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# Choroidal Neovascularization in Primary Membranous Nephropathy

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Data Collection B  
Statistical Analysis C  
Data Interpretation D  
Manuscript Preparation E  
Literature Search F  
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2 European Institute of Eye Microsurgery (IEMO), Udine, Italy**Corresponding Author:** Paolo Lanzetta, e-mail: [paolo.lanzetta@uniud.it](mailto:paolo.lanzetta@uniud.it)  
**Conflict of interest:** Paolo Lanzetta: Bayer; Centervue; Novartis Pharma AG**Patient:** **Male, 61-year-old**  
**Final Diagnosis:** **Choroidal neovascularization**  
**Symptoms:** **Decrease in the visual acuity • metamorphopsia**  
**Medication:** —  
**Clinical Procedure:** —  
**Specialty:** **Nephrology • Ophthalmology****Objective:** **Rare co-existence of disease or pathology****Background:** We describe the retinal findings in a patient affected by primary membranous nephropathy (MN).**Case Report:** A 61-year-old man presented with a 3-month history of metamorphopsia and decreased visual acuity in both eyes. He was affected by nephrotic syndrome in primary MN and treated with systemic corticosteroids. Dilated fundus examination, optical coherence tomography, and fundus fluorescein angiography revealed the presence of peripapillary choroidal neovascularization (CNV) in the right eye and peripheral CNV in the left eye. A serous retinal detachment with gravitational tract was also observed in both eyes. The patient was treated with intravitreal bevacizumab in the right eye and oral corticosteroids were discontinued. Both eyes achieved a morphological and functional improvement.**Conclusions:** We present the first case of primary MN associated with CNV, possibly secondary to central serous chorioretinopathy, successfully treated with intravitreal bevacizumab and discontinuation of oral corticosteroids.**MeSH Keywords:** **Central Serous Chorioretinopathy • Choroidal Neovascularization • Glomerulonephritis, Membranous****Full-text PDF:** <https://www.amjcaserep.com/abstract/index/idArt/923454>

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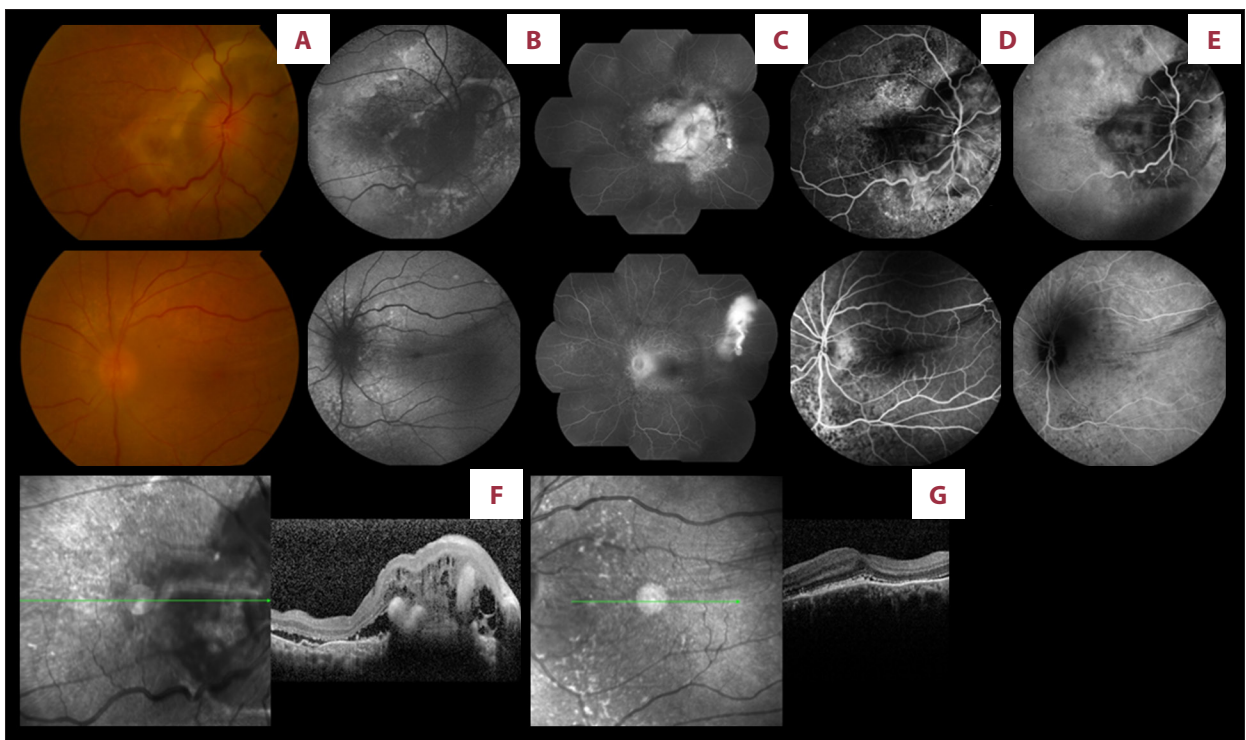


## Background

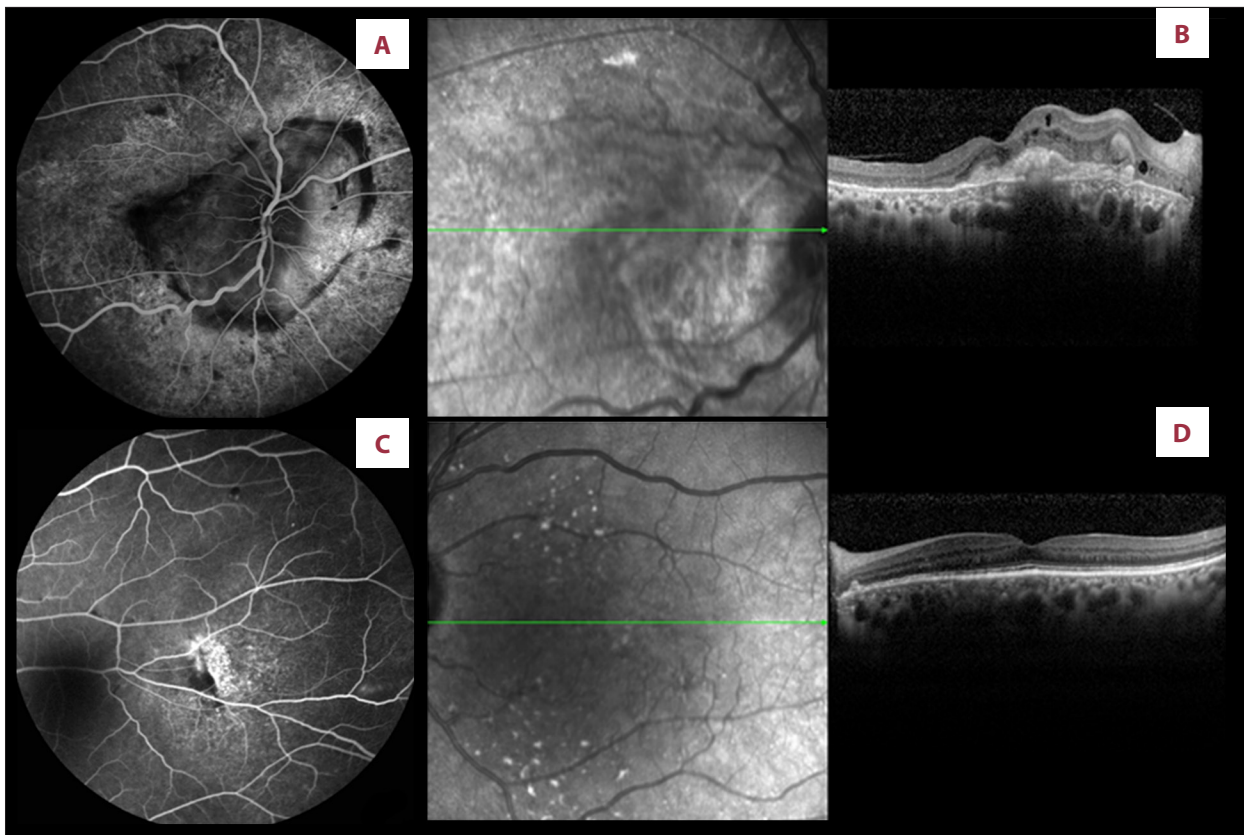
Membranous nephropathy (MN) is the leading cause of nephrotic syndrome in nondiabetic Caucasian adults over 40 years of age, with an incidence of approximately 10 cases per 1 million, resulting in end-stage renal disease over 10 years in one-third of patients [1]. The etiology cannot be identified in up to 80% of cases and the disease is therefore called primary MN. Light microscopy of renal biopsy reveals thickening of capillary walls and presence of immune deposits in glomerular basement membranes. Immunohistology shows positive staining for immunoglobulin G (IgG), especially the IgG4 subclass, and for complement components 3 (C3) and 4d (C4d) [1]. Kidney and choroid have anatomical and histological similarities since both have a large capillary bed made up of fenestrated vessels; thus similar disease processes may affect both sites [2]. A literature review did not reveal any previously described associations between primary MN and ocular abnormalities. To our knowledge, this is the first case of a patient with a history of primary MN complicated by choroidal neovascularization (CNV), possibly associated with central serous chorioretinopathy (CSC).

## Case Report

A 61-year-old Caucasian man came to us with a 3-month history of metamorphopsia and decreased visual acuity in both eyes. Best corrected visual acuity (BCVA) was 20/800 in the right eye and 20/40 in the left eye, with a refractive error of +6.50 diopters in both eyes. Past medical history did not reveal any previous ocular condition. One year earlier the patient was diagnosed with nephrotic syndrome in primary MN and he started treatment with oral cyclosporin 50 mg/day and oral prednisone 12.5 mg/day. Light microscopy analysis of kidney biopsy showed irregular thickening of capillary basement membranes. Immunofluorescence revealed a roughly granular pattern with IgG, C3, and Ig light chain subepithelial staining. Dilated fundus examination of the right eye revealed multiple intermediate-sized drusen at the posterior pole and a peripapillary CNV with subretinal fibrosis extending toward the fovea. Examination of the left fundus showed a CNV in the superotemporal midperiphery. A serous retinal detachment with gravitational tract was also observed in both eyes. Optical coherence tomography (OCT) showed macular subretinal fluid associated with the presence of abundant subretinal hyperreflective material in the right eye and serous detachment of the neuroepithelium in the left eye. Enhanced depth imaging OCT revealed no evidence of pachychoroid in both eyes. Fundus fluorescein angiography (FFA) showed peripapillary and macular leakage



**Figure 1.** Color fundus photography (A), fundus autofluorescence (B), fundus fluorescein angiography (C), late-phase fundus fluorescein angiography (D), late-phase indocyanine green angiography (E) of the patient at baseline (right eye in **upper line**, left eye in **lower line**), and OCT images of the right eye (F) and of the left eye (G) of the patient at baseline.



**Figure 2.** Late-phase fundus fluorescein angiography (A) and OCT image (B) of the right eye after five bevacizumab intravitreal injections; late-phase fundus fluorescein angiography of the superotemporal midperiphery of the left eye (C) and OCT image of the left eye (D) 4 months after discontinuation of oral corticosteroids.

in the right eye and an area of leakage in the superotemporal periphery in the left eye. A granular pattern of hyperfluorescence in intermediate and late phases, consistent with retinal pigment epithelium (RPE) decompensation, was also present in both eyes. Indocyanine green angiography showed diffuse hypercyanescence in late phases in both eyes due to increased choroidal permeability (Figure 1). These findings were consistent with a diagnosis of bilateral CNV possibly associated with CSC. In suspecting a possible role of steroid therapy in worsening the presumed CSC, oral prednisone was discontinued after consulting the patient's nephrologist. The patient received five intravitreal injections of bevacizumab in the right eye. BCVA in the right eye improved from 20/800 to 20/200 and there was an almost complete disappearance of subretinal fluid and a reduction of subretinal hyperreflective material on OCT images. FFA revealed a disappearance of macular leakage in the right eye. BCVA in the left eye improved from 20/40 to 20/25 and OCT images showed a remission of subretinal fluid over a 4-month period. FFA of the left eye revealed an area of hyperfluorescence in the superotemporal midperiphery due to fluorescein staining, without any leakage (Figure 2). After 8 months of follow-up both eyes showed anatomical and functional stability.

## Discussion

Primary MN is a rare condition that constitutes a leading cause of nephrotic syndrome in nondiabetic Caucasian adults over 40 years old [1]. Complement-mediated C3 glomerulopathies (C3G), an uncommon cause of chronic nephritis involving predominantly children and young adults, with an estimated incidence of 1-2 cases per 1 million [3], show histopathological similarities to MN, such as IgG deposits along basement membranes [1,3]. The literature reports an association between C3G and ocular abnormalities such as drusen, RPE irregularities, CSC, and CNV [4,5]. This is probably due to histological similarities between kidney and choroid. Moreover, basal laminar drusen resemble glomerular deposits and their form and size variability may reflect the stage of the underlying renal disease [4]. This parallelism between renal and retinal findings may be valid also for patients affected by primary MN.

We report the case of a patient affected by primary MN complicated by CNV, possibly secondary to CSC. Retinal changes described in this clinical case are similar to those found in patients affected by C3G. However, to our knowledge, this is the first case of primary MN-associated ocular abnormalities described in the literature.

## Conclusions

Clinicians should be aware of the possibility of retinal abnormalities associated with primary MN. The presence of vision loss and metamorphopsia in patients affected by this renal disease should induce the treating clinicians to promptly refer patients to an ophthalmologist to exclude severe complications such as CSC or CNV.

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## Conflict of interest

Tommaso Gambato and Lorena Francescutti: none. Paolo Lanzetta: Bayer; Centervue; Novartis Pharma AG.