Renal and Perinephric Abscesses Revisited

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Abstract

Background: This study was carried out to assess the spectrum of renal and perinephric space infection among urology patients admitted in the last three years.

Methods: Medical records of patients with renal and perinephric abscess and emphysematous pyelonephritis were reviewed.

Results: Out of 2278 patients admitted in last three years, 29 (1.2%) patients suffered from renal and perinephric space infection, 13 (45%) patients had renal abscess, 11 (38%) perinephric abscess and five (17%) emphysematous pyelonephritis. Sixteen (55%) patients recovered conservatively, nine (31%) patients required percutaneous drainage of the abscesses and remaining four (14%) underwent surgical exploration. The overall mortality was 14% in this study.

Conclusion: Renal and perinephric space infection continues to be a serious urological problem with high mortality rate. A high index of suspicion, prompt diagnosis, appropriate antibiotics and surgical intervention may be effective in reducing mortality.

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Key Words : Renal abscess; Perinephric abscess; Emphysematous pyelonephritis; Xanthogranulomatous pyelonephritis

Introduction

Suppurative infections of the kidney and perinephric space are uncommon. However, they can cause significant morbidity and mortality [1,2]. These infections affect both sexes equally except renal cortical abscess, which is three times more common in males. The incidence also increases in elderly and those with associated obstructive uropathy [3-5]. These infections are either intrarenal (cortical) or perirenal [1]. Ten percent of renal cortical abscesses rupture through the capsule forming a perinephric abscess, which is difficult to manage and carries a poor prognosis [3]. The mortality is high even after surgical intervention [6,7]. The clinical differentiation is difficult and computerized tomography (CT) scan is the best method to identify a renal cortical or perinephric abscess [8].

Material and Methods

In this retrospective study, medical records of all patients suffering from renal and perinephric space infection in the last three years were reviewed. Suspected patients were clinically evaluated and investigated using ultrasound scan of the abdomen. When the findings were suggestive of renal and perinephric space infection, plain and contrast enhanced computed tomogram (CECT) scan of the abdomen was done to confirm the diagnosis and grade the abscess.

After the diagnosis, all patients were put on combination antimicrobial regime in form of injection ceftriaxone 2 gm tid, injection amikacin 500 mg bid and injection metronidazole

500 mg tid as the first line therapy, good hydration and close monitoring for symptomatic relief, decrease in fever, flank pain and local tenderness. In cases of poor improvement in 48 hours, the regime was upgraded to injection ceftazidime 2 gm tid and ultrasound guided percutaneous drainage /surgical exploration was considered. After recovery, patients were re-evaluated at four to six weeks for abscess resolution and management of other predisposing factors (obstructing renal or ureteric calculi, diabetes mellitus).

Results

Out of 2278 patients in the study group, 29 (1.2%) patients comprising of 17 (59%) males and 12 (41%) females suffered from renal and perirenal space infections in the age group of 10-70 years. Majority (38%) were young in the age group of 21-30 years. At the time of presentation, the commonest symptom was fever (93%) followed by flank pain (86%) weakness and lethargy (76%) and lump abdomen (24%). The average duration of symptoms was 23 days (range 7-60 days).

On clinical examination, all patients were febrile (range 99-103° F) with marked costovertebral tenderness in 93% and a palpable, tender, retroperitoneal mass of varying size in 31% cases. On investigation, 26 (90%) had raised leucocytes count with evidence of septicemia in six (21%) and azotemia in three patients. It was seen that 13 (45%) patients had renal abscess, 11 (38%) perinephric abscess and five (17%) emphysematous pyelonephritis. The predisposing factors were diabetes mellitus (35%), ureteric calculi (31%) and renal calculi (24%) in these patients (Table 1).

Ten patients of renal abscess improved with conservative management and three required ultrasound guided aspiration

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Fig. 1 : CT scan showing a large renal abscess involving right kidney.

Table 1

Patient's profile and clinical data (n=29)

Sex	No. of patients (%)
Male	17 (59)
Female	12 (41)
Side	
Right	16 (55)
Left	13 (45)
Age (in years)	
10-20	1 (3)
21-30	11 (38)
31-40	9 (31)
41-50	6 (21)
51-60	2 (7)
>60	1 (3)
Predisposing factors	
UTI	3 (11)
Renal calculi	7 (24)
Ureteric calculi	9 (31)
Renal and ureteric calculi	1 (3)
Diabetes mellitus	10 (35)
Chronic renal failure	2 (7)
End stage renal disease	1 (3)
Presenting symptoms	
Pain in flanks	25 (36)
Fever with chill and rigor	27 (93)
Loss of weight	6 (21)
Weakness/lethargy	22 (76)
Pyuria	2 (3)
Decreased urine out	2 (3)
Clinical findings	
Fever	28 (97)
Costovertebral tenderness	27 (93)
Palpable lump	9 (31)
Diagnosis	
Renal abscess	13 (45)
Perinephric abscess	11 (38)
Emphysematous pyelonephritis	5 (17)

Fig. 2 : CT scan showing perinephric abscess and the obstructing calculus in right kidney.

Fig. 3 : CECT scan showing emphysematous pyelonephritis involving left kidney, perinephric space and retroperitoneum.

because of large size of the abscesses (Fig. 1). Four out of eleven cases of perinephric abscess improved with conservative management, while percutaneous drainage was done in five and internal stenting (double J) in two patients to relieve the distal obstruction (Fig. 2). One patient of emphysematous pyelonephritis (Fig.3) improved conservatively and four underwent surgical exploration because of deteriorating general condition and septicaemia (Table 2). Pathogenic organisms from pus/aspirate/debris/urine were isolated in 17 (59%) cases, with *E coli* in nine (31%), *Proteus sp* in five (17%) and *Ps aeruginosa* in three (11%) patients. Once the general condition improved, the predisposing factors were managed like controlling diabetes mellitus and calculi removal. Four (14%) patients died post operatively during the study period, one each from renal abscess and perirenal abscess and two from emphysematous pyelonephritis.

Table 2**Treatment and outcome (n=29)**

Treatment	No. of patients	Nephrectomy	Death
Antibiotics alone	14	-	-
Antibiotics + PCD	9	3	1
Antibiotics + urinary drainage	2	-	-
Antibiotics + exploration			
Drainage of pus & debris	1	-	-
Nephrectomy	3	3	2
Ureterolithotomy	9	-	1

PCD = Percutaneous drainage.

Discussion

Successful treatment of renal abscess requires prolonged intravenous and oral antibiotics while surgical or percutaneous drainage is reserved for non-responders [9, 10]. Antistaphylococcal therapy is indicated for the renal cortical abscess while therapy directed against the gram negative uropathogens is indicated for most of the other entities [3]. The duration of antibiotic treatment is determined by the patient's clinical response and the current recommendations are to continue parenteral antimicrobial therapy for at least 24 to 48 hours after clinical improvement and oral antibiotic therapy can then be administered for an additional two weeks [3].

Perinephric abscesses usually occur because of disruption of a corticomedullary intranephric renal abscess, recurrent pyelonephritis, xanthogranulomatous pyelonephritis or an obstructing renal pelvic stone causing pyonephrosis. Gram negative bacterial abscess commonly develops due to rupture of corticomedullary abscess while the staphylococcal infection develops due to rupture of a renal cortical abscess. Approximately 30% of cases are attributed to haematogenous dissemination from other sites of infection such as wound infection, furuncles or pulmonary infection. Abscess can also occur from ascending urinary tract infection, the presenting symptoms of which are nonspecific [11].

Factors associated with antimicrobial treatment failure are large abscesses, obstructive uropathy, severe vesico-ureteral reflux, diabetes, old age and urosepsis with gas forming organisms [4]. A drainage procedure should be considered when there is a large abscess and no clinical improvement occurs after 48 to 72 hours of appropriate antibiotic therapy [4]. If obstructive uropathy is present, prompt drainage by percutaneous nephrostomy should be performed and the lesion corrected once the patient

is stable and afebrile. If open drainage is required, an incision and drainage is preferred while nephrectomy is reserved for patients whose renal parenchyma is diffusely damaged and for elderly patients whose survival depends upon urgent surgical intervention [12].

Patients with emphysematous or xanthogranulomatous pyelonephritis usually require surgical excision and total nephrectomy is the commonly used procedure [3]. Out of 29 cases of renal and perinephric space infection and emphysematous pyelonephritis, 16 (55%) patients had complete resolution with conservative management, percutaneous drainage was required in nine (31%). Four (14%) patients had complete destruction of renal parenchyma with presence of gas in kidney and retroperitoneum, requiring nephrectomy in three cases and one died.

Conflicts of Interest

None identified

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