Correspondence on 'Bowman's capsule rupture on renal biopsy improves the outcome prediction of ANCA-associated glomerulonephritis classifications'

Bowman's capsule rupture was first reported more than 30 years ago and only few case reports described its presence in diseased kidneys to date.[1] We read with great interest the recent article by L'Imperio *et al* reporting that presence of Bowman's capsule rupture was significantly associated with renal outcome in patients with antineutrophil cytoplasm antibodies (ANCA)-associated glomerulonephritis (GN).[2] Furthermore, a better performance of the established histopathological subtyping proposed by Berden *et al* and Brix *et al* was observed after the implementation of Bowman's capsule rupture to the classification systems.[2–4] While these findings are of great interest and require further validation, the overall prevalence of Bowman's capsule rupture in ANCA GN remains elusive. Here, we describe the frequency of Bowman's capsule rupture within 44 renal biopsies with confirmed ANCA GN.

In our single-centre cohort, we observed the presence of extensive Bowman's capsule rupture according to L'Imperio *et al* (figure 1A). Quantitative analysis revealed that this lesion was present in 9/44 (20.5%) of renal biopsies (figure 1B). Within renal biopsies with Bowman's capsule ruptures, 7.2% of total and 12.7% of crescentic glomeruli were affected by this lesion (figure 1C). Interestingly, we also observed focal Bowman's capsule rupture in 23/44 (52.3%) of renal biopsies (figure 1D,E), affecting 15.7% of total and 29.2% of crescentic glomeruli (figure 1F). In summary, extensive Bowman's capsule rupture according to L'Imperio *et al* was present in a considerable subset of renal biopsies in this cohort. In addition, focal Bowman's capsule rupture with less extensive lesions was observed even more frequently in ANCA GN.

In early stages of ANCA GN, neutrophilic infiltration into the capillary lumen has been proposed with consecutive destruction of the glomerular basement membrane and designated glomerular tuft necrosis, which reflects focal segmental necrotising GN. Thereafter, extracapillary cellular proliferation forms the crescent occupying the glomerular capsule circumference. Progressive inflammation destroys the basement membrane of the Bowman's capsule followed by the recruitment of inflammatory cells into the interstitial lesions surrounding injured glomeruli thereby causing tubulointerstitial damage and tubulointerstitial nephritis.[5] Since the tubulointerstitial compartment contains peritubular capillaries supplying oxygen for a major fraction of renal parenchyma, it is possible that Bowman's capsule rupture and tubulointerstitial damage may cause local hypoxia, aggravating tubular damage and renal outcome in ANCA GN.[6] Moreover, a relationship between tubulointerstitial and glomerular damage has also been proposed, further supporting an interplay between glomerular and tubulointerstitial lesions.[7]

In conclusion, we show that Bowman's capsule rupture is frequent in ANCA GN and observed in a subset of renal biopsies in our single-centre cohort. Moreover, focal Bowman's capsule rupture with less extensive lesions is even more frequent in ANCA GN. Based on the recent findings by L'Imperio *et al* that Bowman's capsule rupture was significantly associated with renal outcome in patients with ANCA GN and our observation that Bowman's capsule rupture affects a considerable subset of patients, this issue requires further investigation especially with regard to distinct extensive or focal lesions.

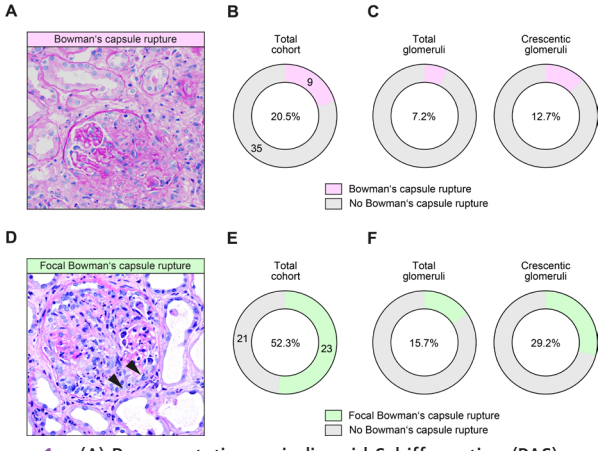

Figure 1 (A) Representative periodic acid-Schiff reaction (PAS) photomicrograph of extensive Bowman's capsule rupture according to L'Imperio *et al*. (B) Frequency of extensive Bowman's capsule rupture in the total cohort of 44 renal biopsies. (C,D) Within renal biopsies with extensive Bowman's capsule ruptures, the fractions of total and crescentic glomeruli affected by this lesion are shown. (E) Representative PAS photomicrograph of focal Bowman's capsule rupture. (F) Frequency of focal Bowman's capsule rupture in the total cohort of 44 renal biopsies. (G,H) Within renal biopsies with focal Bowman's capsule ruptures, the fractions of total and crescentic glomeruli affected by this lesion are shown.

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