STUDENTS' CORNER
CASE REPORT

Unilateral Valsalva retinopathy as an initial presentation of pancytopenia: A case report

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Abstract

We report the case of a man in his 40s who presented to the ophthalmology clinic complaining of a black shadow in the centre of his right vision. He was diagnosed with Valsalva retinopathy and a complete blood count was performed, which revealed pancytopenia. The patient was admitted a few days later due to worsening of his symptoms and an extensive blood workup revealed folate and vitamin B12 deficiency. He got better after blood transfusions, folic acid supplementation, and intravenous B-complex (Neurobion: B1 100 mg, B6 100 mg, B12 1 mg). After three months of follow-up, the retinal haemorrhages had resolved and the patient's vision had improved. This appears to be the first documented case of unilateral Valsalva retinopathy as an initial manifestation of pancytopenia. This case highlights the importance of a thorough eye examination and workup to reveal a potentially life-threatening condition.

Keywords: Valsalva retinopathy, Pancytopenia, Megaloblastic anaemia, Multidisciplinary care.

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Introduction

Valsalva retinopathy is characterised by a pre-retinal haemorrhage that is usually caused by a sudden increase in intra-thoracic or intra-abdominal pressure. This increase in pressure can be due to constipation, coughing, vomiting, lifting heavy loads, and sexual intercourse. It is a clinical diagnosis but may be confirmed with optical coherence tomography (OCT). Bed rest and lifestyle changes to mitigate risk factors are often sufficient and most of the cases resolve spontaneously.

Pancytopenia is a condition in which there is a decrease in all peripheral bloodlines. Deficiency of each of these blood cell lines results in different manifestations due to the reduction of their physiologic functions. Anaemia, leukopenia, and thrombocytopenia may cause weakness, increased susceptibility to infections, and prolonged bleeding, respectively. The presence of all three of these conditions concurrently in pancytopenia has the potential to cause significant morbidity and mortality to the patient.[1]

We present a case of Valsalva retinopathy as an initial presentation of pancytopenia.

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Case Report

A 44-year-old male resident of Karachi, Pakistan, presented to the ophthalmology clinic at the Aga Khan University Hospital, Karachi, in October 2017. He complained of a sudden onset painless black shadow in the centre of his vision in the right eye since morning. The shadow was not increasing in size or changing with eye movements. He had a recent history of vomiting after breakfast and generalised weakness. However, he had not consulted anyone regarding this complaint. His previous ocular history was unremarkable. On examination, his visual acuity (VA) was hand movement in the right eye with no further improvement noted on pinhole or refraction. His VA was 20/20 unaided in the left eye. Intraocular pressure (IOP) was 18 mmHg in the right eye and 20 mmHg in the left eye. His pupils were round, regular, and reactive to light, and no relative afferent pupillary defect (RAPD) was present. Extraocular muscles had full range of movement. On slit lamp examination, the anterior chamber was normal in both the eyes. A pre-retinal haemorrhage involving the macula was noted in the right eye and the left fundus was normal.

The patient had been diagnosed with pulmonary tuberculosis (TB) seven months ago, for which he underwent video-assisted thoracoscopic surgery (VATS) and decortication five months ago. He was on anti-TB therapy, taking Isoniazid, Rifampicin and, Pyridoxine. He had an addiction to betel nut chewing and his family history was positive for diabetes mellitus type 2 and hypertension.

To confirm our diagnosis, fundus photos and OCT were

performed as shown in Figure 1. Multicolour fundus showed a well-defined, round pre-retinal haemorrhage extending between the superior and inferior arcades. On OCT, the haemorrhage was confirmed to be pre-retinal.

On fundus examination, Valsalva retinopathy, anaemic retinopathy, and leukaemic retinopathy were the differentials. As the patient presented with a history of vomiting after breakfast, a diagnosis of Valsalva retinopathy was established.

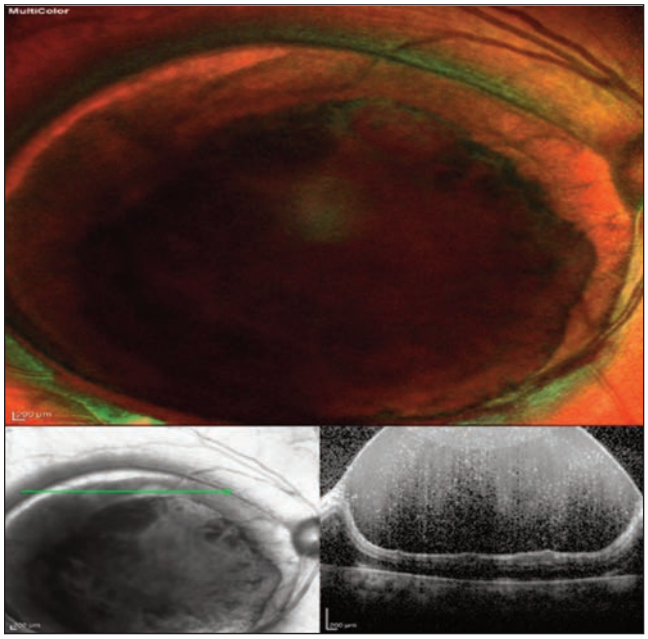

Figure-1: Multicolour fundus and OCT images of the right eye showing a pre-retinal haemorrhage overlying the macula.

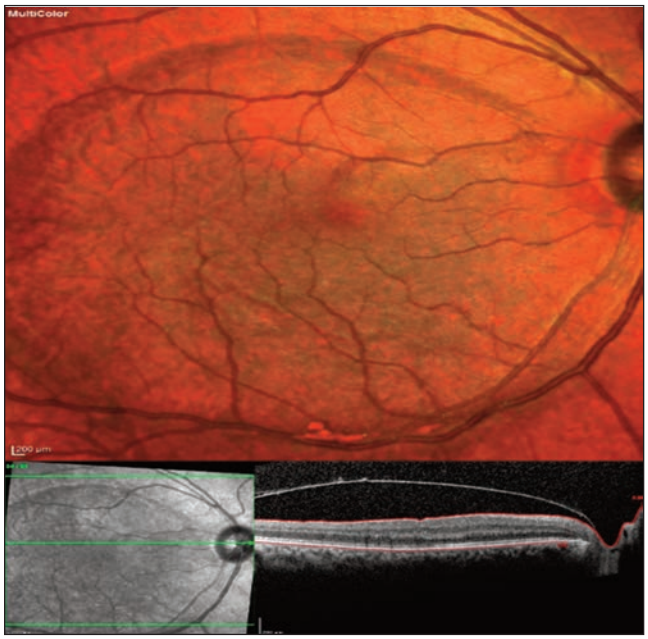

Figure-2: Multicolour fundus and OCT images of the right eye after three months showing resolution of the haemorrhage.

The patient was treated conservatively. He was advised bed rest and advised against lifting heavy weights. A follow-up appointment was scheduled for one week later.

A complete blood count (CBC) was performed to check for any haematological abnormalities. It showed haemoglobin (Hb) = 6.1 g/dl (12.3 - 16.6), haematocrit (Hct) = 18.1% (38.4 - 50.7), mean corpuscular volume (MCV) = 93.8 fL (76.0 - 96.0), total leukocyte count (TLC) = 2.7 x 109/L (4.8 - 11.3) and platelets = 32 x 10^9/L (154 - 433). The peripheral smear was positive for hyper-segmented neutrophils as well. The patient was admitted shortly after his CBC report due to worsening of his symptoms of weakness, nausea, and decreased appetite. Pallor was noted on examination. After a comprehensive lab workup, serum folic acid = 0.70 ng/ml (2.6 – 12.2) and serum vitamin B12 = 85 pg/ml (>201) were noted to be low. Erythrocyte sedimentation rate (ESR), c-reactive protein (CRP), and lactate dehydrogenase (LDH) were elevated at 61 mm/hour (0 - 15), 1.87 mg/dL (0 - 0.5), and 5,290 (208 – 378) IU/L, respectively. Blood and urine cultures were both negative. Furthermore, serum electrolytes, renal function tests, liver function tests, amylase, lipase, prothrombin time, activated partial thromboplastin time, magnesium, albumin, calcium, phosphorus, ferritin, and intrinsic factor antibodies were all within normal limits. He was diagnosed with pancytopenia secondary to B12 and folate deficiency.

During his hospital stay, the patient was transfused three packed cell volumes (PCV) and six units of platelets. He was treated with intravenous B-complex (Neurobion: B1 100 mg, B6 100 mg, B12 1 mg) and oral folic acid before being discharged two days later in stable condition.

At one-week ophthalmology follow-up, the patient felt better and an improvement in pre-retinal haemorrhage was noted on examination. His VA had improved to 20/400 in the right eye. The patient was managed conservatively. At three-month follow-up, the haemorrhage had resolved and the right VA improved to 20/30. Figure 2 shows the resolution of haemorrhage as seen on the fundus photo and OCT.

His repeat CBC two weeks later showed Hb = 10.6 g/dl (12.3 - 16.6), TLC = 5.3 x 109/L (4.8 - 11.3) and platelets = 760 x 109/L (154 - 433). His CBC and serum vitamin B12 were repeated one month later, which showed Hb = 14.6 g/dl (12.3 - 16.6), TLC = 4.7 x 109/L (4.8 - 11.3), platelets = 140 x 109/L (154 - 433), and B12 = 465 pg/ml (>201).

Discussion

To the best of our knowledge, this is the first case of unilateral Valsalva retinopathy as an initial presentation of

Table-1: A compilation of cases where Valsalva retinopathy was an initial presentation of pancytopenia.

Study	Age (yrs)	Gender	Unilateral/Bilateral	Associated Conditions
Anitha, P. 2014[2]	17	Male	Bilateral	Vitamin B12 Deficiency
Kumar, A. 2021[3]	40	Male	Bilateral	COVID-19
Current Study	44	Male	Unilateral (Right)	Folate and Vitamin B12 Deficiency

pancytopenia. A case has previously been reported of a patient with bilateral subhyaloid haemorrhages who was later determined to have pancytopenia.[2] Another patient who had bilateral large premacular haemorrhages on examination was later discovered to have pancytopenia.[3] Notably, all cases of Valsalva retinopathy as an initial manifestation of pancytopenia (Table 1) have been reported in men. Multiple cases can be seen in the existing literature of known cases of pancytopenia who later presented with Valsalva retinopathy. A 20-year-old male with pancytopenia secondary to occupational benzene exposure was later diagnosed with Valsalva retinopathy.[4] Another young male with pancytopenia secondary to etoposide and Ifosfamide use for metastatic Ewing's sarcoma was later diagnosed with Valsalva retinopathy.[5] Similarly, cases have been described of patients with known pancytopenia, secondary to aplastic anaemia and vitamin B12 deficiency respectively, who developed retinal haemorrhages resembling Valsalva retinopathy.[6,7]

Medications taken for TB, especially Rifampin, have rarely been associated with haematologic abnormalities as a complication. This may be caused by an acute drug reaction or by intermittent dosing. An acute case of autoimmune haemolytic anaemia secondary to Rifampin has previously been reported.[8] A case of disseminated intravascular coagulation that occurred after the ninth monthly Rifampin dose has also been documented.[9] In the current case, the patient had been on daily Rifampin therapy for seven months prior to his diagnosis of pancytopenia. Therefore, as he was not on intermittent dosing and had been using Rifampin for a long time, it is unlikely that pancytopenia was related to his TB treatment regimen.

ESR, CRP, and LDH were all noted to be elevated in this patient on admission. However, he was afebrile, and both blood and urine cultures did not show any growth. ESR, CRP, and LDH have all been shown to be elevated in cases of megaloblastic anaemia.[10,11]

It has been postulated that hypoxaemia observed in anaemia may damage the endothelial lining of the retinal vessels. However, this does not always manifest in anaemic patients due to the protective effect of platelets. In pancytopenia, concurrent anaemia and thrombocytopenia may predispose patients to a greater risk of retinal haemorrhage. The prevalence of retinal abnormalities in anaemic or thrombocytopenic patients has been noted to be as high as 28.3%. However, if these conditions are seen synergistically, the prevalence increases to 42%.[12] Therefore, it may be prudent to perform a basic blood workup in patients presenting with Valsalva retinopathy to rule out any unidentified bleeding disorders.

Conclusion

Early diagnosis of pancytopenia allowed for management before severe deterioration of the patient in this case. If the patient had not visited the ophthalmologist and had a CBC done, it is likely that his diagnosis and treatment would have been delayed. This may have resulted in a worse prognosis. Ophthalmology can play a key role in detecting systemic disease before the development of complications.

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Author Contribution:
ASG: Literature review, drafting and revision.
RS: Directly involved with patient care and revision.