



## Case Report

# Pre-retinal haemorrhage: A complication of anemic retinopathy in a patient of microcytic hypochromic anemia

Diti Patel<sup>1,\*</sup>, Dhvani Maheshwari<sup>1</sup>, Hemali Bhavsar<sup>1</sup>, Indravadan Vasava<sup>1</sup>

<sup>1</sup>Dept. of Ophthalmology, Baroda Medical College, Vadodara, Gujarat, India



### ARTICLE INFO

#### Article history:

Received 26-04-2020

Accepted 04-05-2020

Available online 22-12-2020

#### Keywords:

Anemia

Anemic retinopathy

Menorrhagia

Preretinal haemorrhage

Roth spot

### ABSTRACT

A 20-year old Indian female reported dimness of vision in both eyes since 5-6 days. Her best corrected visual acuity [BCVA] in right eye 6/24 (OD) and left eye 6/6 (OS). Anterior segment evaluation revealed conjunctival pallor. An ophthalmological evaluation revealed bilateral hyperemic disc with venous tortuosity and arterial attenuation, Roth spots in entire periphery in both eye. Pre-retinal haemorrhage over macula in right eye and flame shaped haemorrhage around macula in left eye. Hematological evaluation revealed the presence of anemia due to heavy blood loss in menstruation (with haemoglobin ~2.1 gm%). General examination showed severe pallor. Other causes of anemia have been ruled out. She was treated with blood transfusion of four packed cell volume [PCV]. This case documents the rare occurrence of anemic retinopathy in patient of anemia due to menorrhagia.

© This is an open access article distributed under the terms of the Creative Commons Attribution License (<https://creativecommons.org/licenses/by/4.0/>) which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

## 1. Introduction

Severe anemia can present with retinopathy ranging from haemorrhages, exudates to central retinal vein occlusion.<sup>1-4</sup> Though the intimate mechanism of their pathogenesis is not understood. The purpose of this article is to describe the fundus changes seen in severe anemia due to menorrhagia and correlate them with the severity of the disease and with other factors, such as the age of patient, and aetiology. We report here 20 years old young female, having menorrhagia since 15 days and developing complaint of dimness of vision since 5-6 days. Her blood reports showed haemoglobin 2.1 gm% and abnormal red blood cells [RBC] and lower platelet count. Patient had features of anemic retinopathy like pre-retinal haemorrhage and roth spots. Anemic condition of patient improved after receiving four packed cell volumes. Later after two months, patient came for follow up and her visual acuity in both eye was 6/6.

## 2. Materials and Methods

A 20-year-old Indian female who was admitted in medicine ward for menorrhagia, was sent to our out patient department for complaint of dimness of vision in her both eyes, since 5-6 days. Her visual acuity was OD 6/24 and OS was 6/6. Right eye vision did not improve on best corrected visual acuity. Anterior segment evaluation revealed conjunctival pallor. On indirect ophthalmoscopy of both eyes, we found hyperemic disc with venous tortuosity, arterial attenuation, roth spots in entire periphery. Right eye showed pre-retinal haemorrhage on macula with macular oedema.

Patient had menorrhagia since fifteen days. She had breathlessness, fatigue, giddiness since nine days. Patient had no history of trauma and no history of any systemic illness. Her random blood sugar on admission was 105 mg/dl. On admission haematological evaluation showed haemoglobin 2.1 gm%. Smear study showed moderate anisopoikilocytosis with mild microcytic hypochromic red blood cells with few macrocytes and macroovalocytes, elliptocytes and tear drop cells. Some polychromatic RBC's were seen. Platelet in smear were

\* Corresponding author.

E-mail address: [ditipatel22@gmail.com](mailto:ditipatel22@gmail.com) (D. Patel).

mildly diminished. Her erythrocyte sedimentation rate was raised to 32. Sickle solubility test was negative. Activated partial thromboplastin time was 40.70 which is slightly raised. Her fasting blood sugar [FBS] was 98 mg/dl, post prandial blood sugar after two hour [PP<sub>2</sub>BS] 130mg/dl and HbA1c 5.6%. General examination showed severe pallor. There was coincidental finding of bilateral simple ovarian cyst on abdominal ultrasound approximate size of cyst is 2.3cm x 1.8cm. After admission we gave three packed cell volume [PCV], blood transfusion on the first day of admission and one PCV on next day. After four PCV's patient's Hb was 9.20 gm% and platelet was 49000/mm<sup>3</sup> after three days. Her systemic symptoms alleviated. Smear study showed only few abnormal RBC's and reduced platelets. Patient was lost to follow up. Two months after discharge she came for follow up and we learned that patient had restored her normal vision, and currently had no visual complaints.



**Fig. 1:** Right eye fundus shows pre-retinal haemorrhage on macula. Roth's spots and arterial attenuation around macula

### 3. Discussion

This type of retinopathy can be present in myriad of diseases. We ruled out a few of them on basis of following differential:

#### 3.1. Bacterial endocarditis

Our patient didn't have fever, chills, night sweats and abnormal heart sound.

#### 3.2. Leukemia

Patient had normal complete blood count with absence of blast cells.

Hypertensive retinopathy was ruled out because patient had blood pressure within normal range consecutively for 4 days.

Diabetic retinopathy: Patient had no past or family history of diabetes, and her FBS, PP<sub>2</sub>BS, HbA1C were within normal range.



**Fig. 2:** Left eye fundus shows Roth's spots, arterial attenuation and venous tortuosity



**Fig. 3:** Right eye fundus after recovery shows Left eye fundus after recovery shows mild arterial attenuation and venous tortuosity

#### 3.3. Anoxia

On admission patient's partial pressure of oxygen was 99%.

Patient's ELISA report for HIV was non reactive.

Anemia/thrombocytopenia most possible in our case because patient was having history of menorrhagia.

Pre-retinal haemorrhages often seen in Valsalva retinopathy, posterior vitreous detachment [PVD] with secondary pre-retinal haemorrhage, proliferative diabetic retinopathy and exudative age related macular degeneration. Valsalva retinopathy mostly presents with pre-retinal haemorrhage near the macula and may be unilateral or bilateral. There is no age, sex, racial predilection but a history of Valsalva maneuver is elicited.<sup>5</sup> PVD with pre-retinal haemorrhage could mimic our case but symptoms

like flashes, floater will help to differentiate from others.

Proliferative diabetic retinopathy would be asymmetrical or bilateral and there is most often a corresponding history of diabetic mellitus.

Fundus lesions can be the accompanying symptom in many hematological diseases. In cases of anemia or thrombocytopenia, the exact mechanism leading to fundus abnormalities is not completely understood. Retinal changes like cotton-wool spots, haemorrhages, venous tortuosity which may be present at all levels of the retina and choroid. Kanski notes these changes, seem to be related to the reduction in hematocrit and are more common when the anemia coexists with thrombocytopenia, the duration of the anemia itself does not influence the occurrence.<sup>3</sup> Factors such as angiospasm, anoxia, venous stasis, increased capillary permeability, and thrombocytopenia have been implicated in the pathogenesis of anemic retinopathy. Other contributing factors include severity of the anemia, increased blood viscosity, as seen in leukemic and other myeloproliferative disorders, and periods of hypotension (especially following severe hemorrhage). The latter may also result in shock optic neuropathy which has a presentation and prognosis similar to ischemic optic neuropathy.<sup>6</sup> Long-standing anemia from Vitamin B12 and/or folate deficiency may also present with optic neuropathy.

A cross-sectional study of 226 patients with anemia with or without thrombocytopenia was undertaken to study prevalence of fundus findings in anemia and detect risk factors of retinopathy. 28.3% of these patients had fundus lesions associated with severe anemia accompanying thrombocytopenia. In this study incidence of retinopathy in patient with concomitant anemia with thrombocytopenia was 38%. Age, low hemoglobin levels, platelet counts, Red blood cell distribution width [RDW-CV], and increased mean corpuscular volume [MCV], mean platelet volume [MPV] and platelet larger cell ratio [P-LCR] were defined as risk factors for this study.<sup>7</sup>

#### 4. Conclusion

Usually anemic retinopathy resolves with treating the underlying aetiology. In investigation complete blood work, should always include peripheral blood smear. Our young

patient's diagnosis is anemic retinopathy with macular haemorrhage in a patient of microcytic hypochromic anemia with thrombocytopenia. Retinopathy was resolved after replenishing her blood loss. Her normal vision was restored.

#### 5. Source of Funding

None.

#### 6. Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

#### References

1. Ballantyne AJ, Michaelson IC. Textbook of the Fundus of the Eye. Edinburgh: Livingstone; 1962.
2. Duke-Elder S. System of Ophthalmology. London: Kimpton; 1967.
3. Imai E, Kunikata H, Udono T, Nakagawa Y, Abe T, Tamai M. Branch Retinal Artery Occlusion: A Complication of Iron-Deficiency Anemia in a Young Adult with a Rectal Carcinoid. *Tohoku J Exp Med.* 2004;203(2):141–4. doi:10.1620/tjem.203.141.
4. Kacer B, Hattenbach LO, Hörle S, Scharrer I, Kroll P, Koch F. Central Retinal Vein Occlusion and Nonarteritic Ischemic Optic Neuropathy in 2 Patients with Mild Iron Deficiency Anemia. *Ophthalmol.* 2001;215(2):128–31. doi:10.1159/000050843.
5. Regillo CD. Distant trauma with posterior segment defects. In: Yanoff M, Duker JS, editors. Ophthalmology. St. Louis: Mosby; 2004. p. 1017.
6. Beck RW, Smith CH. Neuro-ophthalmology: A problem oriented approach. First edition ed. Boston: Little, Brown, and Company; 1988.
7. Kaur B, Taylor D. Fundus hemorrhages in infancy. *Surv Ophthalmol.* 1992;37(1):1–17. doi:10.1016/0039-6257(92)90002-b.

#### Author biography

**Diti Patel**, Resident Doctor

**Dhwani Maheshwari**, Resident Doctor

**Hemali Bhavsar**, Resident Doctor

**Indravadan Vasava**, Assistant Professor

**Cite this article:** Patel D, Maheshwari D, Bhavsar H, Vasava I. Pre-retinal haemorrhage: A complication of anemic retinopathy in a patient of microcytic hypochromic anemia. *Indian J Clin Exp Ophthalmol* 2020;6(4):654-656.