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Case Report

Anti-GBM antibody disease sans crescents with thrombotic microangiopathy

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Abstract

We report a case of a 38-year-old male with acute renal failure, elevated anti-glomerular basement membrane (anti-GBM) antibody titres, bilateral nodular lung opacities and hypertension. In the renal biopsy examination, whereas direct immunofluorescence revealed significant peripheral linear deposits of IgG typical of anti-GBM antibody disease (Goodpasture's disease), eosin–haemotoxylin staining showed glomerular and vascular changes typical of thrombotic microangiopathy (TMA) and without crescents. We postulate that the TMA was responsible for the acute renal failure and that antibodies, though demonstrable, were not adequate at the site of the glomerular basement membrane to elicit a crescentic response, because of occlusion of the vascular lumina by the thrombotic process. The patient remained dialysis dependent at a 3-month follow-up.

Keywords: anti-GBM antibody disease; Goodpasture's disease; thrombotic microangiopathy

Introduction

Anti-glomerular basement membrane (anti-GBM) antibody disease with or without lung involvement is the prototype of a crescentic glomerulonephritis, with varying crescents in the renal biopsy and with peripheral linear deposits of IgG on immune study. Thrombotic microangiopathy (TMA) characterized by thrombotic events in the microvasculature is also not an uncommon cause of a rapidly progressive renal failure and has been reported in conjunction with conditions such as membranous glomerulonephritis, ANCA-associated vasculitides and SLE. TMA in association with anti-GBM antibody disease is distinctly rare. We report one such case of Goodpasture's disease, where the renal biopsy had findings of TMA sans crescents.

Case report

A 38-year-old male chronic smoker presented with a 10-day history of fever with chills associated with headache, haemoptysis and discharge of dark-coloured urine. Clinical examination revealed pallor and bilateral lung crepitation; his blood pressure was 160/100 mmHg, and mild hypertensive changes were detected on fundal examination.

Significant findings from laboratory tests were haemoglobin, 6.8 g/dl with 1–2% schistocytes and occasional nucleated erythrocytes; serum creatinine, 8.3 mg/dl; bilateral nodular opacities on the chest roentgenogram.

The c-ANCA, p-ANCA and ANA serology was negative, but the anti-GBM antibody titre, (by the enzyme-linked immunosorbent assay method) was strongly positive.

The patient was initiated on haemodialysis, and after two courses of total plasma exchange and 2 days of treatment with 500 mg methyl prednisolone, a renal biopsy was performed.

The biopsy showed 18 glomeruli, one of which was obsolescent, two others showed segmental changes of a simplification of the tuft and mesangiolysis and the remaining were essentially normal with no segmental lesions or crescents. The vessel changes were prominent in the form of eosinophilic fibrinoid deposits in the walls of the arterioles, an occasional arteriolar lumen plugged by fibrin thrombus, and prominent subintimal myxoid thickening of the larger interlobular arteries (Figure 1).

Direct immunofluorescence study showed significant linear deposits of IgG along the glomerular capillary basement membrane (Figure 2) with deposits of kappa and lambda light chains in a similar pattern. There were no significant deposits of IgM or complement in the glomeruli, but irregular deposits of IgM and C3c were seen in the vessel walls.

The diagnosis was concluded as TMA with glomerular and vascular changes. Although the linear pattern of anti-IgG typical of anti-GBM antibody disease was present, crescents typical of the condition were not seen.

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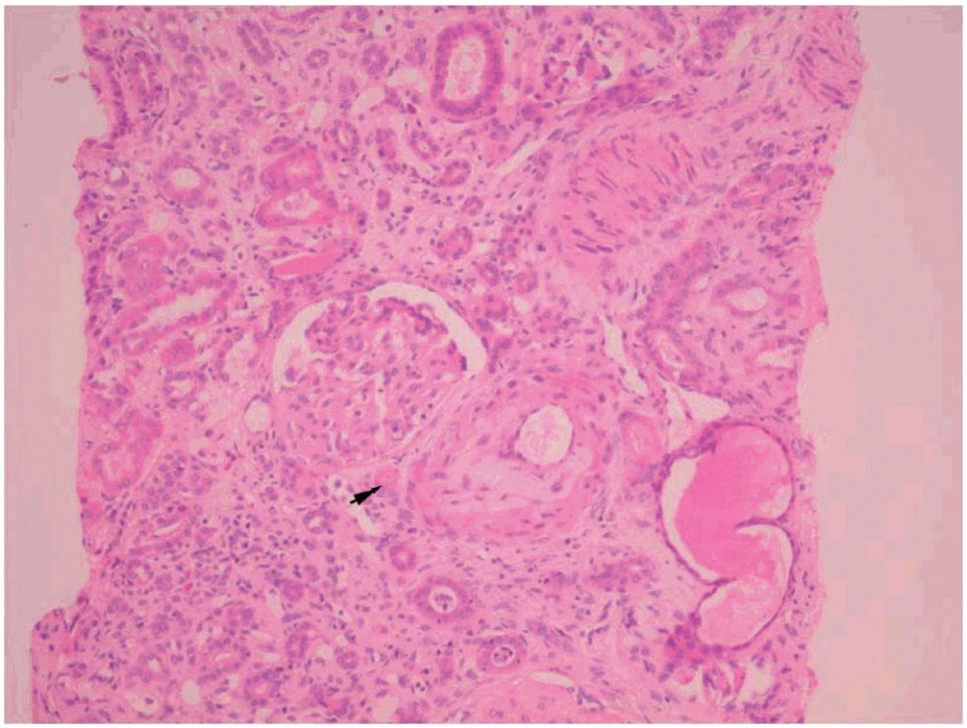

Fig. 1. Interlobular artery showing prominent intimal myxoid thickening, with an adjoining arteriole (arrowhead) showing fibrin thrombus occluding lumen. The glomerulus shows mild ischaemic changes with no crescent (HE100 ×).

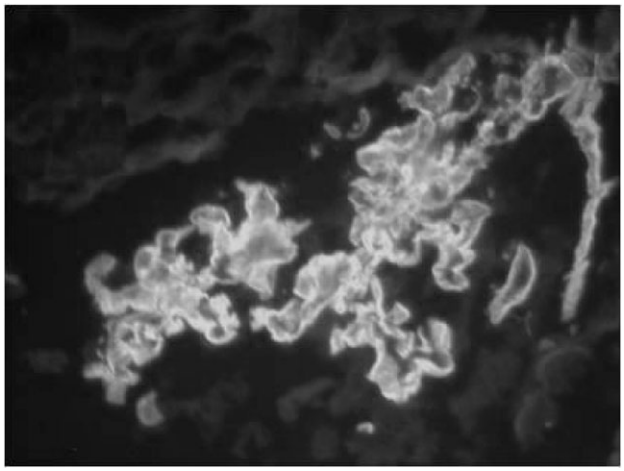

Fig. 2. Peripheral linear deposits of IgG. No crescent (FITC-labelled antiIgG, 200×).

The patient was continued on a further nine courses of total plasma exchange and methyl prednisolone, at the end of which the anti-GBM titre was only weakly positive. At 3 months of follow up, he continues to remain dialysis dependent.

Discussion

Crescentic glomerulonephritis is the hallmark of anti-GBM antibody disease and is seen in up to 97% of these patients with > 50% crescents seen in 85% of them. TMA in association with anti-GBM antibody disease is rare, and the reported cases have essentially been crescentic glomerulonephritis with superimposed TMA [1–4]. It has been suggested that the TMA may contribute to the anaemia and renal failure in these patients.

However, there are no reports of a case similar to ours with acute renal failure, lung involvement, positive anti-GBM antibody titres and the biopsy showing significant linear deposits of IgG without any crescents and with features of TMA. We postulate that the cause for renal failure in this young patient was thrombotic microangiopathy probably secondary to accelerated hypertension. He had an underlying Goodpasture's disease as evidenced by the high titre of anti-GBM antibodies, lung opacities and peripheral linear deposits of IgG in the glomeruli. However, occlusion of the microvasculature secondary to TMA prevented adequate antibodies from reaching the glomerular basement membrane and eliciting the crescentic response. This case taken together with the earlier reports [1–4] also suggests the existence of a possible etiopathogenetic association between TMA and Goodpasture's disease that needs to be further explored.

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Conflict of interest statement. None declared.

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