Extensive Drusen in Type I Membranoproliferative Glomerulonephritis

A case of extensive drusen formation associated with type I membranoproliferative glomerulonephritis (MPGN) is reported. Although similar findings have been noted with type II MPGN, to our knowledge this association has not been previously described in type I MPGN.

Report of a Case. A 26-year-old woman was noted to have a fundus abnormality during a routine eye examination. Her medical history was significant for proteinuria and biopsy-confirmed type I MPGN developing in conjunction with meningococcal meningitis and meningococcemia 7 years previously. Serological analyses then showed low C3 and total complement levels. Renal biopsy with light and electron microscopy showed mesangial interposition, scattered subendothelial deposits, abundant immune complex deposits within the mesangium, and focal thickening of the glomerular basement membrane, consistent with type I MPGN. A repeat biopsy 5 years later showed immunohistopathologic staining of IgM and C3 in the mesangial capillary wall and glomerular basement membrane but no dense deposits indicative of type II MPGN. Her mother had senile cataracts. Two siblings were noted to have “normal eye exams” performed elsewhere.

On examination, visual acuity with spectacles was 20/30 OD and 20/20 OS. Near visual acuity was Jaeger 1+ OU. Anterior segment examination results were normal in both eyes. Ophthalmoscopy showed bilateral, multifocal, 200- to 300-µm, yellowish, elevated lesions at the choroid and subretinal pigment epithelial level, concentrating in the posterior pole but extending to the midperiphery (Figure 1). The peripheral lesions were most easily visualized overlying choroidal vessels. Optical coherence tomography showed multiple, optically lucent, focal elevations of the retinal pigment epithelium (Figure 2). Fluorescein angiography and indocyanine green angiography showed staining of lesions throughout the fundi, more numerous than those observed by ophthalmoscopy (Figure 3). Old fundus photographs (not shown) confirmed presence of the lesions 2 years previously, with gradual enlargement and increased confluency until examination 14 months after her initial visit to us. Visual acuity was unchanged.

Comment. Extensive drusen formation has been described previously in association with type II MPGN.1,2 However, a MEDLINE search (1950 until the time of submission) revealed no citations of drusen formation in as-

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sociation with type I MPGN. In a study in which pa-
tients with various glomerulopathies were systematically
examined for drusen, 5 patients with type II MPGN
showed abnormal drusen formation, whereas 6 patients
with type I MPGN showed no fundus abnormalities.1

The fundus lesions are described herein as "drusen." However, they had a somewhat pale, homogeneous, yel-
low appearance similar to small retinal pigment epithelial detachments. The ophthalmoscopic distinction be-
tween large drusen and small serous retinal pigment epithelial detachments is said to be arbitrary.3 In type II
MPGN, Duvall-Young et al1 described the lesions as being "similar" to drusen. They described significant vari-
ation in appearances of the lesions, some showing marked similarity to this case. Histopathologic studies also ap-
pear to justify the term "drusen." In our case, the presence of hypocomplementemia and immunohistologic
staining of C3 in the glomeruli suggests a role of comple-
ment activation in the drusen formation.

Whereas type II MPGN results from disinhibition of the alternative complement pathway, type I MPGN re-
sults from circulating immune complex deposition that
can activate the classic complement pathway. Type I
MPGN may be caused by a number of conditions that
vary in duration and severity. Such variation may ex-
plain the absence of drusen in previously reported cases.
Notably, drusen have also been observed in poststrep-
tococcal glomerulonephritis, leading to the hypothesis
that "distinct forms of glomerulonephritis with distinct
etiologies may all result in the development of large dru-

sen at a relatively early age."4 The case reported herein
further supports that hypothesis. Awareness of this as-
sociation may be important clinically because of the docu-
mented occurrence of choroidal neovascularization with
MPGN-related drusen.5

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Figure 3. Fluorescein angiography shows staining of retinal pigment epithelial lesions in the macula of the right eye (A) and the superior midperiphery of the left
eye (B). Indocyanine green angiography shows late hyperfluorescence of lesions in the temporal periphery of the right eye (C) and concentration of lesions near
the superotemporal vortex veins of the left eye (D).
Norrie disease (ND) is an inherited eye disease caused by mutations in the Norrie disease protein gene, and it is characterized by congenital blindness due to malformations of the retina. Patients are rarely seen before they develop a retinal detachment (RD), and surgical intervention usually fails because of the longstanding RD. We describe a case of ND in which the clinical course and angiographic findings were examined before the development of an RD. A falciform RD developed and lens-sparing vitrectomy reattached the retina.

Report of a Case. A 4-month-old boy was referred because of leukokoria in his right eye. Informed consent was obtained from his parents to perform genetic analyses, and a single base-pair substitution (c.53 T to A) was detected. Slitlamp examination showed a shallow anterior chamber, a clear lens, and a retrolenticular mass in the right eye. Fundus examination showed preretinal and vitreous hemorrhages located between the normal-appearing and dark retina. B-scan ultrasonography showed a pseudoglioma in the right eye.

Fluorescein angiography with a wide-field digital fundus camera (RetCam; Massie Research Laboratories, Inc, Dublin, California) showed that the peripheral dark area was avascular with leakage from the new vessels. The macula was estimated to be at the border of the vascular and avascular retina; however, this region was obscured by the lack of an avascular zone and macular pigment. Confluent photocoagulation with a 532-nm laser was applied to the peripheral avascular retina.

Five months later, a falciform RD, ie, vascularized retinal fold that extends from the temporal margin of the disc and passes across and obscures the macular region with contraction of fibrovascular proliferations (FVPs), had developed. Fluorescein angiography showed fluorescein leakage from the FVPs and nonablated avascular retina located at the nasal peripheral area that had not been observed at the first examination owing to preretinal and vitreous hemorrhages (Figure, B).

Because the retinal fold could lead to a total RD and phthisis bulbi, lens-sparing vitrectomy, ie, vitrectomy without removal of the crystalline lens, was performed. After conjunctival peritomy, a 3-port vitrectomy commonly used for retinopathy of prematurity in our insti-