Volume 07, Issue 05 (September-October 2024), PP 36-40 **www.ijmsdr.org**
ISSN: 2581-902X

International Journal of Medical Science and Dental Research

Extensive Intestinal and Osseous Metaplasia in Chronic Pyelonephritis: an Unusual Presentation

Dr. Madhu Kumari[1], Dr. Anjali Agarwal[2], Dr Avinash Singh[1], Prof. (Dr.) Punam Prasad Bhadani[3]

[1], *Assistant Professor, Dept. Of Pathology, AIIMS, Patna*
[2.] *Senior Resident, Dept. Of Pathology, AIIMS Patna*
[3.] *Professor & HOD, Dept. Of Pathology, AIIMS Patna*

ABSTRACT: Normal lining epithelium of pelvi-calyceal system in human renal is transitional epithelium. Metaplastic transformation of renal pelvis and ureter transitional epithelium to intestinal epithelium is usually triggered by chronic injury due to various etiologies. Metaplastic changes to intestinal epithelium is prone for malignant transformation into adenocarcinoma. Here, we are presenting first unusual case of extensive intestinal metaplasia of renal pelvis and ureter leaving no residual transitional cell epithelium associated with osseous metaplasia in chronic pyelonephritis in a 63 years old male patient.
This case is unusual in context with osseous metaplasia associated with extensive intestinal metaplasia. Renal stones may lead to metaplasia of pelvicalyceal system. This finding could be associated with neoplastic transformation, so it is prudent to report metaplastic changes in case of chronic pyelonephritis.

Keywords: Chronic Pyelonephritis, Metaplasia, Intestinal, Osseous

I. INTRODUCTION:

Normal lining epithelium of pelvi-calyceal system in human renal is transitional epithelium. Metaplastic transformation of renal pelvis and ureter transitional epithelium to intestinal epithelium is usually triggered by chronic injury due to various etiologies[1]. Metaplastic changes to intestinal epithelium is prone for malignant transformation into adenocarcinoma. Few literatures have mentioned the phenomenon of urinary tract epithelium metaplasic changestosquamous,intestinal,glandular,mucinous,orciliatedepitheliuminrenalpelvis[2]. The presence of mature appearing bone bone in renal parenchyma is described as osseous metaplasia .Osseous metaplasia was first reported in renal cell carcinomaby Murugan*etal*.,2008 [3]. As per our knowledge and literature reviews here by, we report first case of extensive intestinal metaplasia of pelvicalyceal system and ureter along with osseous metaplasia without any residual presence of transitional epithelium in renal parenchyma.

II. CASE PRESENTATION:

A 63 years old male presented in the department of urology, Aiims Patna with two episodes of painless and gross hematuria associated with passage of blood clots, increased frequency of micturition, pain abdomen, pyuria and nocturia for last 3 months. He had history of bilateral vasectomy 20 years ago. No palpable lump was noted on per abdomen examination. Following are the investigation findings (Table 1):

TABLE 1:

Investigation	Finding
Ultrasonography	Right renal solitary calculi at upper pole and left renal microlith at upper pole. Minimal internal echoes and free floating foci in urinary bladder suggestive of cystitis. Insignificant post void residual volume.
CT Urography contrast	Right renal obstructive staghorn calculi of average attenuation 1340 HU measuring 2.4x2.5x3.6 cm in upper renal pole with grade 4 right hydroureteronephrosis.
Retrograde urethrogram and micturating cystourethrogram	Irregular hyperdense staghorn calculus in right kidney.
DTPA Renal dynamic study	Non functioning right kidney
Kidney Function Test	Approximately within normal range
Complete Hemogram	Hb: 11.7, WBC, Platelet: Within normal range

After completion of all pre-operative investigations, Right nephrectomy procedure was performed in the department of Urology and specimen was received in department of Pathology, Aiims Patna.
On gross examination, right nephrectomy specimen measured 11x8x3 cm. Attached ureter measured 5 cm in length and 0.5 cm in diameter. It was covered by perinephric fat. On cut section, entire renal parenchyma is replaced by adipose tissue with foci of area showed grey white lesion with firm consistency measured 4x2x2 cm. There was a cystic area noted measured 2x2 cm. A single stone was identified. No corticomedullary differentiation and normal renal parenchyma appreciated grossly.

On Histopathological examination, renal pelvis showed transformation of transitional epithelium to columnar mucinous lining epithelium with goblet cells. Focal area shows pseudostratification with mild to moderate dysplasia in the form of nucleomegaly and prominent nucleoli. Renal parenchyma was replaced by fibroadipose tissue. There was dense mixed inflammatory cell infiltrate comprising of neutrophils, macrophages, lymphocytes and plasma cells. Lymphoid aggregate and lymphoid follicle formation also noted. Tubular atrophy and thyroidisation of tubules seen [Fig 1]. Few foci showed osseous metaplasia with bony trabeculae formation. On the basis of above morphological features it was diagnosed as a case of chronic pyelonephritis with extensive intestinal metaplasia and osseous metaplasia [Fig 2]. Transitional epithelial lining of ureter also shows extensive intestinal metaplasia [Fig 3].

III. DISCUSSION:

The presence of dystrophic calcification is the usual and non specific findings in the most of the non neoplastic and neoplastic conditions of kidney[4]. Osseous metaplasia is identified as foci of eosinophilic osteoid and woven bone or the mineralized basophilic bone with interspersed lacunae. The pathogenesis of osseous metaplasia is still not clear, however many hypothesis have suggested that it would be a reparative reaction to

necrosis and degenerative changes due to inflammation and tumor [5]. Osseous metaplasia was commonly reported in renal cell carcinoma. First case of osseous and myeloid metaplasia in pyelonephritis was reported by Deepti Gupta et al[6].

Intestinal metaplasia without malignant transformations were reported in 24 cases to the best of our knowledge, mostly common in male. Nine cases were associated with chronic infection and stone.
Primary mucinous adenocarcinoma of kidney is a rare malignancy of renal pelvis as most common site[7]. These tumors are supposed to be originating from the intestinal metaplasia of transitional epithelium[8]. The mechanism of progression of intestinal metaplasia to adenocarcinoma of kidney is still not clear. Some literatures hypothesize that the transformation of metaplasia to malignancy would be due to the loss of cell cycle regulation. the metaplasia could be an unstable change and its evolution to neoplasia would be the result of a loss of cell cycle regulation [9].

Here, we report a case of extensive intestinal metaplasia in pelvicalyceal system associated WITH osseous metaplasia with trabeculae formation leaving no residual transitional cell epithelium lining in a patient with chronic pyelonephritis . This case is unusual in context with osseous metaplasia associated with extensive intestinal metaplasia.

IV. CONCLUSION:

Renal stones may lead to metaplasia of pelvicalyceal system. This finding could be associated with neoplasic transformation, so it is prudent to report metaplasic changes in case of chronic pyelonephritis.

References:

[1] SagnottaA,DenteM,SocciarelliF,CacchiC,StoppacciaroA,BalducciG. Primary adenocarcinoma of the renal pelvis: Histologic features of astepwiseprocessfromintestinalhyperplasiatodysplasiainapatientwithchronic renal abscess. Int J Surg Pathol. 2014;22(2):182-5.

[2] Siderits RH, Fingerman J, Hazra A, Rimmer C, Colaco M, Mikhail N, et al. Renal pelviceal keratinizingsquamousmetaplasiawithsparingofpyramidalzones.CaseRepUrol.2012;2012.[DOI:10.1155/2012/242780][PMID]

[3] Murugan P, Basu D, Manikandan R, Dorairajan LN, Kumar S. 2008. Osseous metaplasia in renal cell carcinoma: Reportof a rare case. *Indian J Pathol Microbiol.*, 51:399-401.

[4] BloomTL,GraySearsCL,WilliamsTR,LinfestyRL, Amling CL.2003.Multilocularcysticrenalcellcarcinoma with osseous metaplasia in 25 year old woman, Urology,61(2):462.

[5] Cribbs RK, Ishaq M, Arnold M, O'Brien J, Lamb J, Frankel WL. 1999. Renal cell carcinoma with massive osseous metaplasia and bone marrow elements. *Annals of Diagn Pathol*, 3(5):294-9.

[6] Dr.DeeptiGupta,Dr.AnjaliTewari,Dr.NupurTrivedi,Dr.ShefaliAgarwalandDr.AshaAgarwal,2017."Osseousa ndmyeloidmetaplasia in chronic pyelonephritis", *International Journal of Development Research*, 7, (12), 17849-17850.

[7] Li H, Xie F, Zhao C, et al. Primary mucinous adenocarcinoma of the renal pelvis misdiagnosed as calculous pyonephrosis: a case report and literature review. *Transl Androl Urol* 2020;9:781-8. 10.21037/tau.2019.12.38 [PMC free article] [PubMed] [CrossRef] [Google Scholar]

[8] Spires SE, Banks ER, Cibell ML, Munch L, Delworth M, Alexander NJ. Adenocarcinoma of renal pelvis. Arch Pathol Lab Med 1993;117:1156-60.

[9] Zhou W, Zhong K, Wang J, Gu Y, Huang L, Jiang Z, et al. Intestinalmetaplasia of the renal pelvis: A case report and literature review. OncolLett.2014;8(6):2664-8.

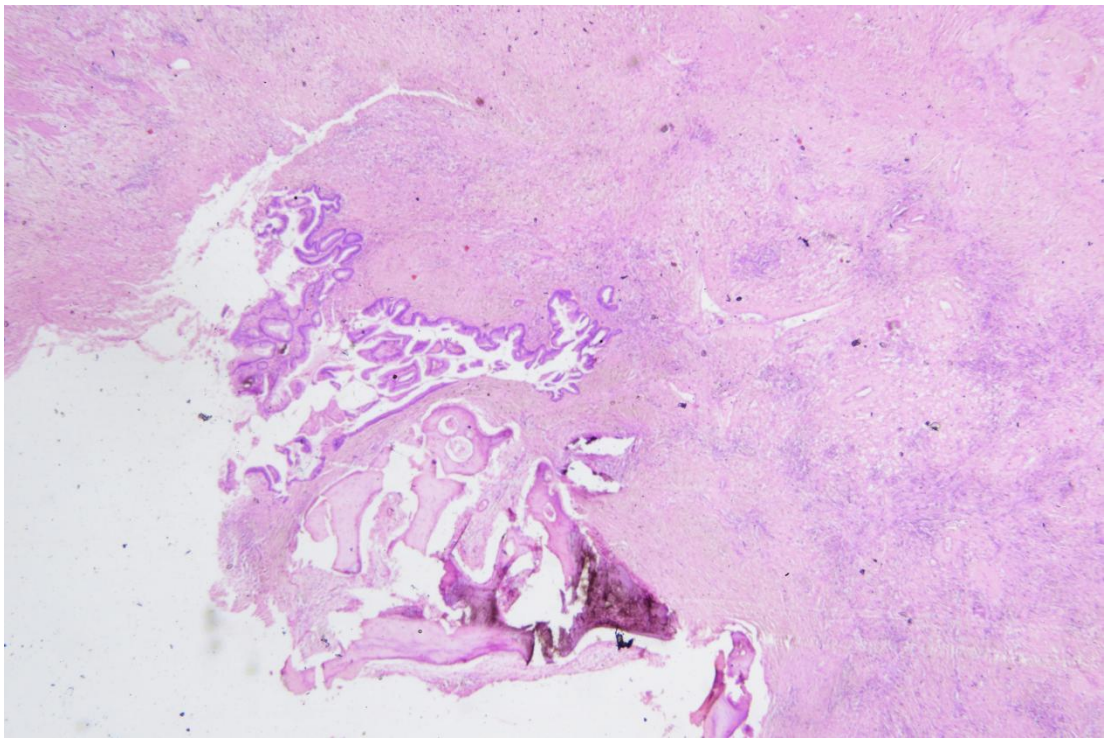

Fig 1: Mucinous metaplasia and osseous metaplasia in chronic pyelonephritis (2x)

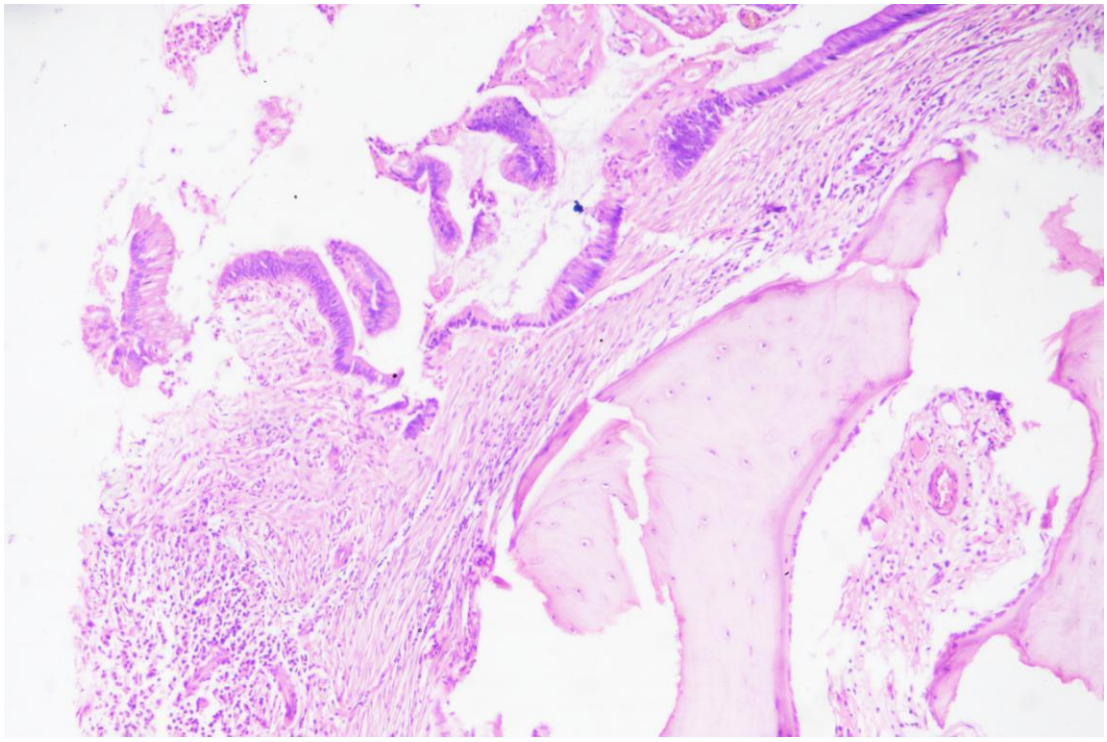

Fig 1: Mucinous metaplasia and osseous metaplasia in chronic pyelonephritis (10x)

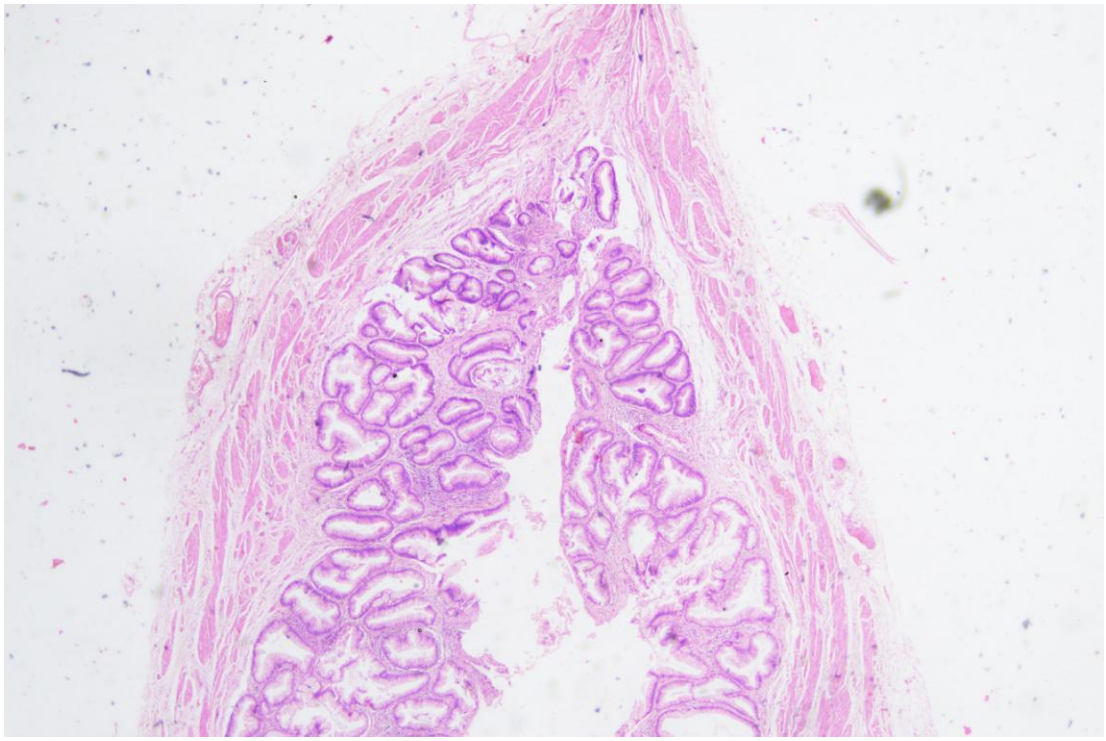

Fig 3: Mucinous metaplasia of ureter in chronic pyelonephritis (2x)