Beyond basal laminar drusen: expanded retinal phenotypes in membranoproliferative glomerulonephritis

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INTRODUCTION & BACKGROUND

- **Membranoproliferative glomerulonephritis (MPGN)** is a group of disorders characterized by a common pattern of glomerular injury in the kidney[1]
- It is caused by **complement** cascade dysregulation (Fig 1)
  1. Classical: immune-mediated MPGN
  2. Alternative: C3-mediated MPGN

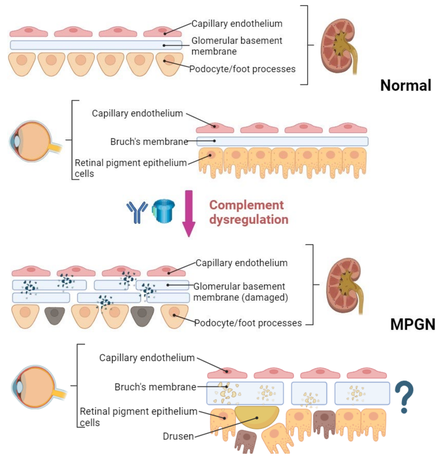


Figure 1: The pathophysiology of MPGN at the cellular level of the kidney and eye[1,2]

- Known **ocular** manifestations of the condition include[2-5]:
  a) Basal laminar **drusen**
  b) Choroidal **neovascularization**
  c) Retinochoroidal **atrophy**
  d) Central serous **chorioretinopathy**

PURPOSE

- To describe a range of retinal manifestations of MPGN

METHODS

- Retrospective, single-centre observational case series
- Patients with ocular pathology and renal biopsy-confirmed MPGN, seen in a specialist eye clinic between 2006-2023
- Multimodal imaging and electronic health records were reviewed
- Data collected on demographic parameters and disease course, including changes in visual acuity (VA) or ocular pathology

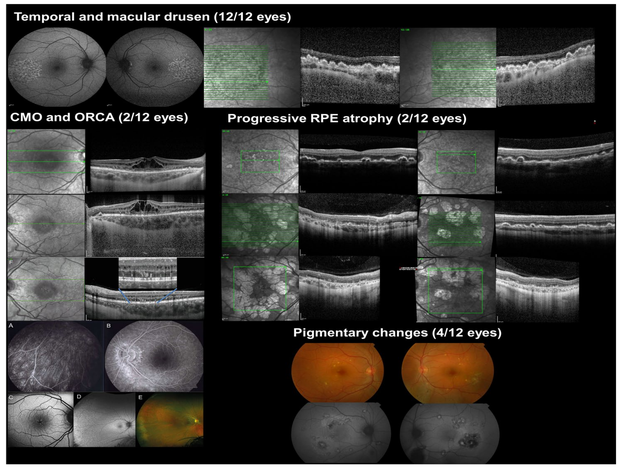


Figure 2: Fundus photographs and OCTs of patients with MPGN. Temporal and macular drusen (OCT from N1), CMO and ORCA from OCT, FA and colour photographs of patient 2 (N2), Progressive RPE atrophy (N4), Drusen and pigmentary changes (N3)

RESULTS

- Total of **6 patients (12 eyes)** included
- Mean (SD) age at presentation to eye clinic: 32.8 (±14) years
- Mean (SD) duration of follow-up: 4.5 years (±4.5)
- VA was >6/12 for all patients by end of follow-up
- All patients had bilateral basal laminar drusen at presentation
- 4/12 eyes had pigmentary changes, 2/12 show progressive RPE atrophy (Fig 2)
- 2/12 eyes demonstrated cystoid macular oedema (CMO) and outer retinal columnar abnormalities (ORCA) on OCT[6] (Fig 2)

N	Age	Sex	Diagnosis (age of onset)	Affected eye(s)	Initial BCVA		Follow up (y)	Final BCVA		Clinical phenotype and course
					RE	LE		RE	LE	
1	34	M	MPGN II (13)	BE	6/5	6/5	0.5	6/5	6/5	Stable temporal drusen
2	18	F	MPGN II (11)	BE	6/12	6/12	3.3	6/9	6/9	Stable temporal and macular drusen, CMO and ORCA (decrease)
3	45	M	MPGN I (31)	BE	6/5	6/5	3.2	6/5	6/6	Macular drusen, pigmentary changes
4	35	M	MPGN II (13)	BE	6/6	6/6	12.2	6/6	6/6	Basal laminar drusen, progressive RPE atrophy, and left choroidal neovascular complex
5	50	F	MPGN II (-)	BE	6/9	6/6	0.6	6/9	6/9	Bilateral peripheral retinal drusen
6	15	F	MPGN II (10)	BE	6/6	6/6	7.2	6/5	6/6	Bilateral macular drusen; stable

Table 1: Demographic and diagnostic profiles of patients with ocular manifestations of MPGN

CONCLUSION & FUTURE OUTLOOK

- Expanded retinal phenotypes in the context of biopsy-proven MPGN are described in the series
- There is phenotypic variation and heterogeneity in MPGN, though the underlying aetiology is complement dysfunction[1]
- Future longitudinal studies genotyping the cohort would elucidate molecular mechanisms and guide therapeutics

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Figure 1 created with BioRender.com

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A Tufail: Allergan (C); Allegro (C); Adverum (C); Annexon (C); Apellis (C); Bayer (C, F); Genetech (C); Heidelberg Engineering (C); Iveric Bio (C); Kanghong Pharmaceuticals (C); Kodiak Sciences (C); Novartis (C, F); Oxurion (C); Roche (C)

C Egan: Heidelberg Engineering (C); Inozyme Pharma (C)

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