

Transurethral Removal of Vesical Fungal Bezoar Using Ho:YAG LASER—A Case Report

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Summary

Fungal bezoars are extremely rare in the urinary bladder, and there is limited literature regarding the modality of management. We report a case, where the piecemeal removal of a vesical fungal bezoar was performed using Ho:YAG LASER. A 60-year-old man presented with lower urinary tract symptoms and on evaluation was diagnosed with vesical calculus. On cystoscopy, a white-colored, smooth contoured ball was identified in the bladder. The effective endourological modalities for the removal of fungal bezoar require mention in the literature. This case report demonstrates the possibility and efficiency of Ho:YAG LASER in the endourological retrieval of fungal bezoar in the bladder.

The rarity of the diagnosis results in difficulty in prompt management.

Keywords: Vesical fungal bezoar, Fungal ball, Fungal bezoar, Ho:YAG, Holmium LASER, Case report

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Introduction

A bezoar or ball formed by the agglomeration of fungal mycelia in a pre-existing cavity is termed a fungal bezoar or fungal ball. Vesical fungal bezoar is a rare entity and was first reported in 1961 (1). Since then, only limited literature has been available for review, and less than 10 cases of vesical fungal bezoar have been reported. The spectrum of patients presenting with vesical fungal bezoar ranges from lower urinary tract symptoms or acute urinary retention to urosepsis (2, 3). In the urinary bladder, fungal bezoars are difficult to diagnose based on conventional imaging, such as a plain radiograph of the bladder, due to nonspecific findings (4). Due to the condition's rarity and inability to diagnose prior to cystoscopy, there arises a quandary and delay in management once cystoscopy reveals such

a condition. The scarce existing literature also contributes to the difficulty in determining an efficient management modality. Our case depicts the management of a patient diagnosed with vesical fungal bezoar.

Case presentation

A 60-year-old man hailing from Karnataka, India, presented to the outpatient department with lower urinary tract symptoms, which were burning micturition, increased urinary frequency, and inability to void completely. The patient had co-existing chronic kidney disease, diabetes mellitus, and a history of *Candida albicans* sepsis 2 years prior to presentation. The patient was on oral hypoglycemic agents for glycemic control,

and HbA1c at presentation was 6.6%. Ultrasound of the bladder revealed a heterogeneous, hyperechoic, free-floating lesion of size 4 cm and a prostate volume of 20 cc. Further evaluation with a noncontrast computed tomography (CT) of the abdomen showed a hyperdense ovoid lesion measuring 4.5 cm with a Hounsfield unit of 300 and was reported as a vesical calculus (Figure 1).

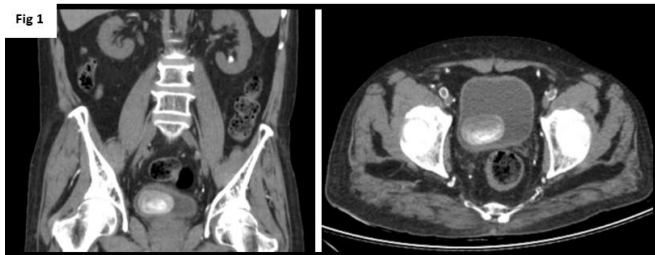


Figure 1. Non-contrast CT of abdomen showing a calculus of heterogeneous density measuring 4.5cm with a Hounsfield unit of 300.

The patient was explained regarding his condition and proceeded for cystolithotripsy with his consent. Under peri-operative antibiotic coverage with Cefoperazone, cystoscopy was performed using a 19F rigid cystoscope, and a suspicious white ovoid smooth contoured ball was noticed, which was assumed to be the calculus identified by radiological imaging. Fragmentation was attempted with a pneumatic lithotripter (Swiss LithoClast), but only punched-out holes could be made with no discernible fragmentation (Figure 2).

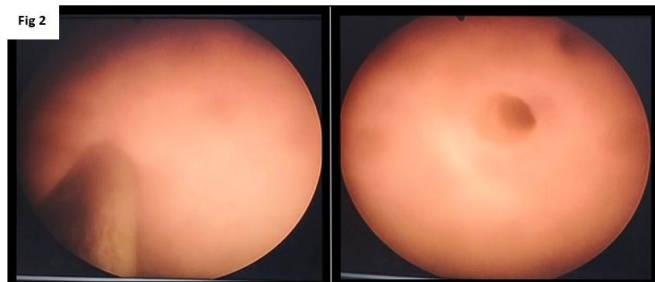


Figure 2. Attempting to fragment the suspicious calculus with pneumatic lithotripter(Swiss LithoClast) but only punched-out holes were made.

The need for an alternate way of removing the calculus was realized at this point, and the decision was made to go ahead with Ho:YAG LASER lithotripsy (Figure 3). The time required to break down the calculus with

Ho:YAG LASER into pieces retrievable through a 23.5F cystoscope sheath was 45 minutes (Figure 4). A suspicion of vesical fungal bezoar was held in mind at this point. The retrieved pieces were sent for culture and histopathological examination. A per-urethral 16F Foley catheter was placed at the end of the procedure.

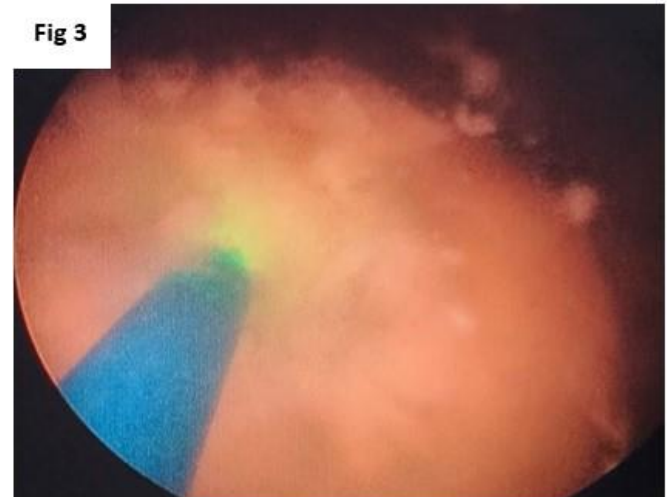


Figure 3. Using Ho:YAG laser to effectively break the fungal bezoar into pieces.

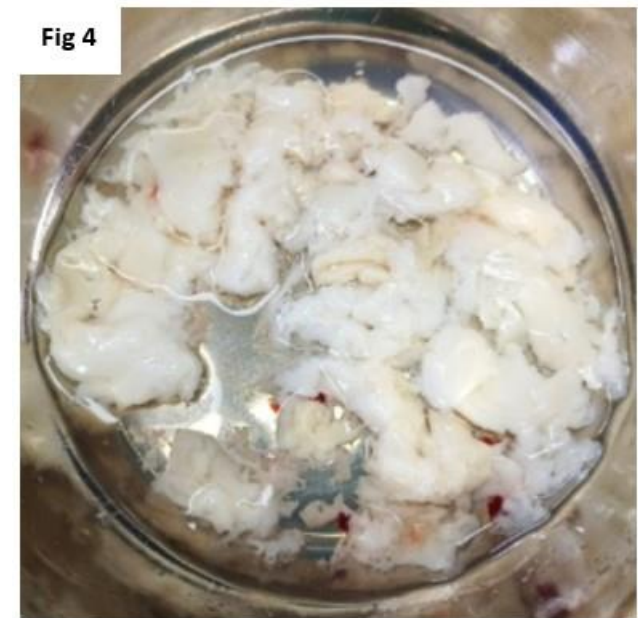


Figure 4. Image showing extracted piecemeal fungal bezoar.

The culture reported the growth of *Escherichia coli*. Microscopic examination showed fibrocollagenous tissue fragments, with thick sclerotic stroma, scattered

lymphocytic infiltrate, and focal foamy histiocytic collection surrounded by numerous clusters and scattered fungal pseudohyphae and budding yeast forms (Figure 5).

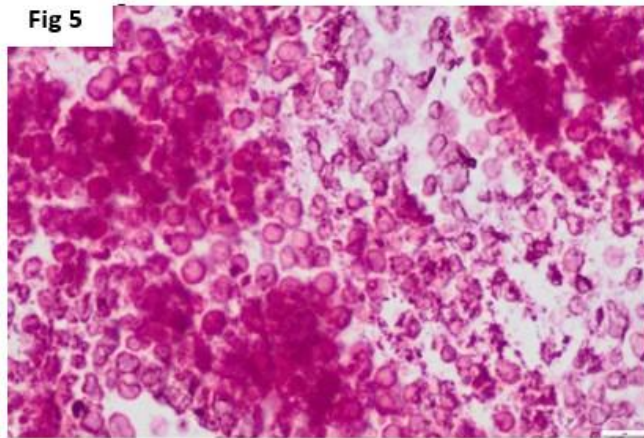


Figure 5. Histopathological image showing thick sclerotic stroma and scattered lymphocyte infiltrate and foamy histiocytic collection surrounded by numerous clusters and scattered fungal pseudohyphae and budding yeast forms.

Further immunohistochemistry studies using Grocott's methenamine silver (Figure 6a) and periodic acid-Schiff (Figure 6b) staining highlighted the fungal elements suggestive of *Candida* species.

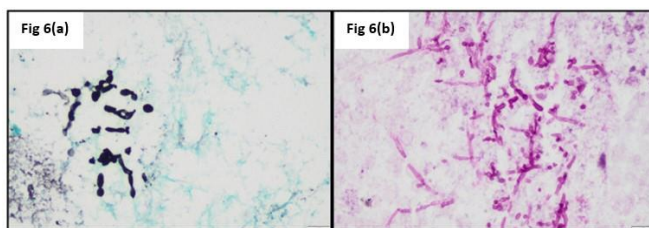


Figure 6. Gomori's methenamine silver (GMS) (a) and periodic acid-Schiff (PAS) (b) staining highlighting the budding and pseudohyphal elements suggestive of *Candida* species.

The patient was started on oral fluconazole 200 mg once a day and discharged on post-operative day 5 with advice to continue medication for 4 weeks. On follow-up 4 weeks later in our outpatient department, the patient was symptomatically better and had no complaints of lower urinary tract symptoms.

The patient's due consent was obtained at this stage for possible reproduction of this case as a public academic text, and written assurance of maintaining anonymity was given to this patient.

Discussion

The risk factors for the development of vesical fungal bezoars are diabetes mellitus, immunosuppression, and prolonged indwelling catheter, among others (5, 6). The presence of long-standing diabetes in the patient is also noted in our case report. With the advent of modern immunosuppressants and their widespread use, the incidence of fungal infection of the urinary system is increasing. The most commonly implicated organism in the formation of fungal bezoars in the urinary system is *Candida* spp., but *Aspergillus* spp. fungal bezoars have also been reported (7). *Rhizopus* has also been found to be a causative agent of renal fungal ball (8). The presence of *E. coli* on culture in our case might be due to the presence of simultaneous infection along with *Candida* spp., which has been proven to be a possibility in previous studies (9). The presence of fungal components can also be ascertained using microscopy and immunohistochemistry staining, as seen in our case. The radiological presentation of fungal bezoars has been found to vary among different cases reported in the literature. On ultrasonography of the bladder, multiple discrete, circular, echogenic masses without acoustic shadowing, floating freely within anechoic urine, will be seen (10). Ultrasound of the bladder performed in our case revealed a similar finding with a single, circular, free-floating, echogenic mass of dimension 2×2 cm, without acoustic shadowing. CT will reveal a heterogeneous soft-tissue density in the bladder, which in the majority of the cases is found separated from the bladder wall by a thin rim of urine (11). Similar findings were noted on CT in our case. The fungal bezoars might have radiolucent cores (3).

Although various techniques have been attempted for the endourological retrieval of vesical fungal bezoars, no gold standard procedure exists for the retrieval of vesical fungal bezoars (3, 12). The difficulty faced in our case was attributed to the pre-operative unawareness of the possibility of the vesical fungal bezoar, leading to

inefficient methods of vesical fungal bezoar retrieval. A bipolar resectoscope has been used for resecting the fungal ball into smaller sections and retrieving them via a cystoscope (12). Alternatively, LASER lithotripsy and piecemeal retrieval of the fungal bezoar can be performed using Ho:YAG LASER (3). There is a lack of evidence on the usage of other LASER modalities, such as thulium laser fiber or Thulium:YAG.

According to Infectious Diseases Society of America (IDSA) 2016 guidelines, patients undergoing urologic procedures for suspected fungal-related etiologies should be treated with oral fluconazole or Amphotericin B deoxycholate for several days before and after the procedure (13). In our case, since the suspicion of fungal infection arose only in the intraoperative stage, we had started the patient on oral fluconazole post-operatively and were advised to continue for 4 weeks. Amphotericin instillation into the renal pelvis via the nephrostomy tube has been documented in cases of fungal infection involving upper urinary tracts and has resulted in the resolution of infection (14).

Conclusion

Vesical fungal bezoars need a high degree of suspicion to be identified with precise interpretation of radiological features. Although vesical fungal bezoars have been associated with uncontrolled diabetes, they can occur in patients with good glycemic control, as in our case report. Cystoscopic piecemeal retrieval of vesical fungal bezoar using Ho:YAG is one of the efficient techniques, as depicted in this case report. Commencing peri-operative antifungal therapy is vital in preventing further escalation or spread of infection. Owing to the rarity of vesical fungal bezoars, more awareness, mention in the literature, and research into other modalities of extraction would help improve its management.

Ethical consideration

Informed consent was acquired from the patient for publication of the case report.

Author contributions

PH led in project administration and in review & editing of the original draft. All authors equally contributed to conceptualization, methodology, supervision, validation and in writing of the original draft.

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