Eosinophilic Solid and Cystic Renal Cell Carcinoma; A Case Report in an Elderly Male
Layla Albayyat1*, Najlaa Al Daoud1, Amani A. Joudeh1
1Department of Pathology, King Fahad Specialist Hospital- Dammam, Saudi Arabia

INTRODUCTION
Eosinophilic solid and cystic renal cell carcinoma (ESC-RCC) was first described by Trpkov et al, as a novel entity of renal neoplasms with characteristic clinical, pathological and molecular features. ESC-RCC has female predominance with few cases reported in males. Herein, we report the first case of ESC-RCC in an elderly male patient.

Keywords: Renal Cell Carcinoma (RCC); Eosinophilic; solid and cystic renal cell carcinoma (ESC-RCC); Tuberous Sclerosis; Emerging entity; Kidney.

CASE REPORT
A 67-year-old male patient, not known to have Tuberous Sclerosis or family history of cancers, referred to our hospital as a case of incidentally found right renal mass discovered on abdominal Magnetic Resonance Imaging, obtained for other compliant. He had no history of haematuria or weight loss. The patient is X-smoker since 30 years. Accordingly, he underwent a computed tomography scan study (CT scan) of the chest, abdomen and pelvis, was performed with renal mass protocol. Final radiological report concluded that there is a right kidney lower pole heterogeneous exophytic mass with minimal cystic changes. The mass measured 4x2.5 cm with enhancement following intravenous contrast. The mass had no extension into the right renal sinus fat. The renal vein was patent. The patient underwent partial nephrectomy procedure to preserve as much as possible of his kidney parenchyma.

Gross examination of the specimen revealed a well-circumscribed, tan-brown, partially cystic mass that measured 4 x2.5 x 2 cm (Figure 1).

Histological assessment of the mass revealed infiltration by neoplastic epithelial cells, arranged in solid, compact nests, and cystic patterns. The cells showed voluminous eosinophilic cytoplasm with cytoplasmic basophilic granular stippling, characteristic of this tumor entity. Occasional intracytoplasmic globules were also noticed. The neoplastic cells had round nuclei with prominent, eosinophilic nucleoli, equivalent to ISUP (grade 2). Foci of clear cell cytoplasmic changes were also noticed as well as scattered collections of histiocytes. No features of high-grade transformation such as sarcomatoid or rhabdoid changes were identified (Figure 2).

Ancillary immunohistochemical studies were requested and showed strong positivity with AMACR, Vimentin, CD10 and faint nuclear staining for PAX8 (confirming renal histogenesis). The neoplastic cells showed focal positivity of CK20, AE1/AE3 and CAM 5.2. It is completely negative for HMB45, Melan-A, CD117 and CK7 (Figure 3).
Based on the combined morphological and immunohistochemical findings, the diagnosis of Eosinophilic Solid and Cystic Renal Cell Carcinoma (ESC-RCC) was rendered. Tissue was sent for chromosomal microarray study which revealed a loss of chromosome 9q34 (including TSC1 gene) and whole gains of chromosomes 7, 12 and 16p13 (including TSC2). The described abnormal genetic results were furtherly confirmed using next generation sequencing study. This finding confirmed the diagnosis of ESC-RCC.

Follow-up computed tomography scan study (CT scan) of the chest, abdomen and pelvis was performed after one year of the surgery. It showed no suggestion of local recurrence and no evidence of distant metastasis.
DISCUSSION

Eosinophilic Solid and Cystic Renal Cell Carcinoma (ESC- RCC) is first described by Trpkov et al, as a novel entity of renal neoplasms with characteristic clinical, pathological and molecular features. Grossly, ESC- RCC typically is well circumscribed tumor which is tan in color, with variable consistency of areas exhibiting solid growth mixed with cystic spaces. The average greatest dimension is 50 mm. Many of the reported cases lack well-defined capsule, however, tumor encapsulation has been described [7], a feature that is present in our case.

Typically, the neoplastic cells are arranged in compact sheets with cystic spaces in between that are lined by cells with voluminous eosinophilic cytoplasm exhibiting hobnail arrangement. The cells exhibit abundant, deeply eosinophilic cytoplasm with characteristic basophilic granular stippling which signifies aggregates of endoplasmic reticulum on electron microscopy, a feature that was recognizable in many reported cases. The neoplastic cells exhibit foci of clear cell change as demonstrated in our case, and reported before [4]. The consistent immunohistochemical finding in all reported cases is variable expression of CK 20, with great majority of the cases show diffuse staining. Cases with patchy focal expression were also reported, as our case [1, 3]. Thirty cases show focal expression of CK 7 [4]. No cases were negative for CK20 and positive for CK7. This finding warrants considering other neoplastic entities [6]. The neoplastic cells are classically reactive for PAX8, Vimentin, CD10 (diffuse or focal) and AMACR while negative for CD117. CK8/18 and Pan-cytokeratin are expressed in 95%, and 100% of the cases reported, respectively [4].

The Differential diagnosis includes eosinophilic variant of clear cell renal cell carcinoma, which typically show prominent vasculature combined with complete negativity of CK 20. Oncocytic variant of chromophobe renal cell carcinoma is rolled out by the complete negativity of CD117 along with vimentin positivity and absence of nuclear irregularity or perinuclear clearing. Cellular morphology, architecture and vimentin positivity makes a diagnosis of oncocytoma is unlikely [10].

Epithelioid angiomylipoma is considered one of the strong differential diagnoses, given that it typically shows features of eosinophilic solid and cystic renal cell carcinoma including solid architecture with frequent intracytoplasmic vacuolization and focal clear cell changes [7]. The main cytological overlap is the cellular cytoplasmic similarity, as both entities are known to exhibit cells with voluminous eosinophilic cytoplasm and prominent granularity. In general, nuclear pleomorphism is more significant in epithelioid angiomylipoma than ESC RCCs [11].

In addition, Tretiakova MS. documented immunophenotypical similarity, with both tumours show expression of Melan-A and vimentin along with negativity of EMA, Pan-CK, CK7 and CD117 [7]. The
application of PAX 8 immunohistochemical stain is useful, given that it is totally negative in epithelioid angiomyolipoma [12].

Mit family translocation carcinoma needs to be considered in the list of differential diagnosis, given the similarities in morphological appearance, particularly in the subtype with TFEB gene abnormality. This possibility was excluded based on negative FISH study for TFEB gene rearrangement.

ESC- RCC is not yet designated as a separate entity in the World Health Organization 2016 classification of renal cell carcinoma [3-5] Many of the cases were misclassified previously as “Renal Cell Carcinoma- Unclassified”, thus, the true incidence of this tumor is still unknown [6]. To date, approximately 60 cases of this entity are reported. This neoplasm was thought to be almost exclusively found in adult female patients, however, cases in males started to be reported, summarized in table 1 [1,2,7,8].

Generally, ESC-RCC is considered an indolent renal neoplasm [3, 4]. However, four reported cases have shown metastasis. Considering this fact, it is justified to use the term RCC to ensure clinical surveillance and close follow up of patients with this neoplasm [2, 6, 7, 9].

Differential diagnosis includes eosinophilic variant of clear cell renal cell carcinoma, which typically show prominent vasculature combined with complete negativity of CK 20. Oncocytic variant of chromophobe renal cell carcinoma is rolled out by the complete negativity of CD117 along with vimentin positivity and absence of nuclear irregularity or perinuclear clearing. Cellular morphology, architecture and vimentin positivity makes a diagnosis of oncocytoma is unlikely [10].

Epithelioid angiomyolipoma is considered one of the strong differential diagnoses, given that it typically shows features of eosinophilic solid and cystic renal cell carcinoma including solid architecture with frequent intracytoplasmic vacuolization and focal clear cell changes [7]. The main cytological overlap is the cellular cytoplasmic similarity, as both entities are known to exhibit cells with voluminous eosinophilic cytoplasm and prominent granularity. In general, nuclear pleomorphism is more significant in epithelioid angiomyolipoma than ESC RCCs [11].

In addition, Tretiakova MS. documented immunophenotypical similarity, with both tumours show expression of Melan-A and vimentin along with negativity of EMA, Pan-CK, CK7 and CD117 [7]. The application of PAX 8 immunohistochemical stain is useful, given that it is totally negative in epithelioid angiomyolipoma [12].

Mit family translocation carcinoma needs to be considered in the list of differential diagnosis, given the similarities in morphological appearance, particularly in the subtype with TFEB gene abnormality. This possibility was excluded based on negative FISH study for TFEB gene rearrangement.

Although ECC-RCC has been documented in 10 % of tuberous sclerosis patients, the majority are sporadic with no relation to the TSC [13, 3, 4].

By reviewing the recent molecular studies of ESC-RCC, somatic, biallelic loss or mutation of TSC genes (either TSC1 or TSC2), has been documented to be strongly related to this neoplasm in phenotypically normal individuals. This finding could expand the potential therapeutic choices [10, 14].

CONCLUSION
Considering oncocytic renal neoplasms, Eosinophilic Solid and Cystic Renal Cell Carcinoma is a unique entity that is mainly affecting adult female patients with few reported cases in male patients. After reviewing medical English literature, this is the first reported case of ESC-RCC in elderly male patient that shows typical morphological, and molecular alterations of ESC-RCC with only focal expression of CK 20.

<table>
<thead>
<tr>
<th>Table-1: ESC-RCC Reports in Male Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>**Name of the first author/Case #</td>
</tr>
<tr>
<td>Li Y et al. Case 1</td>
</tr>
<tr>
<td>Li Y et al. Case 2</td>
</tr>
<tr>
<td>Li Y et al. Case 3</td>
</tr>
<tr>
<td>Li Y et al. Case 4</td>
</tr>
<tr>
<td>Tretiakova MS./Case 5</td>
</tr>
<tr>
<td>Chen YB et al. / Case 6</td>
</tr>
<tr>
<td>Chen YB et al. / Case 7</td>
</tr>
<tr>
<td>Chen YB et al. / Case 8</td>
</tr>
</tbody>
</table>

© 2022 | Published by Scholars Middle East Publishers, Dubai, United Arab Emirates
REFERENCES


