

Management of unexplained vitreous haemorrhage

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Unexplained fundus-obscuring vitreous haemorrhage represents a management dilemma. Traditional practice has been to observe with serial ultrasound scans, a vitrectomy being performed if the patient develops a retinal detachment. Retinal tears are the most important cause of unexplained vitreous haemorrhage. Such patients are at high risk of retinal detachment complicated by proliferative vitreoretinopathy (PVR) leading to poor anatomical and visual outcome.¹ This evidence based article will argue that the default standard care of such patients should be urgent referral for vitrectomy.

Introduction

Vitreous haemorrhage is a relatively common problem. In a population of 542,000 studied over 2.5 years Lindgren et al² found an incidence of 7 cases per 100,000 population per year (by comparison retinal detachment (RD) has an incidence of 12 cases per 100,000 per year). The most common cause of spontaneous vitreous haemorrhage is a partial or complete vitreous detachment (PVD) resulting in traction and tearing of new vessels such as proliferative diabetic retinopathy or branch vein occlusion.

The second most common and arguably most important cause of spontaneous vitreous haemorrhage is a PVD resulting in a retinal tear and a torn normal retinal blood vessel. In the authors experience such tears are typically large and relatively posterior. This second group have a high risk of preventable permanent visual loss secondary to RD.

| Aetiology of non-traumatic vitreous haemorrhage | % | | |
|----------------------------------------------------|------------|--------------------|----|
| Abnormal new vessels with PVD or vitreous traction | 45 | PDR | 32 |
| | | RVO | 11 |
| | | sickle retinopathy | 2 |
| Normal retinal vessels with PVD | 38 | no tear | 8 |
| | | flat tear | 21 |
| | | RD | 9 |
| Macroaneurysm | 2 | | |
| AMD | 2 | | |
| Other | 13 | | |
| Total | 100 | | |

Illustrative Case

A 56 year old non-diabetic, emmetropic, phakic female with no previous ocular history presented with a 1 day history of painless visual loss in the right eye. A dense vitreous haemorrhage was noted. The ultrasound scan revealed no retinal detachment or obvious cause. The fellow eye was normal. When reviewed 4 weeks later a total RD with severe PVR (7 clock hours of posterior grade C) was found. Two vitreoretinal procedures failed to reattach the retina due to severe PVR. She consequently has long term silicone oil tamponade, a severely distorted macula and visual reduction to HM.

Unexplained vitreous haemorrhage is high risk.

Sarrafazadeh et al⁴ retrospectively analysed the outcome of conservative management of patients with unexplained dense vitreous haemorrhage. They included 36 eyes of 34 consecutive patients with fundus-obscuring unexplained vitreous haemorrhage who underwent regular review and B-scan ultrasound. No RDs were evident on ultrasonography at first presentation. Surgery was required in 78% of cases due to a retinal break being identified, an RD developing or failure of the haemorrhage to clear.

48% (14/29) of patients under 80 developed an RD, half of which were complicated by PVR. The visual outcome in this group was poor. No patient over 80 developed an RD. In 76% (22/29) of patients under 80 the cause of the haemorrhage was found to be a retinal tear. The mean final acuity in all patients (none of whom had macular pathology to explain the haemorrhage) was only equivalent to 6/18-1. Cases with anatomical success following non haemorrhagic RD usually have a much better visual outcome.

In another series Yeung et al¹ retrospectively reported a 9 year series of RDs occurring in patients with vitreous haemorrhage. 33% of those with severe (fundus-obscuring) vitreous haemorrhage developed an RD complicated by PVR.

It can be seen from these data above that rapid resolution of an unexplained vitreous haemorrhage is rare, that a retinal tear is the most likely cause of such haemorrhages and that RD might be expected to occur up to 50% of conservatively managed cases. Further to this it is common for eyes that go on to detach to develop PVR. PVR is the single most likely predictor of failure of RD surgery. The natural history of unexplained vitreous haemorrhage is therefore far from benign with poor resulting visual outcome.

Referral for urgent vitrectomy is the safest approach.

There are no randomised trials or other direct comparison data on this subject. Tan et al⁵ and Dhingra et al⁶ have published data which strongly suggest that an early vitrectomy will reduce the overall RD rate with a consequent considerable benefit in terms of final visual outcome.

Tan et al⁵ report the results of 40 eyes undergoing immediate early vitrectomy for either dense unexplained vitreous

continued overleaf

Table 1 Adapted from Spraul et al³ collating figures for non-traumatic vitreous haemorrhage from 6 studies² from USA, UK and Sweden (n=1487).

haemorrhage (27/40, 69%), or cases where a tear was evident but intraocular haemorrhage precluded adequate visualisation and treatment (13/40, 32%). None of the patients were diagnosed with RD prior to surgery, but 2 were found to have an RD at the time of surgery. Tears were identified in 88% of the included eyes. Only two eyes in this series (5%) developed a post-operative RD and the median final post-operative visual acuity was equivalent to 6/7.5.

Dhingra et al⁶ published a series of 12 cases of that had undergone early vitrectomy with fundus-obscuring vitreous haemorrhage. 3/12 eyes showed evidence of an RD on a pre-operative ultrasound. Retinal tears were found intra-operatively in 9/12 eyes (75%). Mean visual acuity improved from HM to 6/12. Two of the 12 eyes (17%) re-detached post op, both however achieved a final VA of 6/9 and no patients developed PVR.

Inherent in a policy of early vitrectomy for unexplained vitreous haemorrhage is the fact that some patients will be found not to have a retinal tear and therefore to have been at low risk of development of a retinal detachment if left untreated. Such patients cannot however be reliably identified pre-operatively. Sarrafzadeh et al⁴ also reported that a vitrectomy was ultimately required in 78% of eyes in their series either due to the development of a retinal detachment or failure of the vitreous haemorrhage to clear, so conservative management will only usually delay an intervention. The requirement for subsequent cataract surgery with its associated costs and potential complications in phakic patients should be recognised but set against the high risk of permanent visual impairment in unoperated eyes. Early intervention is also not universally effective in preventing a retinal detachment, however complication rates are low; 5% RD in above studies^{5,6} when compared against the poor visual recovery and RD rates without early intervention (39%⁴).

Clinical Assessment of Patients Presenting With Vitreous Haemorrhage

It is vital to establish whether vitreous haemorrhage is unexplained and therefore high risk, or if there is a probable cause which can be safely conservatively managed.

The only patients undergoing conservative management should be the elderly (over 80) or those in whom an alternative aetiology such as pre-existing retinal neovascularisation or haemorrhagic age related macular degeneration is known to exist.

Medical enquiry should ascertain whether there is a history of diabetic retinopathy requiring pan retinal laser, sickle cell haemoglobinopathy or anticoagulation therapy. Drug interactions such as antibiotics with warfarin or adjuvant or inadvertent dual anti platelet therapy (as in adding a non steroidal anti inflammatory to the medication of a patients already taking clopidogrel) may exacerbate spontaneous vitreous haemorrhage, however, an underlying cause is still required.

Relevant enquiry and examination of the fellow eye may reveal a history or signs of a known neovascular central or branch vein occlusion, or prior laser for proliferative diabetic retinopathy.

A history of diabetes alone is not a sufficient explanation for a vitreous haemorrhage: the authors have seen two diabetic patients who developed a total retinal detachment with PVR as a complication of an unexplained vitreous haemorrhage. Neither

patient had a history of treatment for proliferative diabetic retinopathy, yet they were conservatively managed due to the history or diabetes.

Patients aged over 80 are most likely to develop a vitreous haemorrhage secondary to neovascular age-related macular degeneration or a retinal macroaneurysm. In this age group vitreous haemorrhage is less likely to be related to a posterior vitreous detachment. In neovascular AMD the haemorrhage may be peripheral rather than sub macular, clues to this diagnosis are the status of the macula in the fellow eye and or the presence of peripheral reticular degeneration and/or eccentric disciform scars or haemorrhages. Such eyes will usually have a central or pre equatorial sub retinal elevation evident on B Scan ultrasound of the affected eye.

Conservative management is not justified by an ultrasound scan which demonstrates an attached retina, no retinal tears and no other causative lesion. **The sensitivity of ultrasound in detecting retinal tears is between 44 and 56%**^{5,7}. This means that half of all retinal tears in eyes with unexplained vitreous haemorrhage will be missed by ultrasound imaging, leaving these patients at ongoing risk of a retinal detachment and long term visual loss if managed conservatively. Ultrasound is an unreliable tool for this purpose. The role of ultrasound is in detecting retinal detachment at first presentation and identifying alternative causative lesions such as eccentric or sub macular vitreous haemorrhage.

Evidence based approach

High risk patients are therefore adults under 80 with no definite alternative cause of their dense vitreous haemorrhage. Retinal tears are present in 75% or more of such patients.

There is an evidence base to justify a default management policy in such patients of early vitrectomy. Visual outcomes are better with this approach because retinal detachments, complicated by PVR, are prevented.

References

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