Scientific Foundation SPIROSKI, Skopje, Republic of Macedonia
Open Access Macedonian Journal of Medical Sciences. 2024 Mar 15; 12(1):136-140.
https://doi.org/10.3889/oamjms.2024.11842
eISSN: 1857-9655
Category: *C - Case Reports*
Section: *Case Report in Surgery*

Benign Perivascular Epithelioid Cell Tumor of the Mesentery Misdiagnosed as a Uterine Fibroid: A Case Report and Review of Literature

Omar Farooq Al-Nahhas[1]*, Aysha Simran Haris[2], Yousif Basim Raad[1], Khaled Alaboud Alkheder[1], Kenichi Miyata[3]

[1]Department of Emergency, Tawam Hospital, Alain, United Arab Emirates; [2]Department of Emergency, Sheikh Zayed Military Hospital, Abu Dhabi, United Arab Emirates; [3]University Surgery Center Merced, California, United States of America

Edited by: Mirko Spiroski
Citation: Al-Nahhas OF, Haris AS, Raad YB, Alkheder KA, Miyata K. Benign Perivascular Epithelioid Cell Tumor of the Mesentery Misdiagnosed as a Uterine Fibroid: A Case Report and Review of Literature. Open Access Maced J Med Sci. 2024 Mar 15; 12(1):136-140. https://doi.org/10.3889/oamjms.2024.11842
Keywords: Benign PEComa; Perivascular epithelioid cell tumor; Mesenteric PEComa; Case report
***Correspondence:** Omar Farooq Al-Nahhas, Department of Emergency, Tawam Hospital, Alain, United Arab Emirates. E-mail: omarfarouk.alnahas@gmail.com
Received: 01-Dec-2023
Revised: 20-Dec-2023
Accepted: 30-Jan-2024

Funding: This research did not receive any financial support
Competing Interests: The authors have declared that no competing interests exist

Abstract

BACKGROUND: Perivascular epithelioid cell tumor (PEComa) is a type of mesenchymal tumor composed of histologically and immunohistochemically distinctive perivascular epithelioid cells. Benign mesenteric PEComa is a rare entity as there has been only one case reported so far. We are presenting a case of benign mesenteric PEComa in a 30-year-old female that presented with abdominal pain and was diagnosed by microscopic morphological examination and immunohistochemical staining. The aim of this case report is to make health-care professionals aware of the diagnostic criteria in similar presentations, treatment modalities offered for this patient, and others reported over the years for malignant as well as benign PEComas and also shedding the light on a new presentation and diagnosis.

CASE REPORT: We reported a case of a 30-year-old female who presented with abdominal pain radiating to the back and rectum. After a thorough physical examination which was unremarkable, a CT scan was done which showed a mesenteric mass. This mass was then resected and sent for histopathology which revealed a PEComa. We report the history, clinical findings, laboratory reports, and gross imaging of a 30-year-old female who presented to our clinic and was diagnosed with a very rare benign mesenteric PEComa.

CONCLUSION: PEComa is a rare tumor, and as PEComas arising from the mesentery being one of the rarer kinds with only 10 cases reported and this case being the 11th, out of those ten cases, only two of them were found to be benign which makes the case we are reporting the second benign mesenteric PEComa reported in English Literature.

Introduction

Perivascular epithelioid cell tumor (PEComa) is a rare type of mesenchymal tumor composed of histologically and immunohistochemically distinctive perivascular epithelioid cells [1]. Tumors such as lymphangioleiomyomatosis (LAM), clear cell "sugar" tumor (CCST) of the lung, angiomyolipomas (AML), clear cell myomelanocytic tumor (CCMMT) of the falciform ligament/ligamentum teres, and abdominopelvic sarcoma of perivascular epithelioid cells are different types of PEComa [2]. PEComas occurring in the mesentery are extremely rare as only 10 cases have been reported so far out of which 9 were malignant and only one was benign [3], [4], [5], [6].

According to Masson [1], the first description of perivascular epithelioid cell (PEC) was given by Apitz in 1943 [2], as an "abnormal myoblast" in a renal AML. In the early 1990s, further description of this distinctive cell type was done by Maurizio Pea and Bonetti [3]. In 1991, Bonetti *et al*. described the unusual cellular link among clear cell "sugar" tumor (CCST) of the lung, the epithelioid clear cell component of AML of the kidney, and liver and LAM. Zamboni *et al*. proposed the term "PEComa" for mesenchymal tumors that contain epithelioid cells that had a close association with blood vessels along with evidence of smooth muscle and melanocytic differentiation [7]. According to the World Health Organization, PEComa is "a mesenchymal tumor composed of histologically and immunohistochemically distinctive perivascular epithelioid cells" [8]. Besides, there is no known normal tissue counterpart to PEC.

Case Report

A 30-year-old female presented with abdominal pain radiating to the back and rectum. She denied any other symptoms. Physical examination was unremarkable.

Computed tomography (CT) without contrast enhancement showed a 51 × 68 × 59 mm mesenteric

mass with several scattered peripheral small stippled calcifications of intermediate significance which was seen immediately posterior to the right rectus abdominis muscle just inferior to the umbilical level in the right paracentral location.

Contrast-enhanced imaging demonstrated homogeneous enhancement of the abdominal aortoiliac arteries with no main portal venous abnormality detected. However, uniform relative intense enhancement of the mesenteric mass was seen.

The tumor was misdiagnosed as a uterine fibroid 4 years ago when an abdominal ultrasound (US) was done during the patient's pregnancy. A mass of 7.2 × 6.2 × 3.8 cm of the uterine fundus was seen in the US at the time. However, the patient did not further follow-up with her gynecologist and neglected the mass.

A CT was done 4 years later for a complaint of left lower quadrant abdominal pain. Imaging showed that the "uterine fibroid" was actually a very vascular soft-tissue mass just posterior to the rectus abdominis. The decision was made to excise this mass, which was done through a midline incision and as an outpatient procedure.

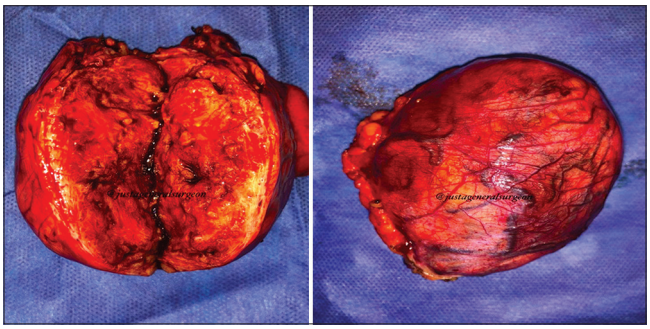

Figure 1: Gross Mass following resection

Macroscopically, tumor was measuring 7.5 × 6 × 5 cm and weighed 40 g (Figure 1). Histologically, tumor was a circumscribed lesion composed of a proliferation of oval-to-spindle cells arranged in intersecting fascicles and trabeculae (Figure 2). There was a thick fibrous capsule surrounding the lesion. The cells are oval/plump to spindled in shape with even chromatin and small to prominent nucleoli and a moderate amount of pale to eosinophilic cytoplasm. There were focal areas of dense fibrous tissue with calcification; however, there was no tumor necrosis and mitotic figures readily seen. Perivascular hyalinization was seen.

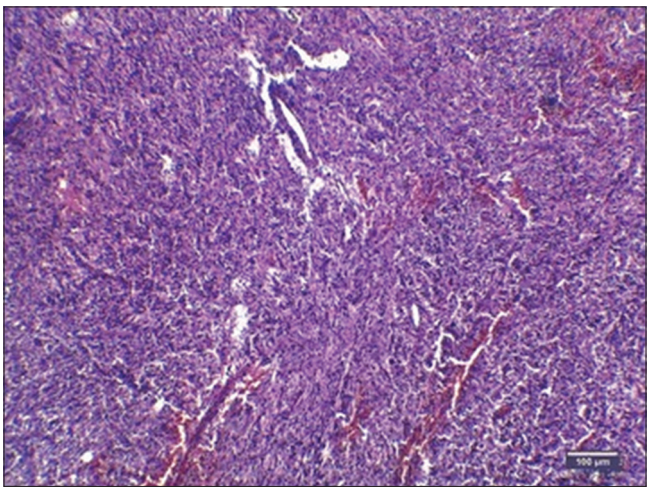

Figure 2: Spindle-shaped PEC cells [9]

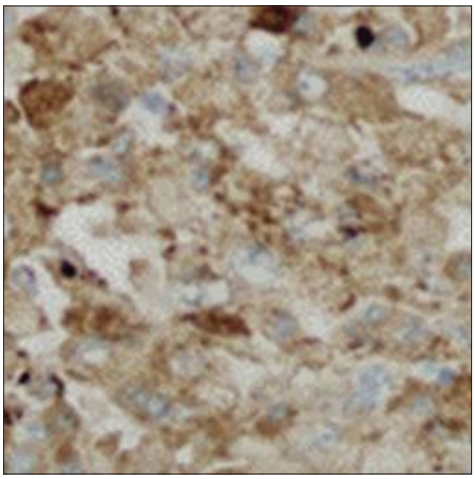

Figure 3: Cathepsin k [10]

Tumor was positive for immunohistochemical stains for cathepsin K (Figure 3), SMA (Figure 4), caldesmon, and HMB45 (Figure 5) but negative for S100, desmin, EMA, CK mix (AE1/AE3 and Cam 5.2), CD34, CD117, DOG1, ALK, ERG, CD21, CD23, p16, MDM2, beta-catenin (cytoplasmic), and STAT6. PHH3 and ki67 proliferation indices are low at about 5%.

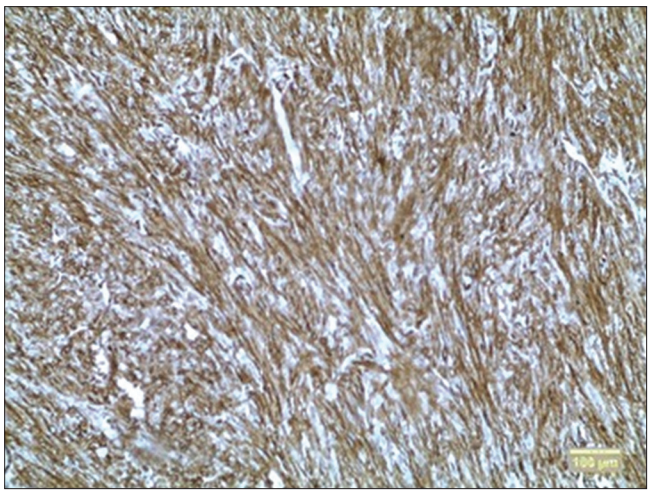

Figure 4: SMA stain [9]

Discussion

According to the World Health Organization (WHO) perivascular epithelioid cell tumors (PEComas) are distinct mesenchymal neoplasm composed of histologically and immunohistochemically unique

perivascular epithelioid cells (PECs) [5]. It is a rare kind of tumor and PEComas arising from the mesentery is one of the rarer kinds with only 9 cases reported and this case is the 11th case (Table 1).

PEComas can arise from different sites in the body such as the kidneys, liver, and female reproductive system. 40% of the cases of PEComa reported were in women, predominantly originating in the uterus. The incidence of PEComa overall is two times higher in females compared to males is 2:1 [2], [8] and mesenteric PEComa specifically is four times more common in females than males.

PEComas in the GI tract show no differences in prevalence in both male and female patients, with regard to the female predominance in PEComa tumors at other sites PEComas consist of perivascular epithelioid cells in discrete stages of modulation with compatible reactivity for melanoma-associated markers such as HMB-45 and Melan-A, unreliable reactivity for muscular markers such as actin and desmin, reactivity to cathepsin K a lysosomal, papain-like cysteine protease with high matrix-degrading activity, and non-reactivity for epithelial markers [8].

The tumor, in this case, was positive for immunohistochemical stains for cathepsin K, SMA, caldesmon, and HMB45 but negative for S100, desmin, EMA, CK mix (AE1/AE3 and Cam 5.2), CD34, CD117, DOG1, ALK, ERG, CD21, CD23, p16, MDM2, beta-catenin (cytoplasmic), and STAT6.

PEComas are mainly formed of nests and sheets of epithelioid cells, where spindle cells along with clear to granular eosinophilic cytoplasm can also be seen in various cases, which exhibit the focal invasion of the blood vessel walls [9].

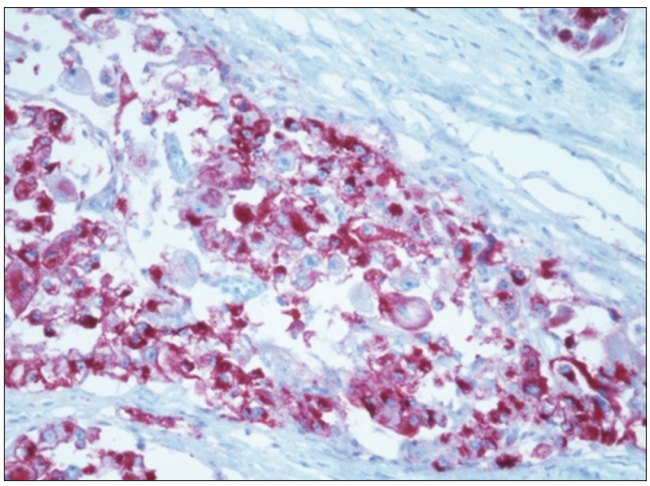

Figure 5: HMB45 stain [6]

The majority of the cases reported were found to be malignant with tissue invasion consisting of 8 out of all the 9 cases in the literature, which makes this case the second benign mesenteric PEComa reported in the literature.

Radiological investigations such as abdominal ultrasonography, CT with and without contrast, and magnetic resonance imaging (MRI) scans are very useful tools for identifying the tumor. However radiological studies, in general, are not sufficient in making a definitive diagnosis of PEComa.

Folpe *et al*. proposed classifying PEComas into “benign”, “of uncertain malignant potential”, and “malignant” based on 6 histological features that indicate high risk including tumor size >5 cm, infiltrative pattern, high nuclear grade and cellularity, high mitotic rate (>1/150 HPF), and necrosis and vascular invasion. Based on these features, a small PEComa (<5 cm) without any of the 6 high-risk features is considered benign, a large PEComas (>5 cm) without any other features is considered of uncertain malignant potential and PEComas with 2 or more of the high-risk characteristics is considered malignant [3].

However, Fadare *et al*. suggested that the most indicative features of potential aggressive behavior were high mitotic rate (>1/10 HPF) along with coagulative necrosis and tumors having cytologic atypia are considered to be the least sensitive or indicative of uncertain malignant potential [7].

This indicates that the size of the tumor cannot solely be used to distinguish between malignant and benign PEComas. In this case, although the tumor measured 7.5 × 6 × 5 cm, there were no tumor necrosis or mitotic figures seen which makes this a benign PEComa.

In terms of management, the best modality for PEComas has not yet been established as it is quite inconstant making surgical excision the gold standard for management.

Patients showing malignant predisposition and features were advised to undergo adjuvant chemo- or radiotherapy and hormonal therapy. The management for this case was surgical excision under general endotracheal anesthesia.

Table 1: Mesentric PEComas in Literature and their Characteristics, Levels of invasion and treatment modalities

No	Authors (yr.)	Diagnosis	Age /Gender	Tumor Size	Nuclear Grade	Invasion	LN Status	Treatment
1	Folpe Al (2005)	PEComa with UMP	67/Female	13	High	No	Not Involved	SE Only
2		Benign PEComa	97/Female	4	Intermediate	No	Not Involved	SE Only
3		Malignant PEComa	80/Female	56	High	Vascular Invasion	Not Involved	SE Only
4		Malignant PEComa	46/Female	Zt	Intermediate	Vascular Invasion	Not Involved	SE + Chemo
5	Gross E (2010)	Malignant PEComa	5.5/Male	5	High	Surrounding Tissue invasion	Not Involved	SE Only
6	Lal CL (2012)	Malignant PEComa	59/Male	Tt	High	Vascular Invasion	Not Involved	SE + Chemo
7	Xinge Fu (2013)	Malignant PEComa	38/Female	10	Intermediate	Surrounding Tissue invasion	Involved	SE + Chemo
8	Kapur, S (2014)	Malignant PEComa	49/Female	13	High	Surrounding Tissue invasion	Not Involved	SE+ mTor
9	Wejman, J. (2015)	Malignant PEComa	67/Female	3	Intermediate	Surrounding Tissue invasion	Not Involved	SE + Chemo
10	Present Case	Benign PEComa	30/Female	7.2	Intermediate	No	Not Involved	SE Only

UMP, Uncertain Malignant Potential; LN, Lymphnode involvment; SE, Surgial Excision; Chemo, Chemotherapy; mTor, mTor Inhibitors.

Combination with radiotherapy can be considered if there are any features of metastasis. Treatment for unresectable PEComa is limited, and there is no standard chemotherapeutic regimen for PEComa. Clinical trials of mTOR inhibitors as target agents are reported. Sirolimus and everolimus showed favorable responses among mTOR inhibitors [11]. mTOR inhibitors have shown some effects against the disease, as they are directly related to the pathogenesis of this cancer. Lack of TSC2 gene involvement in TFE3-rearranged PEComas suggests that these patients may also not respond to mTOR inhibitors [12]. Therefore, further studies have to be done to know the efficacy of such drugs.

In some of the cases reported, the recurrence of the tumor was seen within 6–22 months following surgical resection, even after receiving concurrent chemoradiotherapy. There is only one case reported by Fu and Jiang (2013) which reported a PEComa with lymph node involvement [5].

Due to the rarity of mesenteric PEComas, no uniform criteria for diagnosis have been established yet. The clinical presentation is not always specific which makes it difficult to make a preoperative diagnosis. However, pre-operative differentials include leiomyosarcoma, gastrointestinal stromal tumors, clear-cell sarcoma, and melanoma [7].

Conclusion

This report contributes a crucial case to the limited compendium of mesenteric Perivascular Epithelioid Cell Tumors (PEComas), marking it as only the eleventh known instance and the second benign variant documented in English literature. The rarity and benign nature of this case underscore the diagnostic challenges and the necessity for heightened awareness among clinicians. Our findings not only enrich the understanding of the clinical and pathological spectrum of mesenteric PEComas but also emphasize the importance of considering them in differential diagnoses of abdominal masses, especially those initially suspected as uterine fibroids. The successful identification and management of this case highlight the pivotal role of comprehensive diagnostic strategies, incorporating advanced imaging and meticulous histopathological examination. By delineating the treatment approach undertaken and its outcomes, this report offers valuable insights for future similar cases, aiding in improved patient management and outcomes. Furthermore, this case underlines the need for ongoing research, particularly in the realms of long-term prognosis and targeted therapies for benign mesenteric PEComas. In conclusion, the documentation of this second benign mesenteric PEComa case not only adds a new dimension to the existing medical literature but also provides a significant learning opportunity for the medical community, potentially influencing future diagnostic and treatment paradigms in oncologic and gastroenterological practice.

Consent

A written and informed consent was taken from the patient for publication purposes of any information or accompanying images.

Limitations

The only limitation to disclose is that the imaging and pathology slides were discarded and we were not able to obtain them.

Author's Contributions

Dr. Omar Al-Nahhas: Conceived the data and wrote the paper. Dr. Aysha Simran Haris: Analysis and helped in writing the paper. Dr. Yousif Basim: Collected the data. Dr. Khaled AlAboud: Contributed data or analysis tools. Dr. Kenichi Miyata: Senior author and was directly in charge of patient care.

References

1. Fletcher C, Unni K, Mertens F. Pathology and Genetics of Tumours of Soft Tissue and Bone; 2006. Lyon: IARC Press.
2. Armah HB, Parwani AV. Malignant perivascular epithelioid cell tumor (PEComa) of the uterus with late renal and pulmonary metastases: A case report with review of the literature. Diagn Pathol. 2007;2(1):45. https://doi.org/10.1186/1746-1596-2-45
PMid:180531815
3. Folpe AL, Mentzel T, Lehr HA, Fisher C, Balzer BL, Weiss SW. Perivascular epithelioid cell neoplasms of soft tissue and gynecologic origin: A clinicopathologic study of 26 cases and review of the literature. Am J Surg Pathol. 2005;29(12):1558-75. https://doi.org/10.1097/01.pas.0000173232.22117.37
PMid:16327428
4. Wejman J, Nowak K, Gielniewska L, Komorowska M, Dąbrowski W. PEComa of the mesentery coexisting with colon cancer: A case report. Diagn Pathol. 2015;10(1):31. https://doi.org/10.1186/s13000-015-0265-5
PMid:25896860
5. Fu X, Jiang JH, Gu X, Li Z. Malignant perivascular epithelioid cell tumor of mesentery with lymph node involvement: A case report and review of literature. Diagn Pathol. 2013;8(1):60. https://doi.org/10.1186/1746-1596-8-60
PMid:23587410

6. Kapur S, Patel NK, Levin MB, Huang R. Malignant mesenteric perivascular epithelioid cell neoplasm presenting as an intra-abdominal fistula in a 49-year-old female. Case Rep Oncol Med. 2014;2014:534175. https://doi.org/10.1155/2014/534175
PMid:25114821
7. Fadare O. Perivascular epithelioid cell tumor (PEComa) of the uterus: an outcome-based clinicopathologic analysis of 41 reported cases. Adv Anat Pathol. 2008;15(2):63-75. https://doi.org/10.1097/PAP.0b013e31816613b0
PMid:18418088
8. Bonetti F, Pea M, Martignoni G, Doglioni C, Zamboni G, Capelli P, *et al*. Clear cell ("sugar") tumor of the lung is a lesion strictly related to angiomyolipoma-the concept of a family of lesions characterized by the presence of the perivascular epithelioid cells (PEC). Pathology. 1994;26:230-236. https://doi.org/10.1080/00313029400169561
PMid:7991275
9. Wejman J, Nowak K, Gielniewska L, Komorowska M, Dąbrowski W. PEComa of the mesentery coexisting with colon cancer: A case report. Diagn Pathol. 2015;10:31. https://doi.org/10.1186/s13000-015-0265-5
PMid:25896860
10. Singer E, Yau S, Johnson M. Retroperitoneal PEComa: Case report and review of literature. Urol Case Rep. 2018;19:9-10. https://doi.org/10.1016/j.eucr.2018.03.012
PMid:29888175
11. Shi HY, Wei LX, Sun L, Guo AT. Clinicopathologic analysis of 4 perivascular epithelioid cell tumors (PEComas) of the gastrointestinal tract. Int J Surg Pathol. 2010;18(4):243-7. https://doi.org/10.1177/1066896908330481
PMid:191244500.
12. Shi Y, Geng J, Xie H, Wang B. Malignant perivascular epithelioid cell tumor arising in the mesentery: A case report. Oncol Lett. 2015;9(5):2189-92. https://doi.org/10.3892/ol.2015.3037
PMid:261370387