PROSTATIC ABSCESS BY STAPHYLOCOCCUS AUREUS IN A DIABETIC PATIENT

Prostatic abscess is uncommon and difficult to diagnose because the clinical presentation may mimic symptoms of lower urinary tract infection. We report here a case of prostatic abscess in a 50-year-old known diabetic male patient, who presented with urinary retention. Clinical diagnosis was done by clinical presentation and ultrasonography. The causative agents i.e., *Staphylococcus aureus* was isolated from the aspirate and the patient responded to intravenous Ciprofloxacin therapy. No other surgical intervention was required to treat the patient.

**Key words:** Diabetes; prostatic abscess; *Staphylococcus aureus*

Prostatic abscess is uncommon and is rarely diagnosed. At the onset, symptoms may mimic several other diseases of lower urinary tract.[1] Prostatic abscess has undergone a great shift in mortality rate and the types of aetiologic agents since the discovery and use of penicillin.[2] In the 1940s mortality ranged from 6-30% and the major organism was *Neisseria gonorrhoeae*. More recent data suggests a mortality rate from 3-16%.[3] members of the *Enterobacteriaceae* family being the most common agents. Among these *E. coli* has the highest prevalence and is responsible for about 70% of the cases.[4] Other organisms reported are *Pseudomonas* spp., *Staphylococcus* spp. and occasionally obligate anaerobic bacteria.[5] A few cases of prostatic abscess caused by *Staphylococcus aureus* have suggested a haematogenous pathogenesis.[6] Prostatic abscess is most often seen in patients who are diabetic, on maintenance dialysis for chronic renal failure, immunocompromised, undergoing urethral instrumentation or requiring indwelling catheters.[6] Rare cases of prostatic abscesses due to *Brucella* spp.[7] and fungi like *Candida* spp., *Cryptococcus neoformans* and *Aspergillus* spp. have also been reported.[8,10] We report here a case of prostatic abscess, in a diabetic male, caused by *Staphylococcus aureus* and the diagnosis was achieved by ultrasonography and culture of the aspirated pus from the abscess.

**Case Report**

A 50-year-old male, chronic alcoholic and a known case of diabetes mellitus was admitted on 2nd November 2007 with the history of acute urinary retention since three days. The patient was HIV sero negative. As the patient was admitted with acute retention of urine, catheterisation was done. Catheter free trial was attempted, which failed, therefore re-catheterisation was done. After six days of catheterisation, the patient developed fever with chills. On examination the patient was febrile, abdominal examination was normal and per rectal examination showed grade II fluctuation. There was no history of haematuria, lithuria or symptoms suggestive of acute or chronic renal failure, abdominal swelling or trauma.

Routine urine analysis was done which showed occasional pus cells, no RBCs, no casts. Urine culture showed no growth. Liver and kidney function tests were performed. Total bilirubin was 1.3 mg/dL, direct bilirubin -0.3 mg/dL, aspartate transaminase - 51 IU/mL, alanine aminotransferase - 60 IU/mL, alkaline phosphatase - 417 IU/mL, total protein-6.7 gm%, albumin-2.7 gm%, blood urea nitrogen-7 mg%, serum creatinine-1 mg%, Na+-128meq/L, K+-4.5 meq/L, serum calcium-7.4 mg/dL, serum phosphorus- 2.3 mg% and serum uric acid-1.8 mg%.

As the patient presented with retention of urine, ultrasonography (USG) was done. USG of the prostate (Fig. 1) showed that the mass of the prostate was moderately enlarged, approximately 50.2 x 46.4 x 46.9 mm with heterogenous echogenicity with calcific foci suggestive of prostatic abscess. The liver showed mild diffuse fatty infiltration (likely due to alcoholic hepatitis), the pancreas showed coarse echotexture, both the kidneys showed borderline transcortical diameter with hypoechoic texture suggestive of diabetic nephropathy. However, to rule out malignancy serum prostatic specific antigen (PSA) levels were performed using the chemiluminescence technique at SRL Ranbaxy laboratories, which was normal (0.8 ng/mL).

Transrectal USG guided 10-12 mL of prostatic abscess pus was aspirated from the non dependent area i.e., near the base of the prostate. Gross examination of the aspirate showed that it was frank pus. The aspirated material was processed by Gram staining and was cultured on blood
Figure 1: USG of prostate showing moderately enlarged mass of prostate, approximately 50.2 x 46.4 x 46.9 mm with heterogenous echogenicity with calcific foci suggestive of prostatic abscess.

agar, chocolate agar, Sabouraud dextrose agar, Lowenstein Jensen medium (LJ medium) and in thioglycollate broth (processed anaerobically). Gram stained smear showed plenty of pus cells and gram positive cocci in clusters (Fig. 2). On blood agar, white opaque β haemolytic colonies appeared after overnight incubation (Fig. 3). Secondary smear from the colony on blood agar was performed which showed gram positive cocci in clusters suggestive of Staphylococcus spp. The isolate was confirmed as Staphylococcus aureus by catalase, slide coagulase and tube coagulase tests. The antibiotic sensitivity was put up on Mueller Hinton agar and methicillin resistance was tested using oxacillin disc on MHA with 4% NaCl. The strain was sensitive to oxacillin hence was identified as methicillin sensitive Staphylococcus aureus (MSSA) and the antibiotic susceptibility pattern showed that the isolate was sensitive to ciprofloxacin and resistant to penicillin, amoxycillin + clavulanic acid, cefotaxime and amikacin. The patient was started with intravenous ciprofloxacin 4 gm BD. Even after prolonged incubation there was no growth of anaerobes (after 3 weeks), fungus or mycobacteria (after 2 months). The fever subsided and the patient was responding well to this line of treatment, at the last follow-up.

Discussion

Prostatic abscess is difficult to diagnose because the symptoms at the onset may mimic several other diseases of the lower urinary tract.[1] In the present case the patient presented with acute retention of urine and there was also history of burning and painful micturition. Oliveira et al.[1] retrospectively studied medical records of nine patients diagnosed and treated for prostatic abscess. In their study seven patients progressed to urinary retention, two patients presented previously with lower urinary tract symptoms but there was worsening of the symptoms as happened in the present case. Other signs and symptoms in patients presenting with prostatic abscess included fever (100%), dysuria and frequency of micturition (100%) and fluctuation areas in the prostate (33.3%). The onset of symptoms in the earlier reported study[1] varied from one to 27 days but in the cases with Staphylococcus aureus infection, the mean duration of symptoms was for seven days (1-14 days) and in all the cases, urine culture was negative as observed in the present case. Fisher et al.[9] reported prostatic abscess due to Aspergillus fumigatus. The patient was also diabetic; had undergone liver transplantation and presented with urinary symptoms including frequency, urgency, dysuria, nocturia and then retention of urine and digital rectal examination showed smooth, enlarged, tender prostatic gland. Hass et al.[8] reported prostatic candidiasis in a diabetic patient. The patient also had the same clinical presentations. On physical examination, an enlarged prostate with fluctuation and tenderness was present and the diagnosis was confirmed by USG and diagnostic aspiration as done in the present case. Though prostatitis is a common urologic condition,
many clinicians find it difficult to treat effectively.\[5\] It has been estimated that up to half of the men suffer from symptoms of prostatitis at some time in their lives.\[10\] Culture diagnosis of acute prostatitis is straightforward and is easily accomplished in the laboratory, however, the microbiologic diagnosis of chronic prostatitis and prostatic abscess may be challenging.

Most of the urinary pathogens are also causative agents of acute and chronic prostatitis and prostatic abscess. \textit{E. coli} predominates as a cause of culture positive prostatitis. Other members of \textit{Enterobacteriaceae} such as \textit{Klebsiella} spp., \textit{Enterobacter} spp. and \textit{Proteus} spp. have been reported as causative agents of prostatic abscess. Rare pathogens which have been reported include \textit{Pseudomonas} spp., \textit{Staphylococcus} spp., \textit{Enterococcus} spp. obligate anaerobic bacteria, \textit{Brucella} spp., cytomegalovirus, mycobacteria and fungi such as \textit{Aspergillus}, \textit{Cryptococcus neoformans} and \textit{Candida} spp.. Therefore, if diagnostic aspiration is done and the pathogen is established, it helps the clinician to institute appropriate treatment.\[1,9\]

A few cases of prostatic abscess that have been reported to be caused by \textit{Staphylococcus aureus}, suggested a haematogenous spread. Prostatic abscess is most often seen in diabetics on maintenance dialysis for chronic renal failure, immunocompromised, underlying urethral instrumentation or requiring indwelling catheters or HIV patients. No predisposing factor other than diabetes and alcoholism was present in our patient and we could not find the mode of infection.

Various factors have influenced the shift of epidemiological profile of prostatic abscess, which include routine and widespread use of broad spectrum antibiotics to patients with lower urinary tract symptoms, without the investigations; better control of chronic diseases allowing an increase in the population longevity, therapeutic advances such as haemodialysis, organ transplants, chemotherapy, immunosuppressive drugs.\[6\] It is thought that the retrograde flow of contaminated urine within prostate during micturition is the most prevalent pathogenic factor.\[10\] Some authors suggest that prostatic abscess is a complication of bacterial prostatitis (acute or chronic) but acute incidence and frequency of these events is not known.\[51\] Bacterial haematogenous spread from distant foci was also described such as from respiratory, digestive (appendicitis, diverticulitis), urinary tracts, perirenal abscess or from skin (furuncles, abrasions). In these cases organisms such as \textit{Staphylococcus aureus}, \textit{Mycoplasma tuberculosis}, \textit{E. coli}, \textit{Candida} spp. may be found but in the present case, no such foci could be found. When not adequately treated, the prostatic abscess may progress to sepsis and death.\[12\] Thus accurate diagnosis and efficient treatment are required. Treatment includes parenteral broad spectrum antibiotic administration and abscess drainage. This may be performed by transrectal approach or transperineal ultrasound guided digital puncture/drainage by perineal route, transurethral incision of prostate or open perineal drainage. In our case, the patient responded to intravenous antibiotic therapy and no surgery was required.

In summary, high index of suspicion is required to diagnose such a rare case of prostatic abscess, as symptoms may mimic lower urinary tract infection. Accurate diagnosis and proper treatment are required to prevent complications such as sepsis and death.

**References**


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