Acute posterior vitreous detachment is a common cause of unilateral floaters and flashing lights. These visual experiences are frightening for the patient, and in an eye examination the physical findings are usually few and often subtle. It is a condition that frequently occurs in the older population. **Drs Chintan Sanghvi, Sarita Bhat and Jason Raw** discuss its pathophysiology and management.

**Pathophysiology**

The vitreous is a clear mass that makes up 80 per cent of the volume of the globe and occupies the posterior cavity of the eye between the lens and retina. It has the physical and chemical properties of a hydrogel, being composed mostly of water, and its molecular structure is made up of collagen and sodium hyaluronate. These elements interact in a manner that keeps the vitreous in a stable gel state.

Ageing is accompanied by the formation of liquid filled pockets in the gel. These enlarge and become confluent. Some of these eyes develop a hole in the degenerated cortical vitreous that

Figure 1: Slit lamp image of complete Weiss ring suspended in the vitreous in front of the optic disc
overlies the retina. The collected fluid in the cavities empties into the space between the vitreous and the retina forcibly detaches the posterior vitreous surface from the neural retina. The remaining solid vitreous gel collapses creating disturbing symptoms in the form of suddenly appearing floaters and the accompanying vitreous traction on the retina produces the sensation of flashing lights also called photopsiae.

In normal eyes the peripheral vitreous is loosely attached to the innermost lining of the retina called the internal limiting membrane (ILM) and strong adhesions only occur at the vitreous base and around the optic disc. The detached vitreous attachment to the optic disc typically appears as a donut-shaped opacity in the vitreous and is known as a Weiss ring (see Figure 1). The collapse of the vitreous gel in a PVD in these eyes is not associated with untoward sequelae. In eyes with areas of certain types of peripheral retinal degenerations, abnormally strong adhesions may occur between the vitreous and the retina and during PVD vitreous traction on these adherent areas may result in a retinal tear. If unchecked by prophylactic retinal laser treatment, this may progress to a full retinal detachment, i.e., a break of the neural retina from the retinal pigment epithelium.

Signs and symptoms

PVD is heralded by a sudden onset of flashing lights, usually oriented vertically in the temporal field of vision, and one or more new floaters. The process is painless. The luminous flashes are exacerbated by rapid eye movement. Patients may experience one large floater, which can be distracting when it comes in their line of sight — or may describe spiders, flies, cobwebs or rings moving around in their visual field. Movement of the eye stirs the vitreous so that the suspended debris move correspondingly. Vitreous floaters are most apparent when there is a uniform background illumination, such as a white wall. Floaters typically become less bothersome over a period of weeks to months as they settle below the line of sight or the brain adapts to them. Numerous floaters or decreased vision accompanying the aforementioned symptoms of an uncomplicated PVD are indicative of a more serious problem. Numerous or ‘too many to count’ floaters suggest red blood cells from an avulsed retinal blood vessel or pigment granules from the retinal pigment epithelium are present in the vitreous. A sudden decrease of vision along with the flashes and floaters, or a veil or curtain that obstructs all or part of the vision is indicative of a retinal detachment. These symptoms may not only occur concurrently but can manifest at any time after the onset of PVD. Thus all patients should be encouraged to seek urgent medical attention if they develop these problems after an uncomplicated PVD.

Complications

Symptoms that may indicate a more serious problem include:

- Sudden decrease of vision along with flashes and floaters;
- A veil or curtain that obstructs all or part of the vision;
- A sudden increase in the number of floaters.

Although the majority of patients with acute PVD develop no complications, sight threatening sequelae, such as retinal breaks and vitreous or retinal haemorrhages, may occur. Retinal detachment (RD) can result from retinal breaks caused by PVD; 10–15 per cent of all patients with acute symptomatic PVD have at least one retinal break. The incidence of breaks is higher in myopic eyes as they have pathologically thin retinal tissue and a greater occurrence of peripheral retinal degeneration and diffuse chorioretinal atrophy. In patients with acute PVD and vitreous haemorrhage the incidence of retinal tears increases to 70 per cent.

Management

Clinical history apart from age should include onset, myopia (monocular or binocular), recent trauma or cataract surgery. Apart from the history of presenting symptoms and past ophthalmic history, it is also important to note the past medical history of the patient. Various systemic conditions may predispose the patient to vitreous haemorrhage (eg, diabetes mellitus, sickle cell disease and vasculitis) or retinal breaks (eg, Stickler syndrome). There are no medications or eye drops to make the floaters disappear. Patients with unilateral flashes and floaters require prompt referral to an ophthalmologist and a complete ocular assessment that includes measurement of visual acuity, pupillary examination, confrontation fields, slit lamp examination of the anterior segment and vitreous, and dilated fundus examination using an indirect ophthalmoscope with scleral indentation.
Scleral indentation enhances visualisation of the peripheral retina. It involves the use of an indentor, which is used to exert gentle pressure on the globe through the eyelids. This creates a mound of peripheral retina that can be observed by indirect ophthalmoscopy. When properly done, it is well tolerated by most patients. A prompt and conscientious vitreoretinal examination of patients who experience flashes and floaters, combined with expedient treatment of any retinal tears, provides the most effective known means of preventing retinal detachment secondary to a retinal break.

**References**

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**Conclusion**

Posterior vitreous detachment is a common occurrence among the older population and in the majority of patients does not lead to sight-threatening complications. It represents a significant event to the eye with respect to the risk of development of retinal tears. In order to identify and appropriately treat the small number of patients whose PVD may be complicated by a retinal tear or a vitreous haemorrhage, all patients presenting with symptoms of unilateral flashing lights and floaters should be referred for a prompt ophthalmic evaluation as it may allow timely intervention of PVD-related complications before vision loss can occur.

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