

Posterior Vitreous Detachments (PVD), Retinal Tears and Retinal Detachment

Disclaimer: This Clinical Practice Guideline ('CPG') was written for use in The Royal Victorian Eye and Ear Hospital Emergency Department. It should be used under the guidance of an Ophthalmology or ENT registrar. If clinical advice is required, please contact the Eye and Ear Admitting Officer for assistance: EYE: +61 3 9929 8033; ENT: +61 3 9929 8032. Links to internal Eye and Ear documents cannot be accessed from the website CPG.

Description:

A PVD is a separation of the posterior vitreous gel from the retina as the result of age-related vitreous degeneration and liquefaction. Traction from the vitreous can lead to a vitreous haemorrhage and/or a retinal tear and/or detachment.

Red Flags:

- Risk factors for a retinal break or detachment: high myopia (-6.0 diopters or more), past history of a retinal tear or retinal detachment in either eye, history of cataract surgery complicated by vitreous loss
- If blood is seen in the vitreous or Schafer's Sign ('tobacco dust' in the anterior vitreous) is present, you should assume that a retinal tear is present

How to Assess:

History:

- History of high myopia, complicated cataract surgery, retinal tear or retinal detachment in either eye
- Symptoms: flashes, floaters (new/a change/increase in pre-existing floaters), monocular loss of visual field
Note: A PVD does not cause pain. Pain in the presence of vitreous floaters may indicate vitritis.
- Medications: anticoagulants

Examination:

- Detailed examination of both eyes is essential
- Pupils: must be checked for relative afferent pupillary defect (RAPD) prior to instillation of dilating eye drops. A vitreous haemorrhage, small retinal detachment and a retinal tear will not cause a RAPD.
- Anterior vitreous: look for blood or tobacco dust. Tobacco dust virtually always **indicates the presence of a retinal tear.**

Fundoscopy:

- Dilate both eyes with tropicamide 0.5% and phenylephrine 2.5%
- Examination is more difficult in the presence of a vitreous haemorrhage
- Optic disc – look for a Weiss Ring indicating a PVD
- Macula – determine if a retinal detachment, if present, is macula-off or macula-on. Look for signs of degenerative myopia (tilted discs, peri-papillary atrophy, posterior staphylomas and prominent choroidal vessels), as their presence increases the risk of a retinal tear or detachment.
- Periphery – systematic examination of the peripheral retina is required. If no abnormality is found, proceed with binocular indirect ophthalmoscopy with scleral indentation. If you are unable to perform the latter with an adequate view, examination with a 3-mirror contact lens is an acceptable alternative, but a retinal break cannot be completely excluded by this method.
- If vitreous haemorrhage is present consider other causes, e.g. proliferative diabetic retinopathy, previous central retinal vein occlusion, Terson's syndrome (vitreous haemorrhage in association with a subarachnoid haemorrhage)

Investigations:

- Ocular Ultrasound (B-Scan)
 - If no fundus view possible due to cataract, vitreous haemorrhage, etc. perform ocular ultrasound (B scan) looking for retinal detachment and retinal tears.

Note: Retinal tears cannot be excluded by B-scan alone.

Acute Management:

- Symptomatic PVD with no pigment or blood in the vitreous and no retinal tear
 - Reassure the patient. Intermittent episodes of flashes often persist for weeks to months. Floaters may be permanent, but often become less noticeable to the patient over time.
 - No routine follow-up required if you are confident of your examination findings. Advise the patient that they should return to the Emergency Department (ED) immediately if they develop new or worsening visual symptoms, e.g. increase in the frequency of flashes, new or multiple floaters, a visual field defect or a change in central vision.

- Symptomatic PVD with pigment or blood in the vitreous but no retinal tear or detachment found
 - Confirm examination findings with Admitting Officer, Consultant, Medical Retinal or Vitreo Retinal Unit (VRU) Fellow.
 - The patient should be discussed with the VRU Fellow (during waking hours) and needs to be re-examined within 72 hours in Acute Ophthalmology Service Clinic (AOS) or VRU, depending on VRU advice. A vitrectomy may be required to aid identification and treatment of a retinal tear in cases of a significant vitreous haemorrhage.
 - Advise patient to return to ED promptly if they develop changed or worsened visual symptoms.
- Symptomatic PVD with retinal tear(s) found
 - Most tears can be treated with laser retinopexy by a registrar in ED. If adequate laser coverage is achieved, arrange for a review in AOS Clinic in 1 – 2 weeks. If laser treatment is potentially inadequate, the patient should be followed up within 72 hours, after discussion with the VRU Fellow.
 - For patients with a retinal tear who present overnight retinal laser may be performed the next morning in ED, unless there is a strong indication for immediate treatment, e.g. only seeing eye. Any concerns should be discussed with the VRU Fellow.
 - After retinopexy, the patient must be instructed to return promptly to ED if they develop new or worsening symptoms. The risk of retinal detachment is not eliminated by treatment.
 - If laser treatment is not possible due to vitreous haemorrhage, the patient should be discussed with the VRU Fellow (during waking hours) as they may require vitrectomy.
- Retinal detachment
 - Assuming that the retinal detachment is rhegmatogenous, (i.e. that it arises from a break in the retina), the patient will require surgery. The urgency depends on whether the macula is involved and the chronicity.
 - Keep the patient nil by mouth until the timing of surgery is clarified. The patient should be discussed with the VRU Fellow (during waking hours).
 - In cases of a macula-on retinal detachment, patients should be advised to lie as much as possible until the time of surgery with their head postured appropriately to reduce gravitational spread of the subretinal fluid towards the macula.
 - If patients are required to posture and are being discharged home until surgery, they should be given written instructions on posturing and a copy of the instructions given should be placed in the medical record.

- Which retinal breaks require retinopexy?
 - As a general rule all horseshoe tears should be treated.
Note: Tears in the extreme periphery or tears that are associated with subretinal fluid may require cryopexy (by VRU) instead of laser.
 - Retinal breaks that are caused by ocular trauma.
 - Most operculated tears/holes.
 - Atrophic holes and lattice degeneration do not usually require treatment but non-urgent retinopexy may be considered if there has been a retinal detachment in the fellow eye.

Additional notes:

Give patient copy of [Posterior Vitreous Detachment Factsheet](#).

Evidence Table

Author(s)	Title	Source	Level of Evidence (I – VII)
	Wills Eye Manual 6 th edition 2012		VII

The Hierarchy of Evidence

The Hierarchy of evidence is based on summaries from the National Health and Medical Research Council (2009), the Oxford Centre for Evidence-based Medicine Levels of Evidence (2011) and Melynck and Fineout-Overholt (2011).

- I) Evidence obtained from a systematic review of all relevant randomised control trials.
- II) Evidence obtained from at least one well designed randomised control trial.
- III) Evidence obtained from well-designed controlled trials without randomisation.
- IV) Evidence obtained from well-designed cohort studies, case control studies, interrupted time series with a control group, historically controlled studies, interrupted time series without a control group or with case series.
- V) Evidence obtained from systematic reviews of descriptive and qualitative studies.
- VI) Evidence obtained from single descriptive and qualitative studies.
- VII) Expert opinion from clinician, authorities and/or reports of expert committees or based on physiology.

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