Case Record 1a/1b

1a Floaters and Flashes - Syneresis.

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Dr Peter Frampton
DOptom MSc FCOptom
BAppSc(Optom)(AUS) DipTp(AS)
DipTp(SP) DipTp(IP)

aaron optometrists

Introduction
Referral based on 'Intent to Treat' criteria

Clinical Knowledge Summaries (CKS 2012) indicates that, even in the absence of reduced visual acuity, field loss or fundoscopic signs of retinal detachment or haemorrhage a patient should be referred urgently for ophthalmological investigation if they present with acute onset floaters/flashes. The review further stipulates retinal detachments cannot be excluded using fundoscopy or direct ophthalmoscopy in the primary care setting; evidence quoted is that of expert opinion.

Anecdotally, flashes and floaters are a very common primary complaint in community care optometry; yet the incidence of rhegmatogenous retinal detachment in the general population is only 1 in 10,000 with a lifetime risk of only 3% at age 85 (Kang and Luff 2008). Of 240 patients reporting acute onset of both flashes and floaters, Hikichi and Trempe (1994) found 89% to have posterior vitreous detachments (PVD) but only 27 also had associated retinal breaks. The poor prognostic power of floaters/flashes in isolation was exemplified by Tanner and associates (2000); only 0.8% (1 patient) of patients reporting acute onset floaters and flashes were found to have retinal detachments. Retinal detachments were actually detected in 1.7% (2 patients) of asymptomatic patients; referral of asymptomatic patients would seem to improve sensitivity.

Referral habits based on floaters and flashes in isolation would not appear to be ideal. Further, Tanner et al (2000), Ray-Chaudhuri (2005) and Dayan et al (1996) indicate that in secondary care patients are often triaged by optometrists, doctors or less experienced ophthalmologists; reducing the efficacy of the 'gold standard' referral recommendations.

The sensitivity of detection tests is improved by increasing the prior incidence of the disease entity within the sample population and by utilising multiple test strategies (Aspinall and Hill 1983). Clinically, this approach necessitates an understanding of conditions that predispose patients to retinal pathology and composite test strategies to refine diagnosis.

The identification and differentiation of true PVD from simple gel collapse and syneresis is vital. Ang et al (2005) suggest that in true PVD the posterior hyaloid membrane separates from the neural retina along

with the cortical gel. These authors indicate that only true PVDs leave the eye prone to retinal breaks.

Case 1a March 2012
Simple Vitreous Synergesis

Salient information taken from electronic records

DATE: 6/3/12

Mr Age : 52.
Address

Presenting Symptoms
6 week history of cobwebs in vision – both eyes. Noted while cycling and reading.
Vision seems unaffected but very annoying. Cycles unaided.

POH
Presbyopic – wears varifocals.
No past ocular surgery or trauma

FOH
Nil.

General Health and Medications
General health good – recent Well Man clinic
Hiatus Hernia - Omeprazole
No allergies, No hayfever
Non-smoker

Refraction

R +1.00DS (6/6)	Add +1.75 N5
L +1.00DS (6/6)	Add +1.75 N5

Tensions (GAT) (8.45am)	R 16	L 16
Fields (Full Screen)	Full	
Pupils	E&A D,C& N	

Slit Lamp
VH 4+ Angles open, Iris concave, AC Clear – no pigment. Corneas clear.

Dynamic Anterior Vitreous Examination - Syneresis, no tobacco dust or blood, no hyaloid face visible.

Dilated Fundsocopy (1.0% Tropicamide)
Dynamic Vitreous Examination – no Weiss Ring visible. No Hyaloid Face visible. Vitreous syneresis only. R&L 9 Pts of gaze, no tears, no traction, no haemorrhage, no detachments. No degenerative changes noted.

Advice
Floaters/Flashes leaflet discussed and given. Advised to return immediately if new symptoms appear or fundamental change in vision : 1) flashes or floaters getting worse, 2) a black shadow in vision 3) a sudden cloud of spots, 4) a curtain or veil over vision, 5) any sudden loss of vision

Discharged.

Discussion
Time Critical Assessment

Larkin (2010) indicates that retinal detachment is one of the most time critical ocular emergencies. Regardless of the lack of other presenting signs or symptoms all patients reporting acute onset flashes and floaters must have a thorough ocular examination to exclude potential, or frank, retinal detachment.

It is essential to assess for the presence of PVD, without which a rhegmatogenus retinal tear or detachment is unlikely (Ang et al 2005). These authors indicate that true PVD should demonstrate a Weiss Ring, although they do acknowledge this feature may be fragmented or destroyed and absence should not be relied upon as the sole discriminator. Dynamic examination of the anterior vitreous to identify the Posterior Hyaloid Membrane allows a more accurate diagnosis of PVD (Ang et al 2005). This technique also allows identification of more significant markers of retinal detachment, that of pigment or blood in the anterior chamber. Identification of new anterior vitreous pigmentation increases the risk of a retinal tear or detachment; reported risk levels of between 70% (Larkin 2010) and 90% (Kang and Luff 2008). Previous history is important to ensure pigment has not been long standing post a previous episode.

The absence of a weiss ring, observable posterior hyaloid membrane or anterior vitreous pigment or blood, should give confidence that a retinal tear or detachment is not present, in an otherwise low risk eye. Additional confidence should be gained if intraocular pressure is equal between the eyes and no relative afferent pupil defect is observed (Kanski and Bowling 2011, Larkin 2010). Further, a personal note; observation of bilateral cobweb floaters is intuitively less likely to represent a retinal tear or detachment.

This patient did not show any signs of peripheral degenerative changes, no signs of true PVD were evident, symptoms were bilateral, there was no history of trauma or coexisting symptoms of visual loss elicited and the eyes were not considered to demonstrate at risk characteristics. The patient was confidently diagnosed with vitreal synersis and discharged after reassurance, education on signs and symptoms of change and written information. An open invitation to return if a fundamental change became apparent was stressed.

The distinction of vitreal syneresis from PVD is an important one. Sebag (1987) indicates vitreous syneresis and vitreous detachment are best understood in terms of molecular rearrangement of vitreous components; rheological, biochemical and structural. Vitreous consists of water, collagen and hyaluronic acid (Bergmanson 2004). Levels of hyaluronate do not change in adulthood but the dissolution of the hyaluronate/collagen complex allows a shift of hyaluronate from gel to liquid vitreous and the aggregation of collagen fibrils (Sebag 1987). This process does not constitute a risk for retinal damage. Sebag (1987) defines a PVD as separation of the posterior vitreous cortex from the inner limiting membrane of the retina. Ang et al (2005) indicate that PVD can be observed in eyes having underdone cortical gel extraction in vitrectomy; it is only the separation of the posterior hyaloid membrane that represents true PVD with associated risk of retinal damage.

The majority of true PVDs occur without complication (Ang et al 2005, Gariano and Kim 2004). Had this patient demonstrated a true PVD, with weiss ring and distinguishable hyaloid face, but in the absence of any other significant findings of Shaffers sign, blood cells, frank haemorrhage or peripheral degenerative changes the management would be unlikely to change.

Case 1b
Retinal Detachment

March 2011

Salient information taken from electronic records
DATE: 3/3/11

Mrs Age : 59.
Address

Presenting Symptoms
Reduction in RE vision 2/52. Wavy vision and blur in RE. Vision was very good initially post R IOL but has deteriorated.

POH
Complex lenses prior to Cataract extraction and IOL.
L IOL 2010. R IOL March 2011

June 2010 Rx
R -12.50/-5.50x85 (6/12-) Add +3.00 N5
L -12.00 DS (6/360)
Pathological myopia – correction since age 4.
LE central scotoma (Myopic degeneration)

FOH
Glaucoma - Nil.

General Health and Medications
Smoker. No allergies, No hayfever.
No medications : General health good.
No previous history of general or ocular medication use or surgery.

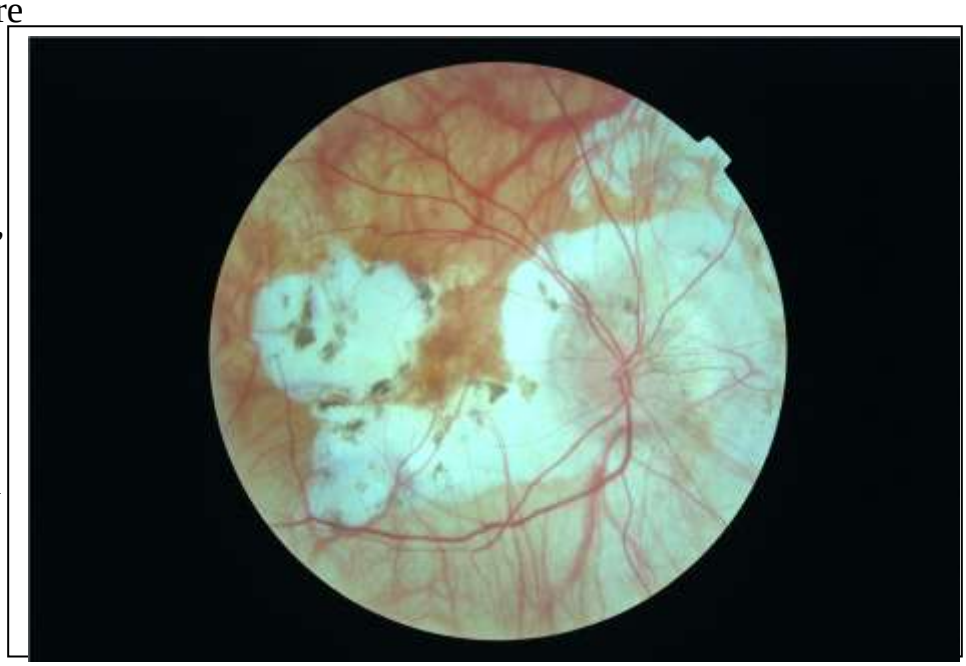
Refraction
R +1.25/-3.00x85 (6/12) Add +3.00 N12
L Plano/-1.00x90 (6/190) Add +3.00 <N48

Tensions (GAT) (10.45am) R 13 L 20
Pupils E&A D,C& N

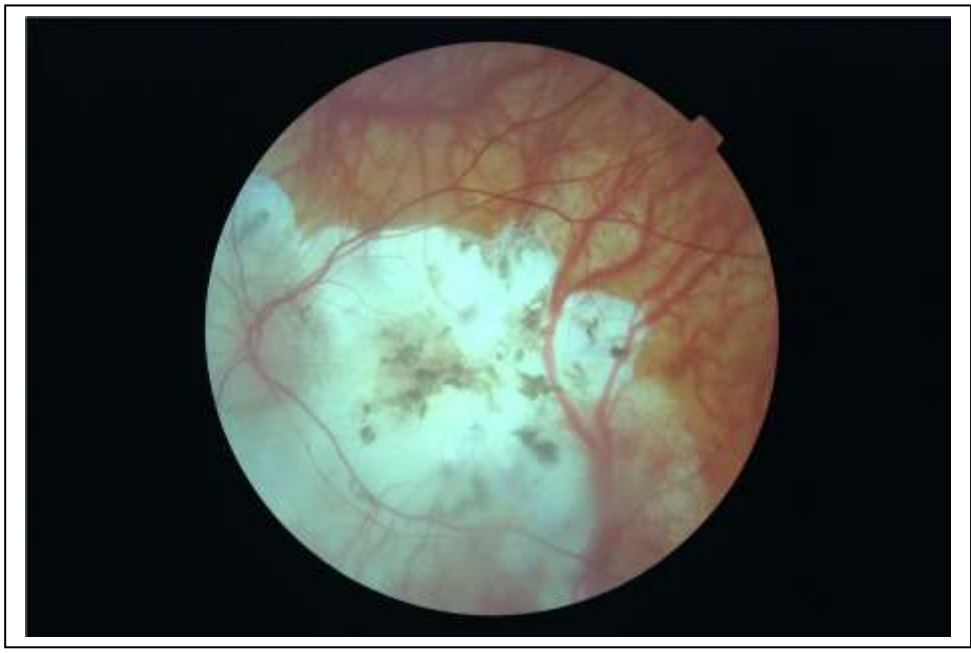
Slit Lamp (1% Tropicamide)
Right Eye - Dynamic Anterior Vitreous Exam – tobacco dust in anterior vitreous. Hyaloid Face visible - PVD. Significant Vitreous Floaters
VH 4+ Angles open, Iris concave, AC Clear – no pigment. Corneas clear.

Left Eye – Dynamic Anterior Vitreous Exam – PVD with hyaloid face. No Shaffer sign

Dilated Fundsocopy (1.0% Tropicamide)
R IOL optics clear. Severe myopic degeneration, vitreous floaters and weiss ring. Peripheral Retina - 9 pts of gaze – no tears, no detachments, no traction or haemorrhages visible, myopic but no lattice degeneration visible. Severe myopic degeneration. Attenuated retinal vasculature with visible choroidal vasculature.



L IOL optics clear. PVD, weiss ring, Vit floaters, 9 Pts of gaze – no tears, no detachments, no traction, no haemorrhages. Severe myopic degeneration. Attenuated retinal vasculature with visible choroidal vasculature.



Clinical Management Plan

Px advised on likelihood of retinal tear. Urgent referral made – copy faxed to HES after telephone confirmation. Copy given to Px.

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INDEPENDENT Prescribing
OPTOMETRISTS
Bellway House, Woodhorn Road, Ashington,
Northumberland NE63 0AE, Tel:01670 813185

Mr
Consultant Ophthalmologist
RVI

Re

3/3/11

Dear Mr

Mrs presented as an emergency reporting rapid reduction in vision since her post-IOL refraction two weeks ago. Refraction gave:
R +1.25/-2.50x96 (6/12) Add +4.00 (N12)
L Plano/-1.00x90 (6/190)

Refraction immediately post extraction gave R 6/9.5 N5.

The right macula appears unchanged with myopic degeneration. A significant PVD with Shaffers sign is present and would account for the visual symptoms. Dilated fundoscopy did not reveal any tears, detachments or haemorrhages; however the presence of vitreous pigment necessitates urgent investigation.

I will fax this directly to you and Mrs will present to Eye Casualty with a copy.

Yours faithfully

Peter Frampton

Discussion
A clear cut emergency

A highly myopic eye, reduced vision, acute onset floaters and haze, recent cataract surgery, clear observation of pigment in the anterior vitreous and clinically lower IOP in the affected eye made a retinal detachment assumed, regardless of not being directly observed.

Cataract extraction, a relatively routine procedure and therefore somewhat underemphasised is worth special note. Gariano and Kim (2004) explain that vitreous hyaluronic acid can pass into the anterior chamber and escape the eye via the trabecular meshwork during cataract surgery so accelerating the liquefication and shrinkage of the vitreous body.
Moderate to severe myopia, greater than 6D (Ang et al 2005, Coffee et al 2007) is a more logical risk; the retina is thinner and there is greater vitreoretinal traction due to the increased axial length (Gariano and Kim 2004).
In this case the presenting symptoms were also very significant with acute onset symptoms of reduced acuity but it was the observation of pigment in the anterior vitreous which constituted a virtually pathognomonic indicator for a retinal tear. Pigment, often indistinguishable from blood, is, in the opinion of the author, the most significant finding; without actually visualising a tear or detachment. Tanner et al (2000) reported that observed vitreous pigment, in isolation, was 95% sensitive and 100% specific for retinal breaks and Kang and Luff (2008) suggest a 90% likelihood of a retinal tear if Shaffers sign is positive.

The American Academy of Ophthalmology (2011) lists a number of asymptomatic and symptomatic frank retinal tears that do not necessarily require treatment. Schweitzer et al (2011a, 2011b) also suggest that only PVDs demonstrating more than 10 floaters, curtain or cloud, vitreous haemorrhages or retinal haemorrhages require follow-up. This level of discrimination is well beyond the remit of optometry. Whether a hole or tear is treated is not our decision, the likelihood one exists is our discriminative task.
This patient was found to have a retinal tear and treated with laser therapy.

Referral Refinement

A thorough case history is essential. Tanner et al (2000) did not find it possible, on the basis of symptoms alone, to determine which patients had retinal breaks. However a case history does identify higher risk groups, myopia, subjective impression of visual acuity changes and duration of symptoms, head and ocular trauma, cataract extraction and previous RD. While most RD is sporadic, some familial disorders may be more prone to RD (Ang et al 2005). It is also necessary to differentially diagnose other conditions manifesting similar visual disturbances; optic neuritis, migraine, uveitis, vein and artery occlusion (Gariano and Kim 2004).

Differentiating acute from chronic symptoms; Dayan et al (1996) indicate that 99% of patients in their study presented within six weeks of symptoms. The severity of symptoms, as opposed to simply reporting floaters or flashes, is also important. Schweitzer et al (2011b) indicate that patients reporting more than 10 floaters or a curtain or cloud, are at highest risk based on symptoms alone.

As Richardson et al (1999) recommend, if vitreous haemorrhage is present then a retinal break is assumed until proven otherwise. Certainly Gariano and Kim (2004) explain that while less than 2% of patients with a PVD also have a retinal break the risk increases to 70% if vitreous haemorrhage is also present. Shaffers sign is considered the most pathognomonic, apart from actual visualisation of the tear or detachment Kang and Luff (2008).

Detection of any peripheral degenerative changes, particularly lattice degeneration, is also vital (Kanski and Bowling 2011).
Subtler signs of reduced IOP in the suspect eye also add more evidence to referral confidence. Kanski and Bowling (2011) suggest a pressure differential of 5mmHg as indicative of a retinal tear; a greater drop could suggest choroidal involvement.

Finally, Sebag (1987) and Sebag (1997) indicate that, while retinal tears may be peripheral, the initiation of PVD is at the posterior pole. This would suggest that if no other anterior or posterior signs of frank PVD are visible with the volk then Ocular Coherence Tomography could identify this anomaly. OCT is now incorporated into the cohort of assessment techniques within this clinic.

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