Microfilaria in Kidney Biopsy Presenting with Nephrotic Range Proteinuria - A Case Report

Vikas Kavishwar, Shital Munde*, Anuradha Murthy and Shaikhali Barodawala
Department of Surgical Pathology, Metropolis Healthcare Ltd, Mumbai, Maharashtra

ABSTRACT

Background: A 59 year old male from the North was referred with Nephrotic Syndrome and heavy proteinuria (8gm) and weakness. Urine examination showed 2-3 pus cells, 4+ protein. Two cores of renal tissue were submitted in buffered formalin and Michel’s transport medium.

Objective: The case is presented for its rarity. The discussion will include immunological review and glomerular patterns of injury associated with Microfilaria.

Result: The immunofluorescence pattern was negative for IgG, IgM, IgA, C3, C4, C1q, kappa and lambda. The light microscopy revealed 3 glomeruli showing mild increase in mesangial cellularity. Tubules show cloudy change. Interstitium shows focal lymphoid infiltrate. An unusual finding is the presence of segmented microfilaria in glomerular capillaries.

Conclusion: Diagnosis of filariasis on kidney biopsy by identifying microfilaria is rare. High index of suspicion is required to diagnose filariasis due to its wide range of clinical presentation and laboratory findings. In the archives of 1108 renal biopsies over a period of 4 years, this is the first case we came across.

Keywords: Microfilariae, Kidney Biopsy, Nephrotic Syndrome, Filarial Nephropathy

Introduction
Filarisis is an important public health problem in India, and 40% of the worldwide disease. According to the limited literature available on the subject, approximately 45% of untreated microfilaremic patients have renal pathology, which manifests as microscopic haematuria (~35%) and/or proteinuria (~20%). It is known to present in a wide variety of clinical picture with lymphatic and extra-lymphatic symptoms. Renal manifestations in these patients can range from asymptomatic proteinuria, chyluria, nephrotic syndrome, to acute glomerulonephritis. In department of Histopathology Metropolis Healthcare Ltd, Mumbai, we have received 858 native and 250 transplant kidney biopsies over a period of 4 years; one unusual native biopsy with microfilaria has been discussed.

Case Report
A 59 year old male from Delhi presented with whole body swelling since 15 days and weakness. Urine examination- 2-4 pus cells, 4+ protein, heavy proteinuria (8gm), no history of chyluria. Two cores of renal tissue were submitted in 10 % buffered formalin and Michel’s transport medium. On histopathological examination, the light microscopy revealed glomeruli with mild increase in mesangial cellularity. There was no evidence of endothelial or epithelial proliferation or thickening of basement membrane. Occasional capillary loop in glomerulus revealed cross sections of segment of microfilariae. The latter showed parallel arrangement of nuclei throughout their length and were covered by sheath on external aspect (Fig 1(A, B, C)).

Discussion
The parasites causing filariasis belong to the superfamily of Filarioidea. Four different parasites, each transmitted by its own specific vector, are responsible for three clinical diseases. The different parasites are identified by their location, periodicity, morphological characteristics, and clinical presentation of the disease they cause. Several studies have recently shown a clear association of filariasis and glomerular disease; however the exact incidence of renal involvement in filarial infection is very difficult to estimate. Asymptomatic urinary abnormalities are reported in 11-25% of patients, nephrotic syndrome is seen in 3-5% of cases. Proteinuria and or haematuria have been reported in 50% of patients with lymphatic filariasis. 25% showed glomerular proteinuria. Two third of the patients with nephrotic syndrome and 38% of patients with nephrotic syndrome in filarial endemic regions exhibit...
antibodies to microfilarial antigen by enzyme –linked immunosorbent assay. Renal abnormalities in filariasis have been attributed to two factors: (1) mechanical damage to glomeruli and (2) immune complex deposition. According to some studies, damage caused by deposition of immune complexes in the glomerular basement membrane is likely to be a far more common cause of renal pathology in filariasis. Several patterns of glomerular pathology are described with filarial nephropathy and include minimal change disease as in the present case, collapsing focal segmental glomerulosclerosis, mesangiocapillary, and diffuse and mesangioproliferative glomerulonephritides. Microfilariae seen in capillary lumina, peritubular capillaries, arterioles. Electron Microscopy: podocyte effacement and electron dense deposits in subepithelial, subendothelial and intramembranous location. Immunofluorescence: IgM, IgG, C3 in mesangium and along capillary loops.

**Conclusion**
Diagnosis of filariasis on kidney biopsy by identifying microfilaria is rare. High index of suspicion is required to diagnose filariasis due to its wide range of clinical presentation and laboratory findings

**Acknowledgements**
We are sincerely thankful to Dr Vikas Kavishwar for reporting kidney biopsy, Dr Shital Munde for preparing manuscript, Dr Anuradha Murthy for reviewing case and conceptual guidance and Dr Shaikhali Barodawala for literature review and data collection related to case.

**Reference**
1. Ramaiah KD, Das PK, Michael E, Guyatt H. The economic burden of lymphatic filariasis in India. Parasitol Today. 2000; 16:251-3.
2. Dreyer G, Dreyer P, Piessens WF. Extralymphatic disease due to bancroftian filariasis. Braz J Med Biol Res. 1999; 32(12):1467–72.
3. Van Velthuysen M-LF, Florquin S. Glomerulopathy Associated with Parasitic Infections. Clinical Microbiology Reviews. 2000; 13(1):55-66.
4. Ramachandra R, Jha V. Nematode Infections. In. Neil Turner N, Goldsmith D, Winearls C, Lamierre N, Himmelfarb J, Remuzzi G. Oxford Textbook of Clinical Nephrology. 4th Ed. Oxford University Press. 2005; 1P.1602-3.
5. Chaturvedi P, Harinath BC, Reddy MV, et al. Filarial antibody detection in suspected occult filariasis in children in an endemic area. J Trop Pediatr. 1995; 41:243-5.
6. Vankalakunti M, Jha PK, Ravishankar B, Vishwanath S, Rampure S, Sudar-shan BH. Microfilariae-associated nephrotic range proteinuria. Kidney Int. 2011; 79(10):1152.
7. Shubham S, Ahuja A, Bhardwaj M Microfilaria in Kidney biopsy: A report of two cases. J Infect Public Health.2018; 11(5):732-734

*Corresponding author:
Dr. Shital Munde, Metropolis Healthcare Ltd I Kohinoor City Mall, Commercial I, I A Wing, 4th Floor, Vidyavihar West Mumbai, Maharashtra, India- 400 070.
Phone: +91 9869159459
Email: shtlmunde5@gmail.com

Financial or other Competing Interests: None.