Section: General Medicine

Case Report

CENTRAL RETINAL ARTERY OCCLUSION AS A PRESENTING SIGN OF POLYCYTHEMIA VERA

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ABSTRACT

39 year old male non-smoker, non-alcoholic with no known co-morbidities presented with complaints of sudden onset painless loss of vision in left eye since 2 days. Fundoscopy and slit lamp examination of left eye showed central retinal artery occlusion. Complete hemogram was suggestive of polycythaemia vera. After ruling out relative and secondary causes, worked up for primary polycythaemia vera. Bone marrow aspiration and biopsy showed excessive erythroid hyperplasia in marrow with mild dysplasia of myeloid elements. Erythropoietin levels were low, Myeloproliferative neoplasms reflex panel test was negative. CT head and neck angiogram showed partial thrombosis of left carotid bulb and left ECA with near total occlusion of ICA. Patient was treated with low dose aspirin, oral anti-coagulants, statins and three cycles of phlebotomy. Patient is on regular follow up and compliance to medications and symptomatically better, except for left eye vision loss.

Keywords: CRAO, Polycythemia vera.

INTRODUCTION

Polycythaemia vera is a myeloproliferative neoplasm, generally characterised by an increase in red cell mass along with, thrombocytosis, Leucocytosis and splenomegaly. Patients with polycythaemia vera are prone to haemorrhagic and thrombotic events which contribute to morbidity and mortality from disease. Ocular involvement is rarely seen in the form of bilateral retinal haemorrhages, peripheral non-perfusion, retinal vein occlusion, retinal artery occlusion and visual defects secondary to cerebral non perfusion. Increased adhesiveness of erythrocytes to endothelium causes thrombus formation and arterial occlusion. Polycythaemia vera should be considered as a possible etiology for evaluating patient with CRAO.

CASE PRESENTATION

A 34 year old male who is non-smoker and non-alcoholic, with no known comorbidities, presented with complaints of sudden onset painless loss of vision in left eye since 2 days. Patient had no history of loss of consciousness, headache, vomiting, diplopia, pre-syncopal attacks, arthralgia, myalgia, skin rash, pruritis, episodes of transient vision loss.

On examination - Left eye perception of light absent, Right eye visual acuity 6/6 and conjuctival congestion present. Blood pressure -120/70 mmhg, Pulse-89 bpm regular and Saturation- 98% at room air. There were no markers of atherosclerosis and neurocutaneous markers. Systemic examination were unremarkable.

INVESTIGATION

Ocular fundus examination done on presentation showed retinal whitening with cherry red spot at macula and narrowed arteries.

Figure 1: FUNDUS FLUORESCEIN ANGIOGRAM showing delayed arterial filling with diagnosis consistent with CRAO

Presentation	After phlebotomy (1)	After phlebotomy (2)	After phlebotomy (3)
Hb - 19.6 g/dl	Hb - 18.8g/dl	Hb - 16.5g/dl	Hb - 14.8g/dl
PCV - 58.2%	PCV - 55.4%	PCV - 52.6%	PCV – 48.8%
RBC -5.93 million/cumm			
TLC - 9250 cells/cumm			
PLT – 2.03 lakh/cumm			

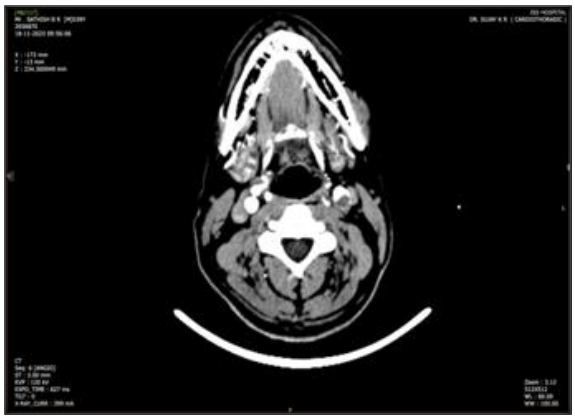

Figure 2: CT HEAD AND NECK ANGIOGRAM showing filling defect in ICA with 60-70% block

Other investigations like peripheral blood smear showed normocytic normochromic with erythrocytosis. Chest x ray, ECG, LFT, RFT, PT/INR, and urine routine were all within normal limits. Fasting lipid profile showed dyslipidemia. Serology testing for HIV and HbsAg were negative. Erythropoietin levels were low (2.02mlu/ml), thrombophilia profile, antinuclear antibody and myeloproliferative neoplasm reflex panel done were negative. Bone marrow trephine biopsy done showed hyper cellular marrow with erythroid and megarkaryocytic hyperplasia.

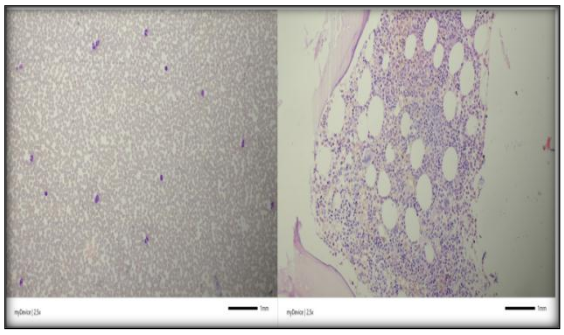

Figure 3: Bone marrow trephine biopsy showing hyper cellular marrow with erythroid and megakaryocytic hyperplasia

Initial differential diagnosis were hyper homocystenemia, Antiphospholipid antibody syndrome and polycythaemia vera. Patient homocystiene levels were marginally elevated, thrombophilia profile, including APLA profile were negative. JAK 2 Mutation and Myeloproliferative neoplasm panel test were also negative. Bone marrow aspiration and biopsy suggestive of erythroid and megakaryocytic hyperplasia .On basis of diagnostic work up and laboratory evaluation, considered this case as a possibility of primary polycythemia vera after ruling out secondary causes.

MANAGEMENT

Patient was started on low dose aspirin of 75 mg once a day along with moderate intensity statins. After sending for thrombophilia profile and MPN reflex panel test, patient was started on low molecular weight heparin based on body weight. Patient had undergone 3 sessions of phlebotomy after which repeat hb was 14.5 g/dl. Patient was shifted from parenteral anticoagulents to NOAC'S and discharged with regular follow up advice.

OUTCOME AND FOLLOW UP

Patient was discharged after 5 days of hospital stay with single antiplatelet, oral anticoagulant and moderate intensity statins. Patient had no further episode of thrombotic events in hospital. Patient is on regular follow up, has no fresh complaints and symptomatically better except for left eye vision loss.

DISCUSSION

Polycythemia vera is chronic clonal hematopoietic stem cell disorder characterised by increase in red cell mass, thrombocytosis, leucocytosis.[1]

Diagnostic criteria of polycytemia vera is

Major Criteria

1. hb > 16.5g/dl in men, hb >16 g/dl in women

   Or

Haematocrit >49% in men, haematocrit>48% in women

   Or

increased red cell mass

2. Bone marrow biopsy showing hypercellularity for age with trilineage growth (panmyelosis) including prominent erythroid, granulocytic and megakaryocytic proliferation with pleomorphic and mature megakaryocytes.
3. Presence of JAK2V617F or JAK2 exon 12 mutation

Minor Criteria

1-Subnormal serum erythropoietin level.

As patient meets criteria with 2 major and 1 minor criteria, patient was diagnosed as polycythemia vera. Since the elevated red blood cell mass leads to an increased haemoglobin concentration, haematocrit value and blood viscosity, patient with polycythaemia vera are at increased risk for thrombosis.[1,2,3,4] Acute coronary syndrome, myocardial infarction and cerebrovascular accidents were common among patients with polycythaemia vera.[5] Ocular symptoms are seen in 13.6% patients

presenting with polycythaemia vera, but patient presenting with ocular symptoms are rare.[6] Few case reports have been published where patient presenting with CRAO or CRVO diagnosed as polycythaemia vera, where in these cases occlusions in vessels lead to irreversible damage.[7,8,9] In patients with polycythaemia vera , decrease in haematocrit is most important factor to decrease risk of thrombotic events.[10]

JAK2 gene is usually located on short arm of chromosome 9 and loss of heterozygosity on chromosome 9p due to uniparental disomy is most common cytogenic abnormality in polycythaemia vera.. JAK2 is usually found to be positive in patients with polycythaemia vera , but it is not essential to make a diagnosis according to WHO classification .There were few case reports of patients with JAK2 negative polycythaemia vera and also there was no significant difference in clinical presentation compared to JAK2 positive patients .

LEARNING POINTS

- CRAO/CRVO is rare but can be presentation in polycythaemia vera patients.
- Young patient presenting with vascular events, always rule out polycythaemia with basic haematological workup.
- Phlebotomy is important part of polycythaemia vera treatment, as it reduces risk of thrombotic events and if done early might even improve ocular symptoms presenting with CRAO/CRVO.
- JAK2 mutation is not necessarily required for diagnosis of polycythaemia vera.
- All the relative and secondary causes of polycythaemia vera should be ruled out before testing for primary polycythaemia vera, as they can be curable if treated early.

REFERENCES

1. Spivak JL. How I treat polycythemia vera. Blood. 2019; 134(4):341–52.
2. Spivak JL. Polycythemia Vera. Curr Treat Options Oncol. 2018; 19(2):12.
3. W. D. Some speculations on the myeloproliferative syndromes [editorial]. Blood. 1951; 6(4):372–5 Blood. 2016; 127(6):663.
4. Liisborg C, Hasselbalch HC, Sørensen TL. Ocular Manifestations in Patients with Philadelphia-Negative Myeloproliferative Neoplasms. Cancers (Basel). 2020; 12(3):573.
5. Griesshammer M, Kiladjian JJ, Besses C. Thromboembolic events in polycythemia vera. Ann Hematol. 2019; 98(5):1071–82.
6. Yang HS, Joe SG, Kim JG, Park SH, Ko HS. Delayed choroidal and retinal blood flow in polycythaemiavera patients with transient ocular blindness: a preliminary study with fluorescein angiography. Br J Haematol. 2013; 161(5):745–7.
7. Ahn BY, Choi KD, Choi YJ, Jea SY, Lee JE. Isolated monocular visual loss as an initial manifestation of polycythemia vera. J Neurol Sci. 2007; 258(1–2):151–3.
8. Rao K, Shenoy SB, Kamath Y, Kapoor S. Central retinal artery occlusion as a presenting manifestation of polycythaemiavera. BMJ Case Rep. 2016; 2016:bcr2016216417.
9. Zhao PY, Abalem MF, Rao RC. A Flushed Face and Dilated Retinal Veins. JAMA Ophthalmol. 2018; 136(12):1414–5.
10. Kwaan HC, Wang J. Hyperviscosity in polycythemia vera and other red cell abnormalities. SeminThrombHemost. 2003; 29(5):451–8.