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Transformed, Uninformed!! A Rare Case of Intestinal Metaplasia of Renal Pelvis In Chronic Pyelonephritis

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ABSTRACT

Metaplastic changes in the renal pelvis are infrequent and may lead to malignant transformation to adenocarcinoma. The present study reports a case of fifty five years old female who presented with non functioning right kidney associated with chronic pyelonephritis and pelvicalyceal calculi. Intestinal metaplasia without evidence of adenocarcinoma was accidentally detected in the right renal pelvis.

KEYWORDS : Intestinal metaplasia, chronic pyelonephritis

Introduction

The renal pelvis is normally lined by transitional epithelium. However, under rare circumstances in cases of chronic infection and urinary calculi, the transitional cell epithelium may undergo phenotypical changes, usually in the form of intestinal or squamous metaplasia. (Deniz 2010).Intestinal metaplasia is considered to be closely associated with adenocarcinoma.(Deniz 2010, Weimin Zhou 2014) The present case report is a rare case of intestinal metaplasia of renal pelvis without evidence of adenocarcinoma in a case of chronic pyelonephritis associated with multiple renal calculi.

Case report

A fifty five years old female came with right flank pain, fever, generalized weakness, decrease in appetite since 3 months. She had no past history of hypertension or diabetes mellitus. Clinical examination revealed pallor. There was no palpable abdominal lump. Kidneys were not palpable. Investigations revealed blood counts within normal limits, Urine examination revealed protienuria, pus cells 30/high power field (hpf) and red blood cells 10/hpf.

Liver function tests revealed total protein-7 gm/dl, total bilirubin-0.4 mg/dl, Alkaline phosphatase- 77 IU/L, SGOT -22 IU/L, SGPT-7 IU/L. Kidney function test revealed sodium- 126.2 mEq/L, potassium- 4.15 mEq/L, blood urea- 54 .00 mg/dl, serum creatinine-2.1 mg/dl

Ultrasonography revealed right ureteric calculus and right pyelonephritis. Hence right percutaneous nephrostomy (PCN) was done with right lumbar drain.

Computed Tomography (CT) and urography revealed small sized right kidney with multiple renal and ureteric calculi and delayed excretion of contrast. (Figure 1A) Diethylene triamine penta acetic acid (DTPA) scan revealed markedly decreased right renal function of 5.9%. Left kidney showed normal size and function. Hence right uretero lithotomy was done and two stones were removed. Because of markedly decreased renal function right nephrectomy was done.

We received right nephrectomy specimen of size 8x5x4cm with scarring on external surface with adherent fat. Cut section revealed thinned out cortex with obliterated corticomedullary junction with fatty infiltration. Renal pelvicalyceal system was dilated. No growth or projections were visible grossly. (Figure 1B) Microscopy revealed pelvicalyceal system lined by glandular epithelium with plenty of goblet cells. Focal areas showed stratification of lining epithelium without evidence of dysplasia. Subepithelial tissue showed atrophic tubules lined by flattened lining with thyroidization. Glomeruli were lost and some showed sclerosis. Interstitial tissue showed marked chronic inflammatory infiltrate and fibrosis. (Figure 2 A- D, 3 A) Even after extensive sampling there was no evidence of any malignancy. Alcian blue Periodic acid Schiff (AB-PAS) stain confirmed intestinal type of mucin. (Figure 3 B) Hence diagnosis of intestinal metaplasia associated with chronic pyelonephritis was offered.

Discussion

The intestinal metaplasia of the renal pelvis without associated malignancy is extremely rare. Very few cases have been reported in English literature. To the best of our knowledge only 18 cases have been reported.(Deniz K 2010, Weimin Zhou 2014, Mathur S 2004) Most often intestinal metaplasia of renal pelvis is an incidental finding. A review of literature revealed that almost all the cases have been associated with chronic irritation of renal pelvis, majority being chronic urinary tract infection associated with pelvicalyceal calculi. (Deniz K, Weimin Zhou)

The exact mechanism of glandular metaplasia is not well understood, however it is hypothesized to be associated with the endodermal origin of the embryonal cloaca and intestine. (Salm R 1969) Urothelium normally expresses simple epithelial cytokeratins such as CK7, CK8, CK18, CK19, CK20, and other isoforms like CK5, CK4, and CK17. CK5 is expressed in basal cells and CK13 and CK20 are expressed in superficial umbrella cells. In the study by Deniz K CK7, CK8, CK18, CK19, CK20, and CK5/6 expression were preserved in normal urothelium whereas metaplastic epithelium showed loss of CK7, CK19, and CK5/6 expression and gained stronger CK20 expression. Similarly Weimin Zhou et al reported that CK5/6 expression was absent in the metaplastic epithelium, however, stronger CK20 expression was present. They proposed that the renal pelvis epithelium underwent changes in phenotype in the intestinal metaplasia.

Adenocarcinomas may arise from metaplastic changes of this potentially unstable epithelium.(Manunta A 2005) Spires et al reviewed 59 cases of adenocarcinoma and observed that tubulovillous and mucinous tissue types accounted for 93% of cases which were morphologically similar to intestinal tumors, and therefore may arise from foci of intestinal metaplasia. Thus, considering that adenocarcinomas are likely to develop from the progressive transformation of these metaplastic cells in a stepwise adenoma-carcinoma sequence, possibly in a similar manner to colonic carcinogenesis (Sagnotta A 2013). Alteration in cell cycle regulators such as p16 and p53 are noted in urothelial and nonurothelial carcinomas. (Schulz WA 2006) The p53 expression indicates loss of cell cycle control and thus transformation into dysplasia. The p53 gene product is known to modulate the transition from premalignant to malignant condition. (Deniz K 2010) The pl6 is frequently involved in urinary bladder carcinogenesis and plays a role similar to p53. (Lopez- Beltran A 2004)

Conclusion- Intestinal metaplasia of renal pelvis though rare, should be reported in nephrectomy specimens. Other kidney should be meticulously followed up particularly in cases of recurrent, multiple renal stone as they are prone to develop adenocarcinomas.

Figure 1

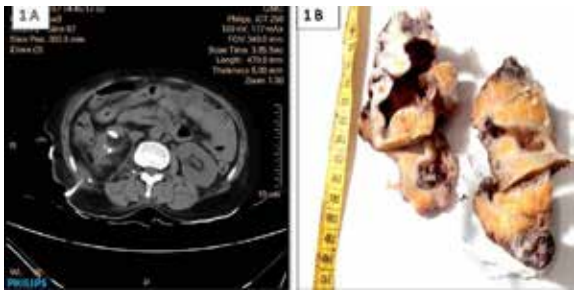


Figure 2

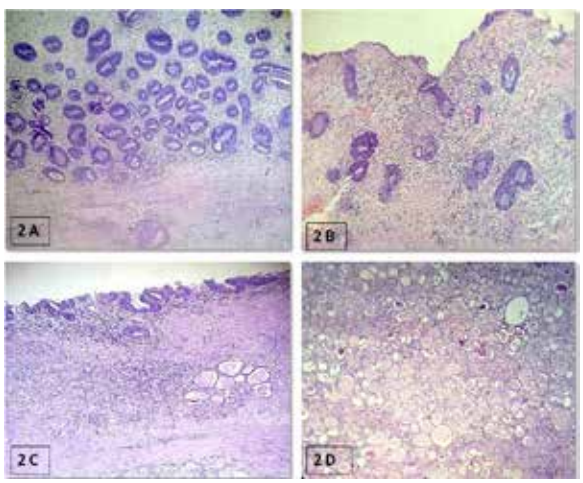
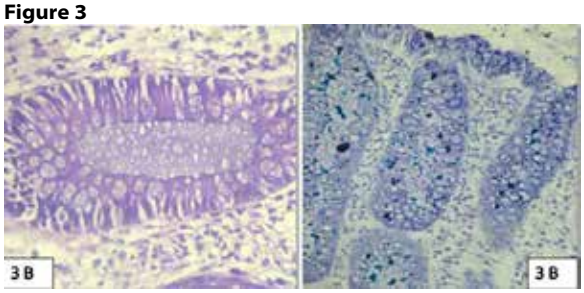


Figure 3



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