Nephrotic Syndrome Associated with Malignant Mesothelioma

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Discharge

Admission

Total protein

•Albumin

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Dear Sir,

The association between nephrotic syndrome and malignancy has been well documented [1-3]. Several types of glomerular injury have been noted in patients with cancer [2], and the neoplasms that have been implicated include a variety of histological types from different primary sites [3]. We present a case with nephrotic syndrome associated with malignant mesothelioma.

A 77-year-old man was admitted to our hospital with systemic edema, generalized weakness, and fatigue. Two years previously he had a pneumonia, at which time urinalysis showed no protein. He had not been receiving any medications. He had been working as an engineer on a ship and had been exposed to asbestos approximately 40 years prior to admission.

Physical examination: On auscultation of his lungs, there were decreased breath sounds and some moist rales on the left. Heart sounds and abdomen were normal, and there was no lymphadenopathy. There was pitting edema of the whole body.

Laboratory values included the following: total serum protein 5.4 g/dl, serum albumin 1.3 g/dl, total serum bilirubin 0.2 mg/dl, serum glutamic-oxaloacetic transaminase 32 IU/l, serum glutamic-pyruvic transaminase 22, alkaline phosphatase 556 IU/l, blood urea nitrogen 14 mg/dl, serum creatinine 0.8 mg/dl, Na 130 mEq/l, K 3.7 mEq/l, Ca 6.4 mg/dl, P 2.8, serum glucose 141, total cholesterol 184, triglycerides 107 mg/dl, erythrocyte sedimentation rate 50 mm/h, hemoglobin 8.9 g/dl, hematocrit 27.4%, white blood cell count $11.1 \times 10^9/\mu\text{l}$ (with an increase in

neutrophils), platelets $551 \times 10^9/\mu\text{L}$, IgG 1,320 mg/dl, IgA 825, IgM 152 mg/dl, and CH₅₀ 64.2/ml; circulating immune complexes, antinuclear antibody, and rheumatoid

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Fig. 1. Clinical course. The arrows show the chemotherapy cycle (carboplatin 100 mg/day, etoposide 100 mg/day, methylpredni-solone 250 mg/day). Total serum protein and serum albumin levels increased, and the urine total protein level decreased after chemotherapy. factor were negative. Serum and urine immunoelectrophoresis showed no evidence of an M component. Urinalysis revealed protein-uria without selectivity, microscopic hematuria, and a few hyaline casts. The 24-hour urinary protein excretion was 13.5 g/day, and his creatinine clearance was 88.5 ml/min.

Chest roentgenograms showed multiple large nodules along the left side of the thorax and a pleural plaque on the right. Computed tomography revealed pleural thickening around the left lung. A needle biopsy spe-

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cimen of the left pleura revealed an area consistent with malignant mesothelioma. The patient became anorexic and weak and was subsequently treated with a 3-day course of carboplatin 100 mg/day and etoposide 100 mg/day. He also received methylpredni-solone sodium succinate 250 mg/day for 3 days followed by prednisolone 20 mg/day to reduce side effects (fig. 1). His urinary protein excretion decreased, and 1 month later a second course of chemotherapy was administered. The patient's strength and appetite im-

tient had proliferative segmental glomerulonephritis. This histological type has rarely been seen in nephrotic patients with malignancies [6].

In our patient chemotherapy was effective in treating his nephrotic state. Schroeter et al. [4] reported that proteinuria did not respond to treatment with prednisolone and cyclo-phosphamide, but improved during treatment with doxorubicin hydrochloride and dacarbazine, also without noticeable effect on tumor growth. Our clinical data and laboratory examination allow us to exclude other causes of nephrotic syndrome except malignancy, though it is unknown whether the nephrotic syndrome responded to steroids or chemotherapy. Clinical presentation and course of our patient suggest that he may be another example of an association of nephrotic syndrome with mesothelioma.

Fig. 2. Renal histopathology by biopsy. Glomerulus showing mild segmental mesangial cell proliferation. Periodic acid-schiff. $\times 400$.

proved considerably, and his edema almost disappeared. A 24-hour urine collection revealed only 0.15 g protein. Total serum protein and serum albumin levels rose to 6.7 and 2.5 g/dl, respectively. However, tumor growth was not suppressed.

A subsequent renal biopsy specimen showed light microscopically a mild segmental mesangial proliferative glomerulonephritis (fig. 2). Immunofluorescence staining for IgG was positive in

capillary loop and mesangium, and IgA, IgM, C3, and fibrinogen stained slightly positive in the same areas. Electron microscopy showed segmental mesangial cell proliferation and increased matrix. Electron-dense deposits were seen in the mesangial area. The patient was discharged after nearly 4 months, but was readmitted 1 month later with anorexia and emaciation. He died shortly thereafter.

Malignant mesothelioma is a comparatively rare disease which is highly associated with asbestosis. Only 2 cases of nephrotic syndrome associated with mesothelioma have previously been reported [4, 5]. The histological findings of the 2 previously reported cases were minimal-change nephropathy [4] and membranous nephropathy [5]. Our pa-

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