Spicular Cap of Amyloid on the Outer Aspect of the Bowman's Capsule

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Dear Sir,

Spicular formation in renal amyloidosis is not only of great morphological interest but is also a valuable aid in the diagnosis of early amyloidosis by light microscopy [1]. This variant of amyloid deposits is defined as argyrophilic perpendicular projections on the epithelial side of the glomerular basement membrane (GBM) [2]. Spicules have also been observed on the epithelial side of the tubular basement membrane, the inner aspect of the Bowman's capsule and, rarely, the endothelial side of the GBM [1, 3]. In a clinicopathological study of 61 cases of renal amyloidosis [4], we encountered a unique occurrence of this structure on the outer aspect of the Bowman's capsule.

A 50-year-old woman presented with severe bone pain of her right arm and left fingers, anorexia and diarrhea in June 1983. X-ray examination revealed punched out lesions of the skull. Relevant laboratory tests showed mild anemia (erythrocyte count, $306 \times 10^9/\text{mm}^3$; hemoglobin, 10.1 g/dl) and monoclonal hypergammaglobulinemia (IgG, λ -type, 2,190 mg/dl). Moderate proteinuria of 2 +, Bence Jones proteinuria and a few erythrocytes were found on urinalysis. There was neither nephrotic syndrome nor renal dysfunction. Atypical plasma cells constituted 16.6% of aspirated bone marrow cells. Renal and rectal biopsies revealed amyloid deposition of glomeruli and small blood vessels in the mucosa, respectively. Thus she was diagnosed as suffering from multiple myeloma associated with systemic amyloidosis. In July 1983 treatment with cyclophosphamide and prednisolone was started. In September 1983 the patient developed congestive heart failure; she died on November 3, 1983.

An autopsy revealed generalized amyloid deposits mainly affecting the blood vessels of all organs examined. The kidneys were swollen, weighing 250 and

Fig. 1. a Note three amyloid deposits on the outer aspect of the Bowman's capsule. Amyloid deposits are also present in the mesangium and scattered on the epithelial side of the glomerular capillary wall, b Amyloid on the Bowman's capsule showing apparent spicular structure. Movat's silver staining, a $\times 600$. b $\times 1,200$.

260 g. Microscopically, there was diffuse deposition of amyloid in glomeruli, tubules, small arteries and arterioles. Amyloid deposits were identified as AL protein, based on negative stainability with anti-AA protein and antiprealbumin sera and resistance to KMnO₄ treatment

before Congo red stain [4]. In the glomeruli amyloid affected diffusely the mesangium and inner as well as

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outer side of the glomerular capillary wall. Spicular arrangement was often noted on the epithelial side of the GBM and tubular basement membrane. It was surprising that spicules were scattered on the outer aspect of the Bowman's capsule (fig. 1). Cast nephropathy due to myeloma was concomitant with amyloidosis.

The connection between the epithelial cells and the spicular formation of amyloid deposits within the kidney has been investigated [1, 4, 5]. It is worth noting that this peculiar organization is usually found in association with epithelial cells of the glomerulus and tubules [1]. It is, therefore, generally accepted that amyloidogenic precursors present within the blood stream are filtered through the glomerular capillary wall and react in some way with epithelial cell products to form this unique variant of amyloid [1, 4, 5]. However, the present case showed the occurrence of spicules on the outer, not inner, aspect of the Bowman's capsule which is devoid of an epithelial lining. This finding stands against the above-mentioned hypothesis. To our knowledge, this phenomenon has never been described in the English literature.

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