Optometry (2007) 78, 10-16

Optic disc drusen: Complications and management

Mira Silbert Aumiller, O.D.

Wilmington Veterans Administration Medical Center, Wilmington, Delaware.

KEYWORDS
Disc drusen;
Subretinal neovascular membrane;
Disc edema;
B-scan ultrasound;
Fluorescein angiography;
Non-arteritic ischemic optic neuropathy

Abstract

BACKGROUND: Disc drusen have been found clinically in 0.3% of the population with up to 91% presenting bilaterally. Disc drusen gradually change in their ophthalmoscopic appearance throughout a patient's lifespan. This case highlights the possible ocular complications of disc drusen and the complexity in their treatment because of the risk of visual acuity loss.

CASE REPORT: A 43-year-old patient with documented bilateral buried disc drusen presented without symptoms for a routine examination. A subretinal neovascular membrane (SNVM) one quarter of a disc diameter in size with an adjacent subretinal hemorrhage was observed in the right eye with a small subretinal hemorrhage in the fellow eye. The patient was evaluated by a retinologist who deferred photocoagulation of the SNVM considering its nasal disc location.

CONCLUSIONS: Diagnosing disc drusen is critical because of the serious pathology they can mimic, including disc edema. Although typically benign, patients with disc drusen should be monitored on a regular basis to rule out ocular complications, which can be potentially sight threatening.

Optometry 2007;78:10-16

Case report

A 43-year-old white man presented to the Wilmington Veterans Administration Medical Center for a routine eye examination. His chief complaint was that of recent onset fluctuating vision consistent with fluctuations in his blood sugar levels. The patient's systemic history was positive for diabetes mellitus type 2 for 8 years with insulin control for the last 2 months and hyperlipidemia. His ocular history was remarkable for bilateral optic disc drusen, which had been confirmed previously with B-scan ultrasonography. The patient maintained 20/20 best-corrected visual acuity in the right eye (O.D.) and the left eye (O.S.) with a mildly hyperopic prescription. No afferent pupillary defect (APD) was present. Confrontation visual fields were full to finger count O.D. and O.S., and no restrictions were present with extraocular muscle testing. Slit lamp examination was unremarkable in both eyes (OU) with grade IV open angles by van Herick estimation and no evidence of iris neovascularization OU. Goldmann tonometry was 17 mmHg O.D. and O.S. at 10:50 AM. Dilated fundus examination found buried disc drusen OU, which were most prominent nasally with mild disc elevation O.D. greater than O.S., consistent with documentation from previous fundus examinations. Additionally, there was an area of subretinal elevation with an overlying neurosensory detachment at the 1 to 2 o'clock position off the optic disc margin of the right eye. This lesion measured a quarter disc diameter in size and was suspicious for a subretinal neovascular membrane (SNVM). An adjacent large subretinal hemorrhage O.D. was also present (*see* Figure 1). No vitreal or nerve fiber hemorrhages were present OU. A smaller subretinal hemorrhage was present at 12 o'clock O.S. without evidence of an SNVM (*see* Figure 2). The patient was educated

Corresponding author: Mira Silbert Aumiller, O.D., Wilmington Veterans Administration Medical Center, 1601 Kirkwood Highway, Wilmington, Delaware 19805.

E-mail: msaumiller@yahoo.com

1529-1839/07/$ -see front matter
doi:10.1016/j.optm.2006.07.009

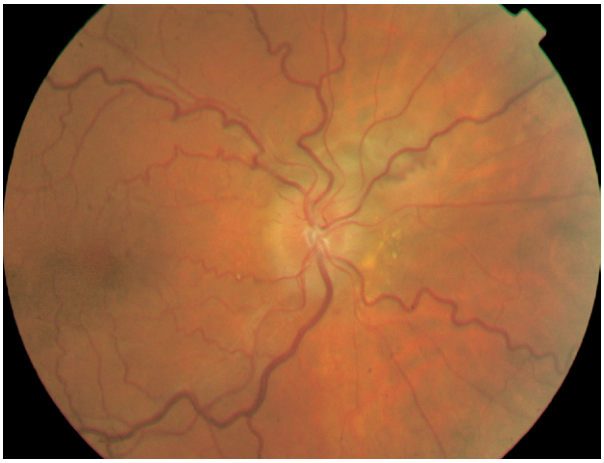

Figure 1 SNVM present at 1:00-2:00 O.D. with adjacent subretinal hemorrhage.

about these findings and was scheduled for the next available fluorescein angiogram.

Autofluorescence of the temporal aspect of the disc O.D. and the entire disc O.S. was observed with red-free photography before fluorescein dye injection (*see* Figure 3). Fluorescein angiography confirmed the diagnosis of SNVM O.D. with classic hyperfluorescence and late leakage, evident by obscuration of the adjacent vasculature.

The patient was referred to a retinologist who recommended a conservative treatment plan considering the location of the SNVM, which was nasal and therefore nonthreatening to the fovea. He was to be followed up by close observation with a dilated fundus examination every 2 to 3 months for any changes in the size of the SNVM O.D. or the development of a SNVM O.S. The patient was educated that fluorescein angiography would be repeated if any changes were detected on dilated fundus examinations. Laser photocoagulation would then be considered by the retinologist if his visual acuity became threatened by either serous or hemorrhagic macular detachment.

Despite multiple attempts to contact our patient, he was lost to follow-up for 18 months. When the patient did return, his only complaint was regarding reading with his current bifocal spectacle prescription. His best-corrected visual acuities were unchanged OU. No APD was present, and results of entrance tests were normal. Dilated fundus examination found a small subretinal fibrotic scar O.D. at the 1 to 2 o'clock position off the optic disc margin (*see* Figure 4). There was no evidence of a new SNVM at this time. The fundus O.S. was clear.

Discussion

The incidence of optic nerve head drusen has been reported as slightly greater than 0.3% of the population with men and women being affected equally.[1,2] Because of its autosomal dominant transmission, the prevalence increases by 10-fold in family members of patients with disc drusen.[3] Disc drusen are most commonly found bilaterally from 67% to 91% of the time.[3,4]

Disc drusen have a dynamic ophthalmoscopic presentation throughout a patient's lifespan, gradually varying in appearance from childhood to adulthood. Disc drusen in children tend to be located deeper within the papilla and have a more "buried" appearance.[4] As the child ages, the disc drusen become increasingly visible as they calcify and enlarge.[2,3] Thus in adulthood, disc drusen are more readily recognized because of their more superficial appearance as discrete, spherical, refracticle bodies.[2-4] Typically the drusen coalesce to encompass the entire disc area.[3] However, in some patients a few drusen are located more predominantly in the nasal region.[3] The calcified deposits have been measured from 5 to 1000 μm in diameter.[5]

Disc drusen have been found to be composed of a different histologic material than that found in macular degeneration.[6] According to most investigators, disc drusen predominantly consist of a mucoprotein matrix that deposits anterior to the lamina cribrosa. These deposits undergo calcification and eventual hyaline body formation contributing to the drusen formation.[4,7,8]

It is most commonly believed that the formation of disc drusen is caused by a chronic obstruction of axoplasmic flow resulting from a narrow scleral opening.[1,4] This chronic obstruction leads to the formation of drusen from axoplasmic derivatives of disintegrated nerve fibers.[4] Consequently, optic disc drusen are rarely observed in black patients whose scleral opening size is typically larger than that of white patients.[4]

Ophthalmoscopic appearance

The ophthalmoscopic appearance of disc drusen in an adult patient is commonly observed as a scalloped border of the disc margins. The clinical changes are localized to the disc, particularly the nasal aspect, which may appear swollen.[9]

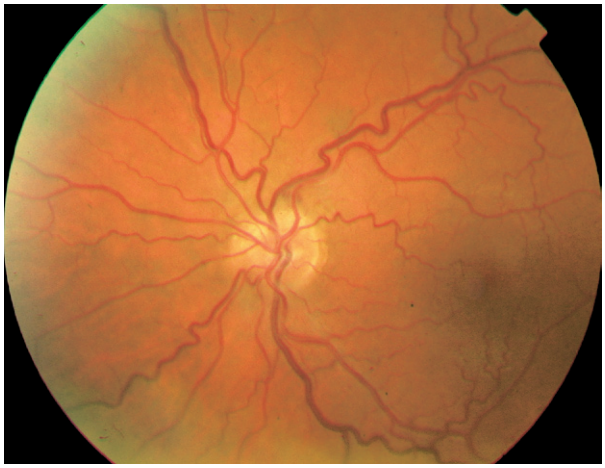

Figure 2 Note the subretinal hemorrhage at 12:00 O.S.