Quiz Case

Two unusual cases of hematuria reported on urine cytology

Swasti Jain, MD<sup>1</sup>, Prajwala Gupta, MD<sup>1</sup>, Sonia Raghav, MD<sup>1</sup>, Minakshi Bhardwaj, MD<sup>1</sup>

<sup>1</sup>Department of Pathology, ABVIMS and Dr. RML Hospital, New Delhi, India.

A 65-year-old male presented with complaints of gross painless hematuria for 2 months. There was no history of associated abdominal mass, pain, dysuria, or fever. General and systemic examination did not reveal any abnormality. Routine hemogram and peripheral blood smear examination findings were normal. On contrast-enhanced computed tomography (CECT) abdomen and pelvis, there was smooth contrast enhancing thickening in the urinary bladder wall. Routine and microscopic urine examination was normal. A 3-day consecutive urine sample was received for cytological examination. It was processed by cytocentrifugation and smears prepared were stained with Giemsa stains [Figure 1a]. Another 65-year-old male presented with gross painless hematuria for 3 months with no significant associated history or abnormal examination finding. Blood picture was within normal limits. On USG of abdomen and pelvis, no abnormality was detected. On MRI of abdomen and pelvis, a small exophytic lesion measuring 2.4 × 2.1 cm was identified in the anterior wall of urinary bladder [Figure 2]. Urine sample was received for cytological examination and processed the same way as in Case 1. Urine cytology revealed the findings, as shown in Figure 1b and c.

Figure 1: (a) Microfilaria larvae with occasional benign urothelial cells and abundant red blood cells, Giemsa ×200. (b) Malignant urothelial cells in clusters and occasional larva, Pap ×400. (c) Malignant urothelial cells in clusters (upper right corner), Pap ×400.

Figure 2: Magnetic resonance imaging abdomen and pelvis; small mass in urinary bladder.

Q1. What is your interpretation?

A. Urinary filariasis
B. Filariasis with underlying malignancy
C. Both
D. None

*Corresponding author: Prajwala Gupta, Department of Pathology, ABVIMS and Dr. RML Hospital, New Delhi, India. prajwalagupta@gmail.com

Received: 01 February 2020
Accepted: 02 July 2020
Published: 16 April 2021

DOI
10.25259/Cytojournal_9_2020

Quick Response Code:
Answer 1: Option C – Both

Explanation

Smears of the first patient revealed predominantly RBCs with occasional benign urothelial cells and polymorphs. Occasional sheathed microfilaria (Mf) larvae with the absence of nuclei at tip of the tail (W. bancrofti) were also noted. The smear was negative for malignant cells. The patient was prescribed diethylcarbamazine (DEC) course for 21 days following which he became asymptomatic.

The cytological examination of the second patient revealed cellular smears with singly scattered and clusters of malignant urothelial cells. The cells show high nucleocytoplasmic ratio, nuclear membrane irregularity, hyperchromasia, prominent nucleoli, and scant cytoplasm. Few sheathed Mf were interspersed and revealed the absence of nuclei at the tail tip. Cytological diagnosis of high-grade urothelial carcinoma with incidental microfilaria was reported.

Q2. What are the causes of hematuria?
A. Filaria
B. Malignancy
C. Both
D. None

Answer 2: Option C – Both

Explanation

Blood in the urine is the most common symptom in patients of urothelial tract malignancies.[3] The hematuria is mostly painless unless there is obstruction caused by the tumor or the blood clots. The common presenting symptoms of filariasis include lymphangitis, hydrocele, chyluria, and elephantiasis. Chyluria occurs due to rupture of the lymphatics and retrograde flow in the urinary tract. Gross hematuria may occur in association with ulceration, congestion, and granulomatous reaction.[2] Sometimes, hematuria is the only presentation with the absence of chyluria.

Q3. What are the CT findings?
A. Bladder malignancy
B. Inflammatory pathology
C. Both A and B
D. In situ neoplasm

Answer 3: Option C – Both A and B

Explanation

Cystitis usually shows diffuse smooth wall thickening of the urinary bladder instead of focal thickened. Focal bladder wall thickening with the presence of trabeculations is more commonly associated with urothelial malignancy. Carcinomas are usually associated with the presence of exophytic lesions in the bladder. However, achylous hematuria along with multiple exophytic lesions can be rarely seen in cases of filariasis.[3]

Mf larvae circulate in blood and can be seen on peripheral blood smear examination. However, the adult form resides in lymphatics. Lymphatic obstruction can lead to the appearance of Mf in urine. Other factors such as vascular wall injury by trauma, inflammation, stasis, or tumor may attribute to the same.[4] A rich vascular supply may be responsible for the presence of filaria in vicinity of the tumor but its exact pathogenesis still remains unclear.[5]

Q4: What is the most sensitive diagnostic modality?
A. Microscopy
B. Urine cytology
C. Polymerase chain reaction
D. Serology

Answer 4: Option C – Polymerase chain reaction

Explanation

Detection of Mf on microscopy is relatively frequent on sediment smears of cystoscopically catheterized urine samples but very rarely in the voided samples.[6] Detection of filarial DNA by polymerase chain reaction (PCR) is regarded as the most sensitive modality for the diagnosis of filarial infection.[7] Serological methods including detection of immune complexes have been recently developed which prove to be highly sensitive.[6]

DISCUSSION

Filariasis is a parasitic infection commonly seen in the tropical and subtropical countries.[10] It is caused mainly by Wuchereria bancrofti, Brugia malayi, and Brugia timori with W. bancrofti being the most common. Incidental detection of Mf has been documented in various cytological samples, although rare in exfoliative samples.[1] There are only a few case studies which report Mf in achylous hemorrhagic urine sample.[10] The conventional diagnosis of filariasis relies on finding microfilaria in the peripheral blood smear, usually with eosinophilia. However, in occult filariasis, there is the absence of eosinophilia and filaria in peripheral blood.[6] Webber et al. first reported Mf in voided and catheterized urine sample from the same patient who presented with intermittent hematuria.[9] Achylous urine with exophytic bladder lesion is an unusual finding of filariasis which may mimic malignancy.[3,10] To the best of our knowledge, no single case has been reported that revealed Mf larva in urine with concomitant underlying malignancy.
SUMMARY
We reiterate that microfilaria may be seen as an incidental finding in urine in patients presenting with achylous hematuria with negative peripheral blood smear findings. Although clinically and radiologically, the bladder filariasis may mimic malignancy; cytological examination of urine helps establish an early diagnosis. Concomitant presence of incidental microfilaria with high-grade urothelial carcinoma is rare in a radiologically unsuspected case for any mass lesion. We emphasize the diagnostic role of urine cytology in such unusual cases during early screening of patients with hematuria.

COMPETING INTEREST STATEMENT BY ALL AUTHORS
The authors declared that they have no competing interest.

AUTHORSHIP STATEMENT BY ALL AUTHORS
Each author has participated sufficiently in the work and takes public responsibility for appropriate portions of the content of this article. All authors read and approved the final manuscript. Each author acknowledges that the final version was read and approved.

ETHICS STATEMENT BY ALL AUTHORS
As this is case without identifiers, our institution does not require approval from the Institutional Review Board (or its equivalent).

LIST OF ABBREVIATION (In alphabetic order)
CECT – Contrast-enhanced computed tomography
DEC - Diethylcarbamazine
DNA – Deoxyribonucleic acid
Mf – Microfilaria
PCR – Polymerase chain reaction
RBC – Red blood cell
W. bancrofti – Wuchereria bancrofti

EDITORIAL/PEER-REVIEW STATEMENT
To ensure the integrity and highest quality of CytoJournal publications, the review process of this manuscript was conducted under a double-blind model (authors are blinded for reviewers and vice versa) through automatic online system.

REFERENCES
1. Hurwitz M, Spless PE, Garcia JA, Pisters LL. Urothelial and Kidney Cancers. Cancer Network; 2010.
2. Nag VL, Sen M, Dash NR, Bansal R, Kumar M, Maurya AK. Hematuria without chyluria: It could still be due to filarial etiology. Trop Parasitol 2016;6:151-4.
3. Jain S, Desai P, Goel G, Singh N, Kaushal S. Urinary filariasis masquerading as the bladder tumor: A case report with cyto-histological correlation. J Cytol 2015;32:124-6.
4. Verma R, Vij M. Microfilariae of Wuchereria bancrofti in urine: An uncommon finding, Diagn Cytopathol 2011;39:847-8.
5. Khandelwal R, Agnihotri N, Pandey S. Unanticipated cytodiagnosis of filariasis: A study of 16 Cases. Int J Med Res Rev 2018;6:166-7.
6. Seth A. Microfilaruria in a patient of intermittent chyluria. J Cytol 2009;26:151-2.
7. Hassan MJ, Jairapuri ZS, Jetley S, Khan S, Rana S, Hussain M. Microfilariae of Wuchereria bancrofti in a patient of chylous haematuria: Report of an unusual finding in urine cytology. J Clin Diagn Res 2014;8:153-4.
8. Chaturvedi P, Gawdi A, Dey S. Occult filarial infections. Natl Med J India 1990;3:7-9.
9. Webber CA, Eveland LK. Cytologic detection of Wuchereria bancrofti microfilariae in urine collected during a routine workup for hematuria. Acta Cytol 1982;26:837-40.
10. Gourlay WA, Chiu A, Montessori VC, Dunn JJ. Urinary filariasis presenting as bladder pseudotumors. J Urol 1999;161:603-4.