Acute-Onset Floaters and Flashes

Is This Patient at Risk for Retinal Detachment?

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Context Acute onset of monocular floaters and/or flashes represents a common presentation to primary care physicians, and the most likely diagnosis is posterior vitreous detachment (PVD). A significant proportion of patients with acute PVD develop an associated retinal tear that can lead to retinal detachment and permanent vision loss if left untreated.

Objective To quantify the association between relevant clinical variables and risk of retinal tear in patients presenting with acute-onset floaters and/or flashes and PVD.

Data Sources Structured MEDLINE (January 1950–September 2009) and EMBASE (January 1980–September 2009) searches and a hand search of references and citations of retrieved articles yielded 17 relevant studies.

Study Selection Studies of high-level methods that related elements of the history or physical examination in patients presenting with floaters and/or flashes and PVD to the likelihood of retinal tear.

Results For patients with acute onset of floaters and/or flashes who are self-referred or referred to an ophthalmologist, the prevalence of retinal tear is 14% (95% confidence interval [CI], 12%-16%). Subjective visual reduction is the most important symptom associated with retinal tear (likelihood ratio [LR], 5.0; 95% CI, 3.1-8.1). Vitreous hemorrhage on slitlamp biomicroscopy is the best-studied finding with the narrowest positive LR for retinal tear (summary LR, 10; 95% CI, 5.1-20). Absence of vitreous pigment during this examination is the best-studied finding with the narrowest negative LR (summary LR, 0.23; 95% CI, 0.12-0.43). Patients initially diagnosed as having uncomplicated PVD have a 3.4% chance of a retinal tear within 6 weeks. The risk increases with new onset of at least 10 floaters (summary LR, 8.1-36) or subjective visual reduction (summary LR, 2.3-17) during this period.

Conclusions Primary care physicians should evaluate patients with acute-onset floaters and/or flashes due to suspected PVD, or patients with known PVD and a change in symptoms, for high-risk features of retinal tear and detachment. Physicians should always assess these patients' visual acuity. Patients at increased risk should be triaged for urgent ophthalmologic assessment.

JAMA. 2009;302(20):2243-2249 www.jama.com

CLINICAL SCENARIO

A 62-year old woman with hypertension but no previous ocular history presents to her family physician with a 1-week history of a large floater in the left eye. She reports "a cloud that moves around her visual field" and says that although she can see well enough to watch television, her vision while wearing her glasses is decreased from normal. On further questioning, she also reports that she experienced a single brief episode of "light flashes" in the left peripheral field while gardening 5 days ago. She had a normal eye examination result from her optometrist 6 months ago, with 20/20 corrected vision in both eyes. Do this patient's symptoms require an urgent ophthalmology assessment?

WHY IS THIS QUESTION IMPORTANT?

The report of acute-onset floaters and/or flashes in a patient's field of vision represents a common scenario to primary care physicians. Most cases of acute-onset monocular floaters and/or flashes are ocular in nature and caused by posterior vitreous detachment (PVD). The role of primary care physicians is to make the diagnosis of probable PVD and to identify patients at increased risk of retinal tear and detachment based on history and physical examination to determine the urgency of ophthalmologic assessment.

The objectives of this article are to (1) describe the pathophysiology and clinical spectrum of PVD, retinal tear, and

See also Patient Page.

CME available online at www.jamaarchivescme.com and questions on p 2266.

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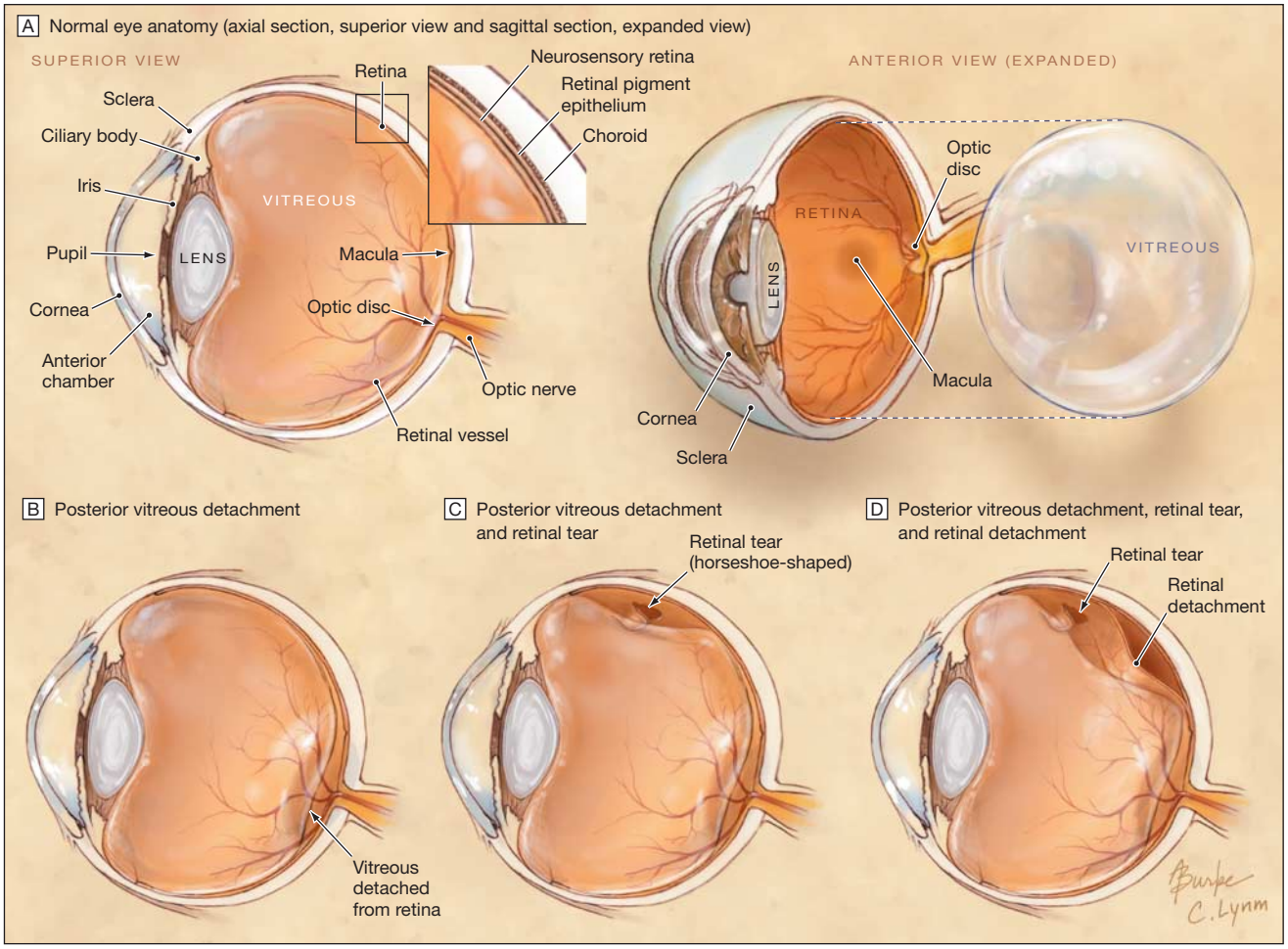
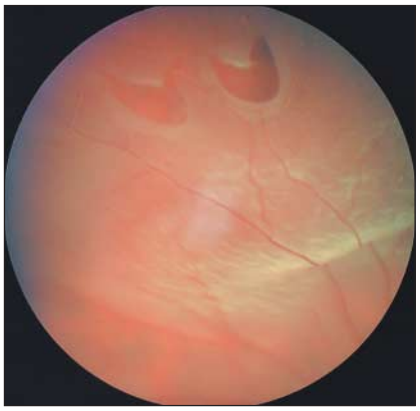
Figure 1. Normal Eye Anatomy, PVD, Retinal Tear, and Retinal Detachment



A, Normal eye anatomy. B, Posterior vitreous detachment (PVD) involves separation of the posterior vitreous from the retina as a result of vitreous degeneration and shrinkage. C, In the acute phase of PVD, as the vitreous shrinks and detaches from the retina, tractional forces may be sufficient to cause a full-thickness tear in the retina. D, When a retinal tear occurs, fluid is allowed entry into the subretinal space, which can lead to retinal detachment (separation of the neurosensory layer from the underlying retinal pigment epithelium).

Figure 2. Area of Peripheral Retina With 2 Horseshoe-Shaped Retinal Tears in an Area of Billowing Retinal Detachment



retinal detachment; (2) outline a practical primary care approach to the evaluation of patients presenting with new-onset floaters and/or flashes; (3) present an evidence-based review of specific clinical features that can help identify patients with floaters and/or flashes and PVD at increased risk of retinal tear and detachment; and (4) outline a suggested primary care approach to the triaging of patients with floaters and/or flashes for ophthalmologic assessment.

Pathophysiology and Clinical Spectrum of PVD

Posterior vitreous detachment involves separation of the posterior vitreous from the retina as a result of vitreous degeneration and shrinkage (FIGURE 1 and FIGURE 2). This is an age-related event, with prevalence in the general population increasing from 24% in adults aged 50 to 59 years to 87% among those aged 80 to 89 years.[1] Other risk factors for PVD include the presence of myopia, trauma, and intraocular inflammation.[2]

Posterior vitreous detachment may be asymptomatic, but more frequently patients report floaters and/or flashes in the affected eye. Floaters are a sensation of gray or dark spots moving in the visual field caused either by light bending at the interface of fluid pockets in the vitreous jelly or cells located within the vitreous (see video at http://www.jama.com simulating a patient's

experience of floaters). Floaters may persist for months to years in cases of chronic, uncomplicated PVD and are not a cause for alarm if no recent change in symptoms is reported. Flashes are usually described as monocular, repeated, brief flashes of white light in the peripheral visual field related to traction on the peripheral retina from areas of tightly adherent vitreous jelly.

Although most persons develop PVD at some point in their lives, in the majority of cases it is a benign occurrence without any long-term complications. However, in the acute phase of PVD, as the vitreous shrinks and detaches from the retina, tractional forces may be sufficient to cause a full-thickness tear in the retina. Such tears allow fluid to gain entry to the subretinal space, which can lead to separation of the neurosensory layer of the retina from the underlying retinal pigment epithelium (ie, a retinal detachment). This results in disruption of photoreceptors and eventually precipitates tissue necrosis if left untreated. Approximately 33% to 46% of untreated retinal tears result in retinal detachment.[3-5]

Retinal detachment occurs with an estimated incidence of 0.8 to 1.8 per 10 000 persons per year[6-13] and a prevalence of 0.3%.[14] Classic symptoms of a retinal detachment include decreased vision and a progressive monocular visual field defect ("curtain of darkness"). Prompt diagnosis and surgical treatment of retinal detachment can prevent impending vision loss or can restore vision.[9]

Primary Care Evaluation of Patients With Acute-Onset Floaters/Flashes

Step 1: Elicit the Patient's History of Visual Symptoms and Assess for Nonocular Causes. Not all floaters and/or flashes represent ocular problems, and nonocular causes can usually be differentiated by a careful history taking (BOX). By far the most common condition mimicking PVD is visual aura associated with migraine, or *classic migraine*.[15] Patients with classic migraine describe an amorphous pattern of lights or jagged lines and colors "marching" through the binocular visual field, sometimes surrounding a central area of visual field loss. Contrary to flashing lights of retinal origin, this phenomenon is bilateral, involves the sensation of colored lights (vs white lights in PVD), and evolves over 5 to 30 minutes before resolving with onset of a headache. The visual aura may occur without headache, representing a so-called *acephalgic migraine*. In these cases, most patients have a known history of migraine. Patients with visual aura have visual acuity that is normal (20/20) or unchanged and a normal ocular examination result.

Rarely, occipital lobe disorders such as ischemia or infarction, hemorrhage, arteriovenous malformation, seizure disorder, and neoplasm may present with migraine-like symptoms, including headache and/or visual symptoms. However, in these cases there are usually systemic symptoms and signs or other atypical features to suggest a neurological etiology. Postural hypotension can produce brief flashes or dimming of vision in all or part of the binocular visual field, although the diagnosis should be readily apparent from a history of transient visual symptoms accompanying lightheadedness or ataxia precipitated by orthostatic change in posture.

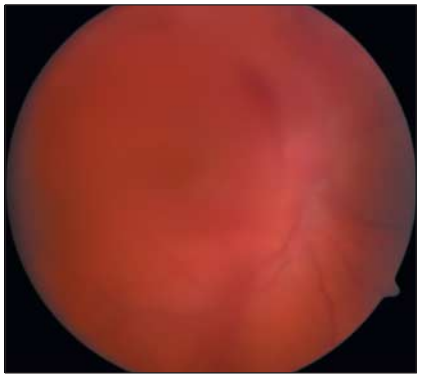
Step 2: Perform an Eye Examination. The physical examination for patients with new-onset floaters and/or flashes begins with measurement of best-corrected visual acuity in each eye separately with a Snellen chart (corrected with glasses/contact lenses or pinhole if available). This simple assessment is imperative and often the most informative aspect of the examination because patients with retinal tear or detachment may have decreased visual acuity in the affected eye. Ideally, vision is measured with a calibrated distance vision chart, but vision can also be measured at a reading distance using a near card. If visual acuity is measured at near distance, the examiner must ensure that the patient is using his/her usual near spectacle correction.

Confrontation visual field testing is another key element of the examination because the finding of a monocular visual field defect in the affected eye suggests an area of detached nonseeing retina. To assess for field defects, the examiner has the patient cover one eye and sits adjacent to the patient, face to face, at approximately 1 arm's length away. The patient is told to focus on the examiner's nose, and the examiner holds up fingers in each quadrant to grossly test the patient's visual field in those quadrants using his/her own visual field as a refer-

Box. Differential Diagnosis of Acute Floaters and/or Flashes

- Ocular causes
  - Floaters and/or flashes
    - Posterior vitreous detachment
    - Retinal tear or retinal detachment
    - Posterior uveitis
  - Predominantly floaters
    - Vitreous hemorrhage secondary to proliferative retinopathy
  - Predominantly flashes
    - Oculodigital stimulation
    - Rapid eye movements
    - Neovascular age-related macular degeneration
- Nonocular causes
  - Migraine aura (classic)
  - Migraine aura (acephalgic migraine)
  - Occipital lobe disorders
  - Postural hypotension

Figure 3. Fundus Photograph of Vitreous Hemorrhage



Superiorly, vitreous hemorrhage is completely obscuring retinal details. Inferiorly, some hazy retinal details (including vessels) can be observed through the vitreous hemorrhage.

ence. Next, the pupils should be examined for direct response, consensual response, and presence of a relative afferent pupillary defect.

Slitlamp biomicroscopy is available in urgent care and emergency department settings and is now considered a basic competency for emergency physicians.[16] The slitlamp examination may reveal vitreous pigment or hemorrhage (FIGURE 3). Vitreous pigment, also known as "tobacco dust," represents cellular or free melanin in the vitreous, presumably released from the retinal pigment epithelium in association with a full-thickness retinal tear. To diagnose vitreous hemorrhage or pigment accurately, the slitlamp beam is focused behind the crystalline lens into the anterior portion of the vitreous. Having the patient look up, then immediately down, then immediately straight ahead before focusing the light beam on the anterior vitreous improves visualization of vitreous hemorrhage or pigment.

Direct ophthalmoscopy after pharmacological pupil dilation can potentially provide additional information to the generalist physician. There are no absolute contraindications for generalist physicians to use mydriatic agents in patients with possible retinal tears, aside from known allergy to a given drop. A common dilating approach is to use 1 drop of tropicamide, 1.0% (maximum effect in 25 minutes; duration, 3-6 hours) and 1 drop of phenylephrine, 2.5% (maximum effect in 20 minutes; duration, 3 hours) into each eye and wait 30 minutes before examination. Dilating the eyes allows for better visualization of the fundus and may allow a generalist physician to detect an obvious retinal detachment or vitreous hemorrhage. Measurement of intraocular pressure by the generalist physician is not necessary in the evaluation of flashes and floaters.

Step 3: Consider Ocular Causes of Floaters/Flashes and Identify High-Risk Features for Retinal Tear or Detachment. There are a number of ocular conditions aside from PVD that may present with floaters and/or flashes (Box). In general, these conditions are benign and are easily differentiated by history taking (symptoms that occur with oculodigital stimulation or rapid eye movements), are suggested by the patient's ocular history, or are very uncommon. The bottom line is that from the perspective of the primary care physician, once an ocular cause of acute-onset floaters and/or flashes is suspected, in the absence of symptoms such as eye pain or photosensitivity to suggest a rare inflammatory ocular condition (eg, posterior uveitis, which has a prevalence of 0.004%),[17] the presumed diagnosis should be PVD.

A particular concern for generalist physicians is the presence of acute flashes and/or floaters in patients with diabetes. Advanced proliferative diabetic retinopathy can lead to vitreous hemorrhage and, thus, mimic PVD symptoms of new-onset painless floaters. A patient with a long-standing history of diabetes and known severe diabetic retinopathy who reports acute onset of thousands of floaters and monocular vision loss most likely has vitreous hemorrhage related to bleeding from friable new retinal vessels, though PVD with retinal tear cannot be excluded.

When triaging patients with new-onset floaters and/or flashes and a presumed diagnosis of PVD, primary care physicians must first consider and rule out an obvious red flag sign of retinal detachment. The main sign to consider is a progressive monocular visual field defect in the affected eye due to an area of detached nonseeing retina. Confrontation visual field testing may demonstrate this defect, and direct ophthalmoscopy through a dilated pupil may reveal a billowing retinal detachment. A patient with suspected retinal detachment requires emergent ophthalmologic assessment. Failure to elicit a visual field defect through confrontation or to see the retinal detachment with direct ophthalmoscopy does not rule out the process of retinal detachment.

Once an obvious visual field defect is ruled out, the primary care physician must decide on the urgency of an ophthalmology referral. The role of the ophthalmologist is 2-fold. First, the ophthalmologist can rule out other ocular causes of floaters and/or flashes. Second, the ophthalmologist can perform a comprehensive retinal examination to assess for retinal tears. To help guide primary care physicians in the triaging process, we systematically reviewed the literature to quantify the importance of symptoms and signs in patients with floaters and/or flashes and a diagnosis of PVD that might indicate the presence of retinal tears and increased risk of retinal detachment.

EVIDENCE-BASED REVIEW AND META-ANALYSIS

A detailed description of our methods is in the eAppendix (available at http://www.jama.com). The MEDLINE search identified 193 candidate studies, 12 of which were relevant for the review.[18-29] The EMBASE search identified 126 candidate studies; of these, 10 were relevant[18-25,27,28] and all had already been found in the MEDLINE search. Thus, a total of 12 relevant studies were found in the electronic searches. After reviewing citations and references from these studies, we found an additional 5 studies.[30-34] (See eTable 1 for criteria used to grade methodological quality and eTable 2 for an outline of studies used in the review.)

The studies were all performed in ophthalmology clinics. Study populations were primarily patients referred from primary care or optometrists with the exception of 1 study of patients referred from general ophthalmology,[34] 2 studies of nonreferred patients,[23,24] and 3 studies that did not state the source of patient referral.[22,29,32] In all studies, patients had an acute onset of floaters and/or flashes of suspected ocular origin and ophthalmoscopic diagnosis of PVD. Overall, in this setting the summary prevalence for retinal tear complicating PVD is 14% (95% confidence interval [CI], 12%-16%).

The prevalence of retinal tears among patients with flashes but no floaters (prevalence, 13.7%; 95% CI, 11.3%-16.6%) is almost identical to those who present with floaters but no flashes (prevalence, 13.5%; 95% CI, 11.1%-16.2%).

Demographic and Clinical Characteristics

We performed a meta-analysis of the relevant studies to examine demographic and clinical risk factors for the occurrence of retinal tears in patients with floaters and/or flashes and a diagnosis of PVD. A total of 9 studies[19,22,23,27,29-33] analyzed sex as a risk factor for retinal tear. Men are slightly more likely to have retinal tears than women (summary likelihood ratio [LR], 1.5; 95% CI, 1.1-2.0). Two studies[22,30] included data on age and suggest that being older than 60 years, a finding associated with an increased likelihood of an initial PVD, does not increase the likelihood of a retinal tear (summary LR, 0.70-1.3) and that younger adults (≤60 years old) are not appreciably less likely to have a retinal tear (summary LR, 0.78-1.7). Four studies[30-32,34] were unable to show an association between myopia and retinal tear (summary LR, 1.2; 95% CI, 0.37-3.9) in the setting of acute PVD.

Historical Features

The review identified 9 studies[18,19,22,25,30-32,34] that related symptoms to the incidence of retinal tears (TABLE 1). The presence of both floaters and flashes, rather than one or the other, is not diagnostically useful in predicting the presence of retinal tears among patients with PVD (LR, 1.2; 95% CI, 1.0-1.3).

One study reported the symptom of subjective vision reduction and found that the presence of subjective vision reduction signifies an increased likelihood of retinal tear among patients with floaters and/or flashes and a diagnosis of PVD (LR, 5.0; 95% CI, 3.1-8.1).[24] Preservation of the patient's usual visual acuity decreased the likelihood of a retinal tear (LR, 0.60; 95% CI, 0.49-0.73). Using a baseline prevalence of 14%, subjective vision reduction among patients with flashes or floaters increases the probability of a retinal tear to 45% (95% CI, 34%-57%), while the absence of loss of vi-

Table 1. Association of Historical and Ocular Examination Findings With Retinal Tear in Patients With Acute Posterior Vitreous Detachment

Source	Sample Size	Sensitivity, %	Specificity, %	Likelihood Ratio (95% Confidence Interval)	
				Positive	Negative
Floaters and flashes					
Richardson et al,[18] 1999	105	64	69	2.1 (1.2-3.5)	0.53 (0.24-1.2)
Tanner et al,[19] 2000	200	36	54	0.79 (0.46-1.4)	1.1 (0.85-1.6)
Brod et al,[22] 1991	106	63	38	1.0 (0.67-1.5)	0.99 (0.5-2.0)
Byer,[23] 1994	350	56	47	1.0 (0.80-1.4)	0.94 (0.67-1.3)
Hikichi and Trempe,[25] 1994	489	54	57	1.3 (0.96-1.7)	0.80 (0.59-1.1)
Boldrey,[30] 1983	589	52	53	1.1 (0.91-1.4)	0.90 (0.72-1.1)
Jaffe,[32] 1968	84	44	60	1.1 (0.51-2.4)	0.93 (0.50-1.7)
Tabotabo et al,[34] 1980	100	40	70	1.3 (0.59-3.0)	0.86 (0.51-1.4)
Diamond,[31] 1992	147	54	64	1.5 (0.99-2.3)	0.72 (0.46-1.1)
Summary				1.2 (1.0-1.3)	0.90 (0.79-1.0)
Subjective vision reduction with floaters and/or flashes					
Dayan et al,[24] 1996	295	45	91	5.0 (3.1-8.1)	0.60 (0.49-0.73)
Vitreous hemorrhage					
Brod et al,[22] 1991	106	50	71	1.7 (0.96-3.1)	0.70 (0.42-1.2)
Byer,[23] 1994	350	20	96	5.5 (2.4-12)	0.83 (0.72-0.96)
Hikichi and Trempe,[25] 1994	489	50	98	20 (10-38)	0.51 (0.39-0.68)
Novak and Welch,[27] 1984	172	79	96	18 (8.2-38)	0.22 (0.08-0.61)
Sharma et al,[28] 1999	59	63	88	5.3 (2.1-13)	0.43 (0.17-1.0)
Boldrey,[30] 1983	589	47	99	45 (18-110)	0.54 (0.45-0.64)
Jaffe,[32] 1968	84	100	95	16 (6.5-40	0.05 (0-0.79)
Kanski,[26] 1975	150	64	78	2.9 (1.8-4.5)	0.47 (0.33-0.65)
Linder,[33] 1966	106	88	100	155 (9.7-2480)	0.15 (0.05-0.46)
Tabotabo et al,[34] 1980	100	100	93	13 (6.3-28)	0.05 (0-0.74)
Tasman,[29] 1968	91	56	94	9.1 (3.2-6)	0.47 (0.23-0.98)
Summary				10 (5.1-20)	0.49 (0.38-0.64)
Vitreous pigment					
Tanner et al,[19] 2000	200	92	100	318 (20-5081)	0.10 (0.03-0.31)
Brod et al,[22] 1991	106	94	100	166 (10-2643)	0.09 (0.02-0.41)
Sharma et al,[28] 1999	59	63	100	64 (3.8-1053)	0.39 (0.17-0.89)
Boldrey,[30] 1983	589	79	68	2.4 (2.1-2.9)	0.31 (0.22-0.45)
Summary				44 (2.3-852)	0.23 (0.12-0.43)
Vitreous pigment or vitreous hemorrhage					
Sharma et al,[28] 1999	59	88	88	7.4 (3.4-16)	0.14 (0.02-0.89)
Vitreous pigment and vitreous hemorrhage					
Sharma et al,[28] 1999	59	38	100	40 (2.3-719)	0.62 (0.37-1.0)

Table 2. Suggested Approach for Referral of Patients With Presumed Posterior Vitreous Detachment

Clinical Scenario	Recommended Action
Floaters and/or flashes with "red flag" sign of acute retinal detachment	Same-day referral to retinal surgeon as minutes may matter; high risk of having retinal detachment
Monocular visual field loss ("curtain of darkness")	
New-onset floaters and/or flashes with high-risk features including	Same-day referral to ophthalmologist or retinal surgeon for dilated eye examination
Subjective or objective visual reduction	
Vitreous hemorrhage or vitreous pigment on slitlamp examination	
New-onset floaters and/or flashes without high-risk features	Referral to ophthalmologist for dilated eye examination within 1 to 2 weeks; counsel patient regarding high-risk features that should prompt urgent reassessment
Recently diagnosed uncomplicated posterior vitreous detachment with	Rereferral to ophthalmologist to rule out new retinal tear or detachment. The ophthalmologist should be contacted to help determine urgency.
New shower of floaters	
New subjective visual reduction	
Stable symptoms of floaters and/or flashes for several weeks to months, not particularly bothersome to the patient and without high-risk features	Elective referral to ophthalmologist; counsel patient regarding high-risk features that should prompt urgent reassessment

sual acuity decreases the probability to 8.9% (95% CI, 7.4%-11%). We found no accuracy data for the red flag symptom of a patient's perception of a sudden gray curtain obscuring his/her vision.

Ocular Examination Findings

Twelve studies related findings on ocular examination to the presence of a retinal tear[19,22,25,27-30,32-34] and found that 2 findings on slitlamp examination can be very helpful in determining the likelihood that a retinal tear exists (Table 1). The presences of vitreous hemorrhage (summary LR, 10; 95% CI, 5.1-20) or vitreous pigment ("tobacco dust"; summary LR, 44; 95% CI, 2.3-852) are highly suggestive of retinal tear. Using a baseline prevalence of 14%, the presence of vitreous hemorrhage increases the probability of retinal tear to 62% (95% CI, 45%-77%), while the presence of vitreous pigment increases the posttest probability to 88% (95% CI, 27%-97%).

TRIAGING PATIENTS WITH ACUTE-ONSET FLOATERS/FLASHES AND PRESUMED PVD

A suggested approach to ophthalmology referral is based on individual risk factors and is outlined in TABLE 2. Patients with either progressive monocular visual field loss suggestive of acute retinal detachment or high-risk features for retinal tear such as subjective or objective visual reduction or vitreous pigment or hemorrhage on examination require same-day ophthalmology referral. Patients with new-onset floaters and/or flashes or suspected ocular cause but without high-risk features should be evaluated by ophthalmology on a less urgent basis within 1 to 2 weeks and counseled to seek immediate medical attention should they develop monocular visual field defects or decreased vision in the interim.

In the meta-analysis, we also looked at follow-up of patients with acute-onset floaters and/or flashes initially diagnosed as having uncomplicated PVD (ie, without concurrent retinal tear or hole) by an ophthalmologist. Detailed results are available in eTable 3 and eTable 4. In summary, patients recently diagnosed as having uncomplicated PVD have a 6-week incidence of developing retinal tear that is low but not negligible (summary incidence, 3.4%; I^2=45%; P=.16). In this patient population, a sudden increase in the number of floaters (defined as change from $<$10 floaters to $\geq$10 floaters) (summary LR, 8.1-36) or a new onset of subjective vision reduction (summary LR, 2.3-17) is predictive of a new retinal tear and should alert the primary care physician that reassessment by an ophthalmologist is indicated.

LIMITATIONS

There are several limitations of our meta-analysis. First, data from all studies were obtained from ophthalmology clinics where patients were diagnosed as having PVD. Primary care physicians are interested in the clinical approach to a slightly broader group of patients that include primarily patients with PVD but, in addition, include a minority of patients with symptoms attributable to vitreous hemorrhage due to proliferative diabetic retinopathy or other rare ocular conditions (eg, posterior uveitis). Depending on the accuracy of primary care physicians in diagnosing PVD, it is therefore possible that the prevalence of retinal tear (and, consequently, the calculated posttest probabilities of retinal tear) among patients with acute-onset floaters and/or flashes in the primary care setting is lower than the 14% seen in PVD patients at ophthalmology clinics. However, the number is still considerable and there is no reason to suspect a systematic bias that would distort the LRs for the clinical risk factors evaluated.

Second, the CIs for some of the clinical risk factors evaluated, particularly vitreous pigment, are wide. The point estimate in this case is a powerful result, although the lowest limit of the CI cannot rule out a less powerful LR.

Third, slitlamp biomicroscopy is required to detect vitreous hemorrhage and vitreous pigment, and many primary care physicians do not have access to this equipment or do not have the expertise to use it well. This element of the examination will be most useful for experienced emergency department physicians.

SCENARIO RESOLUTION

This woman is presenting with classic symptoms of PVD in the left eye. Corrected visual acuity was 20/20 in the right eye and 20/50 in the left eye. Results of pupil examination, confrontational visual fields, and direct ophthalmoscopy with pupil dilation were normal. The evidence suggests that this patient has a baseline risk of up to 14% for a retinal tear and her report of decreased visual acuity suggests a higher risk (LR, 5.0), translating into a posttest probability for retinal tear of up to 45%.The patient was referred and seen that afternoon by an ophthalmologist and a diagnosis was made of PVD and associated retinal tear in the superotemporal peripheral retina of the left eye without evidence of retinal detachment. The patient was referred to a retinal surgeon at a tertiary hospital for definitive management.

CLINICAL BOTTOM LINE

The acute onset of floaters and/or flashes is common in older adults and is usually due to PVD. Although PVD is most often a benign occurrence, a small but significant proportion of patients develop a retinal tear that, if left untreated, can progress to a retinal detachment. As a minimum approach to evaluating these patients, primary care physicians should elicit a history of change in vision or "curtain of darkness," check actual visual acuity with an eye chart, and assess confrontational visual fields. The evidence suggests that patients with subjective visual loss or vitreous pigment or hemorrhage on slitlamp examination are at increased risk of retinal tear. Patients with monocular visual field defects suggesting retinal detachment or high-risk features for retinal tear should have same-day assessment by an ophthalmologist. Finally, patients with uncomplicated PVD are at a small but significant continued risk (3.4%) of subsequently developing retinal tear and detachment over the weeks after diagnosis. Available evidence suggests that a new shower of floaters or new onset of subjective visual reduction after initial assessment is a worrisome sign, and we suggest urgent ophthalmology rereferral.

Author Contributions: Dr Hollands had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.
Study concept and design: Hollands, Johnson, Brox, Almeida, Simel, Sharma.
Acquisition of data: Hollands, Johnson, Almeida.
Analysis and interpretation of data: Hollands, Johnson, Almeida, Simel, Sharma.
Drafting of the manuscript: Hollands, Johnson, Brox, Almeida.
Critical revision of the manuscript for important intellectual content: Hollands, Johnson, Brox, Almeida, Simel, Sharma.
Statistical analysis: Hollands, Johnson, Simel.
Administrative, technical, or material support: Hollands, Brox, Almeida.
Study supervision: Hollands, Brox, Simel, Sharma.
Financial Disclosures: None reported.
Additional Information: The eAppendix, eTables 1 through 4, and video simulation of floaters are available online at http://www.jama.com.
Additional Contributions: We thank Alan Detsky, MD, PhD, Mount Sinai Hospital, Toronto, Ontario, Canada; James Holmes, MD, Department of Emergency Medicine, University of California, Davis, School of Medicine, Sacramento); and Charles Gerardo, MD, Division of Emergency Medicine and Department of Surgery, Duke University Medical Center, Durham, North Carolina for their advice on earlier versions of the manuscript. No compensation was received.

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