Mesangioproliferative Glomerulonephritis Due to Hepatic Hydatid Disease: A Case Report and Literature Review

Karaciğer Kist Hidatiğine Sekonder Mezangioproliferatif Glomerülonefritis: Olgu Sunumu ve Literatürün İncelenmesi

ABSTRACT

Hydatid cyst (CH), which is quite common in the world, mostly transmitted by dog faeces, is a parasitic disease caused by Echinococcus granulosus. CH often infects the liver and lungs. During the clinical course, renal involvement is rarely seen. In this article; due to liver hydatid disease, mezengioproliferatif glomerulonephritis case is presented.

KEY WORDS: Echinococcus granulosus, Hydatid cyst, Mesangioproliferative glomerulonephritis

ÖZ

Kist hidatik (KH) dünyada oldukça yaygın olup çoğunlukla köpek dışkısı yoluyla insana bulaşan Echinococcus granulosus'un neden olduğu paraziter bir hastalıktır. KH sıklıkla karaciğer ve akciğere yerleşmektedir. Klinik seyri sırasında primer böbrek tutulumu nadiren görülür. Bu yazıda karaciğer kist hidatiğine sekonder, sıra dışı renal bir tutulum olan mezengioproliferatif glomerülonefrit olgusu sunulmuştur.

ANAHTAR SÖZCÜKLER: Ekinokokus granülozis, Kist hidatik, Mezengioproliferatif glomerülonefrit

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INTRODUCTION

Hydatid cyst (CH) is a very common parasitic disease throughout the world and is caused by Echinococcus granulosus that mostly infects people through dog faeces. The primary life cycle is between dog and sheep and more rarely foxes, horses, wolves and jackals. This parasite much more rarely uses humans as hosts accidentally. Although hydatid cyst multi-directionally involves any location, it does not present with general symptoms and signs. Hydatid cysts primarily involve the liver and lung (90%) and rarely the kidney (2%) (1-3). Symptoms generally develop due to the expansion of cysts in the organs or rupture of the cysts. The actual prevalence is unknown as the progress may be asymptomatic. The diagnosis is based on the contact history, radiological identification of the cyst and serological testing. Renal involvement secondary to Echinococcus infestation is extremely rare and sporadic; glomerular involvement has been reported as IgA nephropathy, membranous glomerulopathy and mesangiocapillary mesangioproliferative glomerulonephritis (4-11).

In this paper, we present a case referred to us with loss of renal function and non-nephrotic level proteinuria, and diagnosed as hepatic hydatid cyst, with mesangioproliferative glomerulonephritis (MesPGN) identified on renal biopsy.

CASE

A 46-year-old female presented with swelling of the feet and flank pain. On physical examination, the blood pressure was 130/75 mmHg, and no fever or hepatosplenomegaly was found. Laboratory values at admission were as follows: BUN 19 mg/dL, creatinine 1.4 mg/dL, albumin 3.6 g/dL, and urine swab test positive for blood and protein. 24-hour urine tests revealed microalbuminuria of 794 mg/day, micrototalproteinuria of 1210 mg/day and creatinine clearance of 46 ml/

minute. The WBC value was as 7190/mm^3, hemoglobin 10.8 g/dL, plt 204.000/mm^3 and eosinophil 21/mm^3 on the hemogram. The CRP value was found 28 mg/L, sedimentation 11 mm/hour, hydatid cyst indirect hemagglutination 1/320 positive, ANA negative, anti-ds DNA negative, anti-ss DNA negative, and ASO, RF, cardiolipin IgG and IgM negative while the levels of IgG, IgA, IgM, C3, C4 and plasma lipid levels were in the normal range. On abdominal CT, the size of the liver was 17 cm and a lobulated cystic lesion 6.5x7x7 cm in size extending from segment 8 to segment 5 was observed (Figure 1). Both kidneys were in the normal location and of normal size, while parenchymal echo patterns had increased up to grade 2.

The patient was put on 600 mg/day albendazole and 80 mg telmisartan. There was no improvement in the renal function and regression in proteinuria at the end of 6-month follow-up. Cyst resection was scheduled since hydatid cyst indirect hemagglutination was still 1/320 positive. Renal biopsy was performed simultaneously with resection of the cyst. On renal biopsy, there was a moderate increase in mesangial matrix and cells were seen in the glomeruli with weak mesangial staining with C3 and IgM. The type of immune complex was reported as mesangioproliferative glomerulonephritis (Figure 2).

Medical treatment was continued with the resection. One month after resection of the cysts, the values were BUN 20 mg/dL, creatinine 1.2 mg/dL, microalbuminuria 45 mg/day, micrototalproteinuria 285 mg/day, creatinine clearance 77 ml/min, albumin 3.7 g/dL, CRP 4 mg/L, sedimentation 11 mm/hour, hydatid cyst indirect hemagglutination 1/80 positive and eosinophil 10/mm^3 (Table I) . No recurrent cysts were seen in the liver on follow-up abdominal USG.

DISCUSSION

Hydatid cyst is currently a serious public health problem and is endemic in South America, Central Asia, part of South Europe and Mediterranean countries such as Turkey. The disease is seen in almost every region of our country with a reported incidence of 50-400/100.000 and prevalence of 3.4/100.000 (12). Millions of eggs are scatter from the adult echinococcus living in the intestinal mucosa of carnivores such as dogs, cats, foxes and wolves. A ring strip is excreted in the stool every day, and each ring is accepted to contain 400 to 1000 eggs (Figure 3A,B).

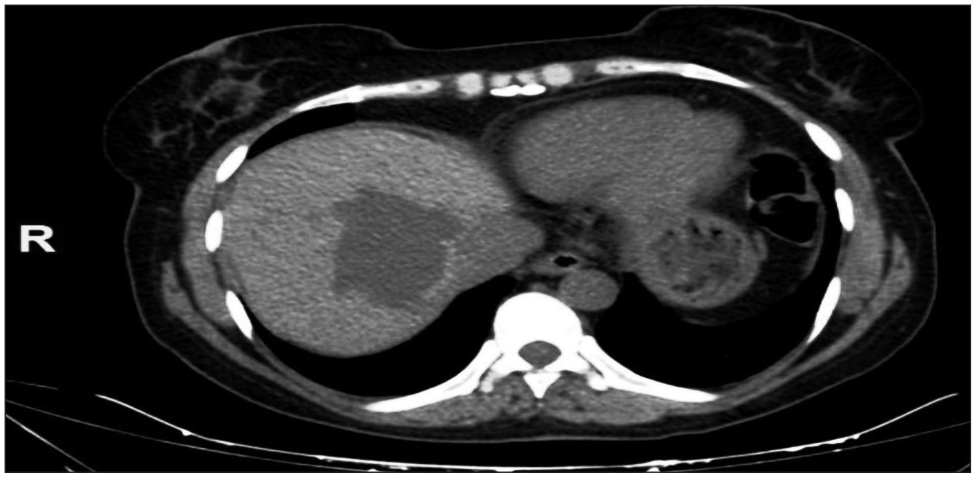

Figure 1: *Lobulated hypodense cystic lesion of 6.5x7x7 cm in size extending from segment 8 to segment 5 in the liver.*

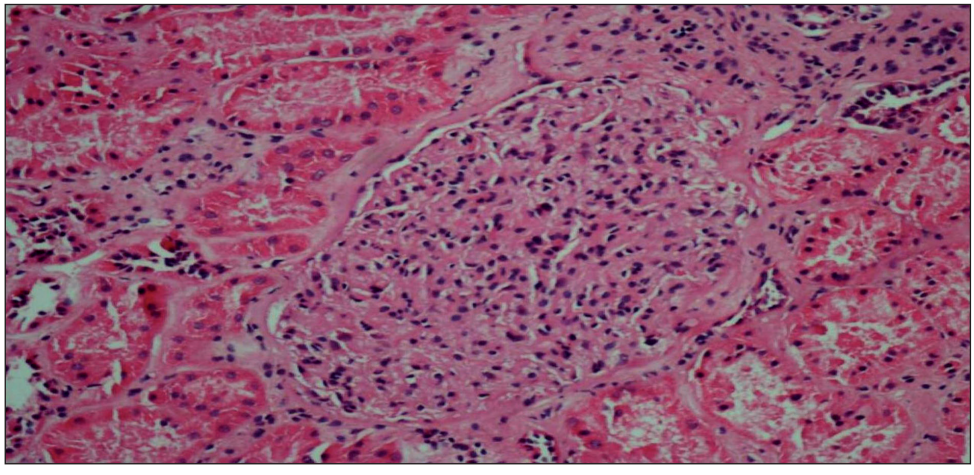

Figure 2: *Moderate increase in mesangial matrix and cells in the glomeruli (H&Ex200).*

Table I: Effects of the medical and surgical therapies on the laboratory parameters.

Parameters	Before medical therapy	After medical therapy	After surgical therapy
Microalbuminuria (mg/day)	794	688	45
Micrototalproteinuria (mg/day)	1210	1092	285
BUN (mg/dl)	20	19	20
Creatinine (mg/dl)	1.4	1.4	1.2
Albumin (g/dl)	3.6	3.7	3.9
Sedimentation (mm/hour)	7	11	12
CRP (mg/L)	28	5	2
Hydatid cyst indirect hemagglutination	1/320	1/320	1/80

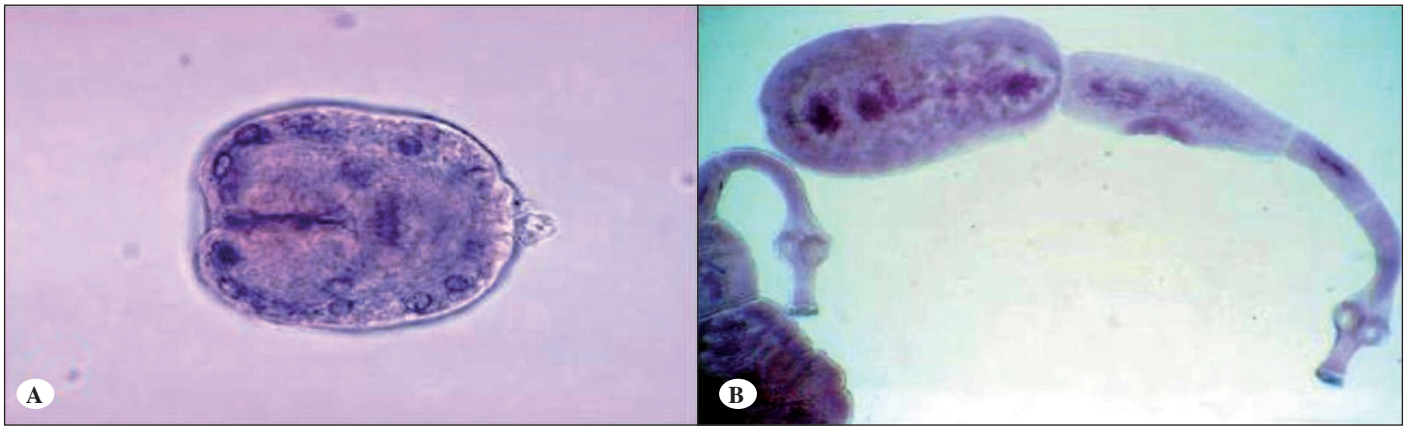

Figure 3: A) *Eggs of Echinococcus granulosus,* ***B)*** *The adult form of Echinococcus granulosus (12).*

These eggs remain alive for seven days in water, 4 days in ice and 10 months in the soil. The eggs of the parasite spreading to the external environment in the stool of the infected animals are ingested by humans through contaminated water and foods, and the embryo is separated from the eggs in the duodenum to mostly go to the liver and secondarily to the lungs through the vena portae or lymphatic system (12) (Figure 4). Renal involvement is rare (2%) and occurs with distribution of the larvae in the systemic circulation (3).

Nephropathies secondary to parasitic infestation include acute renal damage due to the systemic effects of the infection depending on its severity, renal damage caused by the physical invasion of the parasite, and glomerulonephritis from immune interaction between the host and parasite (13). The pathogenesis of glomerular dysfunction resulting from a hydatid cyst is yet to be fully clarified. However, the most widely accepted view is that of an immune complex-related mechanism. Antibody found together with echinococcus antigen has been shown in glomeruli with immunoperoxidase studies (1,14).

The role of hydatid antigen in the pathogenesis of glomerulonephritis was also documented in humans (6,7). The host tends to eliminate the parasite, principally through monocyte phagocytosis, and with an immune mechanism, including induction of natural killer cells and activation of complement with an alternative pathway (15). Monocyte activation leads to an immune response chain induced by the activation of T-helper cells. This pathway is controlled by interleukins such as IL-1, IL-6 and IL-12 released from monocytes (15,16).

Moderate and markedly increased density of MesPGN mesangial cells MesPGN, leukocyte infiltration and capillary narrowing are found together with increased mesangial matrix and fibroepithelial proliferation in the inner surface of Bowman's capsule. The most common form is IgA nephropathy (10,17).

The idiopathic type is characterized by the absence of immune deposits such as MesPGN, Ig M and Ig G. Immunofluorescence microscopy is usually negative in MesPGN. However, immune deposits are seen in postinfectious Berger's disease, Ig M nephropathy, C 1q V and MesPGN cases secondary to a systemic disease such as systemic lupus erythematosus (18). We observed C3 and IgM with weak mesangial staining.

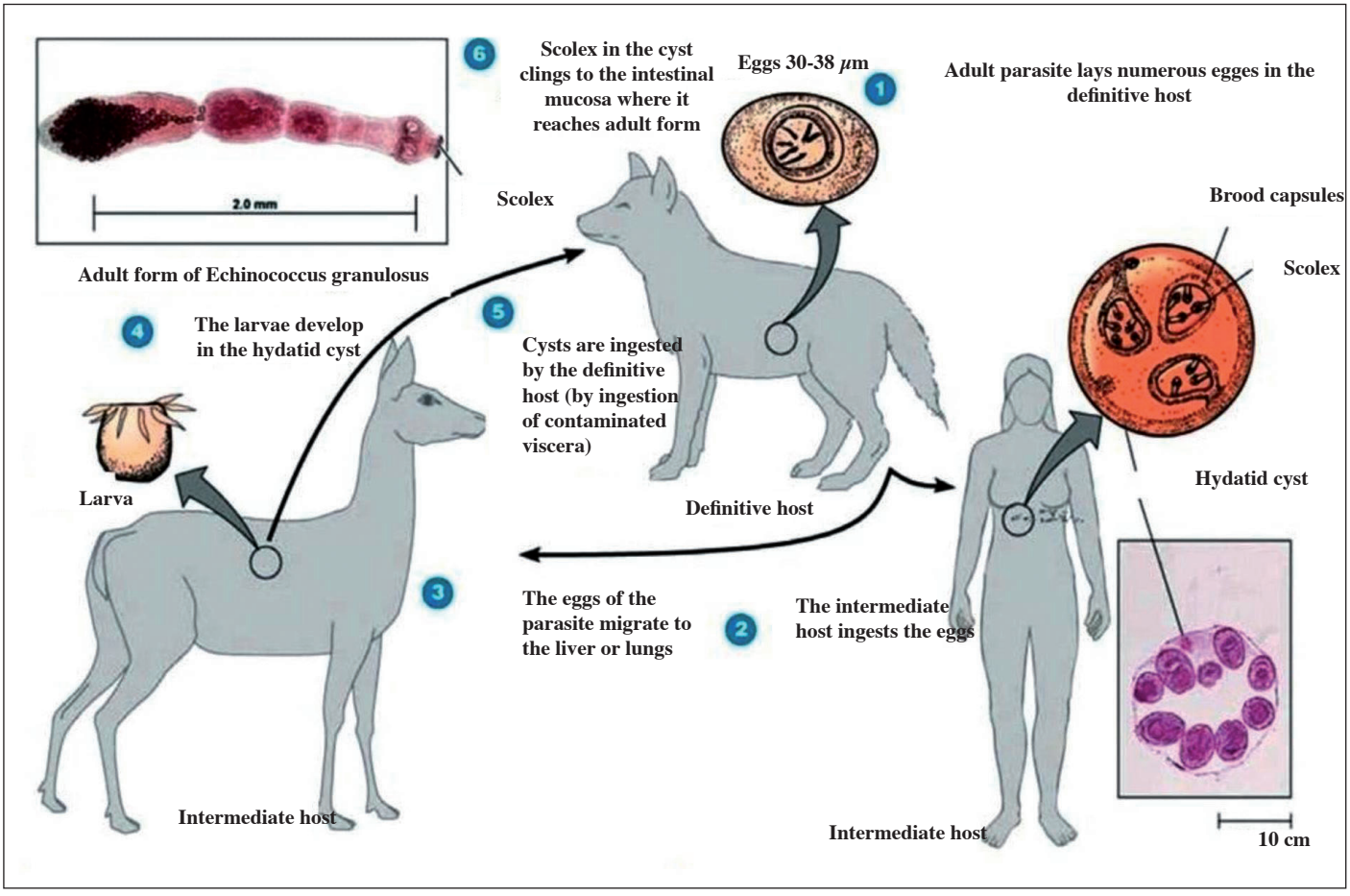

Figure 4: *Lifecycle of the hydatid cyst (12).*

A minimal change on electron microscopy is thought to be a part of the disease and the spectrum of focal segmental glomerulosclerosis (19,20). MesPGN is a disease that may clinically manifest with hematuria, proteinuria or symptoms of nephrotic syndrome. Our case had hematuria, non-nephrotic proteinuria and loss of renal function.

Several studies have reported glomerular pathology due to hydatid cyst to be reversible with treatment of the infection. Aziz et al reported improvement in the nephrotic syndrome following resection of the lung hydatid cyst in a patient with mesangioproliferative glomerulonephritis, while Gelman et al reported complete remission after albendazole therapy in a patient with minimal change glomerulonephritis and Gargah et al reported complete remission of mesangioproliferative glomerulonephritis after resection of the lung hydatid cyst (8,10,21). We could not achieve remission with albendazole and telmisartan therapy in our patient, but improvement in renal function and regression in proteinuria were observed following regression of the liver hydatid cyst.

In conclusion, hydatid cyst cases are a serious health problem and endemic in our country. Secondary glomerular involvement should be kept in mind in the evaluation of the renal functions and when hematuria, proteinuria or the symptoms of nephrotic syndrome are identified in these cases. Furthermore, we believe that surgical treatment should be considered as a first step for the treatment of hydatid cysts in patients with secondary glomerular involvement.

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