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Short Report

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Non-invasively assessing diabetic retinopathy using optical coherence tomography angiography

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Case description

A 29-year-old woman was referred to our ophthalmology department with a poorly controlled diabetes mellitus type 1. The patient reported gradual vision impairment over three years and poor adherence to anti-diabetic medication, suffering from hypoglycemic episodes once a week.

The systemic assessment revealed a glycated hemoglobin (Hba1c) of 10.8%, indicating chronic hyperglycemia. There were no signs of neuropathy or nephropathy. The corrected visual acuity was 20/80 in her right eye and 20/32 in her left. While the anterior chamber was unremarkable, fundoscopy revealed in both eyes vitreous hemorrhages with extensive neovascular vitreoretinal tractional membranes and retinal hemorrhages in all four quadrants. Optical Coherence Tomography (OCT) detected bilateral macular edema. OCT-Angiography (OCTA) confirmed the retinal neovascularizations and displayed extensive capillary dropouts.

Discussion

Given the bilateral high-risk proliferative diabetic retinopathy, the patient required panretinal photocoagulation. The macular edema involved the center in follow-up consultations, indicating intravitreal injections with 2 mg Aflibercept in both eyes. Systemically, insulin degludec as basal treatment with insulin aspart bolus injection regimen was introduced to achieve glycemic control, reducing the HbA1c to 7.3% six months later.

Diabetic retinopathy is among the leading causes of global visual impairment [1]. Retinal microvascular complications include endothelial dysfunction, vascular leakage, pericyte loss, capillary dropouts, and neovascularization [2]. OCTA enables the non-invasive assessment of retinal vasculature compared to the alternative conventional angiography with intravenous fluorescein dye injection. Based on interference patterns of reflected light waves, OCTA senses motion contrasts of blood cells and creates high-resolution images of retinal microvessels [3]. Nevertheless, the technology may carry motion artifacts and provide a limited field of view [3]. The evolving OCTA technology provides a valuable, non-invasive tool for detecting and monitoring retinal changes in diabetic patients.

Declarations

Contributors: All authors were involved in the concept, design, and writing of the manuscript. KF was directly involved in the caring of the patient. SS and FB wrote the first draft. All

authors reviewed the manuscript and selected the pathological images together. Written consent for publication was obtained from the patient.

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