tract
- 4 preretinal tract

Preretinal zone
- a prefoveal lacuna
- b prepapillary lacuna
- c prevascular lacuna
- d lacuna at equatorial degeneration
- e lacuna at peripheral anomaly
- f lacuna at retinal scar

2. Slitlamp Examination of Autopsy Specimens

Autopsy Specimens in Transversal and Longitudinal Optical Sections

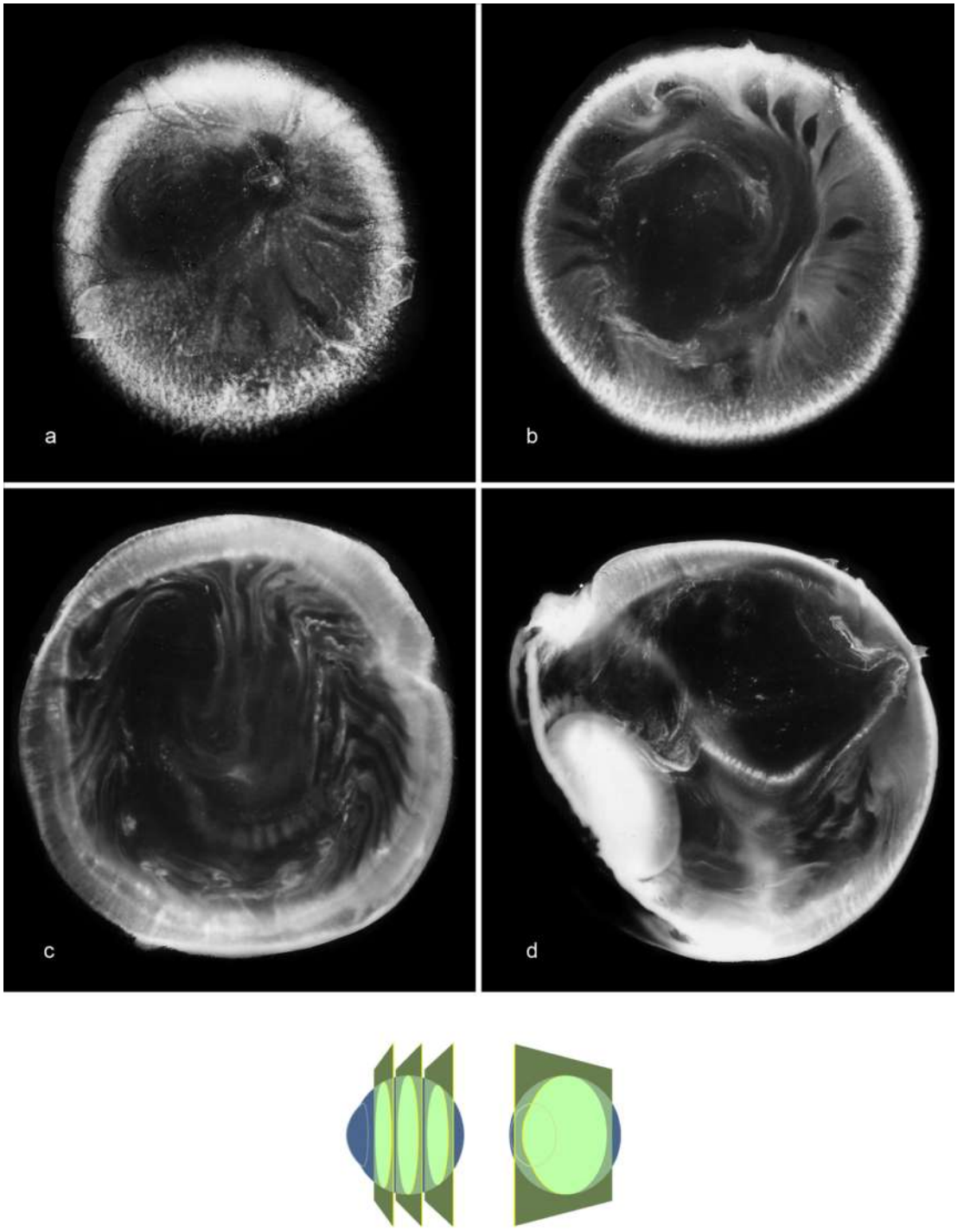
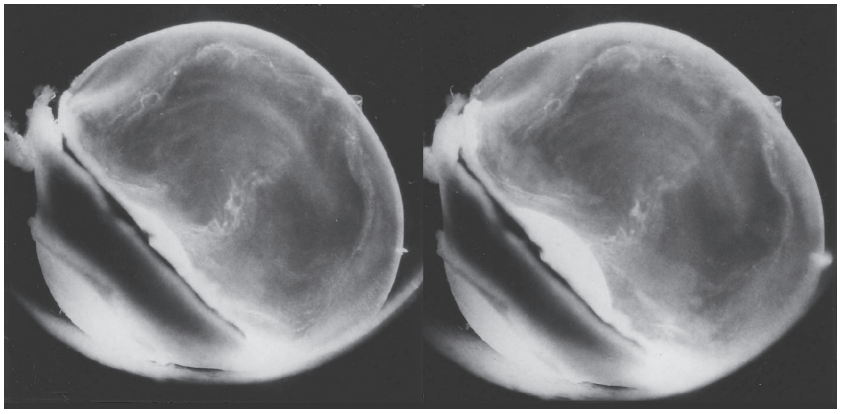


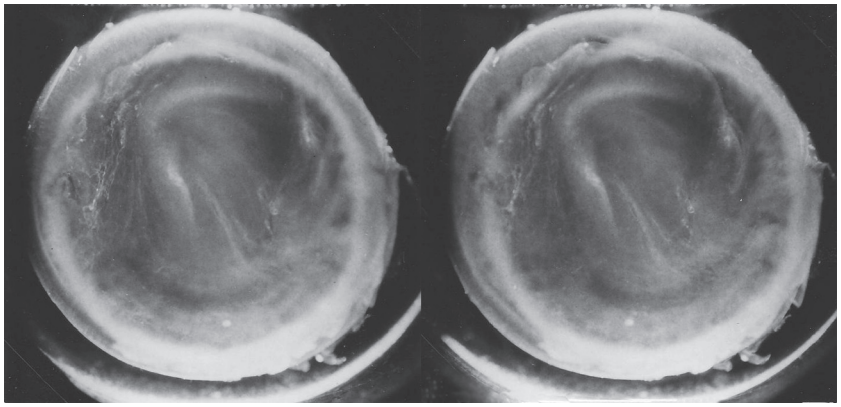
Figure 2:
Autopsy specimens in transversal (a, b, c) and longitudinal (d) optical sections

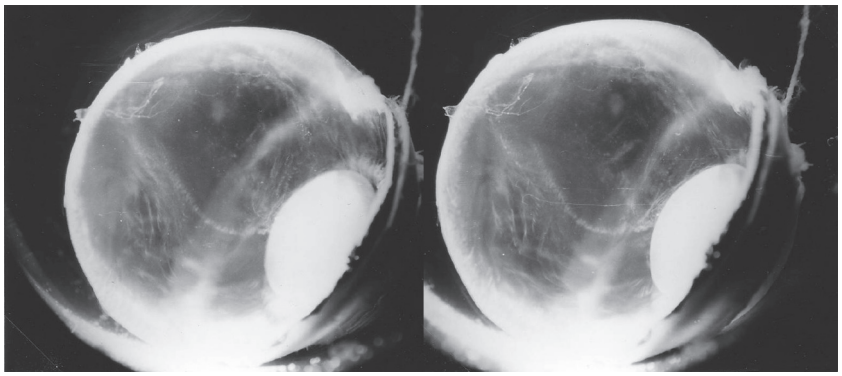
Stereograms of the Vitreous in Unfixed Autopsy Eyes

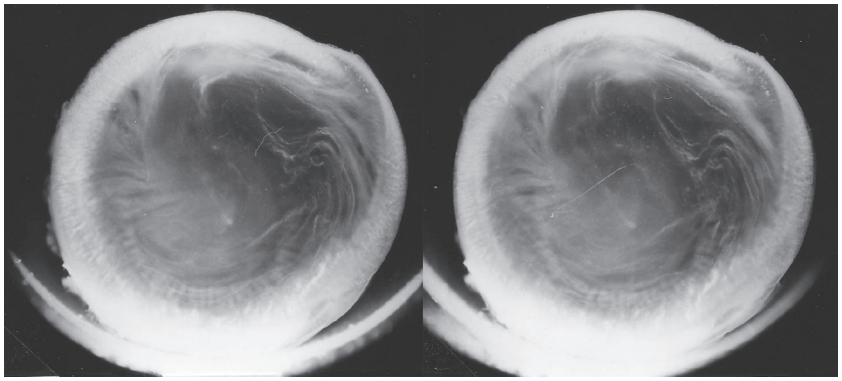
The photographs show eyes from persons of age group 30-60 years. Taken with diffuse illumination they reveal fewer details than photographs made with a slitlamp. Even so they convey an impression of the great variety of patterns within the general blueprint.

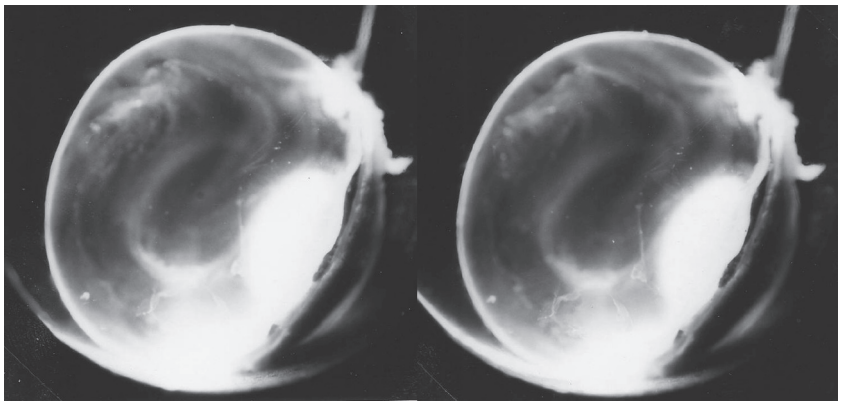
Prints for Use with a Stereoviewer

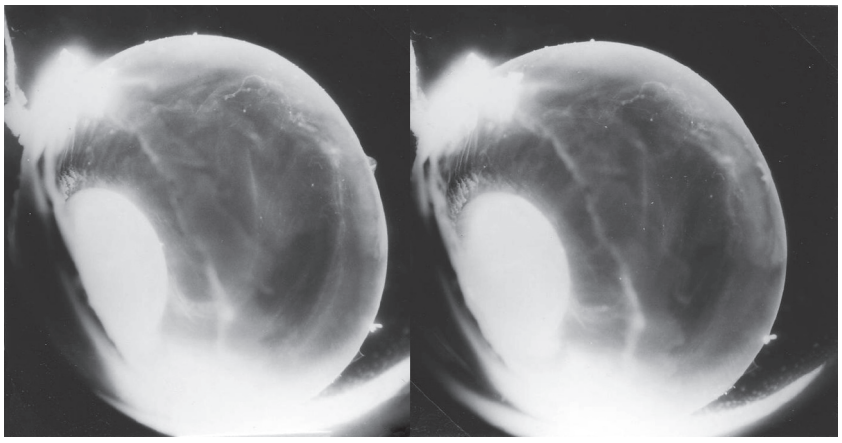


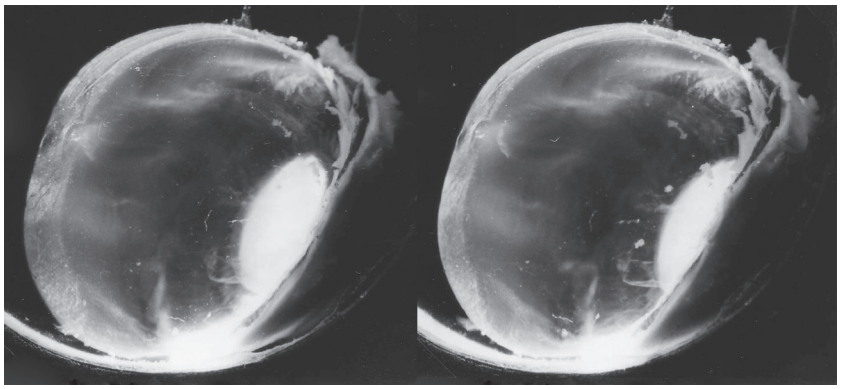


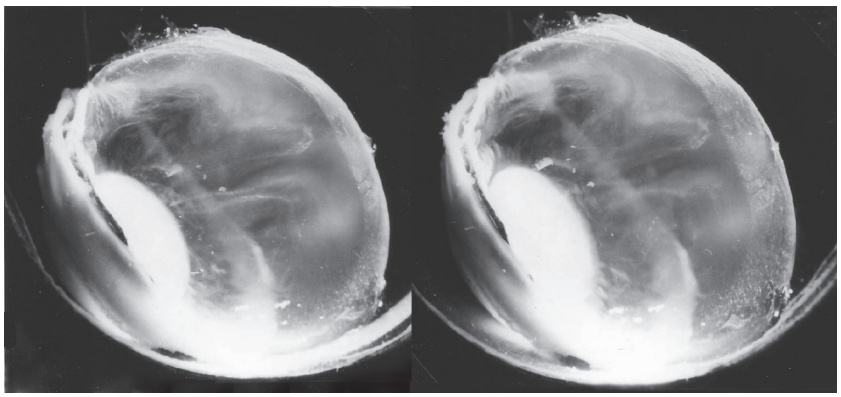


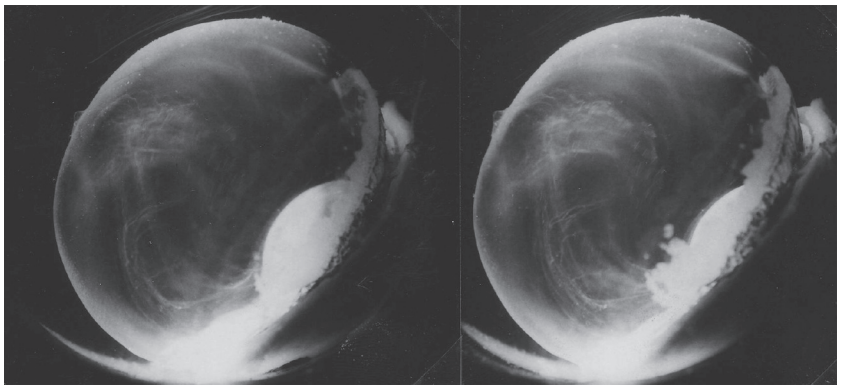


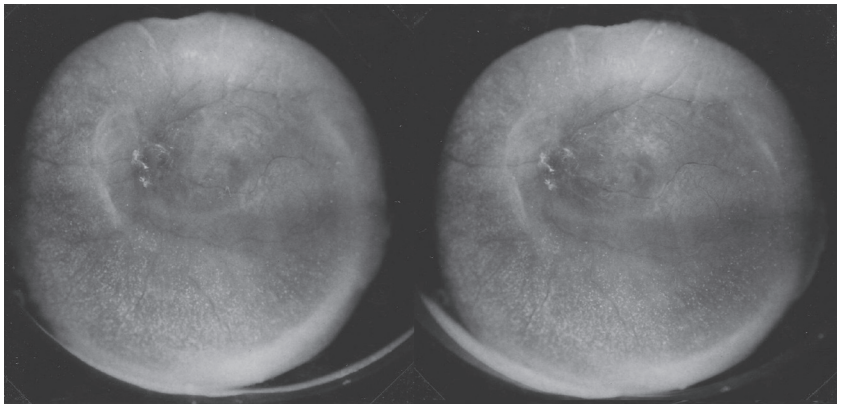


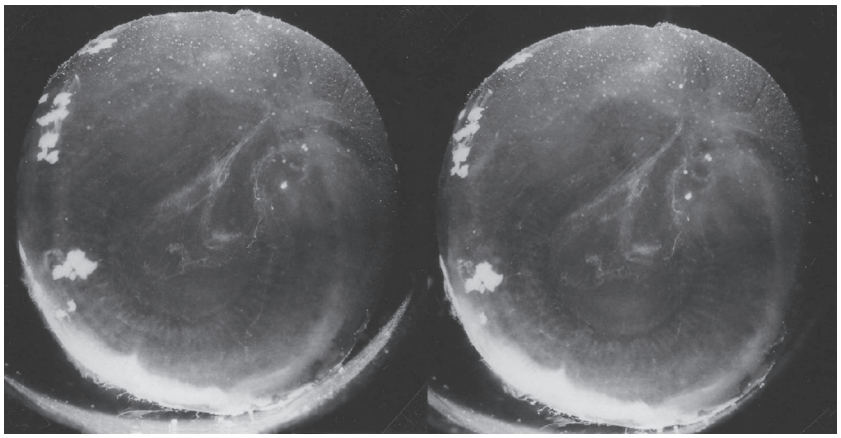


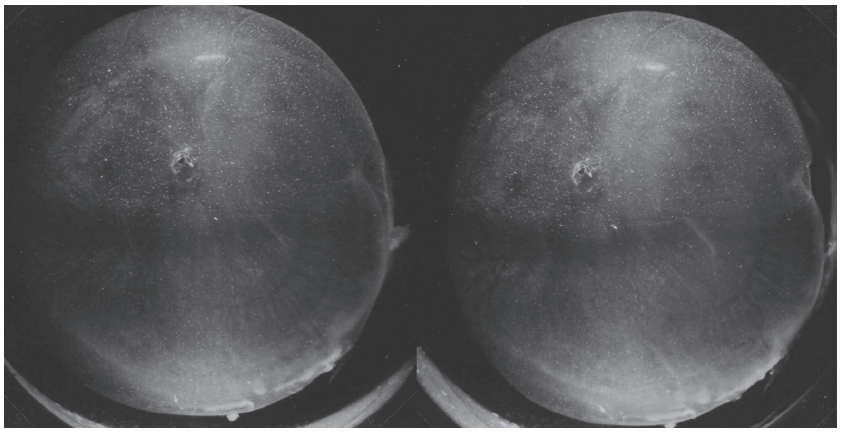


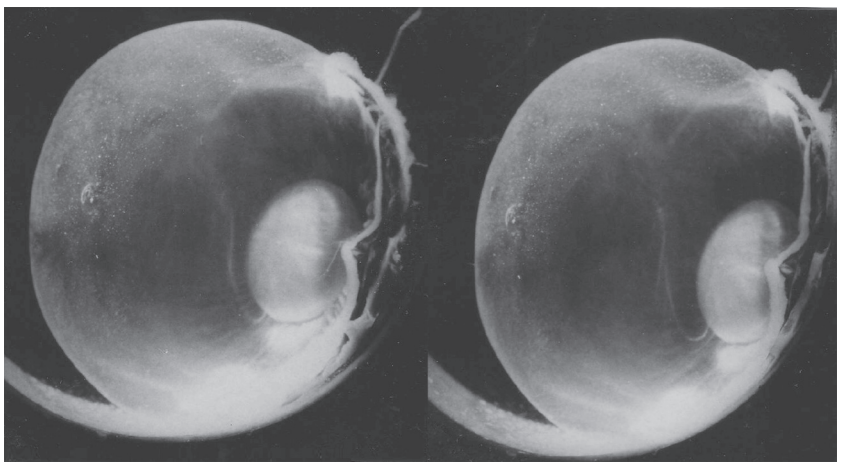












3. Development and Aging

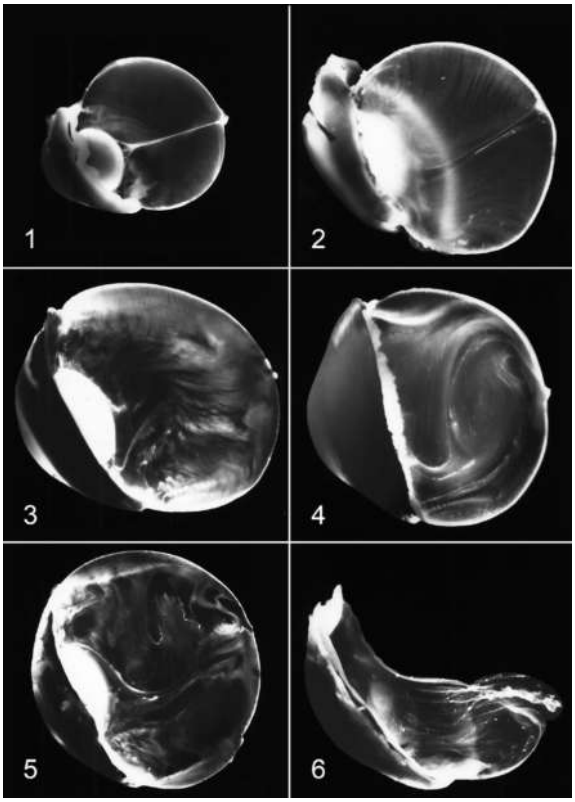


Figure 3:
Development and aging, slit lamp photographs

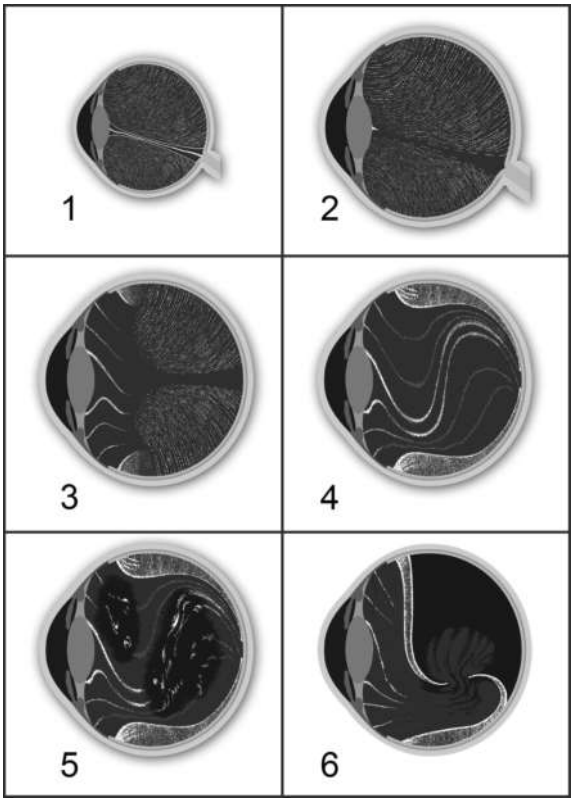


Figure 4:
Development and aging, schemata

1. Premature newborn:
   infantile radial striation
   hyaloid channel with hyaloid artery
2. Infant:
   infantile radial striation
   regression of hyaloid artery
3. Adolescent:
   reorganisation into vitreous tracts anteriorly
   persistence of infantile radial striation posteriorly
4. Adult:
   regression of infantile radial striation
   extension of vitreous tracts throughout the cavity
5. Adult:
   disorganisation of vitreous tracts
6. Old age:
   rhegmatogenous posterior vitreous detachment

The Anterior Limiting Lamina and the Vitreous Tracts at the Vitreous Base

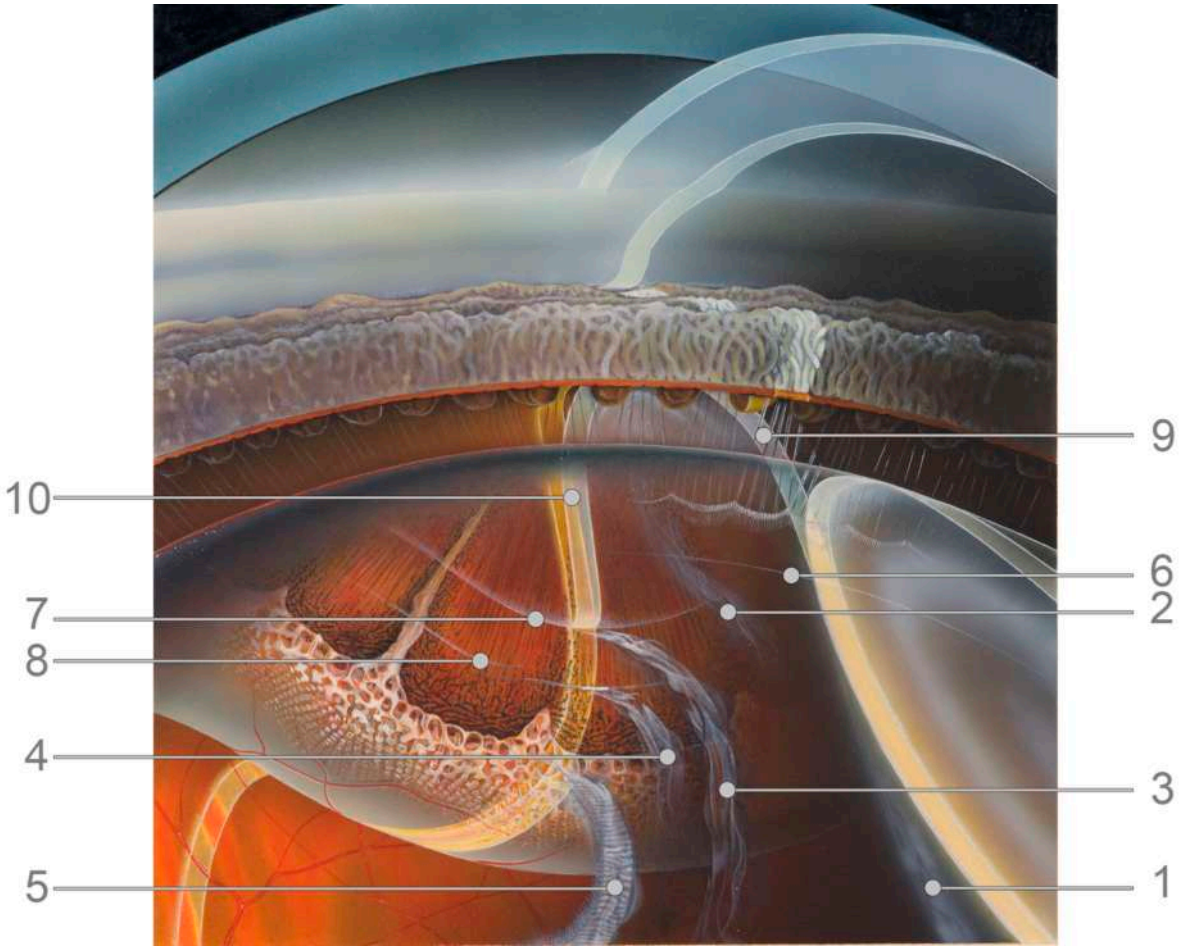


Figure 5:
View of the vitreous base with scleral depression

1. retrolental tract
2. anterior ciliary tract
3. posterior ciliary tract
4. accessory tract
5. preretinal tract
6. retrolental circular zonular ligament
– anterior ciliary ligament not visible in this schema
7. posterior ciliary ligament
8. accessory circular zonular ligament
9. anterior limiting lamina in the perilental space
10. anterior limiting lamina at the pars plana

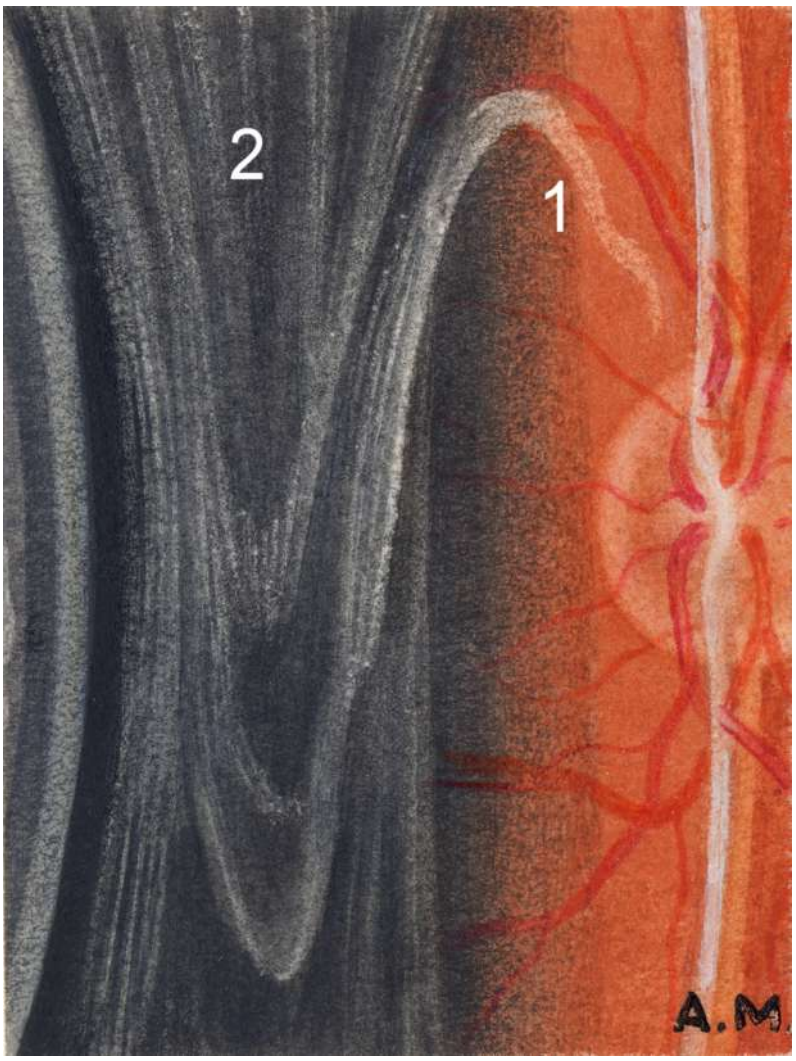
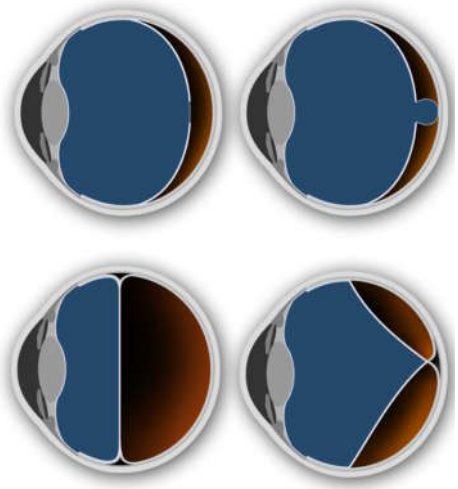


Figure 6:
View of the central vitreous

1 retrolental tract
2 ciliary tracts

Pathology of the Vitreous (DVD 2)

1. Posterior Vitreous Detachments

	Rhegmatogenous PVD	non-rhegmatogenous PVD
Schema	 Figure 7:	 Figure 8:
Aspect	typical	variable
Etiology	physiological	pathological
Detaching Process	collapsing	shrinking
Endpoint of Detaching Process	predictable	unpredictable
Traction	rapid	slow
Resulting Retinal Lesions	tears	folds
Resulting Retinal Detachments	rhegmatogenous	non-rhegmatogenous

Decision Tree in Case of PVD

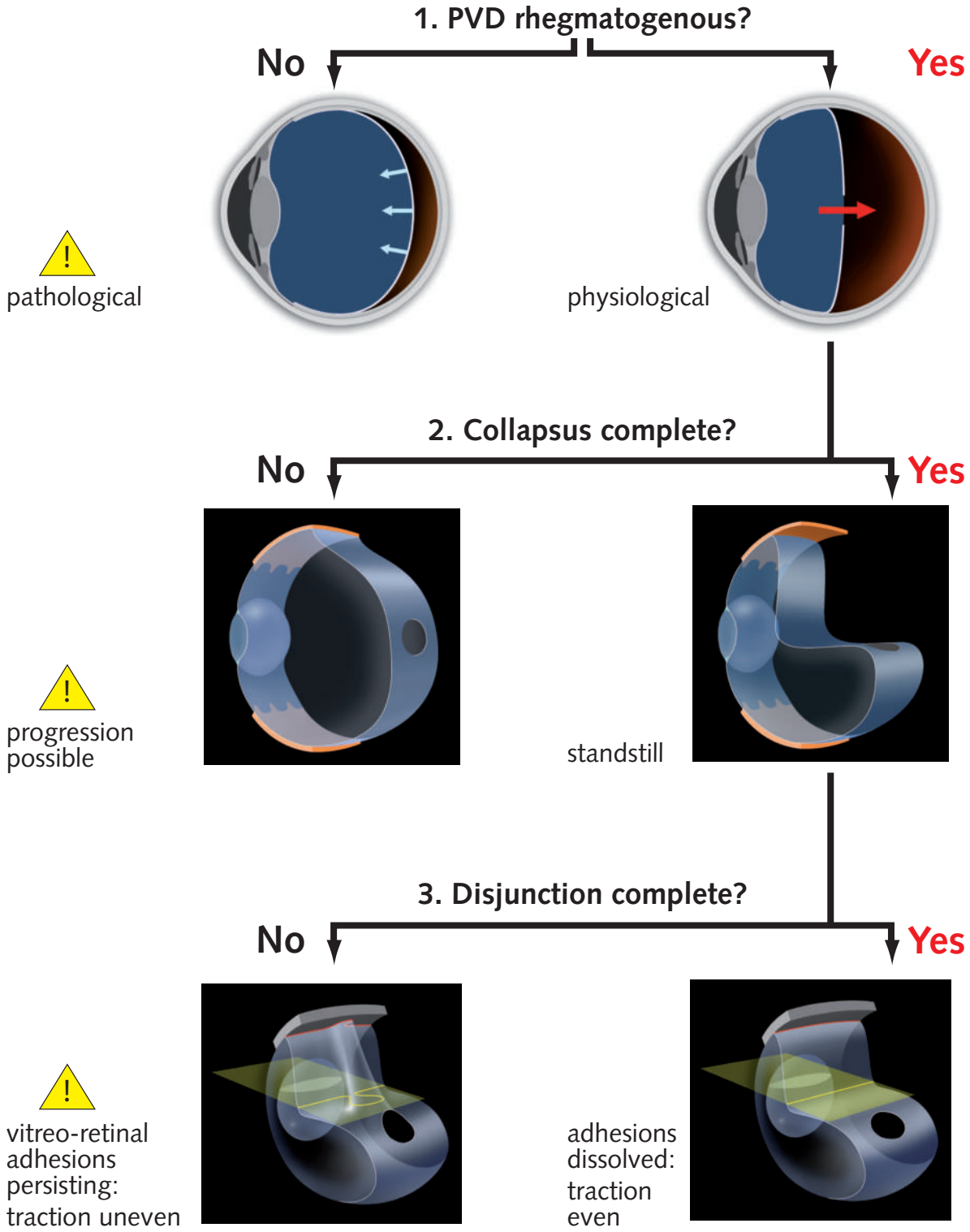
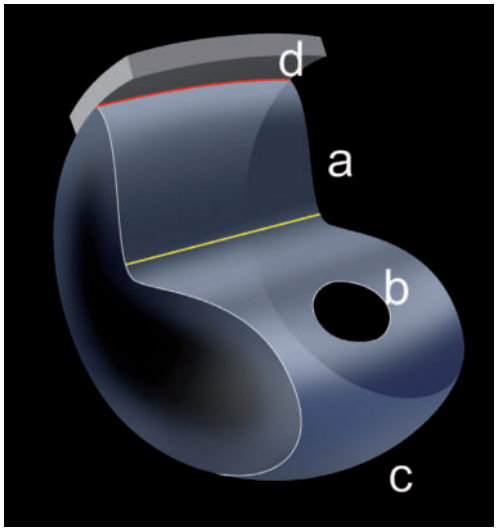


Figure 9: Decision tree in case of PVD

Shortcut of Decision Tree

Risk of complications low?

No **Yes**



Criteria:

Complete collapsus

a: posterior limiting lamina **vertical**
b: prefoveal hole **horizontal**
c: inferior part of limiting lamina **invisible**

Complete disjunction

d: insertion line of posterior limiting lamina **straight**

Figure 10: Complete collapsus and complete disjunction

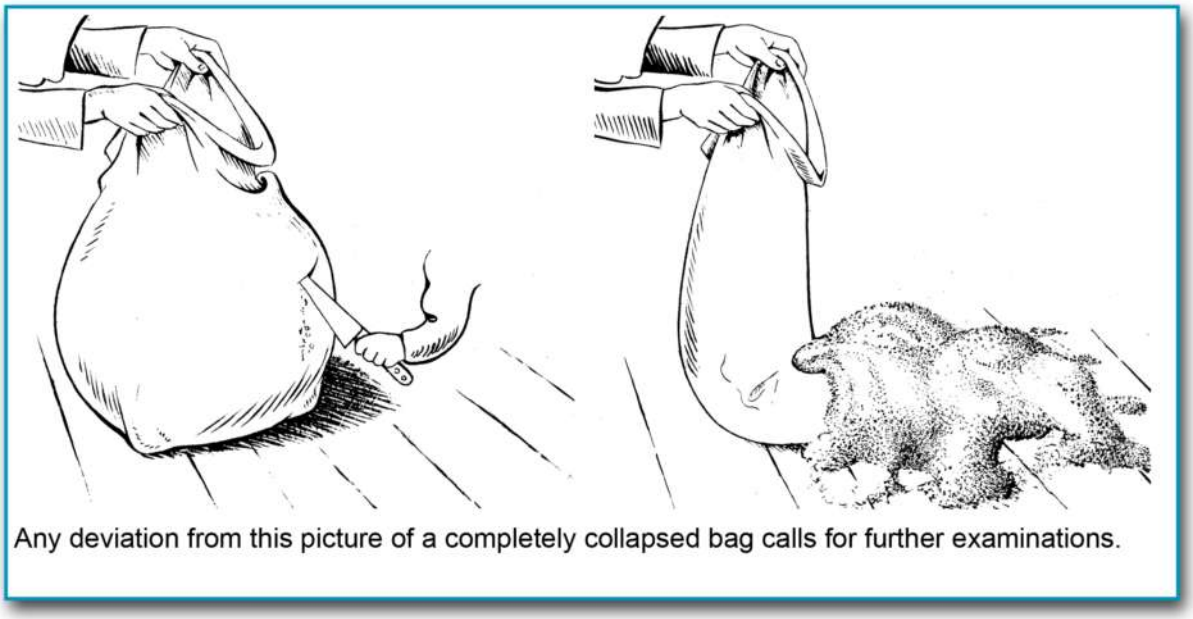


Figure 11: Collapsing bag

2. Invasion of the Vitreous

Invasion of Soluble Proteins

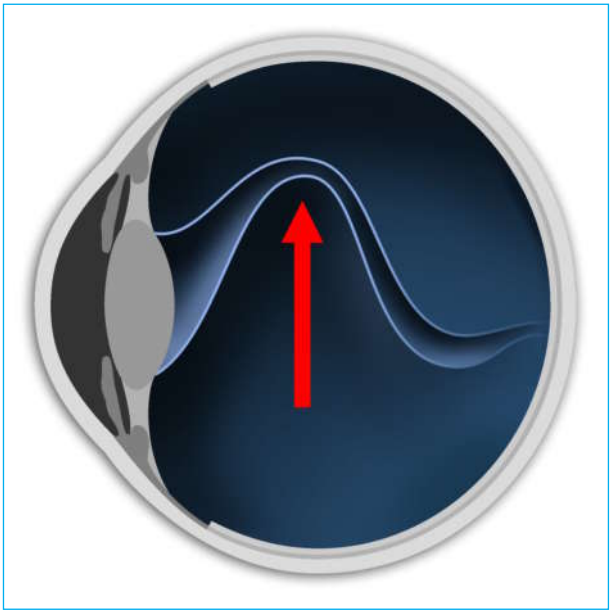


Figure 12:
Invasion of soluble proteins before PVD: ascension of vitreous tracts

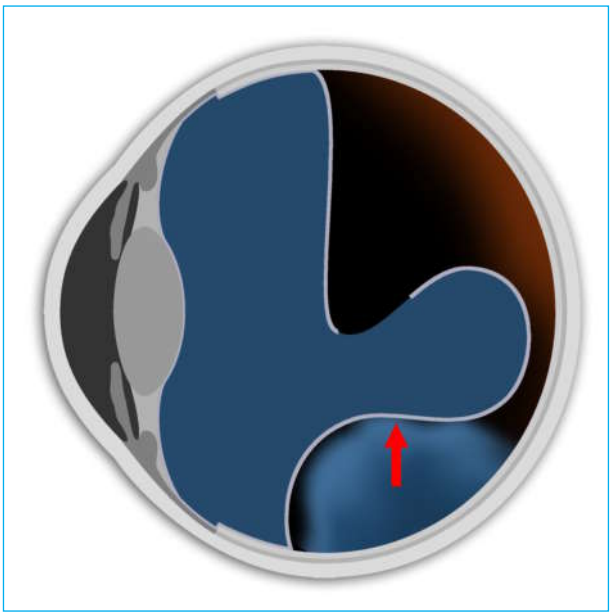


Figure 13:
Invasion of soluble proteins after PVD: ascension of the posterior limiting lamina

Sedimentation of Cells in the Vitreous Framework

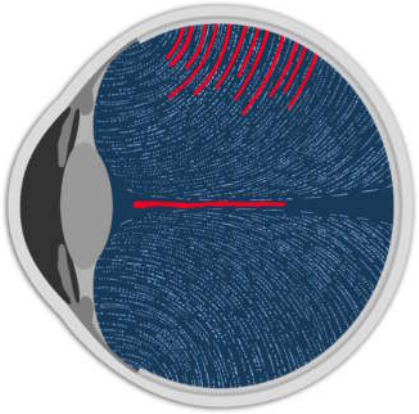


Figure 14: Sedimentation in the infant

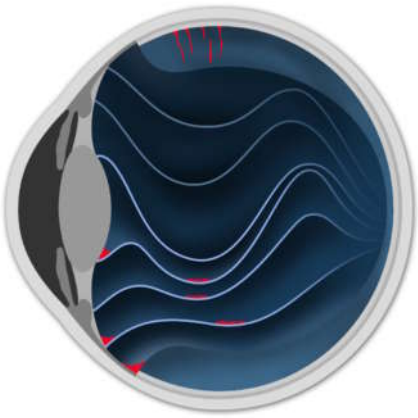


Figure 15: Sedimentation in the adult

Sedimentation of Cells in the Retrovitreal Space

Rhegmatogenous PVD

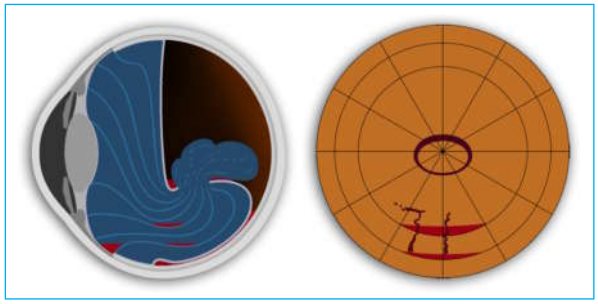


Figure 16: Sedimentation after rheg. PVD

Non-Rhegmatogenous PVD

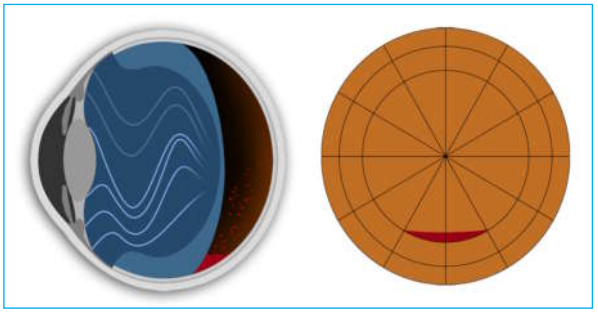


Figure 17:
Sedimentation after non-rheg. PVD

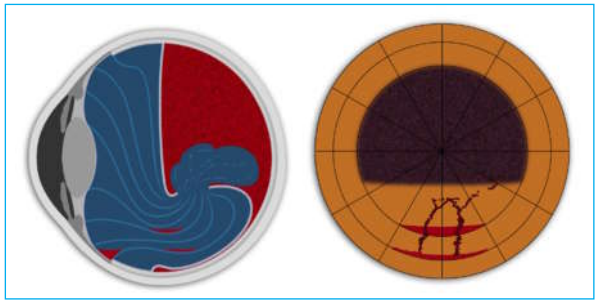


Figure 18:
Massive infiltration of retrovitreal space after rheg. PVD

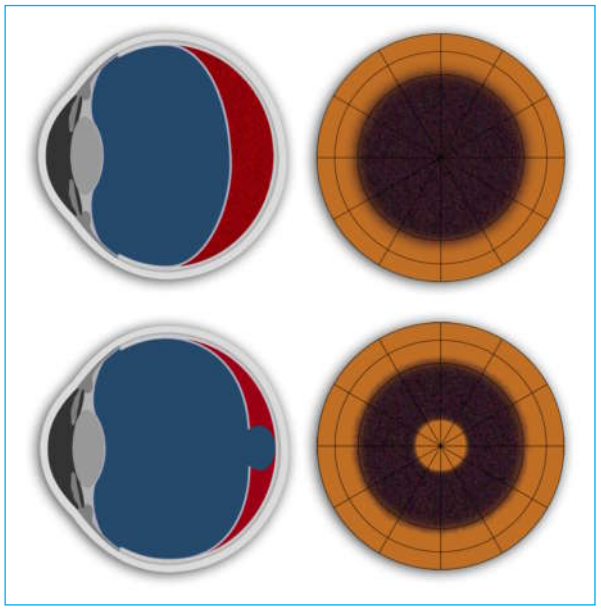


Figure 19:
Massive infiltration of retrovitreal space
after non-rheg. PVD

3. Semiology of the Posterior Limiting Lamina

Deformations of the Posterior Limiting Lamina ("Omega-Folds")

Signs of Complete Disjunction

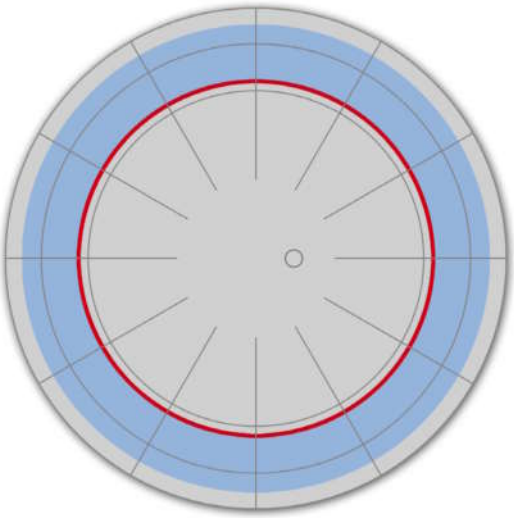


Figure 20: Complete disjunction: straight insertion line

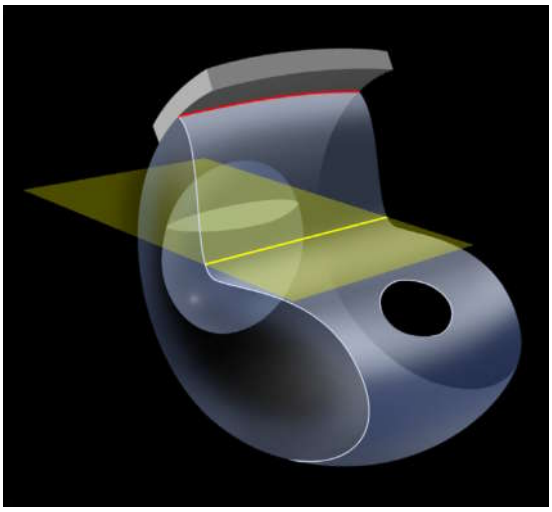


Figure 21: Complete disjunction: absence of folds

Signs of Incomplete Disjunction in the Superior Periphery

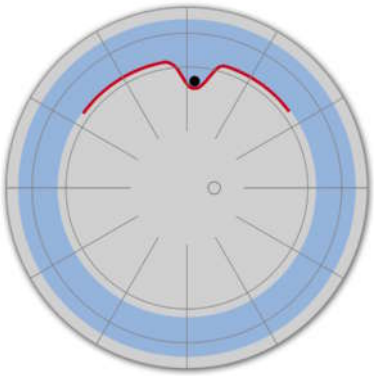


Figure 22:
Incomplete disjunction in the superior periphery: irregular insertion line

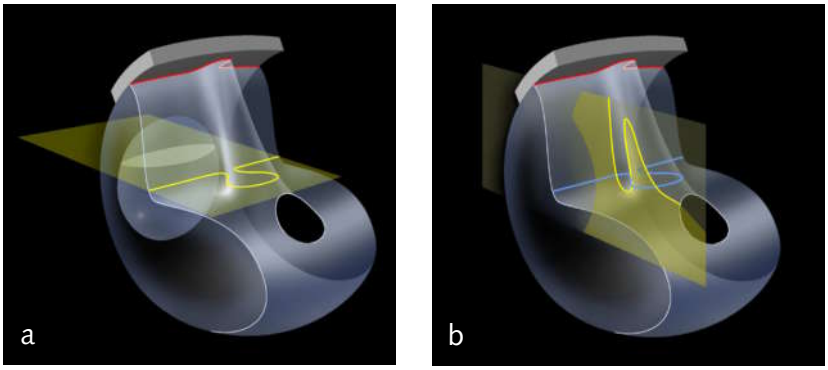


Figure 23:
Incomplete disjunction in the superior periphery:
a) Omega fold in horizontal light slit
b) Multiple contours in vertical light slit

Signs of Incomplete Disjunction in Oblique Meridian

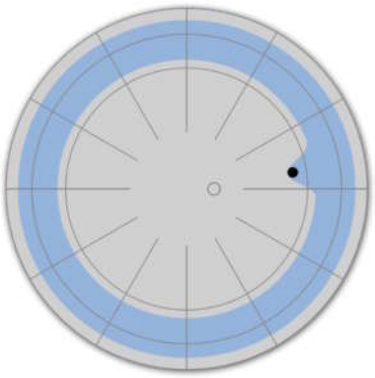


Figure 24:
Incomplete disjunction in oblique meridian

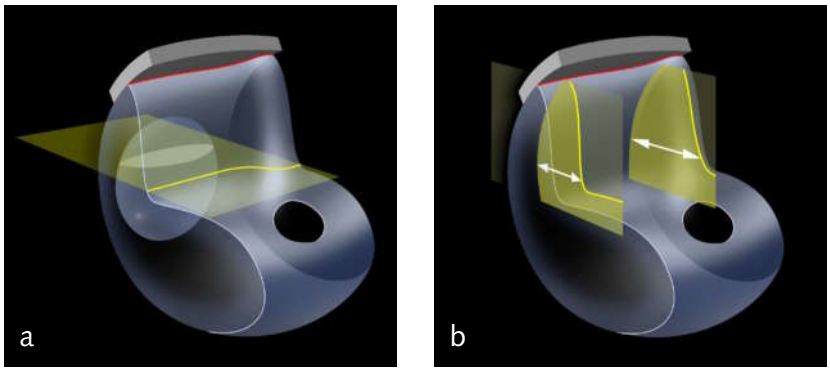


Figure 25:
Incomplete disjunction in oblique meridian
a) Asymmetric fold in horizontal light slit
b) Unequal distances in vertical light slit

Signs of Disjunction in Lower Periphery

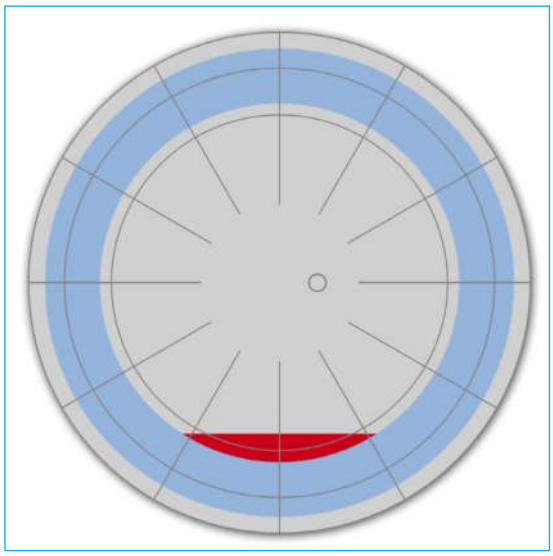


Figure 26:
Complete disjunction in lower periphery: evenly shaped hyphemia

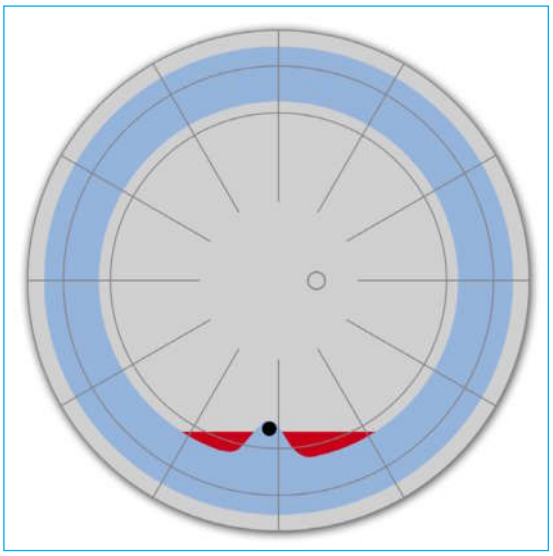


Figure 27:
Incomplete disjunction in lower periphery: split hyphemia

Characteristics of the Pseudo-Posterior Limiting Lamina

The pseudo-posterior limiting lamina does **not** insert at

- the lens border (vs. retrolental tract)
- the circular zonular ligaments (vs. ciliary tracts)
- the ora serrata (vs. preretinal tract)
- behind the ora serrata (vs. posterior limiting lamina)

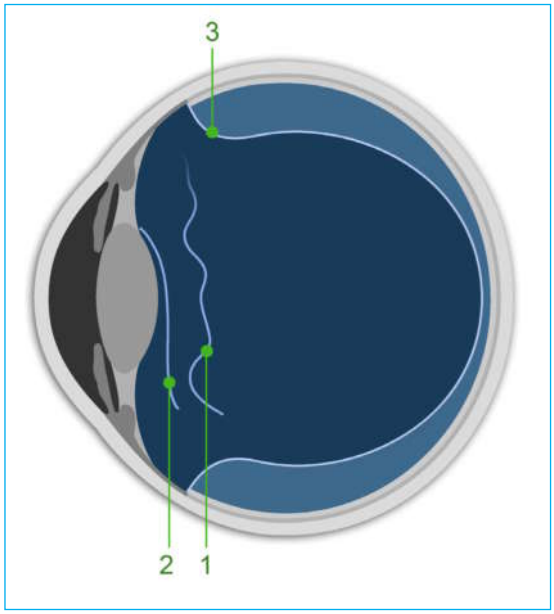


Figure 28:
Pseudo-posterior limiting lamina in a non-detached vitreous

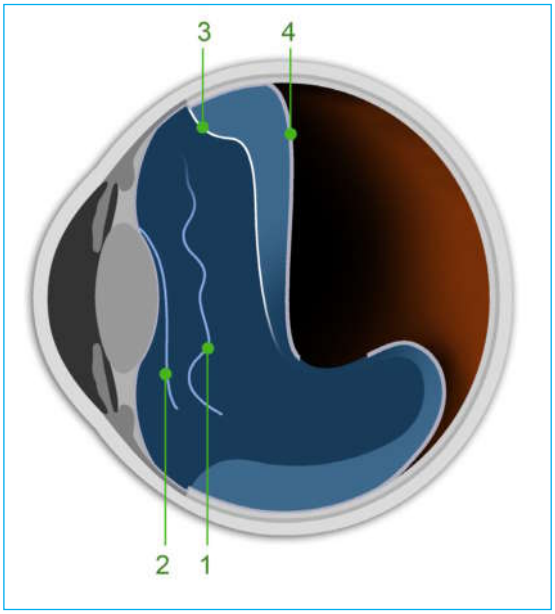


Figure 29:
Pseudo-posterior limiting lamina in a detached vitreous

1 pseudo-posterior limiting lamina
2 retrolental tract
3 preretinal tract
4 posterior limiting lamina

Levels of Separation of the Vitreo-Retinal Fibrillar Complex

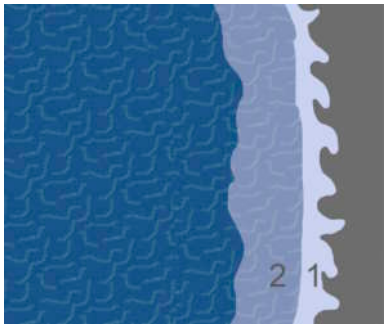


Figure 30:
Intact vitreo-retinal fibrillar complex consisting of:
1 the inner limiting membrane of the retina
2 the posterior limiting layer of the vitreous

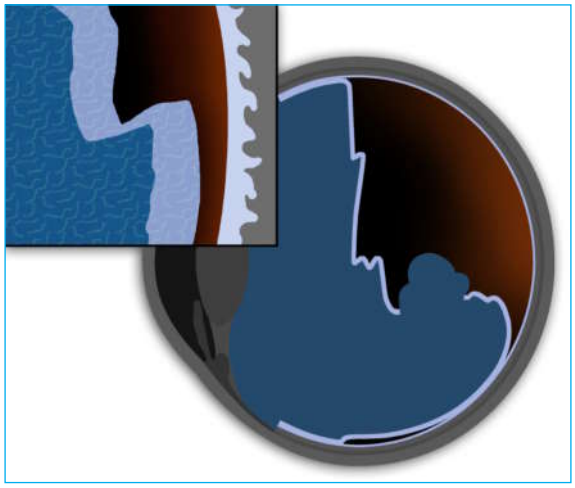


Figure 31:
Preretinal separation: thick posterior limiting lamina

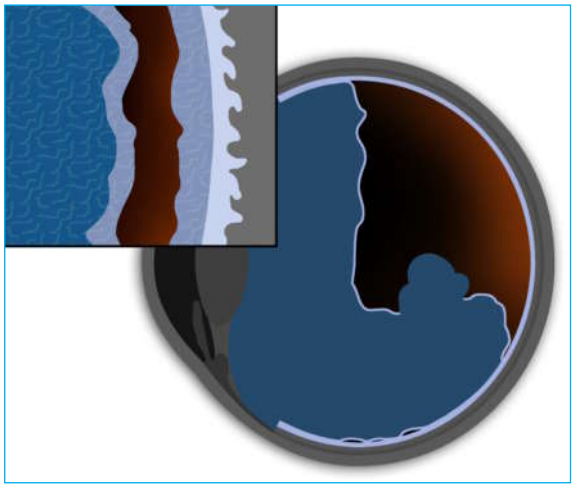


Figure 32a:
Intrafibrillar separation

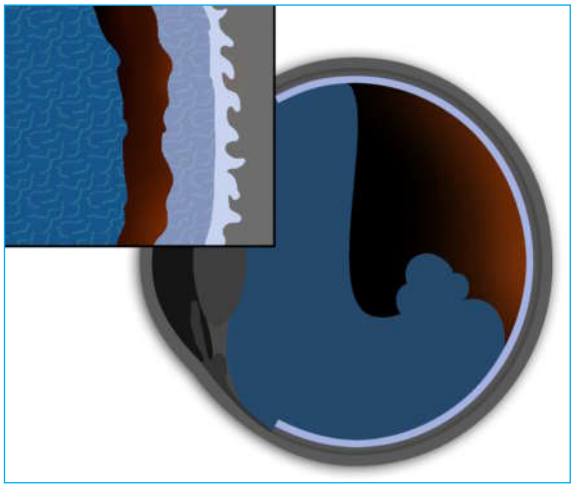


Figure 32b:
Epivitreal separation

Deposits on the Posterior Limiting Lamina

Inflammatory Deposits

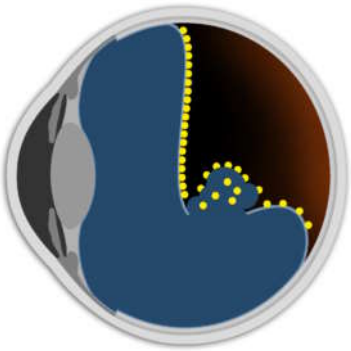


Figure 33:
Inflammatory deposits
acute phase

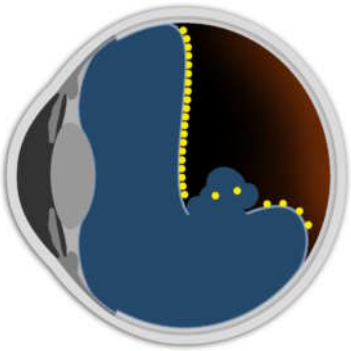


Figure 34:
Inflammatory deposits
late phase

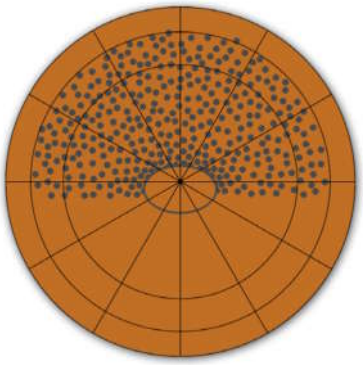


Figure 35:
Inflammatory deposits
late phase

Hemorrhagic Deposits

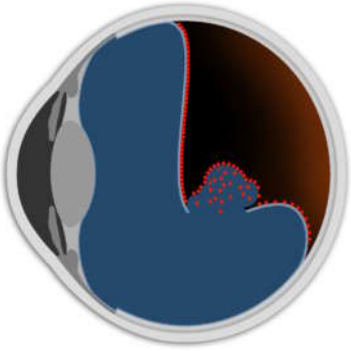


Figure 36:
Hemorrhagic deposits
acute phase

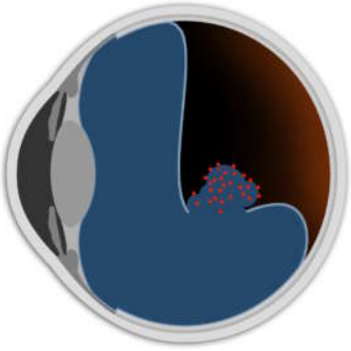


Figure 37:
Hemorrhagic deposits
late phase

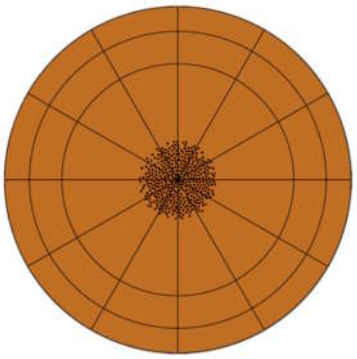


Figure 38:
Hemorrhagic deposits
late phase

Fibro-Glial Imprints

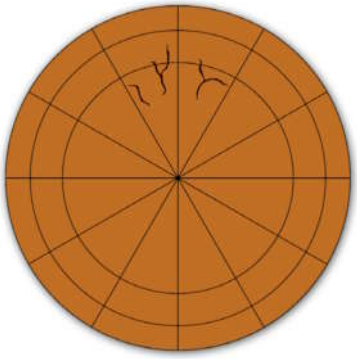


Figure 39:
Fibro-glial imprints
vascular casts

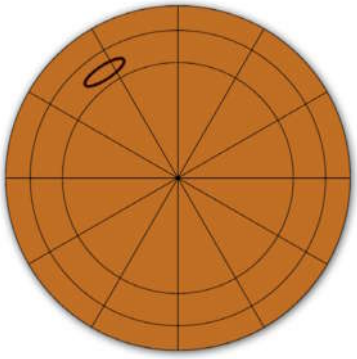


Figure 40:
Fibro-glial imprints
margins of lacunae

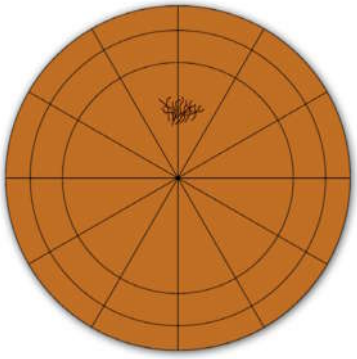


Figure 41:
Fibro-glial imprints
fibrotic veils

4. Semiology of the Vitreous Base

Classification of Lesions at the Retina

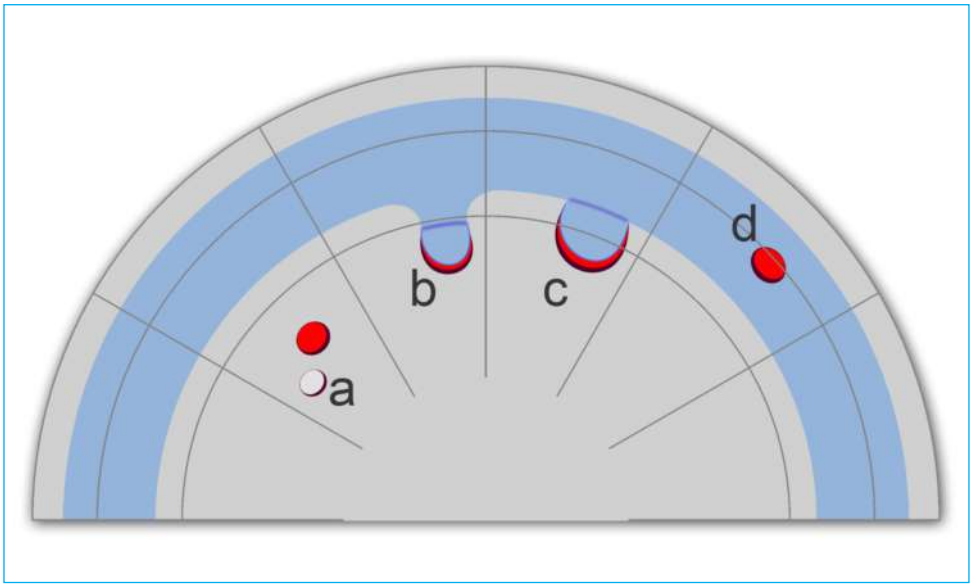


Figure 42: Classification of lesions at the retina

a Extrabasal hole with operculum
b Retrobasal tear incomplete
c Retrobasal tear complete
d Intrabasal hole

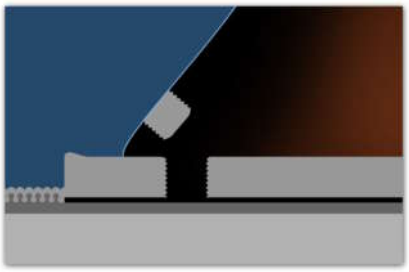


Figure 43: Extrabasal hole (a)

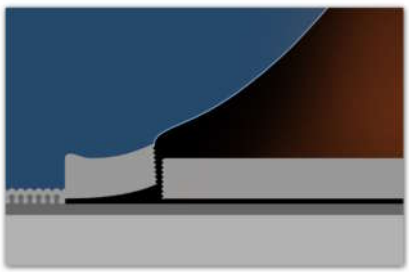


Figure 44: Retrobasal tear (b and c)

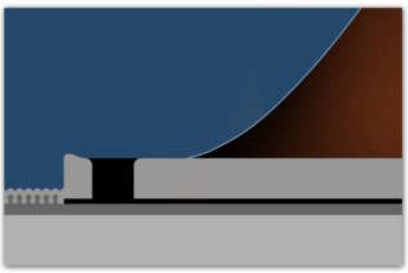


Figure 45:Intrabasal hole (d)

Classification of Lesions at the Ora Serrata

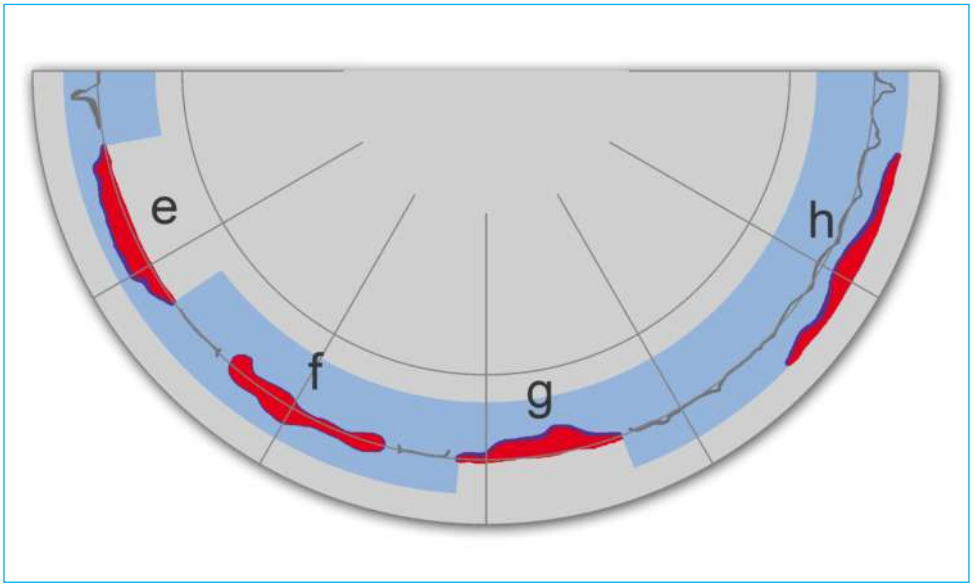


Figure 46: Classification of lesions at the ora serrata

e) Retrobasal tear
f) Intrabasal tear
g) Prebasal tear
h) Pars plana tear

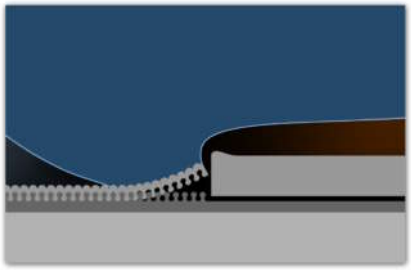


Figure 47: Retrobasal tear (e)

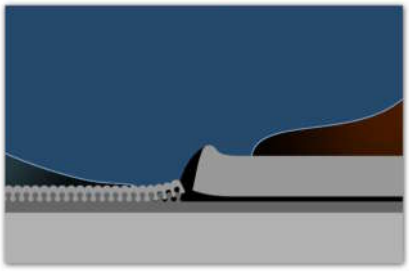


Figure 48: Intrabasal tear (f)

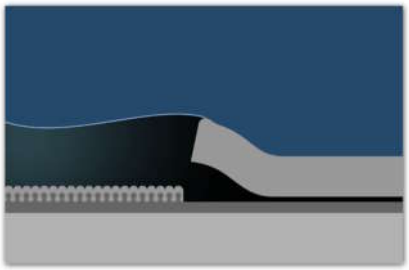


Figure 49: Prebasal tear (g)

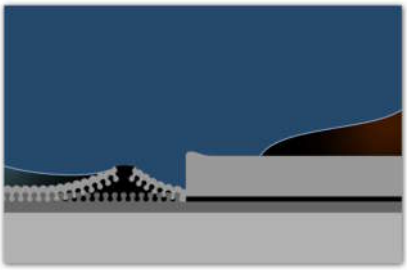


Figure 50: Pars plana tear (h)

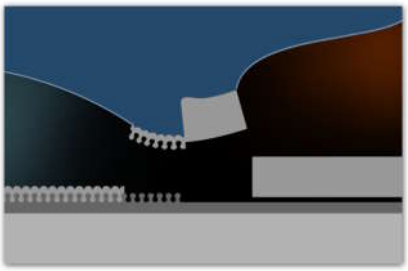


Figure 51: Avulsion of vitreous base

Pseudo-Holes and Pseudo-Flaps at the Ora Serrata

Enclosed Ora Bays

Figure 52:
Pseudo-hole **posterior** to ora serrata

Convergent Ora Teeth

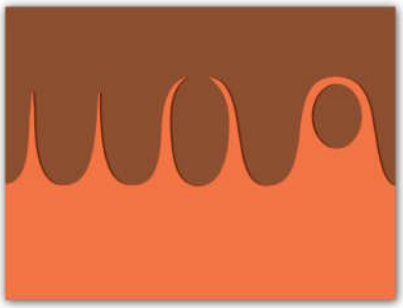


Figure 53:
Pseudo-hole **anterior** to ora serrata

Meridional Ridges and Patches

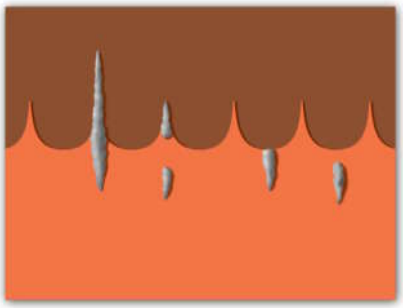
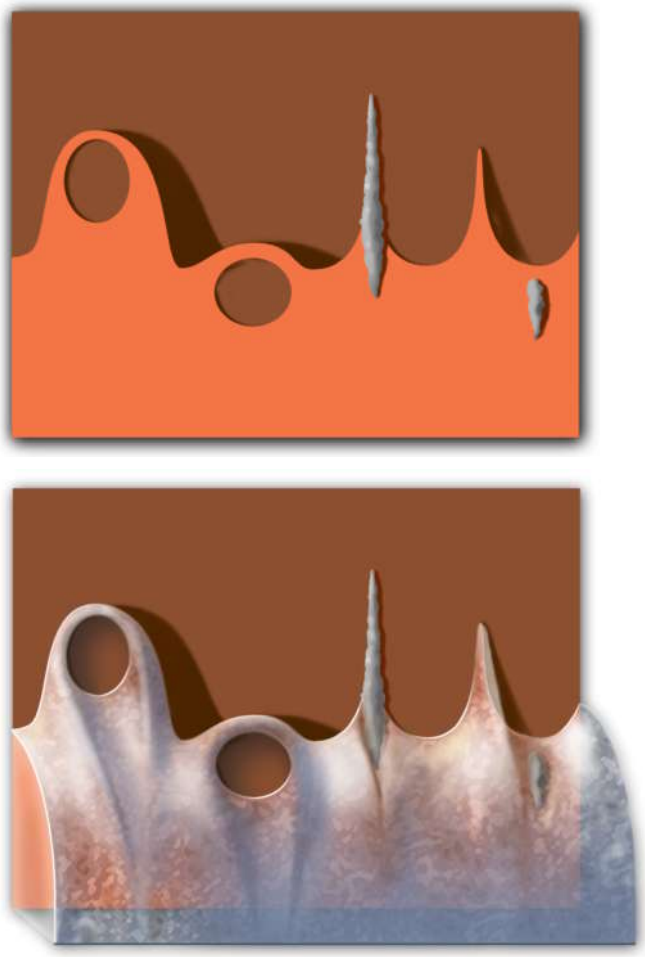


Figure 54:
Pseudo-flaps at **axis** of bays and teeth



Figures 55, 56:
Anomalies of the transition zone at the ora serrata (above) with the insertion of the preretinal tract at their borders (below)

Pseudo-Holes and Pseudo-Flaps at the Ora Serrata

Enclosed Ora Bay

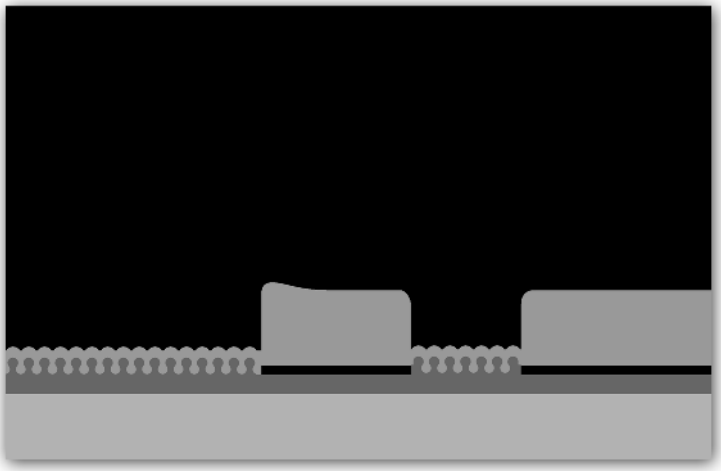


Figure 57: Pseudo-hole: normal ciliary epithelium at **bottom**

Meridional Ridge

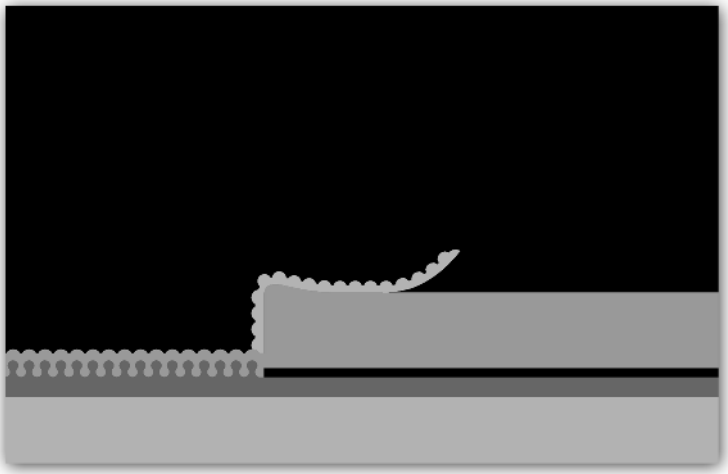


Figure 58: Pseudo-flap: ectopic ciliary epithelium on **surface**

Pseudo-Holes and Pseudo-Flaps behind the Ora Serrata

Surface Anomaly at Retina

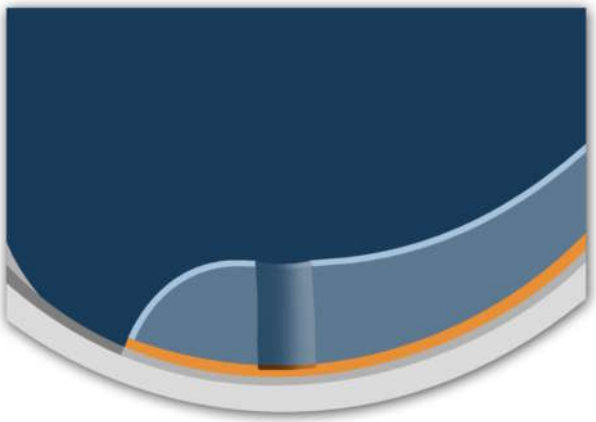


Figure 59: Lacuna **above** lesion

Operculum at Developmental Anomaly

Figure 60: Operculum at preretinal tract; lacuna **below** operculum

Avulsed Operculum in PVD

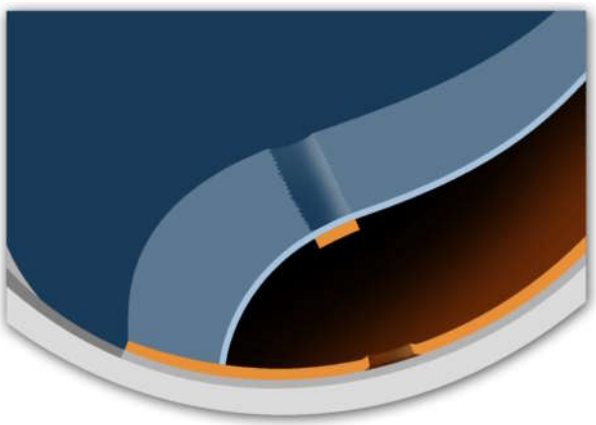


Figure 61: Operculum attached to the posterior limiting lamina; lacuna above operculum

Inflammation at the Vitreous Base

Differential Diagnosis of "Pars Planitis"

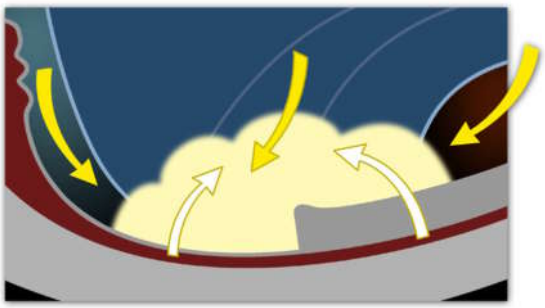
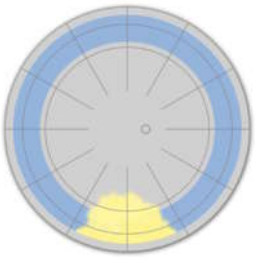
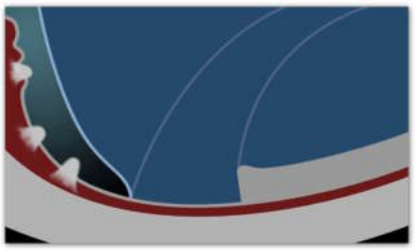
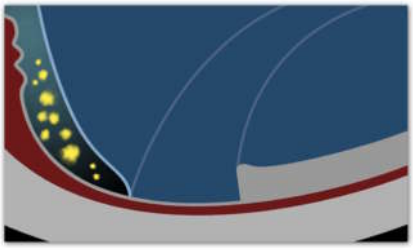
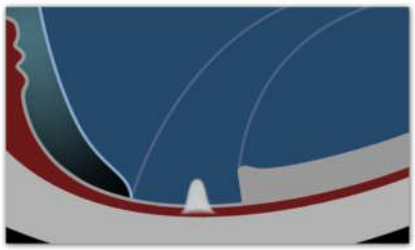
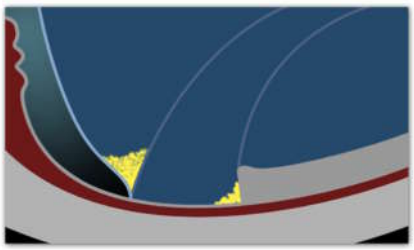
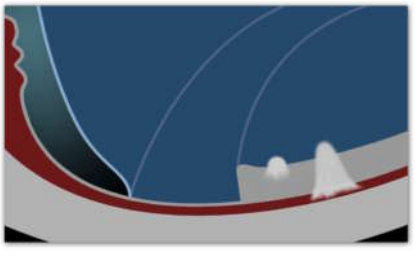
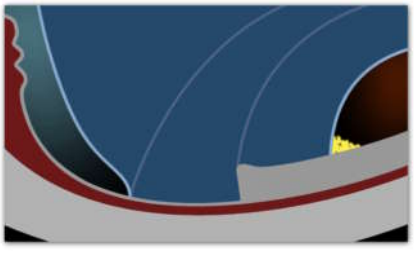


Figure 62: Inflammatory signs at vitreous base

Local Inflammation	Sediments
 Figure 63: Circumferential dissemination	 Figure 67: Accumulation at botttom
 Figure 64: Focal anterior cyclitis	 Figure 68: Sediments from anterior segment
 Figure 65: Focal posterior cyclitis	 Figure 69: Sediments from posterior segment
 Figure 66: Focal retinitis and chorioretinitis	 Figure 70: Sediments from posterior segment after PVD