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SHORT COMMUNICATION

Congenital retinal macrovessel causes reduced retinal sensitivity at the macula

V.A. SHAH, K.V. CHALAM

Department of Ophthalmology, University of Florida College of Medicine, Jacksonville, FL - USA

PURPOSE. *To report a case of reduced macular sensitivity at the macula due to congenital retinal macrovessel as measured by liquid crystal display (LCD) microperimetry.*
METHODS. *Case report.*
RESULTS. *We present a patient with normal visual acuity OU, with fundus OS revealing a congenital retinal macrovessel. LCD microperimetry of the macular area OS revealed reduced sensitivity of the superior retina (median sensitivity, 13.0 dB) compared to the inferior retina (median sensitivity, 15.0 dB) based on numerical values of the sensitivity. Such a difference of sensitivity was not found in OD which had a normal fundus ezamination.*
CONCLUSIONS. *The patient's congenital macrovessel may be causing a relative angioscotoma with reduced retinal sensitivity in the superior half of the macula as compared to the inferior half. (Eur J Ophthalmol 2004; 14: 341-4)*

KEY WORDS. *Microperimeter, Microperimetry, Perimeter, Retinal macrovessel, Retinal sensitivity*

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INTRODUCTION

A congenital retinal macrovessel is a large vessel (usually a vein), which traverses through the macula and has large tributaries on both sides of the raphe.(1). This is usually a unilateral vascular anomaly, with excellent visual prognosis (1, 2). These aberrant congenital macular vessels are rare (3).

We report a case of asymptomatic congenital retinal macrovessel (vein) with normal visual acuity showing reduced retinal sensitivity at the macular area with the vessel, measured by the newly introduced liquid crystal display microperimeter.

Case report

A 67-year old black male was examined at retina service for "routine retinal evaluation".

His medical history was significant for hypertension, which is controlled with medication. No positive ocular history was unremarkable. On examination, BCVA was 20/20 OU. The anterior segment evaluation was unremarkable except for +1 nuclear cataract OU with normal intraocular pressure. Amslers grid was normal OD and mild distortion OS. Ophthalmoscopy of the right eye was normal (Fig. 1 a) while the left eye had an anomalous vein that started from the disc inferior to the hor-

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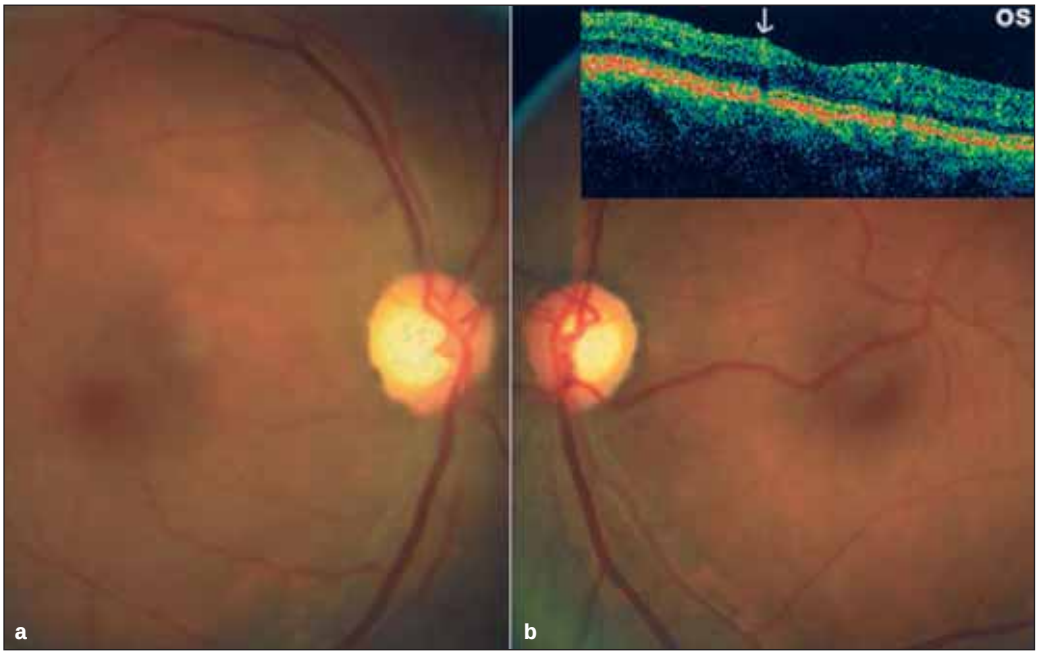

Fig. 1 - a) *Photograph showing normal right fundus.*
b) *Photograph of the left fundus showing the congenital retinal macrovessel starting inferior to the horizontal raphe that extends superiorly across the macula just nasal to the fovea.*
Inset) *OCT OS reveal normal macular thickness. White arrow shows the congenital retinal macrovessel within the retina.*

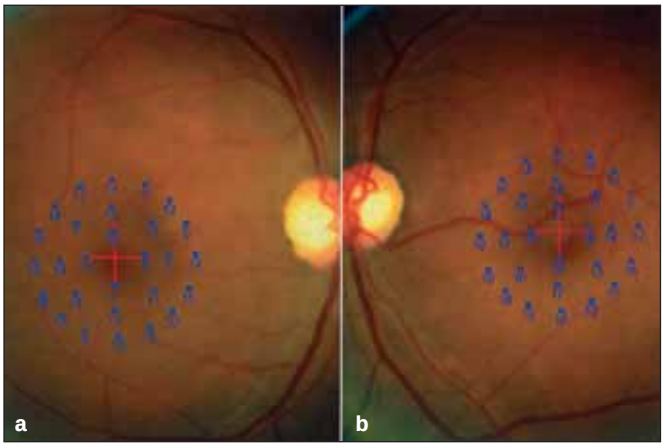

Fig. 2 - a) *Macular perimetry OD with liquid crystal display microperimeter showing numerical values (dB) of the tested macular area.*
b) *Macular perimetry OS with liquid crystal display microperimeter showing numerical values (dB) of the tested macular area.*

izontal raphe and extended to cross the macula just nasal to the fovea and continue superior temporally (Fig. 1 b) with branches traversing inferiorly on either side of the fovea. There was no associated sign of macular edema both clinically or on ocular coherence tomography (OCT).

Microperimetry with the liquid crystal display MP-1 (Nidek Technologies, Vigonza, Italy) was performed to evaluate fixation stability and macular sensitivity. 4-2-1 threshold strategy with Goldmann III size stimulus was used to perform microperimetry. 4° single cross was used as fixation target. Twenty-eight points were tested over the central 12° field (polar pattern) against a white background. Microperimetry revealed comparable mean sensitivity at the macula in the OD 12.17 dB while that of OS was 14.0 dB (p= 0.103, Mann-Whitney rank sum test) (Fig. 2 a and b). Comparison of the numerical values of the sensitivity of the 11 points measured above and below the horizontal raphe (excluding the points on the horizontal raphe) revealed reduced sensitivity of the superior retina superiorly (median sensitivity, 13.0 dB) as compared to the inferior retina in the left eye (median sensitivity 15.0 dB) (p= 0.011) (Fig. 2 b). However such a difference was not found in the right eye (p= 0.186) (Fig. 2 a). Mann-Whitney rank sum test was used for statistical validity.

On fixation stability chart both eyes had relatively unstable fixation. OD had 44% of the fixation within 2∞ and 86% within 4° of the center while OS had 51% of the fixation within 2° and 83% within 4° of the center (Fig. 3 a and b).

DISCUSSION

We present the first documented case of reduced retinal sensitivity measured with liquid crystal display

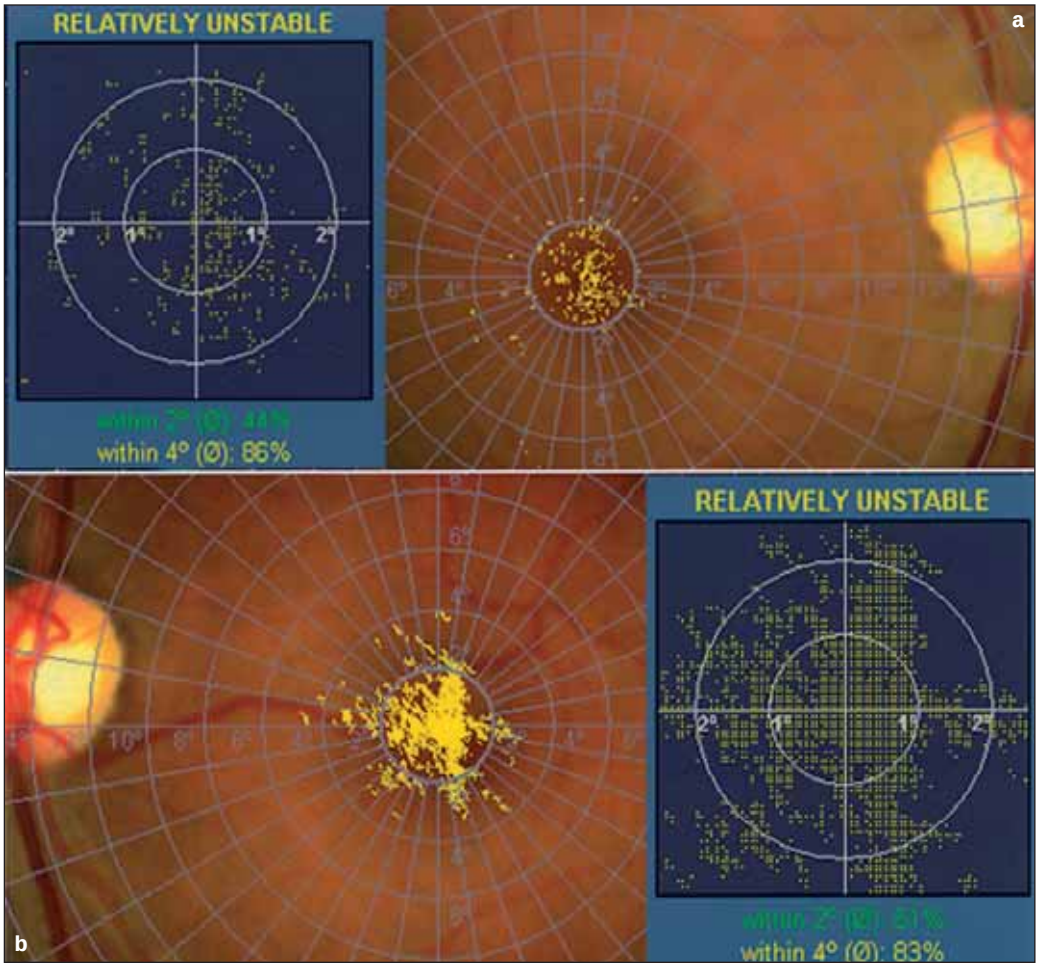

Fig. 3 - a) *Fixation-tracking chart mapped on liquid crystal display microperimeter OD.*
b) *Fixation-tracking chart mapped on liquid crystal display microperimeter OS.*

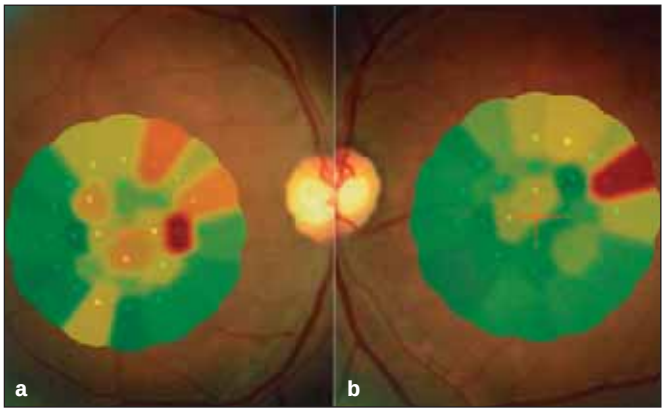

Fig. 4 - a, b) *Liquid crystal display microperimeter color display of the retinal sensitivity at the macula.*

microperimetry at the macula in a patient with congenital retinal macrovessel. The patient presented with no symptoms and normal visual acuity. He had mild distortion on the Amsler's grid in the left eye. The recently introduced microperimeter MP-1 uses liquid crystal display for high resolution and flexibility. The liquid crystal display allows variable selection of the form, number, intensity as well as the movement pattern of the projected stimulus. The other advantages of the equipment are infrared tracking of the fundus and a display with large multiplicity of colors (Fig. 4 a and b). This is a new instrument and no the normative data has not been yet established.

We used the MP-1 to perform the macular perimetry and track the fixation stability.

Mean macular sensitivity was 12.71 dB for the right eye and 14.0 for the left eye. They were statistically comparable ($p > 0.05$). However for the left eye, on comparing the retinal sensitivity of superior (with the macrovessel) and inferior halves of the macula, there was a significantly lower retinal sensitivity in the superior half ($p = 0.011$). This difference was not present in the right eye. Thus we would assume that the low-

er sensitivity could be attributed to the presence of the congenital macrovessel in the superior half.

Precise documentation of the point of fixation during perimetry first became possible with the use of scanning laser ophthalmoscope (SLO). This machine allows performance of simultaneous static perimetry and control of the fundus of the patients (4). It also correlates morphologic changes of the fundus to its function. The liquid crystal display microperimeter measures the retinal sensitivity at the macular area as well as tracks the fixation stability. On fixation stability chart both eyes had a similar relatively unstable fixation. This appears to be an individual variation as the right eye though being normal did not have stable fixation. Thus we cannot attribute the unstable fixation of the left eye to the macrovessel.

It is known that retinal sensitivity is reduced over the larger retinal vessels. This has been attributed to the hemoglobin of the retinal vasculature which reduces retinal sensitivity particularly in presence of a white light stimulus (5). We can postulate that the patient's congenital macrovessel may be the cause of the reduced retinal sensitivity (relative angioscotoma). However larger studies are required to establish this finding.

Reprint requests to:
K. V. Chalam, MD
Department of Ophthalmology
580 W 8th street
Jacksonville, FL 32209, USA
kvchalam@aol.com

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