

## A Hospital Based Study Assessing the Spectrum of Renal and Perinephric Space Infection among Urology Patients

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Conflict of interest: Nil

### Abstract

**Aim:** The aim of the present study was to assess the spectrum of renal and perinephric space infection among urology patients.

**Methods:** The present study was conducted in the Department of General Surgery for the period of 12 months. 100 patients were included in the study. 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.

**Results:** Out of 100 patients, 64 (64%) males and 36 (36%) 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 (97%) followed by flank pain (42%) weakness and lethargy (72%). 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 91%. It was seen that 49 (49%) patients had renal abscess, 41 (41%) perinephric abscess and 10 (10%) emphysematous pyelonephritis. The predisposing factors were diabetes mellitus (35%), ureteric calculi (32%) and renal calculi (23%) in these patients. 60 patients were treated with antibiotics only and 20 patients were treated with antibiotics+ PCD. In 4 patients, there was drainage of pus and debris.

**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.

**Keywords:** Renal abscess; Perinephric abscess

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### Introduction

Renal abscess (RA) is defined as encapsulated pus confined to the renal parenchyma and is further divided into renal cortical or corticomedullary abscess. [1] Perinephric abscess (PNA) is a collection of suppurative material located between Gerota's fascia and the renal capsule. [2] Complications of urinary tract infections (UTIs) and hematogenous seeding from primary infected sites are the common source of infection. [2,3] Additionally, rupture of renal cortical abscess or renal carbuncle can result in the formation of PNA. [2]

As a result of its anatomical location and potential to spread, RA is potentially lethal and the prognosis can be poor, especially in immunosuppressed and cachectic patients. [1,4] PNA originates from hematogenous dissemination, and often has an acute presentation with pain and high spiking temperatures, while in most cases, PNA is

notoriously silent clinically [2,3], thereby the diagnosis can be challenging. It is reported that only 35%-38% of patients with PNA are correctly diagnosed at the time of admission. [5,6]

Recently, computed tomography (CT) and magnetic resonance imaging (MRI) have become more available, and the quality of renal ultrasound examinations has increased. These advances in imaging techniques have led to earlier diagnoses of renal and perirenal abscesses. Furthermore, novel antibiotics and current percutaneous drainage techniques have reduced surgery- related morbidity and mortality. [7-10]

Renal abscess, which is extremely rare in pediatrics, has a long treatment period and is highly destructive to the kidneys. It is an extremely serious type of kidney infectious disease. The clinical manifestations are non-specific, including fever,

abdominal pain, nausea, vomiting, and hematuria. [11-13] There is often a history of cold or surgery before the onset of the disease. The most common pathogens are Escherichia coli and Staphylococcus aureus [11,13,14], which may be retrograde or hematogenous. Potential susceptibility factors include diabetes, vesicoureteral reflux, pelvic ureteral duplication malformation, and nephrolithiasis. [13-16]

The aim of the present study was assess the spectrum of renal and perinephric space infection among urology patients.

### Materials and Methods

The present study was conducted in the Department of General Surgery, Narayan Medical College and Hospital, Sasaram, Bihar, India for the period of 12 months. 100 patients were included in the study. 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

**Table 1: Patient's profile and clinical data**

<b>Gender</b>	<b>N (%)</b>
Male	64 (64)
Female	36 (36)
<b>Age in years</b>	
10-20	3 (3)
21-30	38 (38)
31-40	31 (31)
41-50	20 (20)
51-60	5 (5)
>60	3 (3)
<b>Side</b>	
Right	55 (55)
Left	45 (45)
<b>Predisposing factors</b>	
UTI	11 (11)
Renal calculi	23 (23)
Ureteric calculi	32 (32)
Renal and ureteric calculi	2 (2)
Diabetes mellitus	35 (35)
Chronic renal failure	5 (5)
End stage renal disease	2 (2)
<b>Presenting symptoms</b>	
Pain in flanks	42 (42)
Fever with chill and rigor	95 (95)
Loss of weight	21 (21)
Weakness/lethargy	72 (72)
Pyuria	2 (2)
Decreased urine out	2 (2)
<b>Clinical findings</b>	
Fever	97 (97)
Costovertebral tenderness	91 (91)
Palpable lump	31 (31)
<b>Diagnosis</b>	
Renal abscess	49 (49)
Perinephric abscess	41 (41)
Emphysematous pyelonephritis	10 (10)

Out of 100 patients, 64 (64%) males and 36 (36%) 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 (97%) followed by flank pain (42%) weakness and lethargy (72%). 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 91%. It was seen that 49 (49%) patients had renal abscess, 41 (41%) perinephric abscess and 10 (10%) emphysematous pyelonephritis. The predisposing factors were diabetes mellitus (35%), ureteric calculi (32%) and renal calculi (23%) in these patients.

**Table 2: Treatment and outcome**

Treatment	No. of patients	Nephrectomy	Death
Antibiotics alone	60	-	-
Antibiotics + PCD	20	8	2
Antibiotics + urinary drainage	10	-	-
Antibiotics + exploration			
Drainage of pus & debris	4	-	-
Nephrectomy	8	8	4
Ureterolithotomy	20	-	2

60 patients were treated with antibiotics only and 20 patients were treated with antibiotics+ PCD. In 4 patients, there was drainage of pus and debris.

### Discussion

Suppurative infections of the kidney and perinephric space are uncommon. However, they can cause significant morbidity and mortality. [17,18] 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. [19-21] These infections are either intrarenal (cortical) or perirenal. [17] Ten percent of renal cortical abscesses rupture through the capsule forming a perinephric abscess, which is difficult to manage and carries a poor prognosis. [19] The mortality is high even after surgical intervention. [22,23] The clinical differentiation is difficult and computerized tomography (CT) scan is the best method to identify a renal cortical or perinephric abscess. [24]

Out of 100 patients, 64 (64%) males and 36 (36%) 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 (97%) followed by flank pain (42%) weakness and lethargy (72%). 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 91%. It was seen that 49 (49%) patients had renal abscess, 41 (41%) perinephric abscess and 10 (10%) emphysematous pyelonephritis. The predisposing factors were diabetes mellitus (35%), ureteric calculi (32%) and renal calculi (23%) in these patients. 60 patients were treated with antibiotics only and 20 patients were treated with antibiotics+ PCD. In 4 patients, there was drainage of pus and debris. Successful

treatment of renal abscess requires prolonged intravenous and oral antibiotics while surgical or percutaneous drainage is reserved for non-responders. [25,26]

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. [27] Factors associated with antimicrobial treatment failure are large abscesses, obstructive uropathy, severe vesico- ureteral reflux, diabetes, old age and urosepsis with gas forming organisms. 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. [20] 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. [28]

### 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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