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Case report

Amyloidosis kidney with filariasis presenting as nephrotic syndrome: Incidental finding or unusual association?

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Abstract:

Background: It is estimated that around 120 million people in tropical and subtropical areas of the world are infected by filariasis. In the Southeast and South Asian regions, *Wuchereria bancrofti* is the most prevalent parasite, causing filariasis in 99.4% of cases. We report a rare case of amyloidosis kidney with an incidental finding of microfilariae.

Case report: An 85 year old male presented with complaints of gradually progressive anasarca and loss of weight for 2 months as well as vomiting and decreased urine output for a week. On clinical examination, aside from mild pallor, there was evidence of bilateral pitting pedal edema and free fluid in the abdomen. Sonography revealed the presence of bilateral renal parenchymal disease and bilateral hydrocele with thickened spermatic cord. Lower lobe consolidation was the only significant finding on the chest skiagram. The patient was rigorously worked up to identify pathology in other systems, but all the data were within normal limits. Histopathological examination of the renal biopsy specimen revealed complete to partial replacement of most of the glomeruli by pink, hyaline eosinophilic material and microfilariae of *Wuchereria bancrofti* were seen incidentally. Blood vessels showed pink hyaline material in their walls. Tubules and interstitium were unremarkable. The provisional diagnosis of amyloidosis kidney was confirmed by positivity on methyl violet staining.

Conclusion: In the present case, the clinical picture did not provide any clue regarding the association of amyloidosis kidney with filariasis except for mild peripheral eosinophilia. However, renal biopsy revealed amyloidosis with microfilariae of *Wuchereria Bancrofti*. It is presumed that, in this case, microfilariae entered the glomerular capillaries after breaching the blood renal barrier. This is the first case in which renal amyloidosis was shown to be associated with microfilariae of *Wuchereria bancrofti*. The possibility of the latter condition, resulting in the genesis or development of the former, needs to be further investigated and discussed.

INTRODUCTION

It is estimated that around 120 million people in tropical and subtropical areas of the world are infected with filariasis. Almost 25 million men suffer from genital disease (most commonly hydrocoele); an estimated 15 million people − the majority of them women − have lymphoedema or elephantiasis of the leg.

It is estimated that the Southeast Asian region bears about 67% of the global burden and that India alone contains 74% of the endemic population [1]. In India and the Southeast Asian region, *Wuchereria bancrofti* is the most prevalent parasite, causing filariasis in 99.4% of cases. Conventionally, the detection of microfilariae (Mf) in at least one of three consecutive night time blood peripheral blood smears, along with a high degree of clinical suspicion, is sufficient to establish the diagnosis. However, Mf have been known to surprise pathologists worldwide by appearing in cytological smears prepared from unusual locations like the thyroid [2], breast [3], and various other sites. Usually such a presence is associated with minimal reactive change or without any loss of function. In the present case, however the finding was associated with amyloidosis and renal dysfunction. Various diagnostic tests were conducted to determine the cause of amyloidosis and to look into the possibility of filariasis associated with amyloidosis. An ex-

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tensive search of the literature failed to disclose any previous finding of microfilariae with amyloidosis in the human kidney. The case is therefore worthy of note.

CASE REPORT

An 85 year old male presented with complaints of gradually progressive anasarca and loss of weight for 2 months as well as vomiting and decreased urine output for a week. On clinical examination, aside from mild pallor, there was evidence of bilateral pitting pedal edema and free fluid in the abdomen. Sonography revealed the presence of bilateral renal parenchymal disease and minimal unilateral hydrocele with thickened spermatic cord. Lower lobe consolidation was the only significant finding on the chest skiagram, and this was resolved later by anti-microbial therapy. The microbiological culture from the sputum collected at the start of therapy was subsequently localized as *Staphylococci*. The patient was rigorously worked up to identify pathology in other systems, but the data turned out to be within normal limits. The extremities and external genitalia were normal apart from slight swelling in the left scrotal sac. There was no history of tuberculosis, syphilis, or malignancy. Routine haemogram showed a total leukocyte count of 8200 cells / cu. mm and differential leukocyte count with 60% polymorphs, 22% lymphocytes and 18% eosinophils without evidence of any haemoparasite including the malarial parasite. Moreover three consecutive night time smears failed to isolate microfilariae. The results of urine analysis concurred with the clinical diagnosis of nephrotic syndrome with presence of albuminuria (> 4.0 gm/dl), lipid casts and lipiduria. The biochemical profile showed hypokalemia, hyperlipidemia, hypoalbuminemia (2.1 gm/dl) and slightly increased creatinine values.

Renal biopsy showed 8 glomeruli, tubules, interstitium and blood vessels. Most of the glomeruli were completely or partially replaced by pale, waxy, eosinophilic hyaline material. Microfilariae of *W. bancrofti* were seen in the glomerular capillary of one of the glomeruli and blood vessels showed similar pink hyaline material in their walls. The provisional diagnosis of global and diffuse glomerulosclerosis (end stage renal disease) due to amyloidosis, i.e. “amyloid nephropathy” was confirmed by positivity on methyl violet staining (Figure 1, 2a and 2b). Tubules and interstitium were unremarkable. Subsequent to the positive staining of methyl violet in the renal biopsy specimen, stain was also applied to abdominal fat aspirate to check for systemic amyloidosis. The smears were found to be negative. The possibility of primary amyloidosis was also considered but the results of tests for bence jones proteins and urine electrophoresis negated this possibility. The possibility of

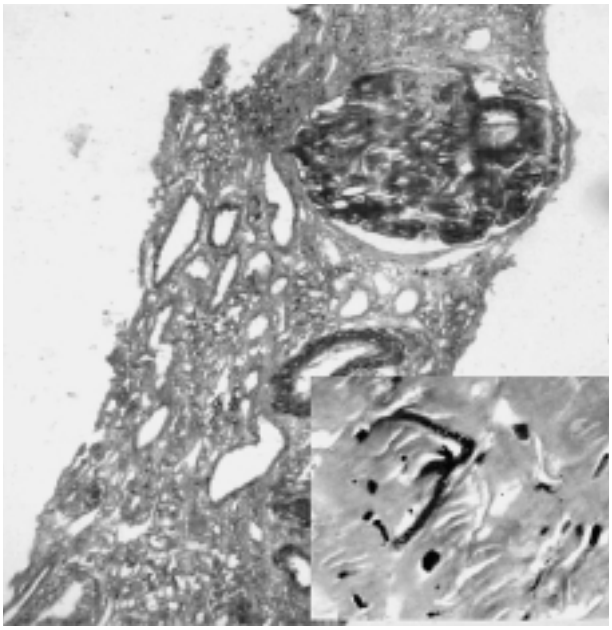

Figure 1 Methyl violet positivity of glomeruli and blood vessels for amyloidosis MV x 100. Inset Microfilariae H&E X 100. (B&W)

secondary amyloidosis arising from some chronic autoimmune collagen tissue disorder was overruled by the absence of complaints,the normal physical examination of joint systems, and the normal range of C-reactive protein and RA factor on serology.

DISCUSSION

In the present case, the clinical picture did not reveal any association between amyloidosis and filariasis except for eosinophilia. However, renal biopsy revealed microfilaria of *Wuchereria bancrofti*. It is presumed that, in this case, microfilariae entered the glomerular capillaries after breaching the blood renal barrier. Nephrotic syndrome and hematuria have been reported in filariasis caused by genera Wuchereria, Brugia, Loa and Onchocerca by various investigators [4]. Microfilariae, presenting as adult nephrotic syndrome, have been reported to cause membranous glomerulonephritis with C3 deposition, diffuse proliferative glomerulonephritis and collapsing glomerulonephritis with loiasis, but have not been incriminated as a cause of renal amyloidosis or as an incidental finding with amyloidosis in the kidney [5]. This is the first case where renal amyloidosis has been reported to be associated with filariasis in humans. In their animal experiments Crowell and Votava induced amyloidosis in hamsters by infecting them with the filarial nematode parasite *Dipetalonema viteae*. The incidence of amyloidosis was 64% in a group inoculated with

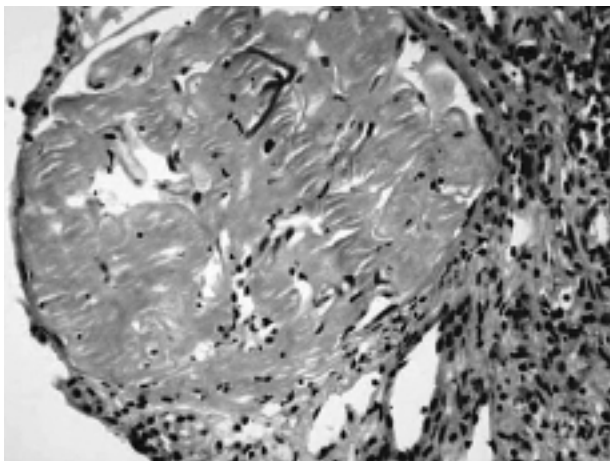

Figure 2a Complete obsolescence of the glomeruli with pale, waxy eosinophilic material with microfilariae of *W. bancrofti*. H&E x 100.

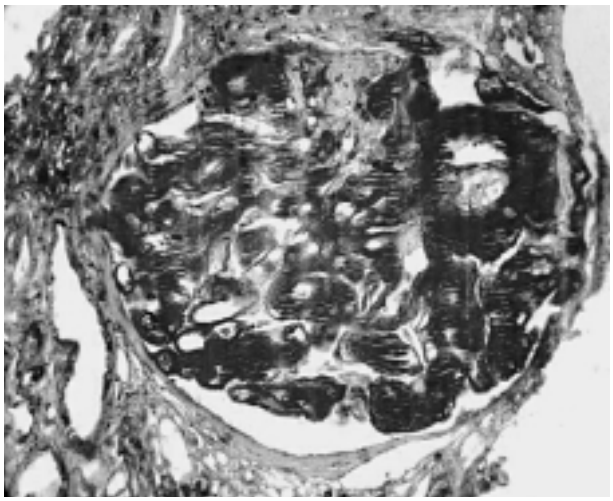

Figure 2b Methyl violet positivity of glomeruli and blood vessels for amyloidosis. MV x 100.

150 larvae and 54% in the group receiving 150 larvae in each of two inoculations. Amyloidosis was not seen in control animals [6].

The argument that amyloidosis could have been due to any other chronic pathology in the present case was confirmed by the fact that the case was rigorously investigated by means of clinical and radiological studies to define chronic pathology in other systems. At the same time, amyloid stain applied to the abdominal fat aspirates was found to be negative – ruling out systemic amyloidosis. Also, primary amyloidosis was ruled out by means of urine electrophoresis. In their study, Crowell and Votava postulated that microfilariae as an independent variable probably served as the antigenic stimulus in the pathogenesis of amyloidosis, since those animals in which amyloidosis was formed had microfilaremias that were significantly greater (P less than 0.05) both in number and duration than those in infected animals that did not develop amyloidosis [6]. This might have been the scenario in the present case as well because ancillary investigations ruled out any secondary or systemic cause of amyloidosis. Our case highlights the need to investigate the presence of microfilaria, wether it is an incidental finding with renal amyloidoisis or a factor in the genesis of amyloidosis. This becomes important for nephrologists serving a large population of people under risk of filarial infestation. If such an association is proven in the future, microfilaria can then be added to the list of independent variables leading to pathogenesis of amyloidosis, and aggressive preventive and therapeutic steps can thus be initiated.

The present case report has important implications, not only for clinicians treating patients in tropical countries, but also for those in the western hemisphere treating patients with chronic renal disease who are either frequent visitors to or first generation migrants from these countries.

REFERENCES

1. http://www.who.int/lymphatic_filariasis/epidemiology/en/ last accessed 27th Dec 2007
2. Mehrotra R, Lahiri VL, Hazra DK. Microfilariae identified in FNA of a thyroid nodule. *Diagn. Cytopathol.* 1997; 16: 149-150
3. Mehrotra R, Singh M, Javed KZ, Gupta RK. Cytodiagnosis of microfilariae of the breast from a needle aspirate, *Acta Cytol* 1999; 43: 517-8
4. Pasaka NM, Neska NM, Nyimi LM: Secondary collapsing glomerulopathy associated with Loa loa filariasis. *Am J Kidney Dis* 1997; 30: 836-9
5. Date A, Gunasekran V, Kirubakaran MG, Shastry JC: Acute eosinophilic glomerulonephritis with Bancroftian filariasis. *Postgrad Med J* 1979; 55: 905-7
6. Crowell WA, Votava CL: Amyloidosis induced in hamsters by a filarial parasite (Dipetalonema viteae). *Vet Pathol* 1975; 12: 178-185.