Tubular metaplasia in Bowman's capsule

A. MILFORD WARD

From the Department of Pathology, University of Sheffield

SYNOPSIS Proximal tubular type metaplasia of the epithelium of Bowman's capsule described in a fit young adult male. This form of metaplasia is unlike those previously described and could cause initial confusion if encountered in a percutaneous renal biopsy.

The upper part of the nephron can be divided into the renal corpuscle, or Bowman's capsule, the neck portion, and the proximal tubule (Rouiller, 1969). In man Bowman's capsule is lined by an inconspicuous layer of flattened squamous cells (Allen, 1962; Brewer, 1964; Heptinstall, 1967); in the mink and mouse the parietal capsular epithelium is cuboidal (Crabtree, 1940; Rouiller, 1969). The neck portion, seen in lower animals but not in man, is lined by an epithelium which has the cytological characteristics of the proximal tubule (DuBois, 1969). Two types of metaplasia of the capsular epithelium have been described, an adenomatoid type (Eisen, 1946; Chappell and Phillips, 1950; Nachman, 1962; Macpherson, 1963) and a columnar type (Lloyd Thomas, 1953; Finckh and Joske, 1954). A third variety is now described.

Case Report

A fit young adult male (aged 19) died from multiple injuries sustained in a road traffic accident. Necropsy revealed no evidence of pre-existing disease. The kidneys were of normal size, weight, and texture.

HISTOPATHOLOGY

Twenty-five per cent of the glomeruli show a high cuboidal epithelium replacing the normal flattened epithelium of Bowman's capsule. The cuboidal

epithelium is usually situated opposite to the vascular pole of the glomerular tuft, but may extend around much of the capsule (Figs. 1 and 2). The cells have regular nuclei situated towards the basal pole of the cell, and an eosinophilic cytoplasm. Some cells show some basal striations whilst all show a prominent brush border which stains intensely with the periodic-acid-Schiff (PAS) method. The cytological characteristics are identical to those of the neighbouring proximal tubular epithelial cells. In some glomeruli direct continuity can be demonstrated between the proximal tubular epithelium and the metaplastic epithelium of Bowman's capsule (Figs. 3 and 4). No other abnormalities were detected in the kidney.

Discussion

Instances of metaplasia of the capsular epithelium are reported rarely in the literature, and one must assume that this is an uncommon finding. The two types so far described differ on cytological and clinical grounds (Table).

The adenomatoid type (Eisen, 1946) occurs in both sexes and at varying ages. All patients have advanced, disseminated malignancy, usually involving the liver. The columnar type (Lloyd Thomas, 1953) occurs in both sexes but all patients are under 25 years. No patient in this group has any evidence of malignant disease, although four had diabetes (Finckh and Joske, 1954).

The present case, representing a third variety

Fig. 1 Glomerulus showing prominent tubular metaplasia of the capsular epithelium opposite the vascular pole of the glomerulus. Haematoxylin and eosin $\times 125$.

Fig. 2 Tubular metaplasia with prominent brush border. Periodic acid Schiff $\times 125$.

Fig. 3 Glomerulus showing continuity between metaplastic capsular epithelium and tubular epithelium. Haematoxylin and eosin $\times 125$.

Fig. 4 Glomerulus showing continuity between metaplastic capsular epithelium and tubular epithelium. Note the prominent capsulo-tubular junction. PAS $\times 125$.