Treatment of a Case of Mesangioproliferative Glomerulonephritis Secondary to *Echinococcus alveolaris* with Albendazole

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**Abstract**

Parasitic infections lead to significant morbidity and mortality, especially in tropical regions. The renal damage caused by these infections occurs via various mechanisms. Two forms of parasitic echinococcus infection widely responsible for infection in humans are *Echinococcus granulosus* and *Echinococcus multilocularis*. *E. multilocularis* causes Alveolar echinococcus infection in humans. Alveolar echinococcus has high mortality, and the possible limits of surgery are generally exceeded by the time of diagnosis. The literature contains no case reports of comorbidity of alveolar echinococcus and glomerulonephritis. Here we discuss the treatment of a patient with comorbid mesangioproliferative glomerulonephritis and alveolar echinococcus, behaving like a tumor, using albendazole since there was no possibility of surgery. This is the first ever such case report.

**Key words:** *Echinococcus alveolaris*, mesangioproliferative glomerulonephritis, proteinuria, echinococcus infection, glomerulonephritis

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**Introduction**

Parasitic infections lead to significant morbidity and mortality, especially in tropical regions. Various renal diseases may develop during the course of such parasitic infections as malaria, schistosomiasis, filariasis and echinococcus infections (1). The nephropathy caused by these infections may appear as severe infection systemic effect-dependent involvement, direct invasion of kidney tissue by the parasite and immune interaction between the host and parasite (2).

Human echinococcus infection is a zoonosis caused by the larval form of *Echinococcus* (worms inhabiting the intestines of carnivores). Two of the described species that lead to significant disease in humans are *Echinococcus granulosus* and *Echinococcus multilocularis*. These give rise to cystic echinococcosis and alveolar echinococcosis, respectively, in humans.

There are many case reports concerning kidney diseases developing during the course of *E. granulosus* infection. These reports generally involve the parasite directly invading the kidney tissue and glomerulonephritis that is thought to be immune complex-associated (2-4). We encountered no case reports of glomerulonephritis caused by alveolar echinococcus, which is less common than *E. granulosus* in the literature. Our intention in this report was to describe the first case of glomerulonephritis comorbid with *E. alveolaris* infection, which can be regarded as a kind of tumoral formation, and to show that albendazole was effective in the treatment of this patient with no possibility of surgery.
A 23-year-old man had been suffering symptoms of nausea, vomiting and lethargy for 20 days. At presentation to our hospital department his blood pressure was 120/80 mmHg, heart rate 84/min and fever 36°C, oral mucosa was dry while cardiovascular and respiratory examinations were normal. On abdominal examination the liver was 3 cm palpable with an irregular contour. Peripheral edema was -/-.

Skin turgor tone was reduced. Laboratory tests showed hemoglobin 11.4 g/dL, leukocyte number 7,100/μL, platelet count 211,000/μL, BUN 40 mg/dL, creatinine 2.5 mg/dL, Na 138 mmoL/L, K 4.7 mmoL/L, uric acid 7.6 mg/dL, total protein 7.6 g/dL, albumin 3.5 g/dL, LDL 106 mg/dL, HDL 45 mg/dL, triglyceride 95 mg/dL, total cholesterol 166 mg/dL, density of urine test 1,020 and protein 300 mg/dL. Six 24-hour urine we determined 3.08 g/day proteinuria and 1.9 g/day albumin excretion. No cellular element or cast was determined in urine sediment. ANA (-), Anti Ds DNA(-), C3 and C4 were normal. The patient appeared dehydrated and C-reactive protein (CRP) decreased to 1.3 g/day. Hepatic enzymes were normal. Follow-up was maintained with albendazole treatment and monthly controls.

**Discussion**

Human *E. alveolaris* is endemic in 42 countries in the world. In Turkey it is endemic in eastern regions in particular (2, 5). Alveolar echinococcosis is a potentially fatal disease. Diagnosis is made based on the presence of two of the following criteria; typical organ involvement using imaging techniques, echinococcus-specific antibodies in the blood, *E. multilocularis* metacystodes being identified histopathologically and *E. multilocularis* nucleic acid being observed in tissue samples (5, 6). We diagnosed *E. alveolaris* in the present patient on the basis of the typical alveolar echinococcosis lesions that we determined at liver ultrasonography and tomography and serological test positivity.

Surgical resection is the main method of treatment recommended for *E. alveolaris* (6). However, in the present case because of the invasion of the portal vein and vascular structures no surgical or interventional radiological technique could be performed. For that reason, our patient was treated in clinical follow-up with albendazole (daily dosage of 800 mg in adults), as recommended in the medical treatment of *E. alveolaris*.

As in other parasitic infections, renal involvement in echinococcus infections takes place through the three mechanisms cited above. Hydatid cyst formation is seen in 2-3% of echinococcus patients (1). Immune-mediated glomerulonephritis, another renal involvement mechanism, has been reported to accompany *E. granulosus* infection. These case reports took the form of membranous nephropathy (7), me-
sangiocapillary glomerulopathy (3, 4) and minimal change disease (8). There also exists a case report of *E. granulosus* infection, a chronic inflammatory process, and amyloidosis (9). In these cases, the removal of the tissue in which the parasite was present generally led to improvement of the glomerular damage. However, we encountered no case report of *E. alveolaris*, which is more fatal than *E. granulosus*, accompanied by glomerulonephritis. The kidney biopsy in the present case was compatible with mesangioproliferative glomerulonephritis.

Pathologically, mesangioproliferative glomerulonephritis is a form of glomerulonephritis with cellular and/or matrix increase in the glomerular mesangium. The most commonly seen form is Ig A nephropathy (10). Mesangioproliferative glomerulonephritis may develop during the course of parasitic infections (1). The course of mesangioproliferative glomerulonephritis, with or without immunohistological deposit, is rather good in the presence of glomerulitis alone. However, the prognosis in the presence of interstitial inflammation, fibrosis or acute renal failure is poor (11). In the present case, we considered immunohistologically negative mesangioproliferative glomerulonephritis because of the increased mesangial cell and matrix among the light microscopy findings and since no deposit was determined at immunofluorescent examination. However, we were unable to completely exclude immune deposit since no electron microscopic investigation was performed. In the light of these findings, the renal pathology in our case was compatible with mesangioproliferative glomerulonephritis with no immune deposit. We thought the etiology was *E. alveolaris* that we diagnosed radiologically and serologically. The size of the lesion in the liver and the calcifications therein suggested that *E. alveolaris* infection had been present for a long time. As Bohle et al stated (11), the absence of interstitial interaction during this process, probably lasting years, may be a marker of good GN prognosis. Considering that glomerulonephritis may retract with treatment of the parasite we first wished to evaluate the possibility of surgical resection, but since surgical line had been exceeded we began parastatic infection treatment and also albendazole for the purpose of treating the glomerulonephritis. At 1-month check-up there was a significant decline in proteinuria and a rise in blood albumin levels.

In conclusion, glomerulonephritis may develop during the course of alveolar echinococcus infection. In addition, the use of albendazole may be beneficial in the treatment of glomerulonephritis in patients with no possibility of surgery.

**The authors state that they have no Conflict of Interest (COI).**

**References**

