CASE REPORT

Thyroid-like follicular carcinoma of kidney: Case presentation and literature review

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Abstract

Thyroid follicular carcinoma like renal tumour (TFCLRT) is a rare variant of primary renal epithelial tumour and was first reported in 2006. Up till now, 40 cases have been identified worldwide and alarmingly, 17 cases have been identified from China only. The condition has been included in the WHO Renal Tumours Classification 2016. We present here the first case of thyroid follicular carcinoma like renal tumour from Pakistan that was managed in our surgical unit and a literature review. Left-sided radical nephrectomy was performed through a midline incision. The left kidney was removed along with intact Gerota fascia, left adrenal gland and lymph nodes alongwith aorta.

Keywords: Follicular variant, renal cell carcinoma, nephrectomy.

DOI: https://doi.org/10.47391/JPMA.086

Introduction

Thyroid follicular carcinoma-like renal tumour (TFCLRT) is a rare variant of primary renal epithelial tumour and was first reported in 2006.[1] Up till now, 40 cases shave been identified worldwide and alarmingly, 17 cases have been identified just from China. It has been included in WHO Renal Tumours Classification 2016.[1] After that Sterlacci et al[2] and He et al[3] separately reported one case each and they used the word 'Tumour' in their reports which indicated that its biological behaviour has not been studied yet. We present here the first case of thyroid follicular carcinoma-like renal tumour from Pakistan that was managed in our surgical unit and few comparative analyses of reported cases so far.

Case Report

A 35-year-old woman presented with a history of pain in the left flank for three weeks at North Surgical Department of Mayo Hospital Lahore on 29th October 2019. Her blood pressure was 190/110 on the first episode of pain. She was put on three antihypertensives to control her BP. She was taking beta-blocker for Supraventricular Tachycardia since last one year. There was no history of haematuria, thyroid disease, renal disease or family history of any significance.

On physical examination, she was obese and her left kidney was palpable. There was no thyroid swelling of any kind. The rest of the examination was unremarkable.

On biochemical screening, her aldosterone levels, urinalysis, and the rest of investigations were normal.

Ultrasound examination revealed an echogenic mass in the middle of the left kidney in the vicinity of the intrarenal pelvis. It was approximately 4 x 3.5cm in size and had internal low-echo solid components. CT of the abdomen and pelvis with contrast showed a left slightly hyperdense soft tissue nodule in the left renal sinus as shown in figures 1.1.

Left-sided radical nephrectomy was performed through a midline incision. The left kidney was removed along with intact Gerota fascia, left adrenal gland and lymph nodes along the aorta.

Pathological features expressed that all the para-aortic

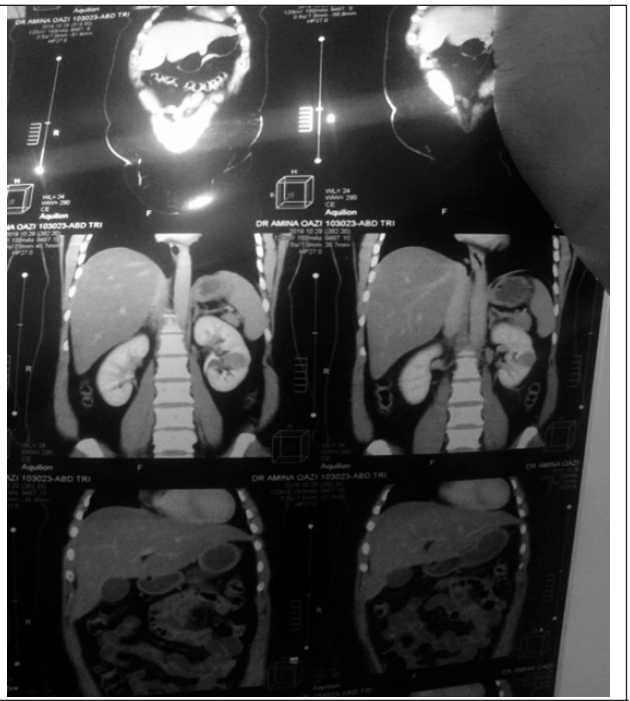

Figure-1: Abdomen and Pelvis with contrast showing a slightly hyperdense soft tissue nodule in the left renal sinus. CT= Computer Tomography.

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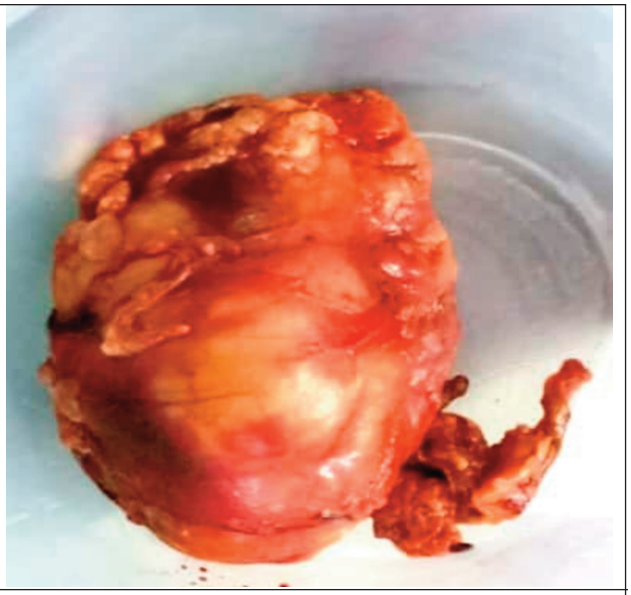

Figure-2: Thyroid follicular carcinoma like renal tumour (TFCLRT) having a thick capsule with no invasion of capsule or preirenal fat.

lymph nodes, adrenal glands, and the ureter were free of tumour. It had a thick capsule with no invasion of capsule or perirenal fat as shown in Fig 1.2. It was approximately 4.2 x 3.5 x 2.5 in size, and the section appeared to be solid; the solid area was grey-white.

The surgical specimens were fixed with 4% neutral formaldehyde solution, followed by routine dehydration, paraffin embedding, divided into 3-µm-thick sections, haematoxylin and eosin (HE) staining, and light microscopic observation.

Microscopically, it was unifocal and there was no microscopic evidence of tumour invasion in any structure besides renal parenchyma. Thyroid follicle-like structures with different sizes and full of colloid-like substance were present. It was a pT1b N0 M0 as shown in histopathology report.

Immunohistochemical staining and histochemical special staining showed CCK7 positive, carbonic anhydrase negative and TTF1 negative.

Follow-up and outcomes: The post-op course remained uneventful and the patient is under follow up. Her BP is within normal values after three months of surgery. She has been advised to have history and physical examination annually, base line abdominal CT after three months of surgery and then annually for three years.

Literature review: Her entity, when identified for the first time, was named Thyroid follicular carcinoma-like tumour of the kidney.[1] Sterlacci et al[2] and He et al[3] have separately reported one case each and they used the word Tumour in their reports which indicated that its biological behaviour has not been studied yet. Among these cases, the one reported by Sterlacci et al[2] also showed metastasis to the left lower lobe of the lung which appeared two months postoperatively. Amin et al reported six such cases in 2009.[4] One of these cases had metastasis to portal lymph nodes. After that, this entity was named Primary Thyroid Like Follicular Carcinoma of the Kidney. The word carcinoma implying its biological behaviour was used for the first time.

Since then, all the cases reported have used the word carcinoma which shows its nature and potential to metastasise. These cases showed metastasis to portal lymph nodes, bilateral lungs, retroperitoneal lymph nodes and skull/meningeal metastasis.[5-8] The WHO kidney tumour classification 2016 included it as a variant of renal cell carcinoma and named it thyroid-like follicular renal cell carcinoma.[9] So far no patient has died of this entity and its biological behaviour has been shown to be a benign one.[10]

Clinical review shows that more females are affected by this variant as compared to males i.e. 28/12.[11] It has affected almost all age groups and the age of onset is 19 to 83 years, while in 34 of these patients the age of onset was between 19 to 60 years. Twenty-five out of 41 cases were detected incidentally, while the others had some pre-diagnosis symptoms mainly haematuria and flank pain (16 cases), and one case was discovered in the autopsy. Our patient had hypertension which was resistant to antihypertensive therapy but no flank pain or haematuria. Thyroid disease has not been found in any of the identified cases. Solitary lesion in one kidney has been discovered in all cases, while the right kidney was involved in slightly more cases than the left kidney i.e. with a ratio of 22:19. Proximity to the renal sinus and pelvis has been found in most of the cases including ours and mid-pole of kidney was involved most of the time.

Gross morphology was mostly solid component with some showing cystic and mixed features. The size of these tumours ranged from 1.1 to 11.8cm. Cases in which local invasion was found involved the capsule, renal parenchyma, renal pelvis, perirenal fat and nervous tissue.[3,12-14] Cross-sectional examination showed yellow to brown surface, and tough consistency with some necrotic areas.

Microscopically the most distinguishing feature was the thyroid follicles- like structures with eosinophilic colloid substance. Specific staining proved it to be mucous proteins rather than the thyroid gel.

This morphology has resemblance with that of thyroid

follicle cancer. In some cases the samples had some papillary components in different proportions of papillary thyroid carcinoma-like structures.[8,14-17] The cases which showed histological heterogeneity were found to be malignant. Fibrous connective tissue had variable widths, while smooth muscle cells were also found in some.[8] Various pathological features such as psammoma bodies, cholesterol crystallisation, haemorrhagic necrosis, lymphocyte infiltration, and germinal centres were present in some cases but it was not a regular features of all the cases.[4,18] Cells mainly had an eosinophilic cytoplasm, while some showed transparent cytoplasm. The nuclei were round or oval, with vague nucleoli, while some cases showed nuclear grooves, frosted glass-like nuclei, or nuclear pseudo-inclusion bodies. Nuclear division phases were rare; most of the nuclei were grade 2, while some cases had significant nuclear atypia.[8]

Immunohistochemical staining analysis from the available data revealed that this tumour invariably expressed the transcription factor PAX-8 but did not stain with the thyroid-specific Thyroglobulin and TTF-1. Almost all cases had positive staining with CK (pan), vimentin, EMA, CK7, and CK19 and had low expression of Ki-67. Some reported varied degrees of positive CD10 and RCC expression, but there was only one case with positive CD117 expression.[11]

It is very rare for thyroid follicular carcinoma to metastasise in kidneys with only 20 such cases reported so far;[19] whenever follicular thyroid carcinoma is diagnosed there should be a comprehensive review of history, examination, immunohistochemistry until exclusion.

Renal primary tumours like clear cell, papillary, or cystic renal cell never show any follicle-like structures and eosinophilic colloid-like substances. Struma ovary metastasise to liver and peritoneum if they do so but never in the kidney,[19,20] but should still be excluded as more and more cases are being reported. Chronic pyelonephritis, obstructive urinary tract disease, and advanced nephropathy can sometimes cause non-neoplastic renal thyroidisation involving both sides in the absence of any localised lesions.

Surgical resection has proved to be the most effective treatment so far in dealing with these tumours. Literature[11] shows that most lesions of diameter of more than 4cm and capsular invasion along with metastasis must be treated with radical nephrectomy along with removal of regional lymph node, while those with diameter less than 6 cm and no breach of capsule can be treated with partial nephrectomy or enucleation.

Thyroid follicular carcinoma-like kidney tumours are tumours with low-grade malignancy, infrequent metastasis, minimal recurrence and arrest of progression after surgery which means they have a very good prognosis.

At the moment understanding of these tumours is not enough and its biological behaviour is under extensive study. With growing evidence of these tumours, we can hope to learn more about them and tackle them effectively.

Conclusion

Although rare, this entity should be included in the differential diagnosis of renal mass and immunohistochemical staining should be done. With growing evidence, it has been formally added to the classification of renal cell carcinomas.

Disclosure: Consent for surgery and for publication was taken from the patient before submission.

Disclaimer: None.

Conflict of Interest: Prof. Ameer Afzal, who is also our head of department, signed the HOD letter and is also one of the authors.

Funding Sources: None.

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