

Renal papillary necrosis as a cause of ureteral obstruction in a diabetic patient

Oğuzhan SARIYÜCE,MD*, Derya BALBAY,MD*, N.Engin AYDIN,MD**, Bahar MÜEZZİNOĞLU,MD*

We report a case of renal papillary necrosis which caused an acute right sided lower ureteral obstruction and hydroureteronephrosis in a diabetic patient with acute pyelonephritis and bacteremia. Appropriate clinical settings such as diabetic urinary infections which may predispose to RPN, obstruction due to the necrotic tissue fragments must be kept in mind and necessary investigations along with early intervention should be prompted in order to restore renal function and reduce the mortality. [Journal of Turgut Özal Medical Center 1(3):204-206,1994]

Key Words: Papillary necrosis, ureteral obstruction, diabetes mellitus

Diabetik bir hastada üreteral obstrüksiyona neden olan renal papilla nekrozu

Bu çalışmada akut piyelonefriti ve bakteriyemisi olan diabetik bir hastada akut sağ üreter alt uç obstrüksiyonuna yol açan bir renal papilla nekrozu olgusu takdir edilmektedir. Diabetik üriner enfeksiyonlar gibi renal papilla nekrozuna zemin hazırlayabilecek klinik durumlarda nekrotik doku parçalarına bağlı obstrüksiyon akılda tutulmalıdır. Renal fonksiyonun bozulmasını önlemek ve mortaliteyi azaltmak amacıyla gerekli tanısal araştırmalar ve erken müdahaleden kaçınılmamalıdır. [Turgut Özal Tıp Merkezi Dergisi 1(3):204-206,1994]

Anahtar Kelimeler: Papilla nekrozu, üreter obstrüksiyonu, diabetes mellitus

Renal papillary necrosis (RPN) has been reported most commonly in association with diabetes mellitus, urinary tract obstruction, analgesic abuse, sickling disorders and severe pyelonephritis¹.

Eknoyan and associates have reviewed reports from United States and found that diabetes is the most common condition associated with RPN¹. The autopsy reports also indicate that papillary necrosis has an incidence of 2.7-7.2% in diabetics whereas it is 0.6-1.4% in nondiabetics^{2,3}. Relative ischemia due to vascular disease and infection and the setting of diabetes may be effective in producing this complication^{1,2}.

Pathologically, the apical two thirds of the pyramids show sharply defined gray-white to yellow color change and in microscopic examination, papillary tips reveal characteristic features of coagulation necrosis, with surrounding neutrophilic infiltration⁴.

Herein, we present a case of RPN with acute right sided ureteral obstruction due to sloughed necrotic renal papilla which was diagnosed after pathological examination of the surgically removed obstructing mass.

CASE REPORT

A thirty seven-year-old woman with a twelve year history of diabetes mellitus regulated by oral antidiabetics was hospitalised with fever and malaise. She had passed three urinary calculi between 0.3-0.5 cm in diameters and insuline treatment was started before hospitalization. On admission, she complained of dysuria, frequent urination, nocturia, gross hematuria and right flank pain. Physical examination revealed a body temperature of 37.7°C, regular heart beat of

* : İnönü University Faculty of Medicine Department of Urology - Malatya

** : İnönü University Faculty of Medicine Department of Pathology - Malatya

120/min, sensitive right costovertebral angle.

Laboratory workup revealed Hb 7 g/dl, WBC 12000/ml, BUN 34 mg/dl, Creatinine 2.4 mg/dl. The urine specimen showed plentiful erythrocytes and leucocytes as well as bacteria. Trace glucosuria and proteinuria were also detected. Creatinine clearance was 11 ml/min. Abdominal ultrasonography demonstrated a hydronephrotic right kidney with dilated proximal ureteral segment. Antibiotic treatment with ceftriaxone was started and continued when both urine and blood cultures yielded *E. Coli* microorganisms.

Bilateral retrograde ureteral catheterization was done and a normal left collecting system was found. On the right side, total obstruction was found on the tenth cm from the right ureteral orifice. A right percutaneous nephrostomy was inserted under ultrasonographic guidance and abundant purulent material was drained. However, the nephrostomy catheter was incidentally pulled out without having an opportunity of antegrade pyelography. Following this, a right lower ureteral exploration was performed through an oblique lower abdominal incision. A firm mass mimicking a urinary stone was palpated in the lower ureteral segment. The ureter proximal to the mass was grossly dilated. Through an ureterotomy a gray-tan mass measuring 4x2 cm was extracted.

Postoperative course was uneventful and the patient improved rapidly. The creatinine clearance was 34 ml/min a week after the operation. Postoperatively, the insulin dosage was lowered gradually and she was instituted on oral antidiabetics in two weeks.

Histopathological examination of the extracted mass revealed a renal papilla with indistinct outlines of the tubules, clumps of bacteria and powdery nuclear material (figure 1). The surface epithelium over the papilla was also lost. There was a dense zone of neutrophils in the base of the necrotic mass (figure 2). The overall picture was consistent with coagulative necrosis of a renal papilla.

DISCUSSION

RPN is a grave condition that must be diagnosed promptly in order to reduce mortality and preserve renal function¹. The most common condition accompanying RPN is diabetes mellitus as revealed by autopsy series and previous reports^{1,3}.

Diabetes was present in 57% of published case reports up to 1960³. A review in 1982 showed that 27.1% of diabetics dying from acute renal infection exhibited RPN on autopsy examination¹. Both

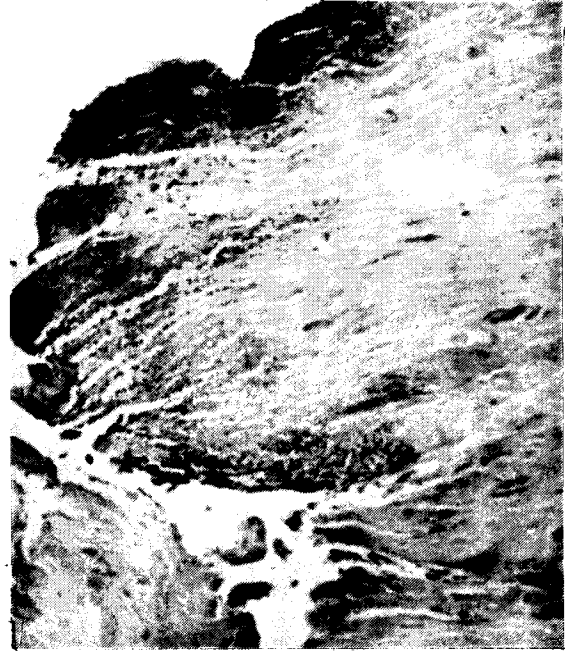


Figure 1. Low power view of the necrotic mass with dark areas of leucocytic infiltration (H.E. x40)



Figure 2. Border of the necrotic tissue with leucocytic infiltration (H.E. x400)

ischemic changes due to vascular complications of diabetes and infection have been found responsible for RPN¹⁻³. The presented case has an acute urinary pyelonephritis with bacteremia, however we could not assess the degree of vascular changes in the kidneys. The lowered creatinine clearance may represent the severity of the diabetic nephropathy.

Whether the infection is the cause of RPN or secondary to PRN is controversial^{1,2}. In our case, the element of infection could well be secondary to the impacted necrotic tissue rather than the initiating cause. However, infection is an important accompanying factor in the development of RPN as revealed in the 6-7% of cases seen by Eknayan et al. In only 4% of the patients was found to be the sole condition associated with RPN. RPN may present as an insidious chronic disease that is diagnosed incidentally on IVP or may have an acute fulminating clinical picture^{5,6}. The diagnosis is usually made from IVP due to the changes in the pelvis and calyces. Irregular sinuses, medullary cavities or ring shadows may be shown due to the papillary or medullary changes^{5,6}. Necrotic papillae may calcify, especially in association with infection. These may also form nidi for chronic infections. Actinomycotic or fungal opportunistic infections have also been reported with RPN⁷⁻¹⁰.

Early diagnosis, adequate antimicrobial therapy, elimination of the ureteral obstruction due to necrotic papillary tissue has improved the prognosis and minimized the decline in renal function in our case. It should be kept in mind that RPN cases may occasionally present with obstructive urologic emergency due to the impacted necrotic tissue in addition to deteriorating renal function and bacteriemic clinical picture¹¹.

REFERENCES

1. Eknayan C, Qunibi WY, Grisson RT, et al. Renal papilla necrosis: an update. *Medicine* 1982; 61:55-73.
2. Harris BR, Silva RG. The spectrum of renal papillary necrosis in diabetes mellitus: a multifactorial process. *Diabetic Nephrol* 1981; 3: 64-71.
3. Lauler A, Schneier GE, David A. Renal medullary necrosis. *Am J Med* 1960; 29:132-39.
4. Kumar V, Cotran RS, Robbins SL. Pathology of renal papillary necrosis. In: *Basic Pathology*. 5th ed. Philadelphia: WB Saunders 1992:454-5.
5. Hernandez CV, King AS, Needle MA. Nephrosis and papillary necrosis after pyelonephritis. *N Engl J Med* 1975;293:1347-51.
6. Lindvall N. Radiological changes of renal papillary necrosis. *Kidney Int* 1978; 13:93-8.
7. Juhass J, Galambos J, Surjan L Jr. Renal actinomycosis associated with bilateral necrotizing renal papillitis. *Int Urol Nephrol* 1980; 12: 199-205.
8. Madge CE, Lombardias S. Chronic liver disease and renal papillary necrosis with *Aspergillus*. *South Med J* 1973; 66: 486-93.
9. Tomaszefski JK, Abramovsky C.R. Candida-associated renal papillary necrosis. *Am J Clin Pathol* 1981;75: 190-5.
10. Vordermark JS, Modarelli RO, Buck AS. Torulopsis pyelonephritis associated with papillary necrosis. A case report. *J Urol* 1980; 123: 96-104.
11. Jameson RM, Heal MR. The surgical management of acute renal papillary necrosis. *Br J Surg* 1973; 60: 428-35.

Correspondence : Oğuzhan SARIYÜCE, MD
PK.6 Karakaş 44300 - MALATYA
Tel: (422)-3230011
Fax: (422)-3249963