

This article is licensed under the Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC) (<http://www.karger.com/Services/OpenAccessLicense>). Usage and distribution for commercial purposes requires written permission.

Case Report

Lipemia Retinalis, Macular Edema, and Vision Loss in a Diabetic Patient with a History of Type IV Hypertriglyceridemia and Pancreatitis

John W. Hinkle Nidhi Relhan Harry W. Flynn Jr.

Bascom Palmer Eye Institute, Department of Ophthalmology, University of Miami Miller School of Medicine, Miami, FL, USA

Keywords

Diabetic retinopathy · Intravitreal injection · Lipids · Macular edema

Abstract

Background: Lipemia retinalis is a rare but known complication of elevated serum triglycerides. This case describes the clinical course of a diabetic patient who presented with lipemia retinalis and macular edema, which responded to systemic and local treatments. **Case Report:** A 40-year-old female with a history of type II diabetes mellitus, hypertriglyceridemia, and pancreatitis presented with decreased vision in the left eye. She had peripapillary and macular edema, intraretinal hemorrhages, and prominent exudates in the setting of lipemia retinalis due to type IV hypertriglyceridemia. She was treated with serial intravitreal bevacizumab injections for macular edema and systemic lipid lowering therapy, and her visual acuity improved back to baseline. **Conclusions:** In the setting of lipemia retinalis and hypertriglyceridemia, the current patient developed macular edema and vision loss. The macular edema was treated with intravitreal injections of bevacizumab, and the patient experienced a rapid recovery of visual acuity.

© 2018 The Author(s)
Published by S. Karger AG, Basel

Introduction

Lipemia retinalis is characterized by retinal vascular changes and variable visual symptoms in the presence of elevated serum triglyceride levels. It is one of the defining features of chylomicronemia, but the visual impact of lipemia retinalis is variable [1, 2].

Case Report

A 40-year-old female with a past medical history of type II diabetes mellitus, hypertriglyceridemia, and pancreatitis presented with worsening blurry vision in her left eye. Previously, she had been treated for diabetic macular edema with a single intravitreal injection of bevacizumab. She reported that she was not currently on any medical treatment for her chronic conditions due to extenuating social circumstances. Best corrected visual acuity was 20/25 in the right eye and 20/400 in the left eye. Fundus examination of the right eye revealed mildly tortuous vessels with intraluminal whitening and white discoloration of the retina. Posterior segment examination of the left eye demonstrated similar vascular changes along with peripapillary and macular edema, intraretinal hemorrhages, and cotton wool spots (Fig. 1a, b). Though normal in the right eye, fluorescein angiography of the left eye demonstrated dilated vessels and late peripapillary leakage (Fig. 1c, d). Ocular coherence tomography (OCT) was significant for increased retinal thickening with intraretinal and subretinal lipid exudation (Fig. 1e, f). Lab workup at this visit was notable for a complete blood count that was within the normal limits, a hemoglobin A_{1c} of 8.9%, and elevated levels of total cholesterol (>650 mg/dL) and triglycerides (>1,575 mg/dL). Subsequent lipoprotein electrophoresis confirmed a pattern of dyslipidemia consistent with type IV hypertriglyceridemia [3]. Upon confirmation that the intraluminal whitening represented lipemia retinalis, the patient was treated with an intravitreal injection of bevacizumab.

After three consecutive monthly intravitreal bevacizumab injections, the patient's vision in her left eye improved to 20/20, though peripapillary hemorrhages, macular edema, exudate, and intravascular whitening persisted (Fig. 2a, b). An OCT scan demonstrated improvement of intraretinal and subretinal fluid with persistent hyperreflective outer retinal exudates (Fig. 2c, d). In contrast to her visual improvement, repeat serum lipid examination showed persistently elevated total cholesterol (872 mg/dL) and triglycerides (>4,425 mg/dL), and the patient was counseled again about the importance of starting systemic treatment. The patient's vision and retinal examination were stable 2 months after the last injection. She reported starting cholesterol lowering therapy with gemfibrozil 600 mg twice daily and atorvastatin 40 mg daily under the guidance of her primary care physician.

Discussion

This case documents the clinical course of a diabetic patient with lipemia retinalis and macular edema treated with bevacizumab. The patient demonstrated typical findings of lipemia retinalis: whitening of retinal vessels and creamy retinal pigmentation in the setting of severely elevated triglycerides and chylomicrons (in this instance due to type IV hypertriglyceridemia). The constellation of optic nerve head edema, intraretinal hemorrhages, retinal edema, and exudates has not been described in association with lipemia retinalis. These findings may represent a nonischemic central retinal vein occlusion (CRVO), diabetic papillopathy,

papillophlebitis, or nonproliferative diabetic retinopathy with macular edema. However, the clinical presentation and response to treatment are not classic for any of these entities. Diabetes mellitus is thought to be a risk factor for each of those conditions, and hypertriglyceridemia has been noted to increase the risk of CRVO independently [4–6]. Lipemia retinalis may be asymptomatic, but reports have described ERG changes in some patients and one hemiretinal vein occlusion [7, 8]. In the current patient with macular edema, intravitreal bevacizumab injections proved highly effective. When treated consistently, the patient's macular edema and vision improved. This treatment response suggests that the patient's edema was at least in part mediated by vascular endothelial growth factor (VEGF). As has been elucidated in the pathophysiology of CRVO, obstruction of blood flow leads to transudative retinal fluid, decreased perfusion, hypoxia, and then exudative retinal fluid mediated in part by VEGF [9]. We speculate that increased viscosity secondary to hypertriglyceridemia could lead to a similar cascade of events and would be similarly responsive to anti-VEGF treatment. As a whole, this case expands the potential complications seen with lipemia retinalis and adds to the urgency with which elevated triglycerides should be treated in patients with this retinal finding.

Conclusion

With well-established systemic complications, lipemia retinalis is a harbinger of serious systemic disease. This case demonstrates extensive, visually significant retinal changes associated with lipemia retinalis and diabetes mellitus. Treatment with anti-VEGF injections improved vision acuity in this patient. However, systemic treatment of elevated triglycerides remains an urgent consideration.

Statement of Ethics

The authors have no ethical conflicts to disclose. The patient consented verbally to the publication of this case.

Disclosure Statement

The authors have no conflicts of interest to declare.

Funding Sources

This work was supported in part by the National Institutes of Health (NIH) Center Core Grant P30EY014801 (Bethesda, MD, USA), and a Research to Prevent Blindness Unrestricted Grant (New York, NY, USA).

References

- 1 Rayner S, Lee N, Leslie D, Thompson G. Lipaemia retinalis: a question of chylomicrons? *Eye (Lond)*. 1996;10(Pt 5):603–8.
- 2 Santamarina-Fojo S. The familial chylomicronemia syndrome. *Endocrinol Metab Clin North Am*. 1998 Sep;27(3):551–67.
- 3 Bilen O, Pokharel Y, Ballantyne CM. Genetic testing in hyperlipidemia. *Cardiol Clin*. 2015 May;33(2):267–75.
- 4 Cheung N, Klein R, Wang JJ, Cotch MF, Islam AF, Klein BE, et al. Traditional and novel cardiovascular risk factors for retinal vein occlusion: the multiethnic study of atherosclerosis. *Invest Ophthalmol Vis Sci*. 2008 Oct;49(10):4297–302.
- 5 Skarbez K, Priestley Y, Hoepf M, Koevary SB. Comprehensive Review of the Effects of Diabetes on Ocular Health. *Expert Rev Ophthalmol*. 2010 Aug;5(4):557–77.
- 6 Arnold AC, Costa RM, Dumitrascu OM. The Spectrum of Optic Disc Ischemia in Patients Younger than 50 Years (An American Ophthalmological Society Thesis). *Transactions of the American Ophthalmological Society*. 2013;111:93–118.
- 7 Lu CK, Chen SJ, Niu DM, Tsai CC, Lee FL, Hsu WM. Electrophysiological changes in lipaemia retinalis. *Am J Ophthalmol*. 2005 Jun;139(6):1142–5.
- 8 Nagra PK, Ho AC, Dugan JD Jr. Lipemia retinalis associated with branch retinal vein occlusion. *Am J Ophthalmol*. 2003 Apr;135(4):539–42.
- 9 Karia N. Retinal vein occlusion: pathophysiology and treatment options. *Clin Ophthalmol*. 2010 Jul;4:809–16.

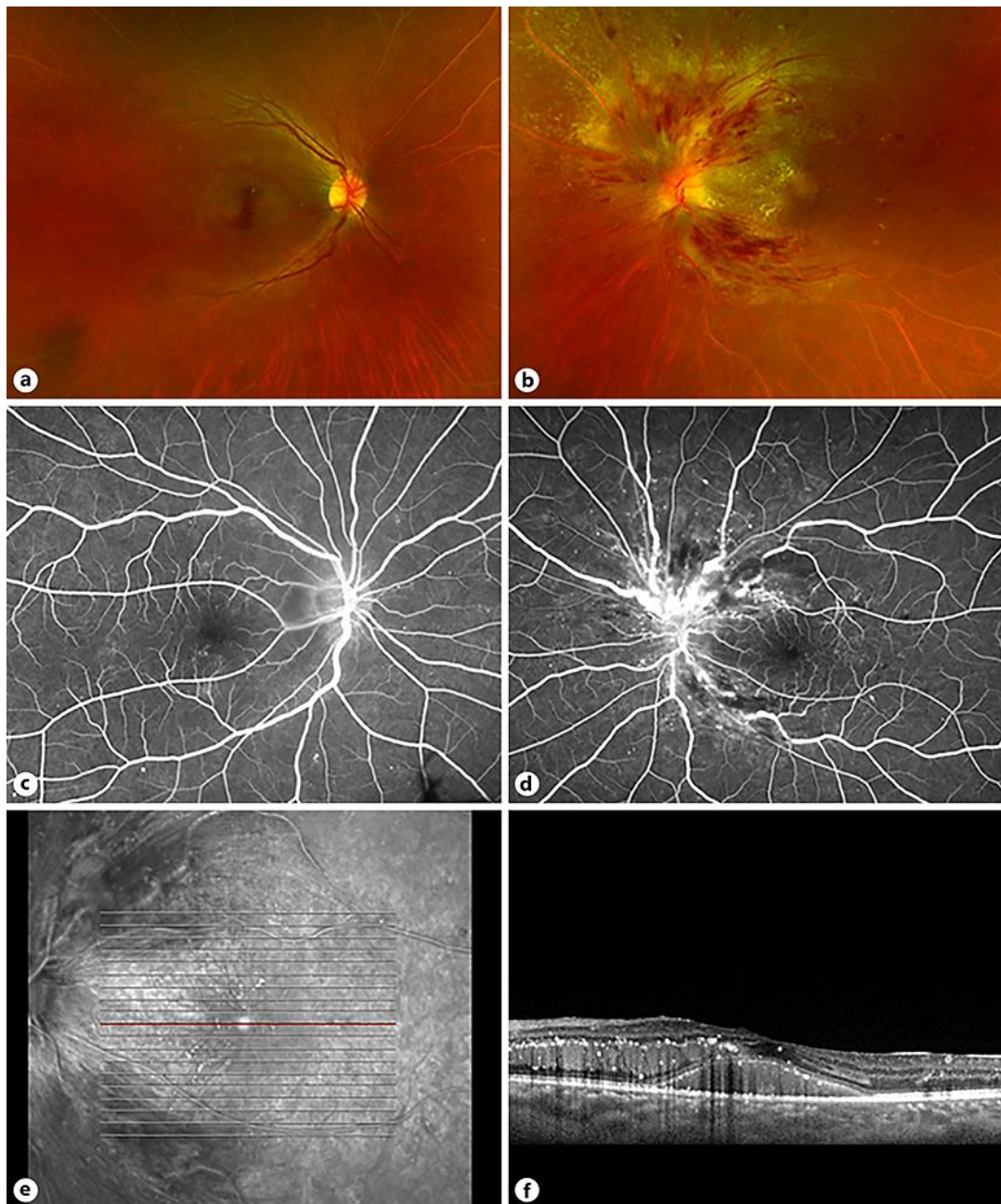


Fig. 1. **a, b** Initial fundus photos show intraluminal whitening of retinal vessels and hypopigmentation of the peripheral retina OU, with peripapillary edema, hemorrhages, cotton wool spots, and exudates OS. **c, d** Fluorescein angiography at presentation shows a normal arteriovenous phase OD, and mildly dilated veins, peripapillary leakage, and blocking from intraretinal hemorrhages OS. **e, f** OCT scans OS at presentation show intraretinal and subretinal deposits, and outer retinal exudates in the central macula.

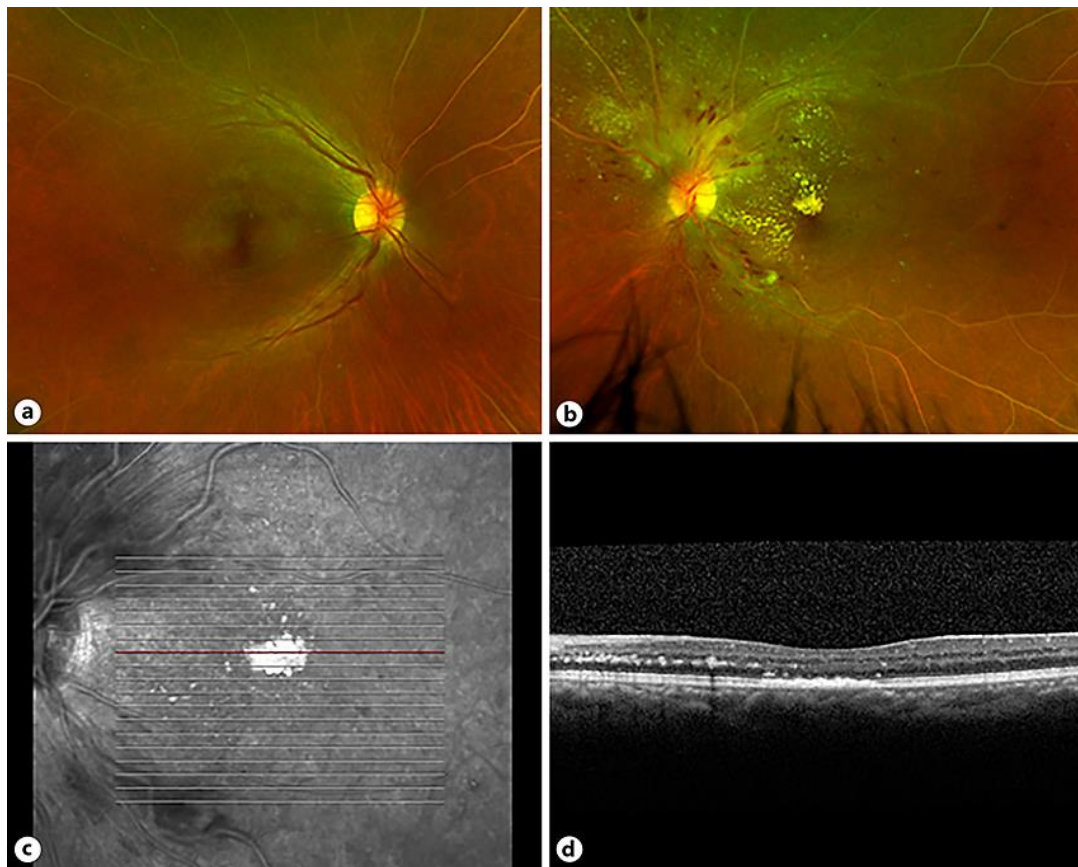


Fig. 2. **a, b** Fundus photos 2 months after presentation show increasingly posterior intraluminal whitening of retinal vessels and hypopigmentation of the retina OU, with interval improvement of retinal edema, hemorrhages, and cotton wool spots with more pronounced exudates OS. **c, d** OCT scans OS 2 months after presentation show interval improvement of subretinal and intraretinal deposits and increased outer retinal exudates.