FOR HEALTHCARE PROFESSIONALS

GENERAL PRACTICE INFORMATION

WHAT TO DO WHEN A PATIENT PRESENTS WITH FLOATERS

By Dr Simon Chen

Objectives

1. To understand that posterior vitreous detachment is a common and benign cause of ocular floaters.
2. To understand the importance of excluding sight-threatening causes of floaters.
3. To understand how to assess patients with floaters.
4. To understand when to refer a patient with floaters to a retinal specialist.
5. To understand that there are effective treatment options for floaters.

Vitreous degeneration and posterior vitreous detachment

The vitreous is a firm, gel structure at birth, consisting almost entirely of water (> 99%) and a meshwork of collagen strands coated with hyaluronic acid. The negatively charged strands repel each other, with water filling the space in between. Surrounding the vitreous gel is the posterior hyaloid membrane (PHM).

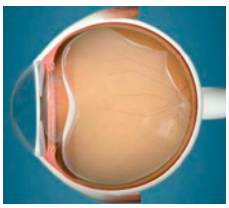
As our bodies age, the vitreous begins to liquefy.

- In children, it has the consistency of a semi-boiled egg.

- In middle-aged adults, it has the consistency of a runny egg.

- In elderly people, it has the consistency of an uncooked egg.

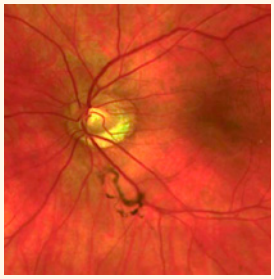
Liquefaction of the vitreous with age results in a reduced ability to maintain its shape and attachment to the retina. Consequently, the vitreous starts to pull away from the retina – in other words, posterior vitreous detachment or PVD starts to occur.



The posterior vitreous detaching from the retina.

The vitreous begins to clump together, forming thick areas of fibrous material. As the gel matrix breaks down, these clusters can float throughout the liquefied vitreous. PVD floaters can take on various shapes including:

- A Weiss Ring (a condensed vitreous ring resulting from detachment around/near the optic nerve head)
- Strands or hairs
- Clouds or cobwebs
- A combination of the above.



Example of a Weiss Ring near the optic disc.

Symptoms are due to the shadow of the floaters on the retina, rather than the person seeing the floaters directly. Symptoms are exacerbated when the pupil is small and/or the floaters are large in size. The opposite is true when the pupil is dilated and/or the floaters are smaller in size.

It may take months, years or decades for the vitreous to completely detach. Partial PVD is present in about half of 40-year-olds, while complete PVD is seen in about 80% of people aged 70 or older.

PVD is by far the main cause of floaters and largely innocuous, BUT there are a number of other causes, some of which are potentially vision- or even life-threatening. These include the possibility of the retina tearing or detaching during PVD – this is a medical emergency.

ALWAYS assume that any patient with floaters has a retinal tear, until proven otherwise.

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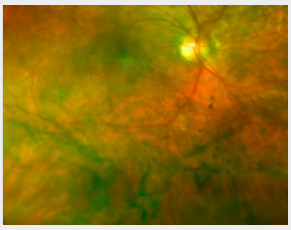
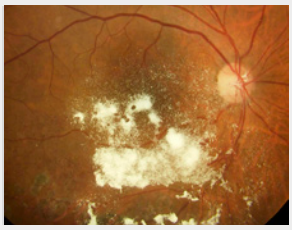
KNOW YOUR DIFFERENTIAL DIAGNOSES

1. INFLAMMATORY CELLS



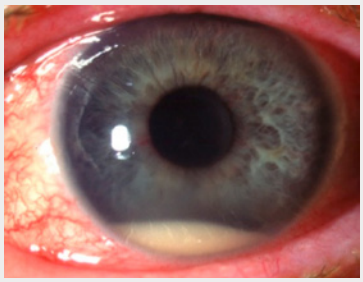
Vitritis (inflammation of the vitreous or the PHM) due to uveitis or a breakdown of the blood–retinal barrier is often characterised by the infiltration of small white cells. Look for signs of vasculitis. Causes include sarcoidosis, toxoplasmosis, syphilis and pars planitis.

2. INTRAVITREAL STEROIDS

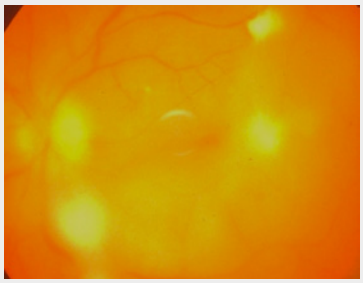


Intravitreal triamcinolone may be used in the treatment of certain retinal diseases. The drug can be seen as white particles that tend to gravitate inferiorly.

3. INFECTION



Bacterial endophthalmitis can result from endogenous causes, trauma or post-operative infection. A dense collection of white cells (pus) may be observed in the anterior chamber of the eye.

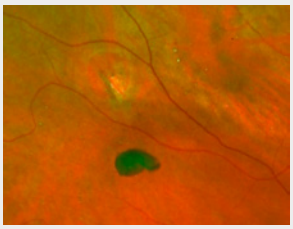


Floaters due to fungal endophthalmitis take on a fluffy, snowball appearance. Patients are generally immunocompromised.

4. NEOPLASTIC CELLS

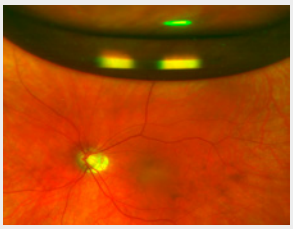
Be aware of masquerade syndromes – neoplastic disorders that mimic ocular inflammatory disease and are often malignant. Ocular lymphoma is one example where snowball opacities may be visible, similar to fungal endophthalmitis. A diagnostic vitrectomy is required to distinguish between these two conditions.

5. RETINAL FRAGMENTS



Vitreoretinal traction can lead to operculated retinal tears. Avulsed retinal fragments may be noticed by the patient as floaters.

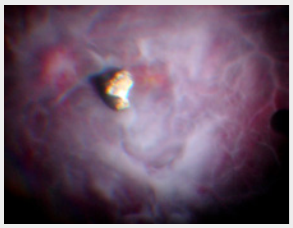
6. GAS BUBBLES



Patients will notice post-operative floaters following vitreoretinal surgery to treat retinal detachments and macular holes. These floaters are the result of gas bubbles from the intraocular gas injection.

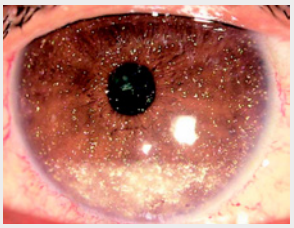
GENERAL PRACTICE INFORMATION

7. INTRAOCULAR FOREIGN BODIES



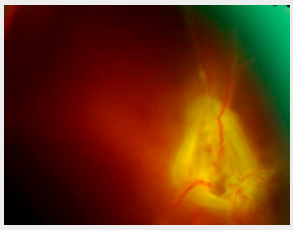
This was a small stone that had flicked off the wheel of a passing car into a young child's eye as they were walking in the street.

8. SYNCHYSIS SCINTILLANS

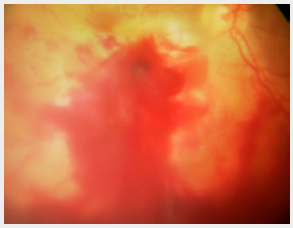


This is a rare condition where yellow crystals of cholesterol can be seen within the eye. Gravity causes the crystals to settle inferiorly, much like a snow globe. Synchysis scintillans occurs in eyes following trauma or phthisis bulbi (i.e. end-stage ocular wastage and shrinkage).

9. BLOOD

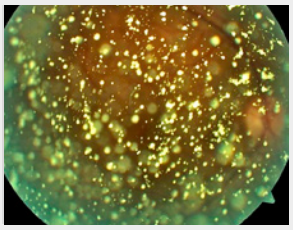


Vitreous haemorrhage can occur with ischaemic retinopathies, such as diabetic retinopathy, central retinal vein occlusion, branch retinal vein occlusion, sickle cell disease, ocular ischaemic syndrome and Eales disease.



Trauma and retinal tears are other causes of vitreous haemorrhage.

10. ASTEROID HYALOSIS



Asteroid hyalosis is a degenerative condition in which calcium-containing particles appear in the vitreous humour. It derives its name from the fact that these reflective opacities resemble a field of asteroids in space.

Approximately 25% of cases are bilateral and examination often reveals a diffuse distribution. Visual acuity is typically not affected to any significant degree. The condition may be more common in patients with diabetes.

Asteroid hyalosis is not a cause for concern and rarely leads to loss of vision. Most patients adjust to any visual disturbance. However, some may be significantly bothered by the opacities, in which case a pars planar vitrectomy may be considered.

11. POST CATARACT SURGERY

Floaters are commonly seen following cataract removal for a number of reasons:

- Pre-existing floaters can be seen more easily
- Lens particles may have escaped into the vitreous following phacoemulsification
- The surgery has caused infiltration of inflammatory cells or induced a PVD.

Even following uneventful phacoemulsification cataract surgery, a number of patients can still end up with retrocapsular lens fragments. One study identified fragments in 16.6% of patients.[1]

Additionally, patients who have selected multifocal IOLs are particularly prone to seeing floaters. This is due to reduced contrast sensitivity and multiple focal planes in the eye, which allow multiple floaters to be visualised.

Floaters are also a possibility following YAG capsulotomy to treat posterior capsule opacification, which is commonly encountered after cataract removal.

TRIAGE THE PATIENT

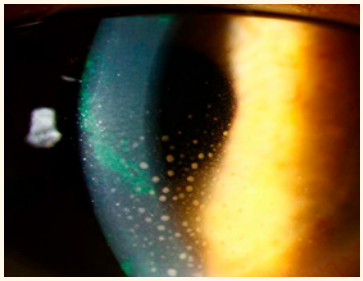
1. Take a detailed history

- **Onset of the floaters**
  - Acute vs chronic
- **Shape of the floaters**
- **Number of the floaters**
- **Refractive error**
- **Previous eye surgery**
- **Any trauma**
- **Associated ocular symptoms**
  - Flashes, visual field defect, blurring, photophobia, redness, discomfort
- **Systemic symptoms**
  - Cough, joint pain, weight loss, fever
- **Medical history**
  - Trauma, diabetes, toxoplasmosis
  - Any conditions associated with uveitis (e.g. rheumatoid arthritis, psoriasis, sarcoidosis, tuberculosis, histoplasmosis, herpes zoster infection, multiple sclerosis, AIDS)
- **Family history**
  - Retinal detachment (RD)
  - Stickler syndrome
- **Quality of life**

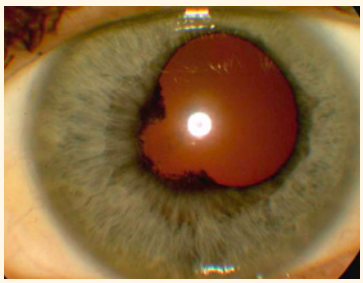
2. Assess the patient and the retina

(a) Look for signs of uveitis

- Cells in the anterior chamber
- Keratic precipitates (cellular deposits on the corneal endothelium)



- Posterior synechiae (iris is attached to the lens)

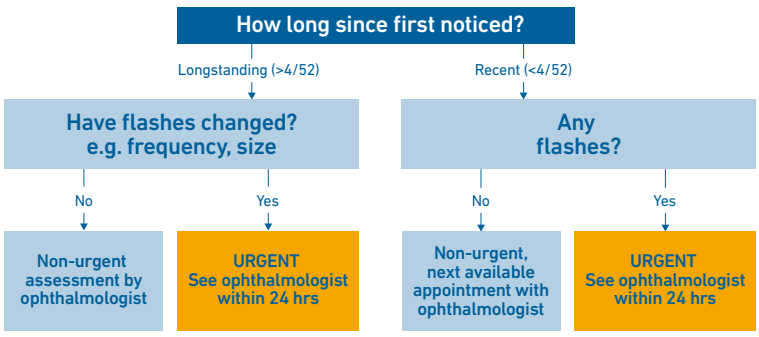


(b) Assess the floaters

- **Location**
  - Anterior/posterior
  - Diffuse/inferior
- **Colour**
  - White/brown/red/yellow
- **Shape**
  - Ring/strands/snowball/clumps
- **Size**
- **Mobility**

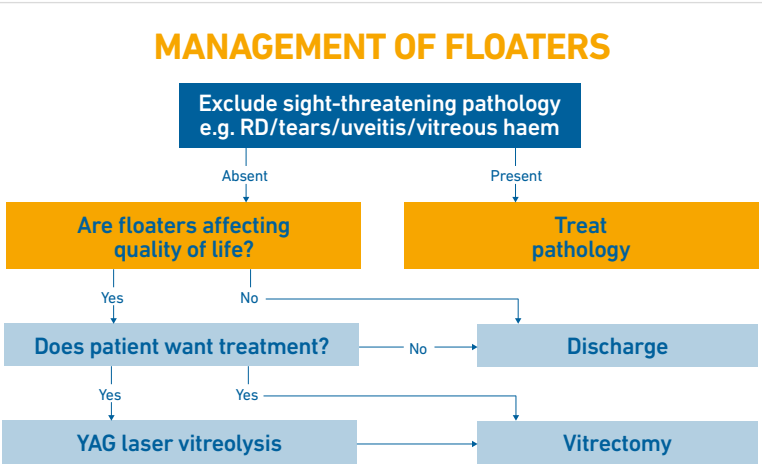
Always examine the peripheral retina whenever a patient presents with floaters.

3. Decide if an urgent referral is required



If you have any doubt about the integrity of the retina, refer the patient to a retinal specialist.

4. Consider next steps for non-urgent cases



(a) Assess the patient's quality of life

Despite their benign nature, symptomatic PVD floaters can significantly impact on quality of life. Patients with floaters in the pre-macula bursa experience particularly debilitating symptoms (severe, well-defined floaters) and are prone to anxiety and depression.

Unfortunately, examination (even with a slit lamp) is unremarkable in many of these cases. The patient may have already visited multiple optometrists and/or ophthalmologists to no avail, adding further to their distress.

Referral to a retinal specialist for further assessment/review and/or discussion of treatment options is warranted for any patient who feels their quality of life is adversely affected by floaters.

(b) Remember that effective treatments are available

Options that are available to improve everyday quality of life include pars plana vitrectomy or YAG laser vitreolysis. Treatment selection will depend on a number of factors, including the number of floaters, their size and density, and the benefit–risk ratio.

Key points

1. Most floaters are innocuous, but it is important to exclude serious pathology (e.g. retinal detachment, uveitis or vitreous haemorrhage).
2. Floaters can have a significant impact on quality of life when they are symptomatic.
3. There are effective treatment options available to treat chronic floaters.

Reference

1. Ang A *et al.* Retrocapsular lens fragments after uneventful phacoemulsification cataract surgery. *J Cataract Refract Surg* 2004;30:849–853.

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