



Case report

Urinary balantidiasis with urinary tract system tuberculosis: a rare case report

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ABSTRACT

Balantoides coli, the largest protozoan, is a rare zoonotic disease in humans, predominantly detected in stool examination. We are presenting a case of incidentally detected urinary balantidiasis in a patient with genitourinary tract tuberculosis, which is the first case with such a presentation.

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INTRODUCTION

Balantidiasis is a zoonotic disease occurring in humans, caused by *Balantoides coli*. It is the largest protozoan, which is the only ciliated protozoan that infects humans.¹ Contamination of water and food by faeces of pigs is the primary source of infection to humans.² The cecum and colon are the most common sites of infection from *Balantidium* in humans. However, it may be found in extra-intestinal sites like the liver, lung, gastrointestinal tract (GIT), and peritoneum.^{1,3}

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In this case report, *Balantiodides coli* was incidentally found in the urine of a patient having lower urinary tract symptoms of dysuria and pyuria for two years. We are presenting this case because of its rarity.

The worldwide prevalence of this disease is low at 0.02% - 1.00%.⁴ Urinary infection by *Balantiodides coli* is even rarer. There are only seven case reports in the literature of this parasitic infection at extra-intestinal sites, all before 2015. These reported sites were appendix, liver, peritoneum, lung and genito-urinary tract (GUT).^{3,5-10}

CASE REPORT

A 37-year male patient, a resident of Maharashtra, India, a farmer by occupation, presented with dysuria, pyuria, and hematuria for two years. Patient did not have diarrhea or any other gastrointestinal symptoms. Urine routine and microscopic examination had already been done multiple times at other centers, with reported findings of an increased number of pus cells only. He did not have a fever or oliguria. Complete blood count, liver function test, renal function test, and random blood glucose were within normal limits. CT Urography showed three cystic lesions in the upper pole of the left kidney, the largest measuring 2.2 x 2.1 cm, showing thin septations and nodular calcifications. Bilateral ureters were normal. The urinary bladder was distended, with a thickened wall, suggestive of cystitis. The rest of the

organs were normal.

As a routine workup, urine samples for three consecutive days were received in the Cytopathology department of our hospital. Grossly, urine was pale yellow, hazy, and acidic. These samples were both centrifuged and cyto-centrifuged. Air-dried and wet-fixed smears were made and stained with Giemsa stain and Papanicolaou (Pap) stain, respectively. Samples of all three days showed similar morphology. The smears showed many parasites in the form of trophozoites and cysts. (fig. 1, 2) Trophozoite forms were oval to kidney-shaped with macronucleoli and cytoplasmic vacuoles on one end. The body surface had multiple, delicate, small cilia. Cyst forms of the parasite were round to polygonal with one macronucleus. A few cysts showed granules in the cytoplasm. However, cilia were not seen. To confirm our findings, a fourth-day sample was also obtained, and wet mount preparation was done. There were large, ciliated organisms having rotary motility. Based on cytomorphological features and wet mount findings, the diagnosis of urinary Balantidiasis was made. In order to determine the source of the infection, a detailed history of the patient was taken again, during which it came to light that he was coming in contact with wild pigs on his farm. To rule out the presence of the organism in stool, fecal samples were also sent to Microbiology. However, no organism was detected in the stool.

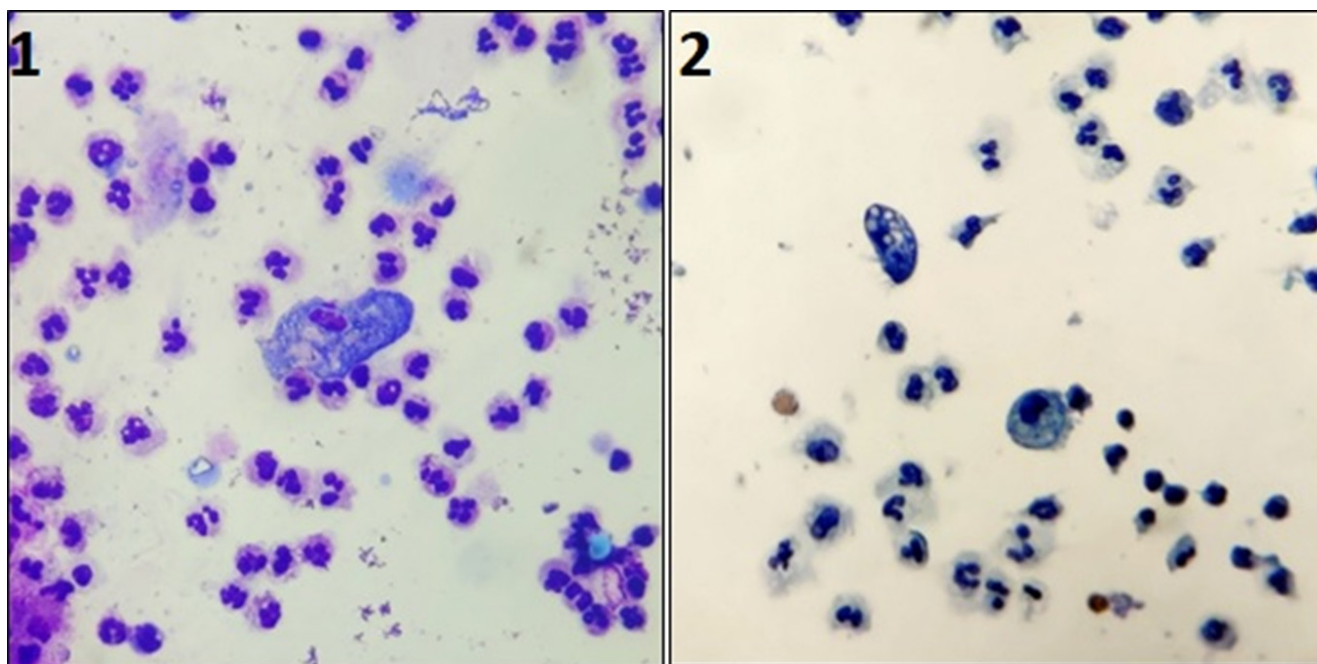


Figure 1,2: (1) Trophozoite form of *Balantidium coli*. (Giemsa stain, 400x); (2) Trophozoite and cyst forms of *Balantidium coli*. (Pap stain, 400x)

Based on CT scan findings and long-standing symptoms, clinicians suspected tuberculosis of the urinary tract. Before sending the sample to the Cytopathology section, a urine sample had been sent for *Mycobacterium tuberculosis*

culture and drug resistance. The sample was positive for low virulent *Mycobacterium tuberculosis* bacilli on Ziehl-Neelsen staining.

DISCUSSION

Balantioides coli was first described by Malmstein in 1857.¹⁰ He identified this species as *Paramecium Coli*. Leuckhart described morphologically similar species from pig's intestines in 1861.¹¹ Stein equated these two organisms and placed them in the genus *Balantidium*.¹² The trophic ciliated organism measures 30-150 micrometers (length) x 25-120 micrometers (width), which may be ovoid, spherical, with diameter of 40-60 micrometers.¹³ It has a mouth located at the tapering anterior end and cytopyge (anus) at the rounded posterior end. It has two nuclei – one kidney or sausage-shaped macro-nucleus, which is visible on microscopy, and a rounded micro-nucleus, which is difficult to see on microscopy. Both asexual and sexual reproduction occur in ciliates. It has rotary/boring motility.¹

It is present in two forms – the trophozoite and the cyst form.¹ Cyst form is the infective form for humans. It has a thick cell wall, which protects it from desiccation and other environmental stress. It survives in a humid climate protected from direct sunlight. Encystment occurs in the colon and rectum of the host, and cysts are found in formed feces.¹⁴ Trophozoites are found in dysenteric stool.¹⁴ The ciliate's diet is made of bacteria and food particles present or passing through the colon. If extensive wall damage is done to the wall of colon, RBCs may also be seen in these organisms as well, and blood can be found in the stool.

In our case, the trophozoite forms were seen. Few parasites showed RBC engulfment in the cytoplasm. Presence of RBCs in the organism and presentation of hematuria might be because of extensive wall damage by the organism and host immune response to the organism and renal calculi. *Balantioides coli* should be differentiated from *Trichomonas vaginalis*, *Entamoeba histiolytica*, ciliocytophthoria phenomenon. *Trichomonas vaginalis* is a small flagellated motile parasite. *Entamoeba histiolytica* is also smaller than *Balantioides coli*, and it moves on the slide surface by means of pseudopods. Ciliocytophthoria are much smaller, anucleate cells with cilia along one edge. *Schistosoma hematobium* is 20 µm x 0.25 µm in dimension, oval in shape, and has terminal spine.

To the best of our knowledge, there are only three case reports of isolated urinary balantidiasis from India, namely by Sukhpreet Kaur et al by using HE stain and Giemsa stain, Umesh et al on urine routine microscopy, Karuna et al, on urine routine microscopy.^{2,15,16} The rest of the case reports showed co-infection with *Trichomonas vaginalis*.² As per the literature search, this is the first case report of urinary Balantidiasis associated with tuberculosis of the urinary tract.

The patient was followed up. He was started on anti-tuberculous treatment and Metronidazole and responded well to treatment.

CONCLUSIONS

Balantioides coli infection is a rare infection, and finding this organism in urine is a very rare occurrence. Our case is the first case where both urinary balantidiasis and tuberculosis of the urinary tract system occurred together in a young male. The urine routine microscopy and cytology smears stained with both Giemsa and Pap smears are very useful in morphological identification. An experienced cytopathologist is an added value in the diagnosis.

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Conflicts of Interest: None

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