

Flashes and floaters

Eye series – 9

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A 55 year old woman presents to your practice noting ‘flashes and floaters’ in her peripheral vision. They had begun the previous night and have increased in size. She tells you it seems as if there is a ‘cobweb’ moving in front of her eye. Apart from glasses for shortsightedness there is no other previous ocular history.

Question 1

Name the differential diagnoses.

Question 2

Describe the possible mechanisms of retinal detachment.

Question 3

Name the possible risk factors.

Question 4

When is referral necessary?

Question 5

What are the treatment options?

Question 6

What is the visual prognosis?

Answers

Answer 1

Differential diagnoses can include:

- posterior vitreous detachment (PVD)
- PVD with a retinal tear or detachment
- (in a diabetic) - vitreous haemorrhage
- ocular inflammation
- migraine.

The vitreous gel fills the central cavity of the eye providing structural support. Over time the vitreous undergoes several changes most notably liquefaction, eventually leading to separation from the retina. This is a relatively normal event occurring in people aged 40–70 years and is called posterior vitreous detachment (PVD). The pulling action of the vitreous upon the retina results in flashes noticed by the patient. Likewise, as the gel falls away the patient may also notice floaters passing across the line of sight (best explained as being similar to the ‘squiggles’ in egg white moving around and casting a shadow on the retina). Almost 90% of patients that notice flashes in their peripheral vision will have a PVD. Not all patients are symptomatic and sim-

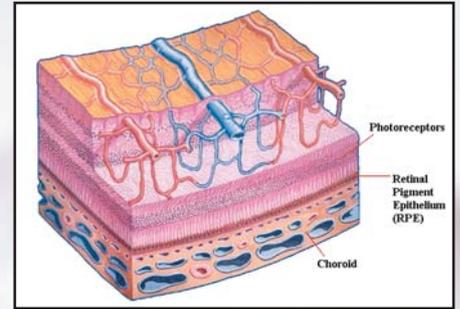


Figure 1. Breakdown of retinal layers

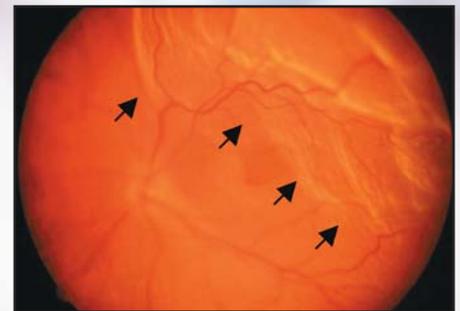


Figure 2. Partial detachment in the peripheral retina

ilarly a PVD may not always develop into a more serious condition. The vast majority of PVDs occur spontaneously (often while asleep) and are not related to stress, heavy exercise or a bump on the head.

If the vitreous is more firmly attached to the retina than the retina is to the underlying pigment epithelial layer (RPE), the PVD may lead to a tear or detachment of the retina from the RPE layer (Figure 1). Until otherwise proven, retinal detachment (RD) should be suspected in all cases of flashes and floaters and treated as an ocular emergency. There is no way to distinguish a PVD from a retinal tear without a dilated retinal examination.

Answer 2

Retinal detachment may be due to:

- a break or tear in the retina (rhegmatogenous detachment) (Figure 2)
- increased traction of the membranes on the retinal surface, or

- accumulation of fluid or mass underneath the retinal layer without any corresponding tear in the retina (usually due to inflammation or tumours).

Rhegmatogenous is the most common type of detachment. Common causes include PVD, blunt trauma, intraocular surgery and myopia. Rhegmatogenous tears occur most commonly in the periphery. Once the retina is torn, fluid from the vitreous can enter the subretinal space and peel the retina off. Presenting initially as a 'curtain' or shadow across the periphery, if left untreated the detachment will rapidly progress to involve the macula and lead to severe loss of vision.

Tractional detachments occur as a result of adhesions between the vitreous and the retina. The most common causes of tractional detachment are proliferative diabetic retinopathy and penetrating ocular trauma. Fibrous retinal tissue will attach itself to the vitreous gel leading to contraction of the retinal layers and finally detachment. Various retinopathies and macular degenerative conditions can lead to the formation of potentially harmful fibrous areas of retina. The formation of fluid in the subretinal layers due to inflammation (eg. retinitis) can cause the outer retina to expand and detach itself. Localised tumour growth can lead to a similar effect and is called exudative or serous detachment.

Answer 3

Several factors can predispose to the onset of RD. These include:

- myopia – over 40% of all patients with RD will be myopic. Several interrelated factors such as myopic retinal degeneration, increased rates of vitreous degeneration and PVD increase the possibility of RD in these patients
- age – the incidence of RD increases with age due to changes described above
- surgery – can lead to increased vitreoretinal traction both during and after the operation, particularly in the elderly. Postsurgery RD rates vary

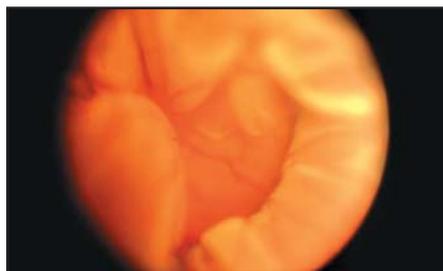


Figure 3. Full RD requiring immediate surgical intervention

between 0 and 2–3%. Complicated surgery that may cause vitreous loss increases the chance of detachment

- trauma – both direct and indirect trauma to the eye may lead to detachment. Patients involved in contact or extreme sports (eg. boxing, bungee jumping) have an increased risk of RD. Intraocular trauma can lead to scarring and further damage
- systemic disease – patients with conditions such as Marfan and Stickler syndromes are at a higher risk of developing RD. Due to the scar tissue formation of resolved haemorrhages, diabetic retinopathy can lead to tractional changes to the retina
- race – some cultures have shown an increased incidence of RD.

Answer 4

Retinal detachment represents a serious ocular emergency and should be referred immediately to an ophthalmologist for further assessment.

Answer 5

In the majority of cases surgery is indicated to restore structure and re-attach the retinal layers. Surgery is dependant on the type, underlying cause, location and size of the detachment. In cases of retinal tears without subretinal fluid, laser surgery is used. A series of small burns around the break will eventually scar and seal the retina to the underlying tissue. Treatment is carried out with anaesthetic drops on the slit lamp and is painless. Patients can go home immediately after treatment. Cryotherapy acts to cause a similar effect and is used if the laser can't

be adequately focussed around the tear (eg. a small pupil or dense cataract). If the tear has progressed to a full detachment laser will have no effect and surgical repair is required (Figure 3). Several options exist:

- intraocular gas may be used to massage the detached layer back to its original position (pneumatic retinopexy)
- suturing a small silicon band or buckle onto the sclera (scleral buckle) pushing the detached area back onto the retina. Laser or cryotherapy is then used to create inflammation and subsequent scarring to close the retinal tear.

In complicated cases a vitrectomy may be required. In the majority of cases of exudative detachment the retina will return to its natural position only when the underlying cause is removed. Inflammatory detachments may only require drainage of the subretinal fluid.

Answer 6

The final visual outcome is dependant on the duration, underlying cause and location of the detachment. Although the majority of surgical procedures successfully re-attach the retinal layer, if the macula itself is detached, vision does not usually return to its pre-detachment level. If treated promptly the patient can retain very good acuity, the longer a retina has detached though the less likely the vision will return due to irreversible damage of the photoreceptor cells.

A peripheral tear or detachment will not affect the central vision. The patient will continue to have good visual acuity but may notice a permanent shadow and subtle loss of peripheral vision. If the macula or central vision is involved, it is unlikely the patient will regain good reading vision. The prognosis of an exudative detachment depends on the underlying cause and the level of subsequent damage.

Conflict of interest: none declared.