The posterior vitreous detachment clinic: do new retinal breaks develop in the six weeks following an isolated symptomatic posterior vitreous detachment?

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CLINICAL STUDY

Abstract

Purpose **Symptomatic posterior vitreous detachment (PVD) is sometimes associated with sight-threatening retinal tears or retinal detachment. Patients are usually reviewed twice because it is believed that retinal breaks may develop within 6 weeks of a PVD and as such the management of a PVD consumes significant resources. The aim of this study was to find the frequency of retinal breaks developing within 6 weeks of an isolated PVD using the same experienced examiner at both visits.**

Method **Patients presenting to the eye casualty with symptomatic PVD were examined by the casualty staff. Those with a retinal break or retinal detachment were referred directly for treatment and those with only a PVD were seen within 8 days in the PVD clinic. They were examined by a vitreo-retinal Fellow using indirect ophthalmoscopy and a 20 D lens with scleral indentation. The position and nature of any retinal abnormalities were noted and compared with those described in the casualty notes. Those with sight-threatening breaks were referred for treatment and the remainder were reviewed 5 weeks later when the presence of any new breaks was noted.**

Results **One hundred and seven patients were referred to the PVD clinic over a 6-month period, of whom 2 did not have a PVD. At the first visit to the PVD clinic 6 patients had round holes anterior to the equator, 2 had equatorial horseshoe tears and 1 had lattice with holes. At the second visit, 2 additional patients had round holes anterior to the equator but in both the retina had been obscured by vitreous haemorrhage at the first visit. No patient in whom a full examination was possible at the first visit developed further retinal pathology.**

Conclusion **These results demonstrate the need to perform a full examination of the peripheral retina with scleral indentation at the time of presentation and emphasise the importance of finding a vitreous haemorrhage following a symptomatic PVD. If no retinal breaks are detected by thorough examination at presentation, further reviews, in the absence of increasing symptoms, may not be necessary.**

Key words Posterior vitreous detachment, Retina, Retinal detachment, Vitreous

A posterior vitreous detachment (PVD) is a common, degenerative process in which the vitreous cortex separates from the retina. Whilst up to 20% of PVDs may be asymptomatic, patients often describe a variety of symptoms including floaters, flashing lights or a net or curtain across the visual field.[1] Up to 35% of symptomatic PVD are associated with retinal breaks or detachments[2–5] and the presence of a vitreous haemorrhage increases the likelihood of an associated retinal detachment.[1] Patients with untreated retinal breaks may develop a retinal detachment within 6 weeks, but this may be as a result of developing new retinal breaks at a different location.[6]

Often patients presenting to casualty with symptomatic PVD have two fundal examinations, separated by 5 or 6 weeks. As the frequency of retinal breaks developing in the 6 weeks after symptomatic PVD is unclear, the aim of this prospective study was to determine the frequency of retinal breaks in patients with symptomatic PVD 1 and 6 weeks after presentation, with the same vitreo-retinal fellow examining at each visit.

Materials and methods

Patients who presented to the eye casualty with symptoms of PVD were examined by senior house officers or specialist registrar trainees. Slit-lamp biomicroscopy with a 78 D lens,

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Table 1. *The frequencies of symptoms and sight-threatening retinal breaks in patients presenting to casualty*

	Symptoms		Retinal breaks	
	n	%	*n*	%
Floaters only	38	35.5	2	5.3
Flashes only	27	25.2	2	7.4
Flashes+	36	33.6	7	19.0
Net	6	5.6	0	
	107	99.9	11	10.3

Symptoms were described as 'floaters', 'flashing lights', a 'net' or a combination of flashing lights with other symptoms (Flashes+).

Goldmann three-mirror contact lens and indirect ophthalmoscopy using a 20 D lens were used routinely to examine the eyes for the presence of PVD, indicated by the presence of a Weiss ring, a retinal hole, tear or a retinal detachment. The use of scleral indentation by the casualty staff was not always reported. Those with retinal breaks or detachments were referred immediately for treatment and the remainder were seen in the PVD clinic within 8 days of presentation.

At the PVD clinic a history of the duration and nature of symptoms, previous ocular trauma and a family history of retinal detachments was obtained. The patient's refraction was recorded and the pupils were dilated with tropicamide 1% and phenylephrine 2.5% drops. At the slit-lamp the vitreous was examined for separation of the posterior vitreous face or the presence of a Weiss ring to define the presence of a PVD. The peripheral vitreous and retina was examined by indirect ophthalmoscopy using a 20 D lens and scleral indentation up to the ora serrata. The location and nature of vitreal and retinal findings were recorded and a three-mirror contact lens was used in patients with significant findings from indirect ophthalmoscopy. If no sight-threatening lesions were found the patient was warned about the symptoms of retinal detachment and was reviewed 5 weeks later to repeat the examination. At either visit, patients with symptomatic PVDs and retinal breaks were referred for retinal laser photocoagulation. Patients were discharged if no significant pathology was found after the second examination.

Results

One hundred and seven patients were seen in the PVD clinic. The median age of all patients was 62 years (range 22–87 years), 65 were female (61%) and the median refractive error (spherical equivalent) was +1.0 D (range −16.0 D to + 3.0 D). Thirty-eight patients (35.5%) presented with floaters only, 31 (29%) with floaters and flashing lights, 27 (25.2%) with flashes only and 11 (10.3%) described a 'net', which in 5 was also associated with photopsia (Table 1). After both PVD clinic visits retinal breaks were found in 2 patients with floaters (5.3%), in 2 with only flashing lights (7.4%) and in 7 if flashing lights were combined with other symptoms (19.0%). The mean interval between the onset of symptoms and presentation for all patients was 5 day (range 1–180 days).

On reviewing the 107 casualty cards, all patients had a diagnosis of PVD based on the presence of a Weiss ring. One patient had a round hole, 2 had lattice without holes and 4 had a vitreous haemorrhage. Five more had other non-sight-threatening retinal findings. The median interval between the onset of symptoms and presentation in patients found to have a retinal break was 6 days (range 1–96 days).

At the first PVD clinic visit 105 patients all had a PVD including a Weiss ring. Of the two patients without a PVD, a 65-year-old female hypermetrope had symptoms of classical migraine and a 25-year-old myopic male described flashing lights following head trauma and concussion. A third patient noticed floaters after using a hammer and chisel. He had a PVD and no foreign body was found after clinical and radiological examinations.

Six patients (5.6%) had round flat holes anterior to the equator of which 4 were associated with opercula. Three patients (2.8%) had equatorial breaks of which 2 were horseshoe tears and 1 was an area of lattice with holes. Only the 3 equatorial breaks were readily visible using the three-mirror lens. Five patients (4.7%) had a vitreous haemorrhage at the first visit and were reviewed at intervals until all the retina could be fully examined.

Table 2. *Details of the retinal findings of patients with retinal breaks at each visit to the posterior vitreous detachment clinic*

Patient no.	Sex	Age (years)	Refraction (dioptres)	Symptoms	Duration (days)	First PVD visit	Second PVD visit
1	M	33	1.0	Both	96	Round hole	Same
2	M	35	0.0	Both	30	Vitreous haemorrhage	Round hole
3	M	66	0.0	Both	8	Round hole	Same
4	M	69	0.0	Floaters	4	Round hole	Same
5	M	70	3.0	Both	1	Horseshoe tear	Same
6	M	74	−1.0	Both	8	Horseshoe tear	Same
7	M	80	0.0	Flashes	3	Round hole	Same
8	F	55	−3.0	Both	30	Round hole	Same
9	F	62	2.0	Floaters	14	Lattice+	Same
10	F	65	−1.0	Flashes	2	Round hole	Same
11	F	69	0.0	Both	4	Vitreous haemorrhage	Round hole

The refractive error was expressed as the mean spherical equivalent in dioptres. Symptoms described by patients were 'floaters', 'flashing lights', a 'net' or a combination of these ('Both'). The interval between the onset of symptoms and presentation to casualty is expressed as the duration in days. One patient had holes in an area of lattice degeneration (Lattice +) and two patients had a horseshoe tear. If no new signs were seen in the second clinic, they were designated 'Same'.

The median interval between the onset of symptoms and presentation of those with retinal breaks was 18 days (range 1–96 days). Five patients (4.7%) had lattice degeneration without retinal holes and 16 (15.2%) had other non-sight-threatening retinal signs. Nine patients (8.4%) were referred for indirect laser photocoagulation following their first visit to the PVD clinic (Table 2).

Ninety-six patients were given appointments for the PVD clinic 5 weeks after their first visit, of whom 10 (9.4%) did not attend and 1 returned to casualty before the PVD clinic appointment because of increased symptoms. None of the 10 missing patients has subsequently been treated for retinal breaks or detachment and no new signs were found in the patient who returned early at the extra casualty visit or at the second PVD clinic.

Two patients (2.1%) were found to have pre-equatorial round holes at their second visit and were referred for indirect laser retinal photocoagulation (Table 2). In both patients a vitreous haemorrhage at the first visit had obscured the retinal view. None of the patients who had a retinal break at the first PVD clinic was found to have further breaks at 6 weeks.

Discussion

The prevalence of PVD increases with age and with myopia[5] and may follow eye trauma, intra-ocular operations or YAG laser capsulotomy. At points of increased vitreoretinal adhesion the shear forces exerted at the retinal surface induced by ocular saccades may be sufficient to create a retinal hole or tear.[7] The likelihood of a retinal break depends on the patients' symptoms. The prevalence of retinal holes in patients with symptomatic PVD who notice only floaters is 4–5%,[1] which is similar to asymptomatic retinal holes found in clinical and post-mortem studies.[8–11] Flashing lights, either alone or with floaters, are associated with retinal breaks in 10–11% of patients and 71% may have a retinal break if a vitreous haemorrhage is found with symptomatic PVD.[1] The accurate diagnosis of PVD is often difficult to make as a partial PVD may occur in the absence of a Weiss ring and the posterior hyaloid face may still be attached inferiorly in the presence of a Weiss ring.[12] B–mode ultrasound scans increase the accuracy of diagnosis of PVD, but ultrasonography was not performed in the study since it is not a routine examination for PVD.

More retinal breaks were found at the first PVD clinic than recorded in the casualty cards. It was not possible to state from this study whether breaks developed between presentation to casualty and the first PVD clinic a few days later, nor can it be stated whether the retinal breaks in patients with vitreous haemorrhage developed between the PVD clinic visits. No retinal breaks developed in the interval between PVD clinic visits where a full retinal examination was possible. This lends support to a management protocol of discharging patients in whom neither retinal breaks nor vitreous haemorrhage are detected after a complete examination at presentation.

Are patients with only symptomatic PVD a different subgroup from those with retinal breaks and is it necessary to review so closely patients in whom no retinal pathology is found at presentation? Neumann and Hyams[6] followed 153 patients with untreated retinal breaks for between 1 and 8 years; only 3 developed retinal detachments within 6 weeks and these detachments were a result of the formation of additional breaks. Byer[13] found that breaks occurred in 8 of 350 patients but only 2 (0.6%) within 6 weeks of presentation, one of whom had a vitreous haemorrhage and the other an aphakic eye. Closer observation of patients would seem appropriate if the retina has already been found to predispose to breaks, is at high risk of developing a detachment (aphakia, high myopia) or should the examiner be less experienced or in any doubt about the thoroughness of their retinal examination.

Our findings support the notion that patients with a vitreous haemorrhage following symptomatic PVD should be considered to have a retinal break until proved otherwise. This study also confirms the association between symptoms of flashing lights and retinal breaks; the frequency of retinal breaks is increased further if flashes occur with other symptoms.

Patients with symptomatic breaks following PVD were referred for indirect laser retinal photocoagulation. Four patients (3.9%) had peripheral round breaks without opercula that may have been atrophic breaks with little potential to progress to retinal detachment; the frequency of such breaks was consistent with that of asymptomatic retinal holes found in previous studies.[6–11]

Through the PVD clinic a significant number of retinal breaks was detected and so may have prevented patients needing more extensive procedures. As many breaks were peripheral we strongly recommend that indirect ophthalmoscopy with sceral indentation be used to examine all patients presenting with symptomatic PVD. We also recommend that the acquisition of these skills be encouraged at an early stage in the training of ophthalmologists.

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