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Treatment of Prostatic Abscess: Role of Transrectal Ultrasound Guided Needle Aspiration

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ABSTRACT

Background: Prostatic abscess is an uncommon condition and is most often associated with prostatitis. The incidence of prostatic abscess has declined markedly with the widespread use of antibiotics and decreasing incidence of gonococcal urethritis. The management of prostatic abscess consists of antibiotic therapy and aspiration/drainage by transperineal, transrectal and transurethral route.
Objectives: The purpose of the study was to present and discuss the clinical presentation, etiologies, diagnosis and treatment outcome of prostatic abscess at our institute in last 8 years.
Patients and Methods: A retrospective study was carried out on 12 patients diagnosed with prostatic abscess during 2002-2010 at our institute. Age of patients ranged from 17-76 years. The data analyses regarding age, presenting complaint, digital rectal examination, diagnostic imaging, bacteriological profile, treatment modalities and outcome. The collected data was compared with the available latest literature.
Results: 10 patients presented with lower urinary tract symptoms, 5 patients were diabetics, 3 patients presented with retention urine and 3 had fever. Two patients had pyrexia of unknown etiology without any LUTS. Urine culture was sterile in 7 patients. On digital rectal examination fluctuation was present in only 5 patients. Pus culture showed Escherichia coli in 5 patients, Staphylococcus aureus in 3 patients, Pseudomonas aeruginosa and Klebsiella sp. in one patient each. 9 patients were cured by TRUS guided aspiration; only 2 patients underwent transurethral drainage and 1 with concomitant BPH underwent TURP. One patient had retrograde ejaculation after TUR deroofing of abscess.
Conclusions: TRUS guided aspiration of prostatic abscess may be the first line treatment of prostatic abscess. TRUS is also helpful in the diagnosis of prostatic abscess and follow up of patients who are treated conservatively. Other modalities should be reserved for failed treatment.

Implication for health policy/practice/research/medical education:
This article suggests that TRUS guided needle aspiration of prostatic abscess is minimal invasive and effective method of treatment of prostatic abscess and should be considered as first modality of treatment.

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1. Background

Prostatic abscess is an uncommon condition and is most often associated with prostatitis, particularly in diabetes and immunocompromised patients (1). The prevalence

of prostatic abscess is about 0.5% of all prostatic diseases (2). The incidence of prostatic abscess has declined markedly with the widespread use of antibiotics and decreasing incidence of gonococcal urethritis (3-6). Prostatic abscess is difficult to diagnose clinically because it mimics several diseases of lower urinary tract (7).With the advent of transrectal ultrasound (8) and computed tomography, the diagnosis of prostatic abscess has been greatly facilitated (9, 10). The management of prostatic abscess consists of antibiotic therapy and aspiration/ drainage by transperineal, transrectal and transurethral route (1).

2. Objectives

In this study we retrospectively reviewed the clinical, laboratory and treatment detail of 12 patients diagnosed with prostatic abscess at our institute during last 8 years.

3. Patients and Methods

A retrospective study was carried out on 12 patients diagnosed with prostatic abscess during 2002-2010 at our institute. The factors analysed were age, presenting complaint, digital rectal examination, diagnostic imaging, bacteriological profile, treatment modalities and outcome. The age of patient was in the range of 17-76 years. The diagnosis was based on clinical and trans rectal ultrasound findings. All patients underwent TRUS. Clean catch midstream voided urine sample and catheter specimen by sterile technique were collected. Pus from prostatic abscess was collected in sterile culture bottle. Antimicrobial susceptibility testing was carried out using disc diffusion methods. All patients were initially treated with intravenous antibiotics. The TRUS guided aspiration was performed with 18 gauge 20 cm long needle (chiba needle) in left lateral decubitus position with knee chest position. No anesthesia was required during TRUS guided aspiration of pus. After aspiration of pus saline was installed in the cavity and reaspirated until the effluent was clear. Antibiotics were given for 30 days as per culture sensitivity report. Patients were again reviewed by TRUS after one week for re-accumulation of pus. Out of 12 patients 4 patients had residual abscess. In one patient, pus was minimal and was treated conservatively. Two patients of residual prostatic abscess underwent transurethral drainage. One patient with concomitant BPH underwent TURP. Criteria for successful treatment were clinical improvement and no pus collection in follow up.

Table 1. Clinical Profile of Patients

Symptoms and Signs	Patients (No.)
Lower urinary tract symptoms	10
Acute retention of urine	3
Fever	3
Sepsis	1
Painful digital rectal examination	12
Diabetes mellitus	5
History of previous UTI	7

4. Results

Out of 12 patients, 10 patients had lower urinary tract symptoms, 5 were diabetics, 3 patients presented with retention of urine and 3 presented with fever *(Table1)*. Two patients had pyrexia of unknown etiology without any LUTS. Complete urine examination was done in all patients and 8 patients had more than 5 leucocytes per high power field. Urine culture was sterile in 7 patients *(Table 2)*. Blood count revealed leucocytes in 8 patients. Digital rectal examination was done in all patients and fluctuation was present in only 5 patients. Abdominal ultrasound was unable to detect abscess in 3 patients. TRUS revealed hypoechoic irregular area containing non-homogenous material within prostatic parenchyma confirming the diagnosis of prostatic abscess *(Figure 1)*.

3 patients had multiple abscesses. Culture of pus by TRUS guided needle aspiration showed Escherichia coli in 5 patients, Staphylococcus aureus in 3 patients, Pseudomonas aeruginosa and Klebsiella sp. in one patient each. No bacterial growth was found in 2 patients *(Table 2)*. On follow up after one week of needle aspiration 4 had remaining abscess pocket. Out of these 4 patients, 2 underwent transurethral deroofing of prostatic abscess. One patient who was 66 years old underwent TURP. In one patient, pus was in very small quantity and was treated conservatively which subsided by antibiotics. All patients recovered well except in one patient who had retrograde ejaculation after transurethral deroofing of abscess. Antibiotics were continued for one month in all patients. Follow up after 1 month TRUS was done in all the patients and no residual abscess was found.

5. Discussion

Prostatic abscess is an infrequent condition in the

Table 2. Bacteriological Profile of Patients.

Test	Patients (No.)
Pus culture	
Escherichia coli	5
Staphylococcus aureus	3
Pseudomonas aeruginosa	1
Klebsiella sp.	1
No growth	2
Urine culture	
Escherichia coli	3
Staphylococcus aureus	0
Pseudomonas aeruginosa	1
Citrobactor sp.	1
No growth	7
Culture sterile	

modern antibiotic era with an incidence of 0.5% to 2.5% of all prostatic diseases (11). Prostatic abscess can occur in patients of any age but is mainly found in men in their 5th and 6th decade of life (12). The pathogenesis of the disease has been thought to involve two distinct mechanisms. The first mechanism occurs in older individual with pre existing bladder outlet obstruction in which a prostatic abscess develops secondary to a lower urinary tract infection. The abscess is caused by Escherichia coli or other Coliform bacteria in this group. The second mechanism involves a much smaller group of patients with a wide age distribution. The causative organism is usually Staphylococcus aureus as a result of metastatic abscess in the prostate from a focus of infection elsewhere (13). Factors predisposing to prostatic abscess include Diabetes mellitus, bladder outlet obstruction, patients on indwelling catheter, chronic renal failure, patients on hemodialysis, chronic liver disease and HIV infected patients (14). In our series Diabetes was the most common predisposing factor and was present in 5 patients. The diagnosis of Diabetes was made first time in two patients when they presented with prostatic abscess. A prostatic abscess should be considered as a possible etiology when evaluating for pyrexia of unknown etiology in young patients as 2 patients without pre-disposing factor presented with pyrexia of unknown etiology in our series. The clinical diagnosis of Prostatic abscess is sometimes difficult because of non specific symptoms (11). This condition usually presents as an irritative voiding symptoms, perineal pain and fever or as an acute urinary retention (15). A prostatic abscess should be suspected in case with chronic urinary symptoms caused by infection that does not respond well to antibiotic and in which a phlegmonous prostatic mass is found (16). The distinguishing palpatory finding of a tender fluctuant prostate on rectal examination has not been a constant occurrence. In this study also during per rectal examination fluctuation was present in only 5 patients.

Recent imaging methods such as TRUS have been suggested as a non invasive technique very helpful for the diagnosis of pathological condition of the prostate. The sonographic pattern of prostatic abscess is characteristic and can be differentiated from other glandular lesions (17). The most common finding is the presence of one or more hypoechogenic area of several sizes containing thick liquid primarily in the transition zone and in the central zone of the prostate, permeated by hyper echogenic area and distortion of the anatomy of the gland. Computed Tomography adds a few benefits to transrectal ultrasound for the diagnosis of prostatic abscess especially when there is extra prostatic collection (2). Documented evidence to distinguish abscess from cancer include the following:

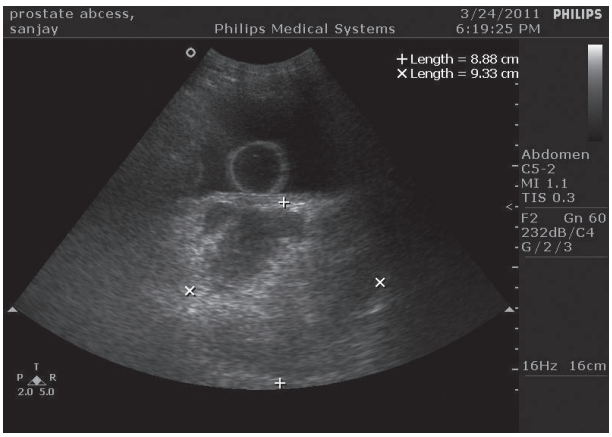
1. Prostate carcinoma usually appears small and is easily differentiated from the surrounding gland, whereas abscess covers large area of one or both lobes.

2. Carcinoma occurs mainly in the peripheral zone of prostate where the usual site of abscess is the central zone.

3. Abscess shows a high perilesional vascularity on Color Doppler ultrasound which is absent in tumor (18).

Treatment of prostatic abscess consists of combined intravenous antibiotic therapy and abscess drainage. Drainage of some kind should be performed if the abscess is larger than 1 cm. Several procedures to drain the abscess have been described including transurethral resection drainage, ultrasound guided transrectal and transperineal drainage and open surgical drainage that has been superseded because of the minimal invasion caused by all the other options (19). Minimal invasive procedures which are performed under local anaesthesia or sedation and repeated whenever required are being preferred. TRUS guided aspiration require no anaesthesia and repeat procedures may be performed with minimal morbidity. TRUS also helps in follow up of patients who are treated with antibiotic therapy alone without any drainage or puncture. TRUS is highly effective in the diagnosis as well as in management of prostatic abscess, reported in different studies (20). In this study also, 9 patients were treated successfully by TRUS guided aspiration of pus and only 2 needed transurethral deroofing and one required TURP. Transurethral or perineal surgical drainage of prostatic abscess should be done with caution and is not advised these days unless other drainage techniques have failed. Perineal incision may lead to impotency due to nerve injury, and transurethral resection can elicit hematogenous spread of bacteria, leading to sepsis (21). TRUS needle aspiration for prostatic abscess is a feasible alternative to transurethral drainage. Complications due to late diagnosis or a poor drainage of Prostatic abscess ranges from spontaneous rupture in the urethra, bladder, perineum or rectum to chronic prostatitis, infertility or sepsis (11). Because of the potential for systemic infection and bacteremia, urethral instrumentation should be avoided in patients with acute bacterial prostatitis especially if the patient is unstable or already showing signs of sepsis. Prostatic abscess currently occurring in a relatively younger population

Figure 1. Transrectal Ultrasound of Patient Showing Prostatic Abscess.



has treatment implication as well (3). Transurethral drainage could result in retrograde ejaculation as seen in one patient in our series. Hence one would like to resort to transrectal or transperineal aspiration. TURP is indicated in elderly patients with associated bladder outlet obstruction due to prostatic enlargement. In our series one patient underwent formal TURP in addition to drainage of abscess.

More recently various reports have shown that the common organism causing prostatic abscess are Escherichia coli and other enteric gram negative bacilli (11, 15). However, the prevalence of immunocompromised individuals has increased in the modern era and the potential of uncommon fastidious pathogens, melioidosis, in addition to typical gram negative bacilli which make the diagnosis of prostatic abscess more complicated (14, 22, 23). In this series 5 patients were having Escherichia.coli,1 Klebsiella spp, and 1 Pseudomonas. aeruginosa infection. 5 patients were Diabetic and 1 had sepsis at presentation. Thus, it is important to send material for culture in order to identify the etiological agent especially in immunocompromised patients because they can present with uncommon microorganism (24). Urine culture may be negative unless abscess ruptures into urethra or the bladder. Thus, it is important to emphasize that pus culture and sensitivity should be performed routinely for management of prostatic abscess (3). In this series urine culture was negative in 7 patients. TRUS guided aspiration of prostatic abscess may be the first line treatment of prostatic abscess. TRUS is also helpful in follow up of patients who are treated conservatively and other modalities should be reserved for failed treatment.

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Conflict of interest

None declared.

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