(International Print/Online Journal)

SJIF IMPACT FACTOR: 5.565
PUBMED-National Library of Medicine ID-101739732

ISSN (Print): 2209-2870
ISSN (Online): 2209-2862

International Journal of Medical Science and Current Research (IJMSCR)
Available online at: www.ijmscr.com
Volume 5, Issue 4 , Page No: 146-151
July-August 2022

IJMSCR

Perivascular Epithelioid Cell Tumors (PEComas): A Case Series

[1]Dr. Jyothi A Raj, [2]Dr. Shashikala K, [3]Dr. Heera S, [4]Dr. Ashima Binny, [5]Dr. Sagarika Mahapathra
[1]Professor and HOD, [2]Professor, [3]Residents,
Department of Pathology, RajaRajeswari Medical College and Hospital, Bengaluru, Karnataka, India

***Corresponding Author:**
Dr. Shashikala K
Professor, Department of Pathology, RajaRajeswari Medical College and Hospital

Type of Publication: Case Report
Conflicts of Interest: Nil

Abstract

Perivascular epithelioid cell tumors are mesenchymal neoplasms defined by the presence of histologically and immunohistochemically distinctive perivascular epithelioid cells. The perivascular epithelioid cell has no known normal tissue counterpart and co-expresses myoid and melanocytic markers. These mesenchymal tumors are colligated under the rubric of PEComas. This tumor family shows marked female predominance and includes angiomyolipoma, clear cell sugar tumor, lymphangioleiomyomatosis, and a group of rare, morphologically and immunophenotypically similar tumors arising at a variety of visceral and soft tissue sites. PEComas can occur sporadically or in association with tuberous sclerosis complex. Although most cases are benign, a subset behaves in a malignant fashion. Since few malignant cases have been reported, firm criteria for malignancy have yet to be established. Here, we describe three case reports, along with imaging and histopathology and provide a comprehensive review as to the history and current literature available regarding these extremely rare tumors.

Keywords: Angiomyolipoma, Soft tissue tumour,Immunohistochemistry

Introduction

The World Health Organization defines PEComa as "a mesenchymal tumor composed of histologically and immunohistochemically distinctive perivascular epithelioid cells". In 1991, Pea and colleagues first noted this unusual cell in both angiomyolipoma (AML) and clear cell sugar tumor (CCST) of the lung. One year later, Bonetti and colleagues proposed a cellular link between AML, CCST, and lymphangioleiomyomatosis (LAM) and their association with tuberous sclerosis complex (TSC). PEComas appear to arise most commonly at visceral (especially gastrointestinal and uterine), retroperitoneal, and abdomino-pelvic sites, with a subset occurring in somatic soft tissue and skin. Few cases of malignant PEComa have been reported and firm criteria for malignancy have yet to be established. However, a recent review report suggested criteria for malignancy including a size of >8.0 cm, mitotic count of >1 per 50 high-power fields (HPFs) and necrosis; and these three criteria helped to stratify PEComas into benign, uncertain malignant potential, and malignant. Herein we report three cases, with histology and immunohistochemical analysis.

Case Reports

Case 1: A 36 year old female presented with complaints of lower abdomen pain and abnormal uterine bleeding since 2 months. Laparoscopic myomectomy was done. On histopathology, the tumor was composed of predominantly epithelioid cells arranged around thick wall blood vessels, with fascicles of muscle bundles. Differential diagnoses of epithelioid vascular leiomyoma and perivascular epithelioid cell tumor were considered. The tumor was positive for Melan-A (Fig 3)and Desmin (Fig 4) .IHC was negative for HMB-45.

Case 2: A 38year old male presented with left sided flank pain and hematuria since 3 months. CT scan (plain & contrast) of the KUB region showed a large mass involving upper and interpolar region of left kidney extending into perinephric space and retroperitoneum and features of spontaneous hemorrhage. Left radical nephrectomy was done. Macroscopic examination showed an exophytic, white-tan, firm, well circumscribed mass measuring 1.8 cms in greatest dimension and clearly demarcated from the adjacent kidney parenchyma. On histopathology, a triphasic mesenchymal tumor composed of epithelioid cells, spindle cells, dysmorphic thick walled blood vessels and focal adipose tissue was noted. Immunohistochemically, both the epithelioid and spindle neoplastic cells of the renal tumor were strong and diffusely positive for Desmin, HMB-45(Fig -8) and Melan-A.

Case 3: A 53 year old female presented with pain abdomen since 3 months. CECT KUB showed an exophytic mass arising from the upper pole of the right kidney. Right radical nephrectomy was done. On histopathology the tumor was composed of proliferating smooth muscle cells in fascicles, epithelioid cells and adipose tissue. The renal tumor was reported as perivascular epithelioid cell tumor, and confirmed by immunohistochemistry. The neoplastic cells were positive for HMB-45, Melan-A and Desmin, confirming our diagnosis.

Discussion

PEComas-NOS have now been reported in almost every body site which include gynecological, genitourinary, gastrointestinal, extremities and skin, as well as single reports in the heart, breast, oral cavity, orbit, and skull base[1] .The common sites being the gastrointestinal tract and retroperitoneum, whilst rare sites include somatic soft tissue, skin and bone. The vast majority of PEComas-NOS have been described in females (as in the cases herein presented), and therefore hormones may play a role in their pathogenesis and/or phenotypic cellular manifestations. Grossly, they appear as a well circumscribed tan to gray mass with variable firm and friable areas. Cut surface is tan to gray-red, with focal areas of hemorrhage and necrosis [1].

PEComas are characterized by epithelioid to spindle cells with eosinophilic to clear granular cytoplasm, centrally placed round to oval nuclei with small nucleoli, striking nuclear atypia, and elevated mitotic activity and an intimate relationship with blood vessels arranged in nested or short fascicular/storiform patterns. They demonstrate positive immunostaining for markers of both melanocytic (HMB45, Melan-A, tyrosinase, microphthalmia transcription factor) and myoid (desmin, smooth muscle actin, muscle-specific actin, caldesmon, calponin) differentiation [2].

PEComas are of interest primarily because of their Immunoreactivity with Melanocytic and Myoid markers. They are also almost always negative for S-100 protein and cytokeratins. Folpe and colleagues recently reviewed all reported cases of PEComa up to 2005 (61 cases). In their review, 100% were HMB-45 positive, 59% were smooth muscle actin positive, 41% were Melan-A positive, 33% were CD117 positive, 31% were Desmin positive, 11% were S-100 positive, and 0% was Cytokeratin positive.

In our study we had two cases of angiomyolipoma with similar morphology as in Guido Martignoni et,al [3]. Originally believed to be a hamartomatous lesion, AML is now recognized to be a usually benign clonal mesenchymal tumor neoplasm. Classic angiomyolipoma is the most common mesenchymal tumor of the kidney. Being composed of a variable mixture of adipose tissue,spindle and epithelioid smooth muscle cells mixed together with abnormal thick walled blood vessels, AML is the prototype of the capacity of PEComa to modulate its morphology [3]. The cases we reported showed strong and diffuse staining for both Desmin and Melan A in both the spindle and epithelioid cell components of all three lesions (uterine and renal),with more intense staining in the epithelioid cells compared to the spindle cells.

The differential diagnosis of PEComa include epithelioid smooth muscle tumors (epithelioid leiomyosarcoma and epithelioid leiomyoma), malignant melanoma, clear cell sarcoma of tendon and aponeuroeses (melanoma of the soft parts), alveolar soft part sarcoma, endometrial stromal sarcoma with clear cell features, carcinoma (especially renal cell and adrenocortical carcinoma), paraganglioma and angiomyolipoma. The clinical presentation, perivascular accentuation of tumor cells on histology and Immunoexpression for myoid markers and multiple melanocytic markers helps in

Volume 5, Issue 4; July-August 2022; Page No 146-151

the diagnosis of PEComa. Pitfalls in the diagnosis of PEComas include aberrant staining of cells with melanocytic markers.

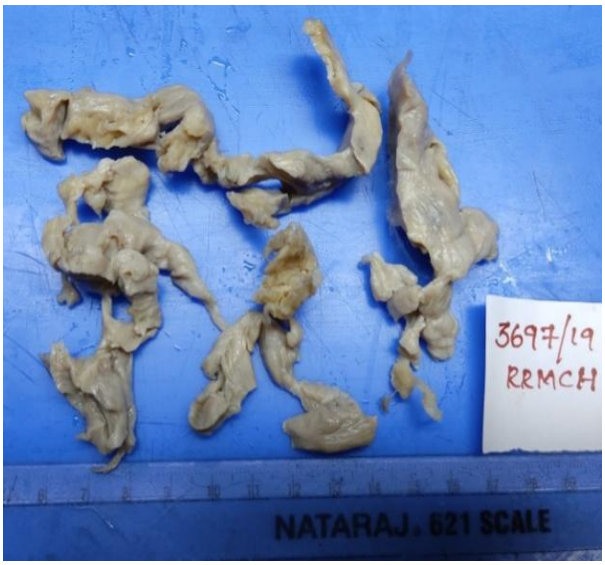
A subset of PEComas behave in a malignant fashion with a high mitotic index and the presence of necrosis, marked cytological atypia, and / or an infiltrative growth pattern. In addition to morphological features, other adjunctive markers (molecular and cytogenetic markers) are necessary for accurate prediction of the biological behavior of PEComas. The treatment of PEComas extends from active surveillance to surgery and anti-hormone treatments[5].

Conclusion

PEComas are unique both in their morphology and Immunophenotypic features. Knowledge of their morphology, adverse prognostic parameters and differential diagnosis helps in arriving at an accurate diagnosis and offering appropriate treatment.

References:

1. Henry B Armah, Anil V Parwani, Perivascular epithelioid cell tumor,ArchPatholLab Med, 2009, 133, 648-654
2. J L Hornick & C D M Fletcher, PEComa: what do we know so far?Histopathology 48, 2006, Blackwell Publishing Limited, pg75–82.
3. Guido Martignoni et,al. PEComas: the past, the present and the future ,Virchows Arch (2008) 452:119–132
4. D'Andrea et,al . Malignant Perivascular Epithelioid Cell Neoplasm (PEComa) of the Pelvis: A Case Report, Urology Case Reports 6 (2016) 36-38
5. Verbeeck et, al .PEComa of the Uterus: A Rare Mesenchymal Tumor Displaying a «Snowstorm» Pattern at Magnetic Resonance Imaging, Journal of the Belgian Society of Radiology, 100(1): 5, pp. 1–4



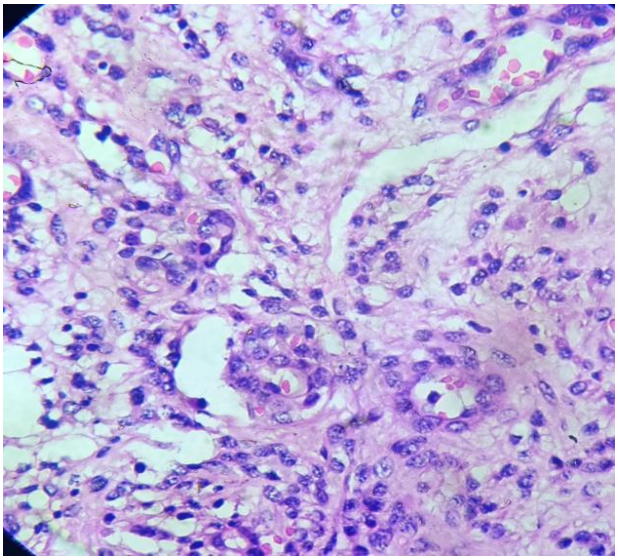


FIG: 1 **FIG: 2**

FIG 1: Gross**:** Laproscopic myomectomy specimen .**Fig 2**: Photomicrograph shows tumor cells composed of perivascular epithelioid cell with a clear cytoplasm.X40, H&E

Volume 5, Issue 4; July-August 2022; Page No 146-151

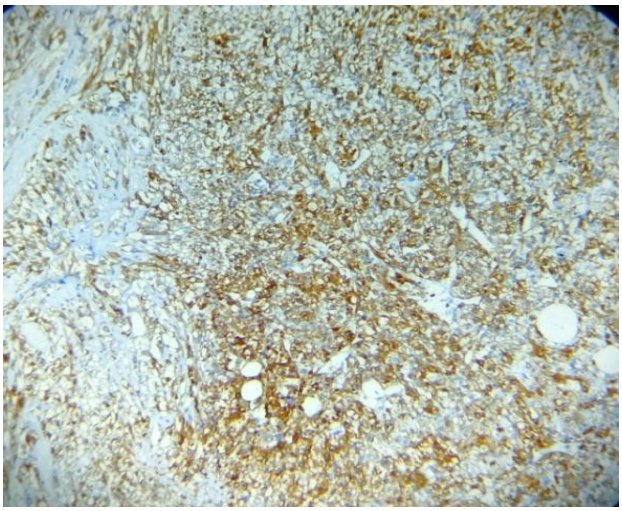


FIG 3: **MELAN -A**

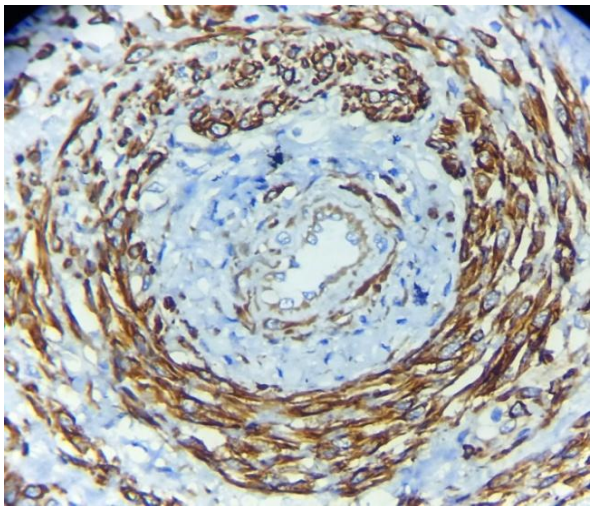


FIG 4: DESMIN

FIG 3: IHC: Epithelioid tumor cells positive for MELAN A, X10, **FIG 4**: IHC: Epithelioid and spindle tumor cells to be positive for Desmin, X40

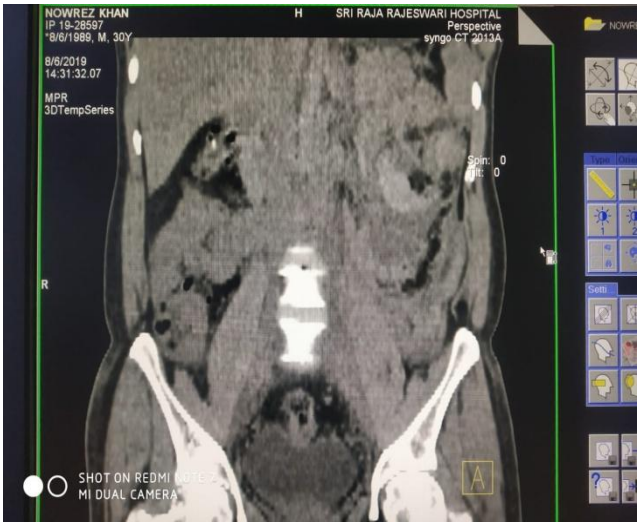


Fig 5

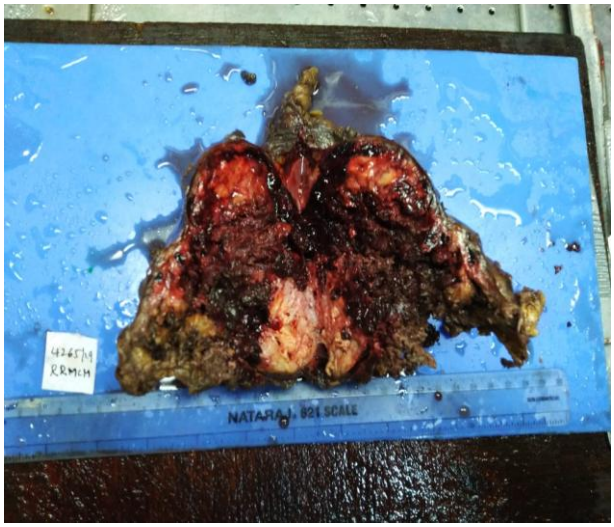


Fig 6

Volume 5, Issue 4; July-August 2022; Page No 146-151

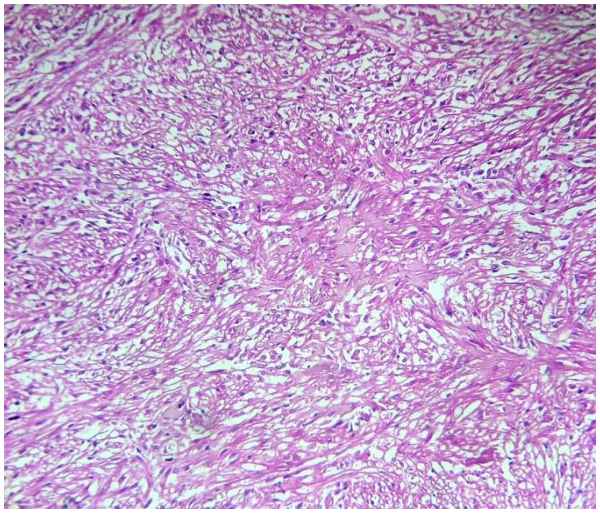


Fig 7 - H&E

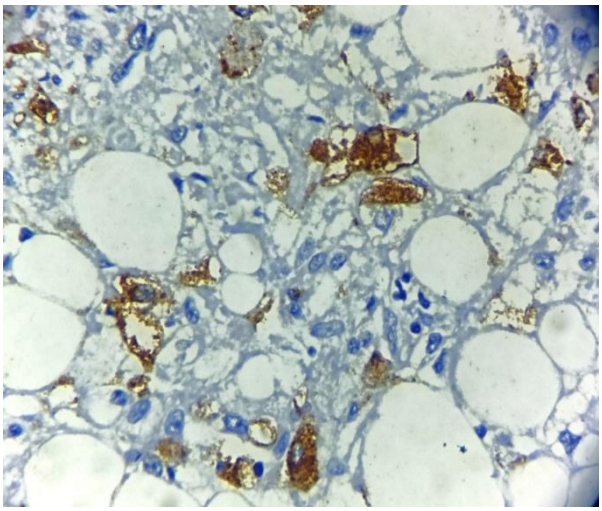


FIG 8-HMB45

Fig 6: CT scan of the KUB region: Exophytic mass in the upper and interpolar region of left kidney .**Fig 7**: Gross: Left radical nephrectomy specimen. **Fig 8**: Photomicrograph shows tumor composed of neoplastic epithelioid cells and spindle cells **Fig 8** : IHC: HMB45 Immunoreactivity in perivascular epithelioid Cells, X20

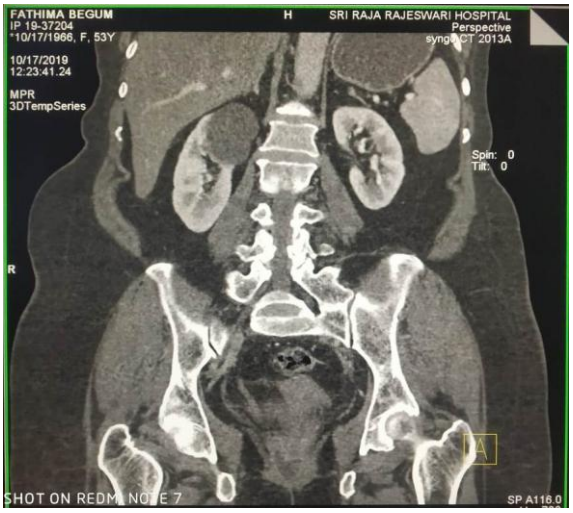


Fig 9

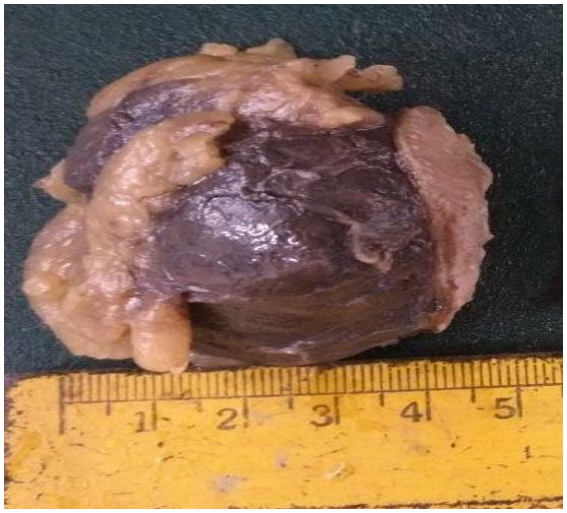


Fig 10

Volume 5, Issue 4; July-August 2022; Page No 146-151

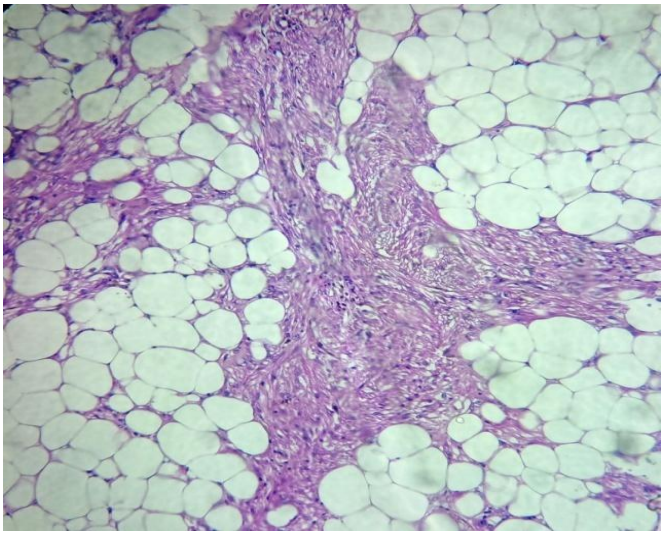


Fig 11

Fig 9: CT scan contrast: Right renal angiomyolipoma and cortical cyst. **Fig7**: Right radical nephrectomy , Tan, firm, well circumscribed mass . **Fig 8** : Photomicrograph shows tumor composed of proliferating smooth muscle in fascicles with epithelioid cells and adipose tissue.

Volume 5, Issue 4; July-August 2022; Page No 146-151