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Unusual Case of Chronic Pyelonephritis with Renal Pelviceal Keratinizing Squamous Metaplasia

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ABSTRACT:

Background: The upper urinary tract can develop squamous metaplasia, which is not frequent. Even more unusual is the occurrence of both florid squamous metaplasia and persistent pyelonephritis simultaneously. Despite its rarity, xanthogranulomatous pyelonephritis or nephrolithiasis may be connected with this illness if it is exposed to irritants or infections over time.

case information In this instance, a 49-year-old man with a history of nephrolithiasis surgery was referred for a straightforward nephrectomy due to an infected kidney that was persistently non-functioning. Histological investigation and gross observations both showed extensive interstitial chronic inflammation and florid squamous metaplasia within the pelvicalyceal system. These findings include the clinical presentation as well as the gross and microscopic ones.

“DIAGNOSIS Chronic Pyelonephritis with Renal Pelviceal Keratinizing Squamous Metaplasia”

Conclusion: Additional squamous metaplasia from renal stones is possible. While this finding can occasionally be a benign process, mimicking neoplasia, or be coupled with it, as was the case in the current case.

INTRODUCTION:

The pelvi-calyceal system in human kidneys is normally lined by transitional epithelium. Chronic irritation may lead to metaplastic changes in the epithelium. The urothelium of the urinary tract is replaced by keratinized squamous epithelial cells in a disease known as keratinizing squamous metaplasia. It is less typical for the upper urinary tract and the renal pelvis to be involved in such metaplasia, despite the fact that the lower urinary system is frequently affected. 1

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"Xanthogranulomatous pyelonephritis, nephrolithiasis, syphilis, tuberculosis, and smoking" have all been demonstrated to be related with the illness, as have other chronic irritating exposures or infections.[2,3]

Only a few cases have been described in the medical literature wherein extensive squamous metaplasia has replaced the entire transitional epithelium of pelvi-calyceal system with no evidence of any dysplasia or malignancy.[2,4] A rare such case is being described here in a middle-aged male patient.

CASE REPORT:

A 49-year-old male patient with a distant history of radial nephrotomy for nephrolithiasis presented with a clinical history suggestive of chronic kidney disease, including recurrent unilateral renal obstruction, chronic hydronephrosis, and nephrolithiasis.

Standard laboratory tests at the time of the current admission were primarily within normal ranges, with the exception of slight anaemia (Hb-9.8 g/dl). A higher total leukocyte count (TLC-14,400/cumm) and an increase in polymorphs (Neutrophils 88%) were seen in the differential count.

Proteinuria was 50 mg/l, there were 2-4 white blood cells/hpf, occasionally there were red blood cells/hpf, and there was no bacteriuria, according to urine tests.

While a CT urography revealed an irregular exophytic heterogeneously enhancing solid cystic lesion at the lower pole of the right kidney and an obstructive calculus in the right renal pelvis causing right sided hydronephrosis with peripheral enhancement suggestive of pyonephrosis, the isotope renogram was suggestive of the right non-functioning kidney.

After performing a right nephrectomy, histopathology was requested. On first glance, the surgical specimen appeared to be a solid cystic kidney with dimensions of 15 cm x 12.0 cm x 5.8 cm, weighing 240 grammes, and without perirenal fat. In terms of architecture overall, kidney polarity was lost. After being cut in half, the specimen showed several cystic regions. There was no sign of a calyx, PUJ (pelviureteric junction), or typical architecture. The substance in the pelvis had a caseous appearance and was foul-smelling, like an epidermal inclusion cyst. (fig 1, 2)

Sections of the renal pelvis showed florid squamous metaplasia without any adnexal structures or tissue analogs which might have been suggestive of an intrarenal teratoma. Sections showed

Multiple locular cysts lined by keratinised squamous epithelium and filled with keratinous material (fig 3). Surrounding renal parenchyma showed atrophy in the form of decrease in number of glomeruli that are mostly sclerosed and hyalinized . Tubules showed atrophy and were small in size filled with colloid like material cast (thyroidization of tubules). In between, there were many areas of fat and fibrosis.[6] Extensive lympho-plasmocytic infiltrate was also

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identified (fig 4, 5). Based on above findings, the diagnosis of chronic pyelonephritis with extensive squamous metaplasia of pelvi-calyceal system was made.

Figure 1. Gross photograph showing multiple cyst on the surface

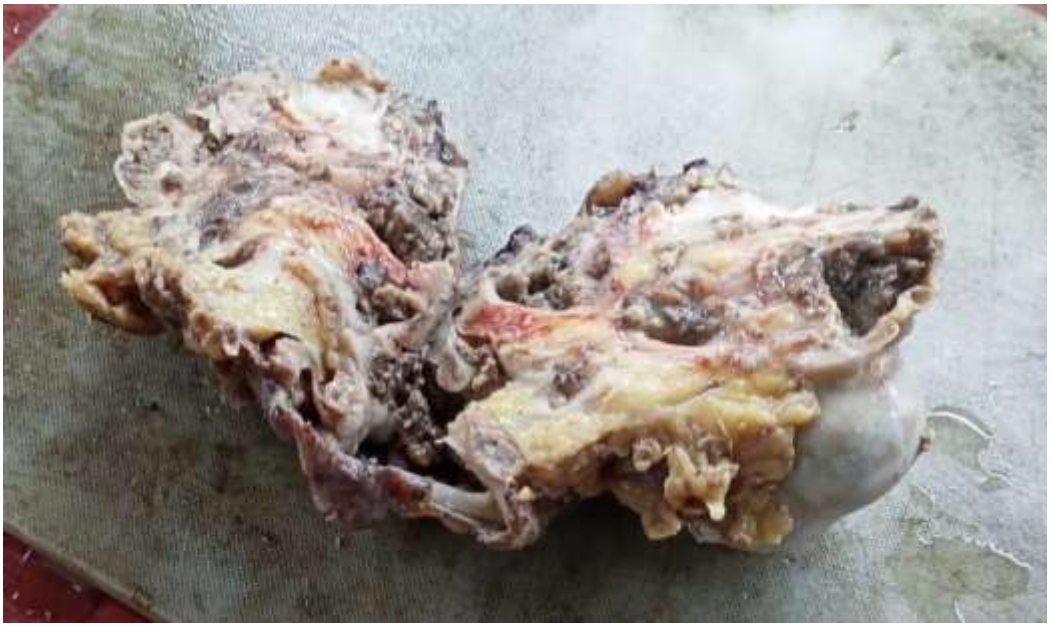

Figure 2. Gross showing on cut surface distortion of the architecture, and pelvis filled with Caseous material

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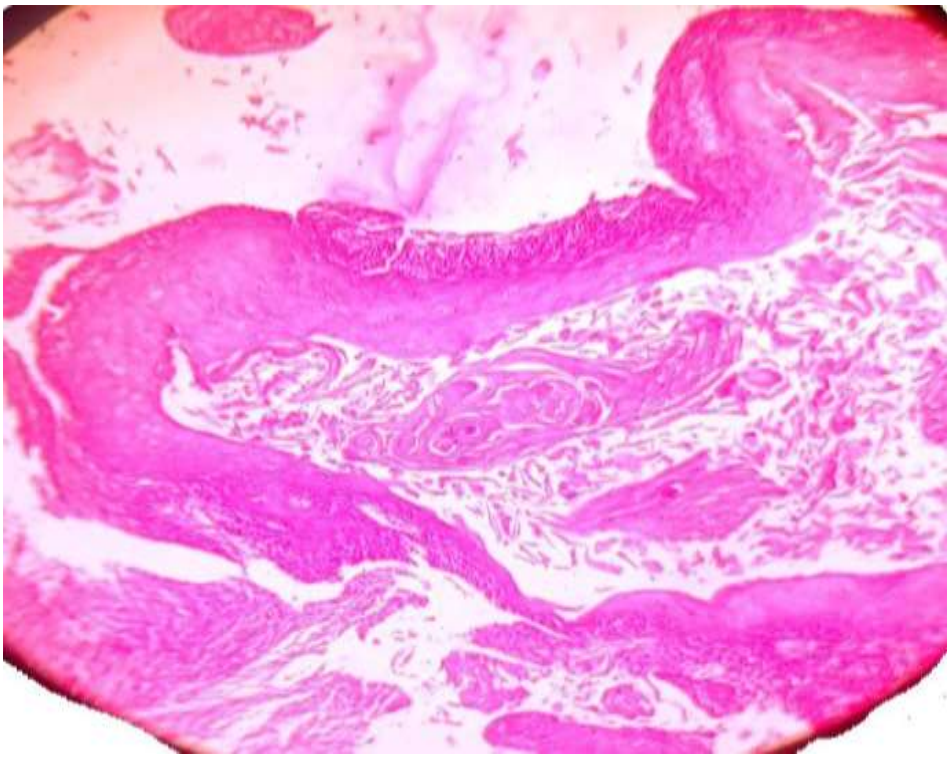

Figure 3. H &E stain (10x) shows locular cysts lined by keratinised squamous epithelium and filled with keratinous material.

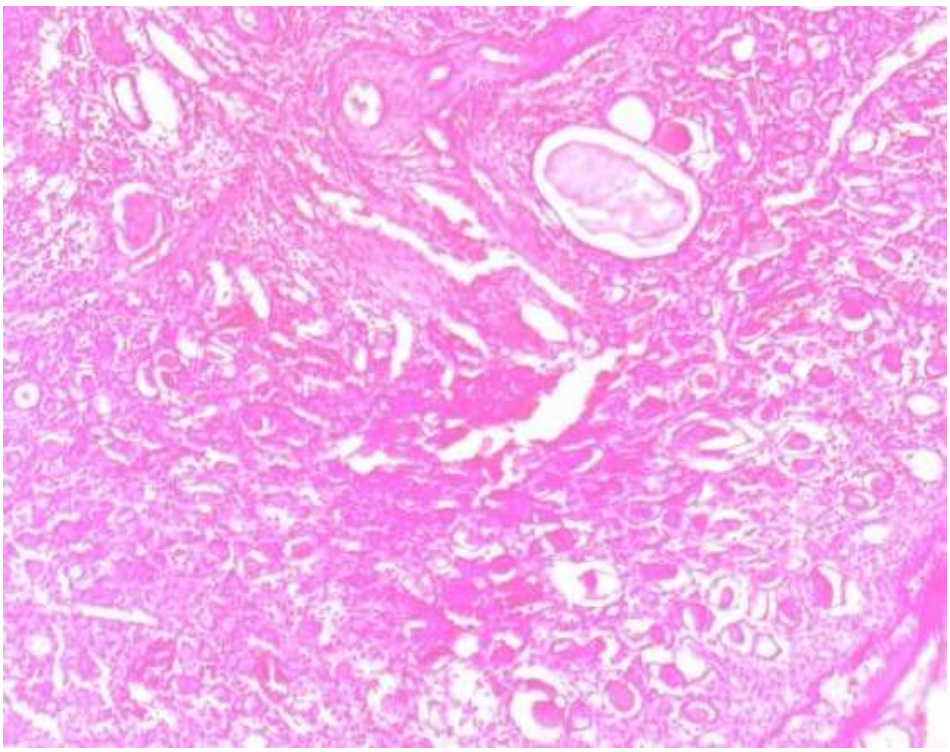

Figure 4. H&E stain (10 X) Shows extensive lympho-plasmocytic infiltrate in the interstitium.

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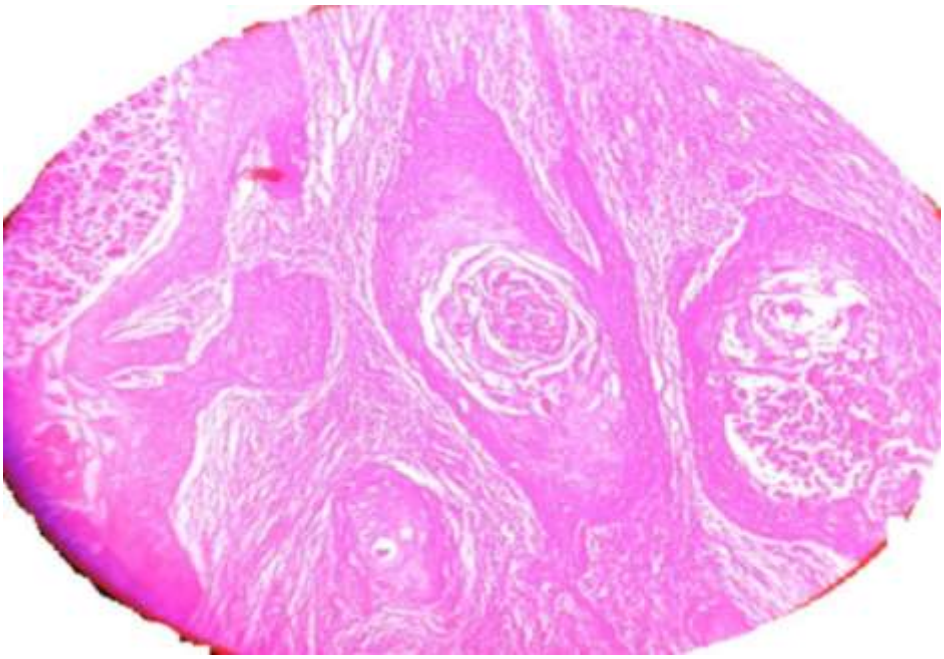

Figure 5. H & E (40 X) Shows multiple cyst filled with keratinous material and lined by squamous epithelium

DISCUSSION:

It is still uncommon to observe squamous metaplasia in the upper urinary tract. 1882 saw the publication of the first case report pertaining to this illness. 5 Stone disease, repeated or persistent infections, and irritants like cigarette smoke have all been linked to chronic inflammation, despite the absence of a definite cause. 6 The defensive response known as metaplasia transforms the transitional epithelium into a stronger keratinized squamous epithelium, minimising harm to the underlying stroma. Metaplasia occurs in response to prolonged insults. 7 With a minor male inclination, it is primarily observed in adults and typically occurs during the third and sixth decades of life.

Hertle and Andraulakakis first described Keratinizing Desquamative Squamous Metaplasia (KDSM) in 1982, which is a name that describes the histology present in this disorder. 8 With keratinization and subsequent desquamation, they discovered that cells were metaplastic rather than dysplastic. Other causes of squamous epithelium in the kidney include teratoma, dermoid cysts, the teratoid type of Wilm's tumour, and renal cancers. [9,10]

Squamous metaplasia of the urothelium evolves from constant irritation. The gradual transformation from glandular metaplasia to the premalignant lesion and then to frank malignancy has been historically documented. However, the significance of this association and its weightiness demands further exploration as in the present case, despite long-standing metaplasia in the kidney, patient did not progress to dysplasia or invasive malignancy as has been reported by several other studies.[11-14]

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CONCLUSION:

Additional squamous metaplasia from renal stones is possible. Despite the fact that this finding is linked to neoplasia, it is incredibly rare for this to be the case, as seen in the current case.

Conflict of Interest: None

Source of Grant: None

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