

Morphological classification of Membranoproliferative GN (MPGN)

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Case scenario

These are representative images of a renal biopsy from a 41-year-old female with a short history of high-grade fever, oliguria, and shortness of breath. The laboratory investigations showed a rapidly rising trend of serum urea and creatinine. These were 151 mg/dl and 5.35 mg/dl, respectively, on the day before the biopsy.

The biopsy was adequate with both cortex and medulla. Upto 26 glomeruli were included. All glomeruli were abnormal. Some of the representative glomeruli with pathologic lesions are shown in the following images.

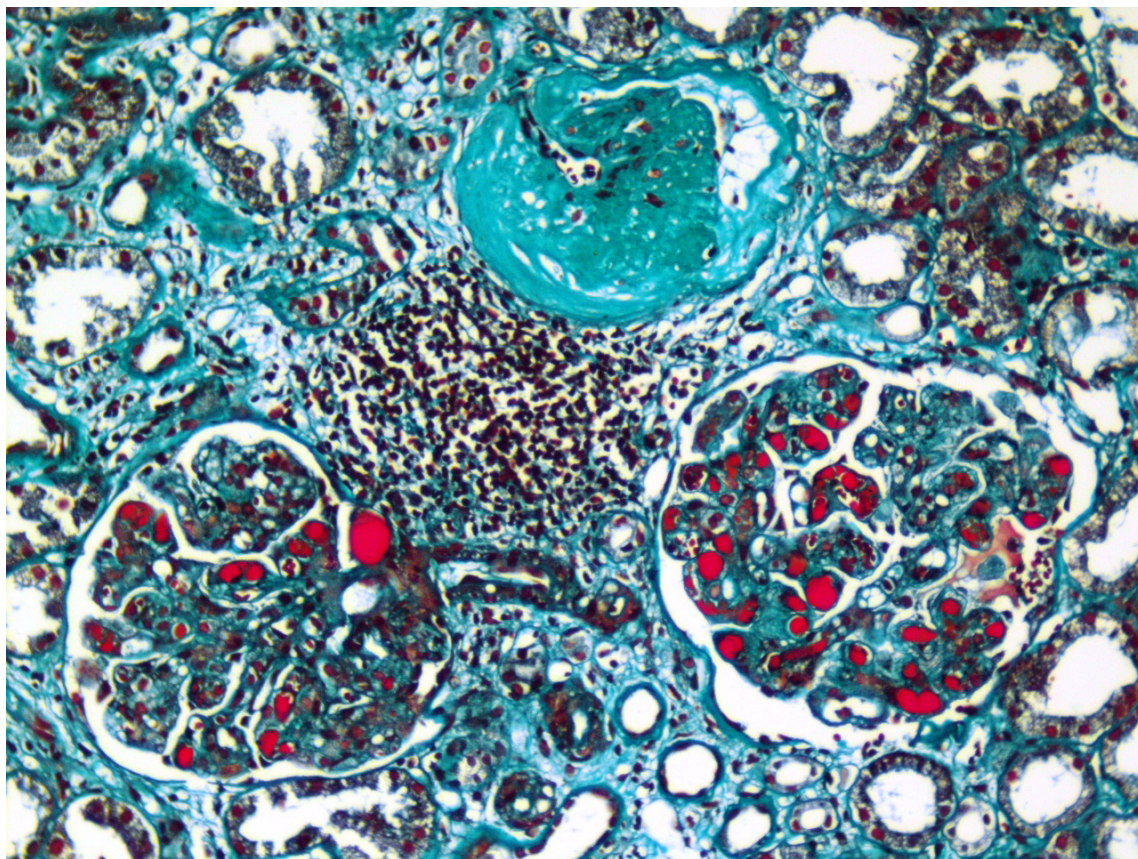


Figure 1. Medium-power view showing renal cortex with three glomeruli. Of these, one at the top is globally sclerosed, most likely from ischemic solidification. The remaining two glomeruli are hypercellular, enlarged in size, and showing

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obliteration of the capillary lumina. Many capillary lumina are filled with homogeneous, deep pink material. There is a dense patch of lymphocytic infiltrate in the interstitium and mild interstitial fibrosis. (Trichrome stain, $\times 200$).

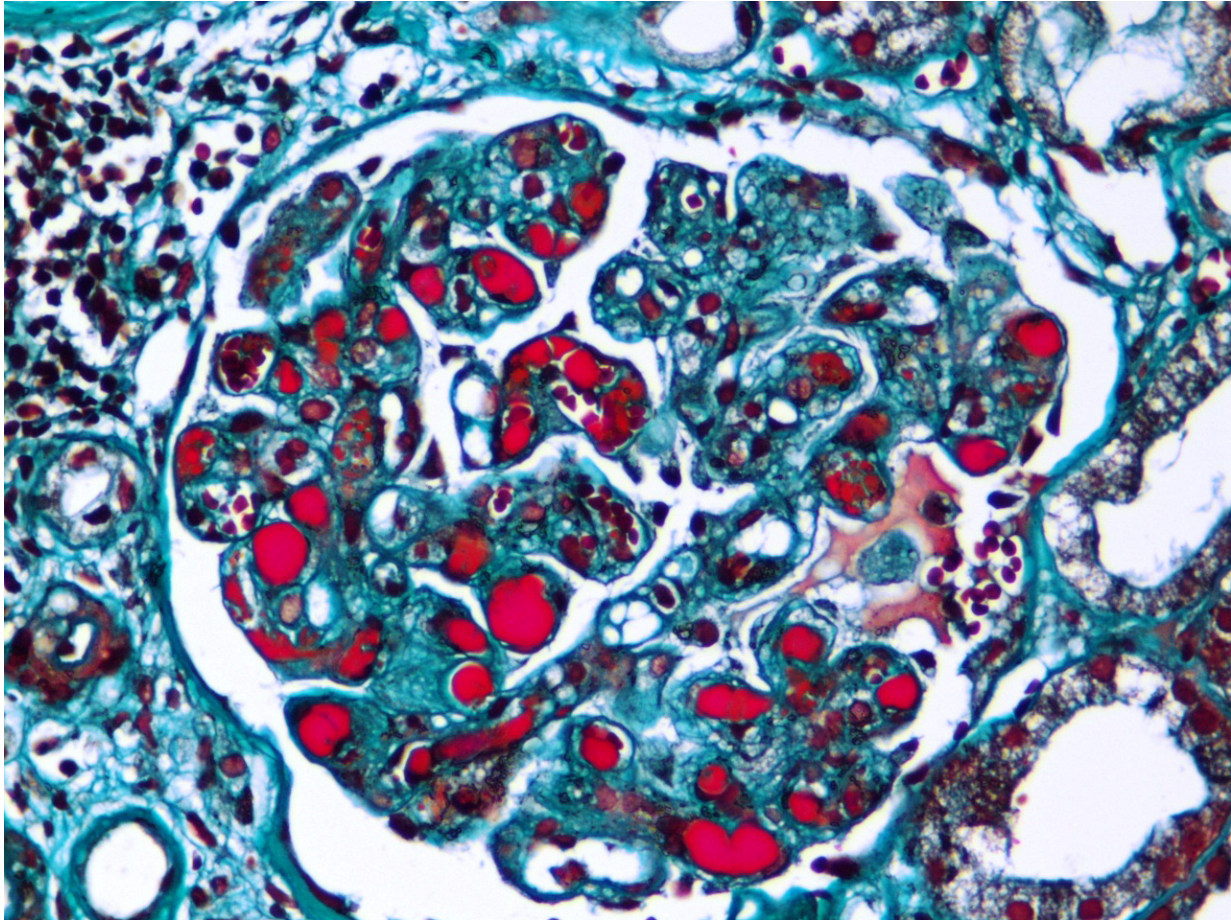


Figure 2. High-power view showing the detailed structure of one of the two abnormal glomeruli noted in Figure 1 above. Notably, the glomerulus is enlarged, has prominent lobulation, and exhibits marked obliteration of capillary lumina by dense, homogenous, and bright pink material. This material comprises of immune complex deposits in the walls and lumina of glomerular capillaries and is designated as wireloop lesions and hyaline thrombi, respectively. There is mild interstitial inflammation. (Trichrome stain, $\times 400$).

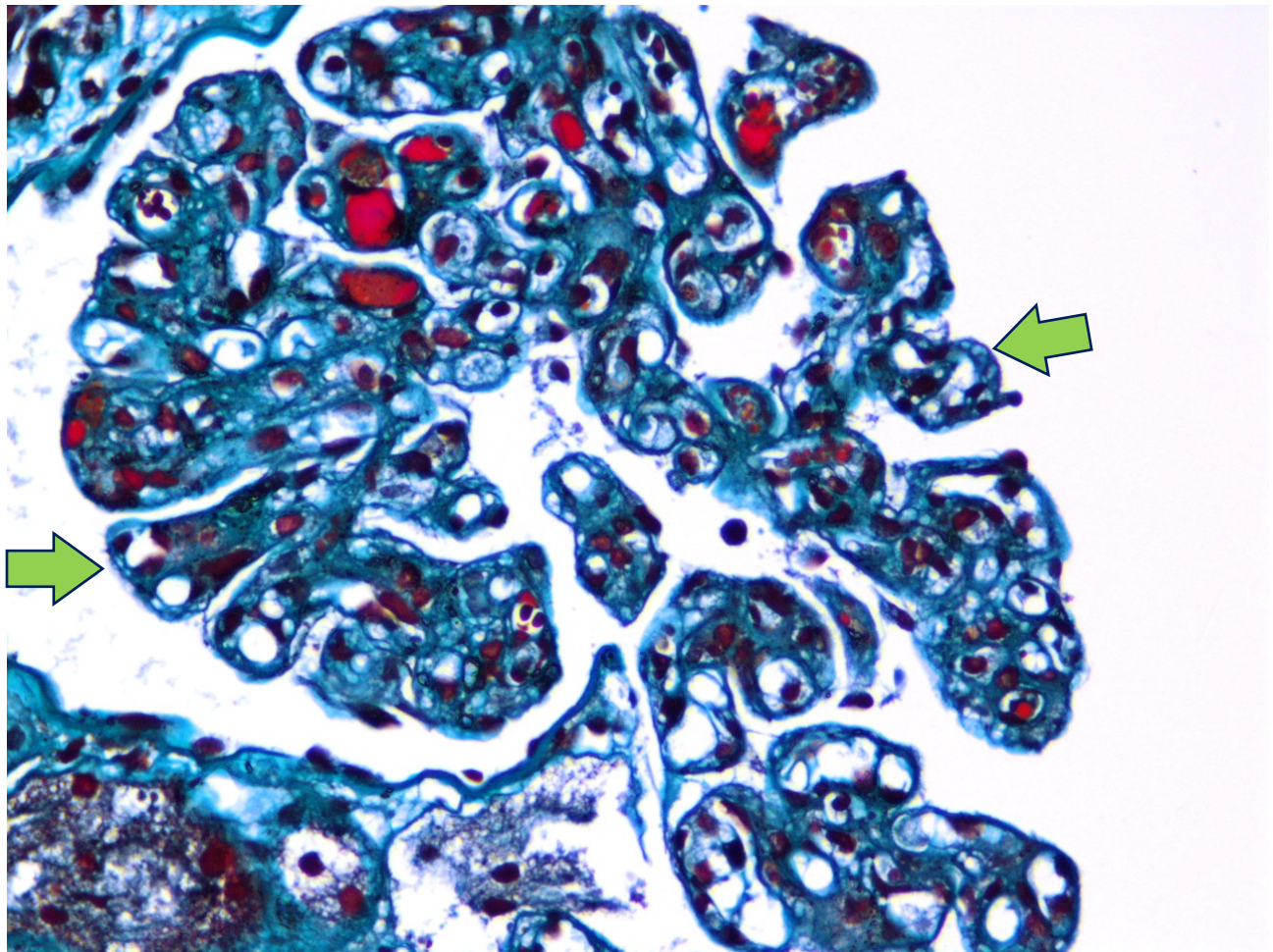


Figure 3. High-power view of one another glomerulus from the same biopsy prominent double contouring of many capillary walls (arrows) in a morphological pattern of glomerular injury designated as MPGN. Some capillary lumina are filled with hyaline thrombi. (Trichrome stain, $\times 400$).

Questions

- Q1. What is the rationale behind naming this lesion as MPGN?
- Q2. What morphological type of MPGN is this particular case?
- Q3. What are other morphological types of MPGN?

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Answers

Answer 1. This morphological pattern of glomerular injury is designated clinically as MPGN because of the involvement of the capillary walls in the disease process. There is reduplication of glomerular basement membranes leading to tram-track appearance on silver and other special stains (Figure 3). This double contouring leads to obliteration of capillary lumina or their marked narrowing, hence, the designation of Membranoproliferative. Pathologists prefer the term mesangiocapillary GN for this pattern of injury.

Answer 2. This particular type of MPGN is designated as MPGN with massive deposits. It is seen in only a handful of conditions such as lupus nephritis and cryoglobulinemia. Hence, its recognition is crucial for accurate diagnosis of the underlying disease condition.

Answer 3. There are six different morphological types of MPGN. These include: Classic, Focal segmental, Exudative, MPGN with massive deposits, Crescentic, and Nodular forms. Some also include a cellular form of MPGN.