MAR Oncology & Hematology (2023) 3:10

Research Article

A Rare Case of Malignant Phyllodes Tumor with Metastasis to the Small Intestine

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Received: 28 September 2023

Published: 15 October 2023

Abstract

Phyllodes tumor (PT) is a fibroepithelial neoplasm, that accounts for 0.3 to 1% of primary tumors of the breast. PTs are classified into benign, borderline, and malignant subtypes.[1] Most PTs have a propensity to recur locally, only the malignant sub-type has a metastatic potential. The most commonly involved sites of metastases are lung and bone.[2] Metastasis to the small intestine is extremely rare. Here, we reported a case of malignant phyllodes tumor with metastasis to the small intestine (distal jejunum and ileum).

Introduction

PTs are classified into benign, borderline, and malignant sub-types; based on gross (expansile or permeative borders) and histological characteristics (stromal hypercellularity, overgrowth, atypia, and mitosis).[3] Most (75%) of these are benign. Although all types of PTs have a propensity to recur locally, only the malignant sub-type has metastatic potential.[1,3] Large tumor size and the presence of malignant heterologous elements are the risk factors associated with metastases.[1] Metastasis to the gastrointestinal tract, especially the small intestine is extremely rare, and only a few case reports are available.

Case Presentation

A 59-year-old lady presented with a left breast lump in 2016. Mammogram showed a lobulated soft tissue opacity in the lower inner quadrant of the left breast which on ultrasonography (USG) appeared as a 58x56 mm sized lobulated hypoechoic lesion with an internal cystic area. A possibility of highly suspicious malignant mass-phyllodes tumor (BIRADS 4C) was given. The patient underwent fine needle aspiration cytology (FNAC) procedure; which on microscopy showed cellular fragments of spindle cells with marked nuclear pleomorphism and mitoses. It was reported as a malignant spindle cell neoplasm with two possibilities; either malignant phyllodes tumour or metastasis from spindle cell sarcoma. Following this, the patient was operated and we received a left Modified Radical Mastectomy (MRM) specimen. On gross, it showed a 60x55x40 mm-sized tumor occupying the whole of the lower inner quadrant of the left breast. On histopathology (figure 2, G,H) the tumor was composed of spindle cells showing marked nuclear

pleomorphism, stromal overgrowth (absence of epithelial elements in one low-power microscopic field showing only stroma), 15-16 mitoses / 10 high-power fields, diffuse stromal cellularity and infiltrative border. It was reported as a malignant phyllodes tumor. Heterologous element was not seen. All 13 lymph nodes were free of tumor. It was staged as pT2N0. The patient was on regular follow-up.

In 2019, she presented with multiple lung metastases, the largest one measuring 40x30mm in the left upper lobe of the lung. Lung metastasectomy was done. On histopathology (figure 2, J), it was reported as a metastatic spindle cell tumor, considering the history of malignant phyllodes tumour; metastasis from the same is suggested. The patient received radiotherapy and was on follow-up.

In 2022, the patient presented with abdominal pain and vomiting. Computed Tomography (CT) scan of the abdomen (figure1,B) showed a 68x55x54 mm hypodense lesion involving bowel loops in the pelvic region. The possibility of a malignant mass lesion was given in the scan report. We received a small bowel resection specimen(figure1,A) measuring 25 cm in length. The specimen consisted of distal jejunum and ileum. On cutting open, it showed an exophytic polypoidal neoplasm measuring 65x55x45mm. Microscopy(figure1C, D)(figure2,I) showed spindle to fusiform tumor cells showing marked nuclear pleomorphism, multinucleation, and mitoses. No epithelial component was found. Mucosal ulceration and focal necrosis were evident. The tumor involved the full thickness of the bowel wall. It was reported as a poorly differentiated malignant neoplasm. Immunohistochemistry (IHC) was done. Vimentin was positive and Ki67 index was 30%.(figure1, E,F) Rest all markers AE1, CD34 (cluster of differentiation), c-kit (CD117, stem cell factor receptor), DOG1(Discovered on GIST-1), h-caldesmon, Desmin, SMA(smooth muscle actin), and ER(estrogen receptor) were negative. The final diagnosis rendered was metastatic malignant phyllodes tumor. The patient received chemotherapy and was doing well. In February 2023, she again developed lung metastases.

Table 1: Metastasis of malignant PT to the small intestine

Author (year)	Age (years)	Clinical presentation	Metastatic site and size	Heterologous differentiation	Interval between primary malignancy and metastasis
Asoglu O et al. [10] (2006)	31	Massive upper GI bleeding	Duodenum; 15×10 ×10cm	No	4 years
Yu PC et al. [11] (2000)	39	Hematemesis and tarry stools	Second part of duodenum; Size not available	No	3 years
Al-Rabiy FN et al. [12] (2014)	49	Intestinal obstruction	Small intestine; 10×8×6cm	Osteosarcomatous and chondrosarcomatous in primary breast tumour and metastasis	2 years
Morcos BB et al. [13] (2010)	52	Ileocaecal intussusception and obstruction	Ileocaecum; Size not available	No	13 months
Schechet SA et al. [14] (2012)	59	Jejunal intussusception, obstruction and anemia	Jejunum; 8× 3.7×3.4 cm	Chondrosarcomatous in the primary breast tumor	12 months
Kelly RJ et al. [15] (2009)	60	Intestinal obstruction	Ileum; 8×5×4 cm	No	6 years
Bilen MA et al. [16] (2012)	60	Jejunal intussusception	Jejunum; Size not available	No	12 months
Bhandari et al. [17] (2023)	55	Intestinal obstruction	Stomach, Duodenum, Jejunum, ileum, Large intestine, mesentery; 12×10×6 cm	Osteosarcomatous (in all the metastatic lesions)	8 months
Present case	59	Abdominal pain and vomiting	Distal jejunum and ileum, 6.8x5.5x5.4cm	No	6 years

Figure 1:

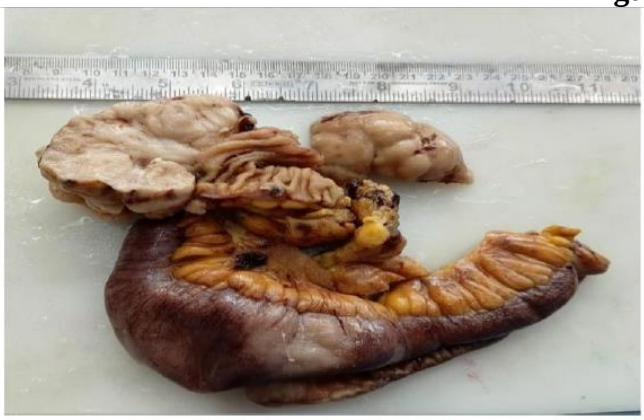

Figure A

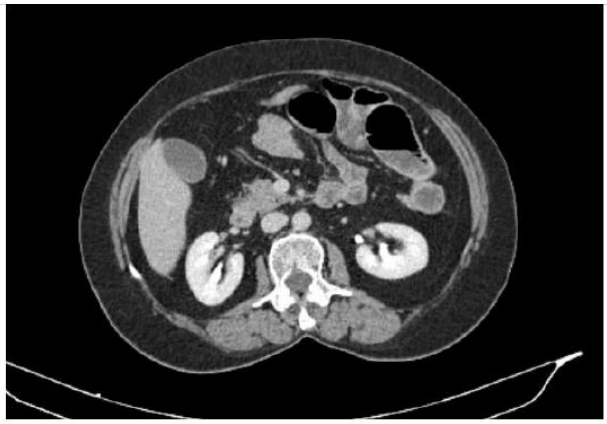

Figure B

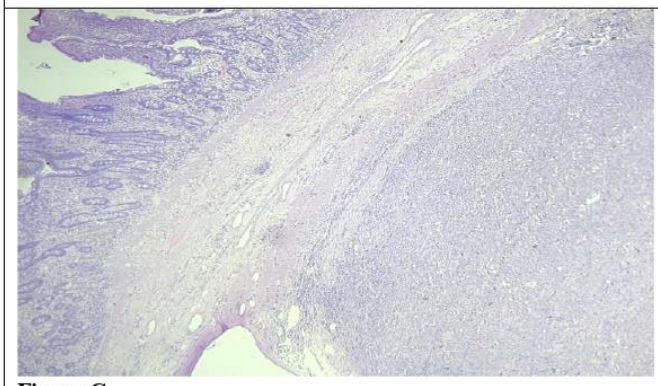

Figure C

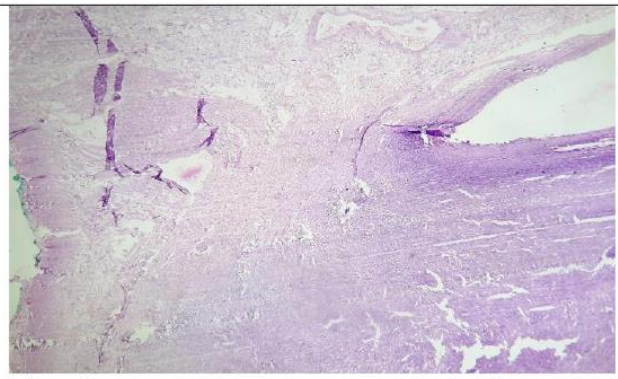

Figure D

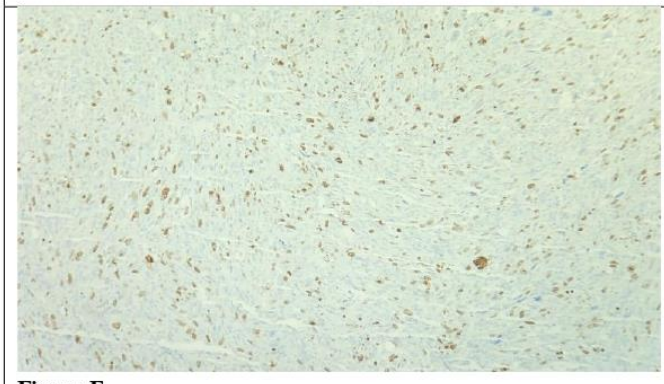

Figure E

Figure F

Figure-A: Gross image of a small intestine(distal jejunum and ileum) with an exophytic polypoidal tumor. Figure-B: CT scan showing hypodense lesion involving small bowel. Figure-C: Small intestine with metastatic spindle cell tumor. (H&E, 4X). Figure-D: Small intestine with metastatic spindle cell tumor extending upto the serosa. (H&E, 4X). Figure-E: Ki67 index. (IHC, 10X). Figure-F: Vimentin. (IHC, 10X)

Figure 2

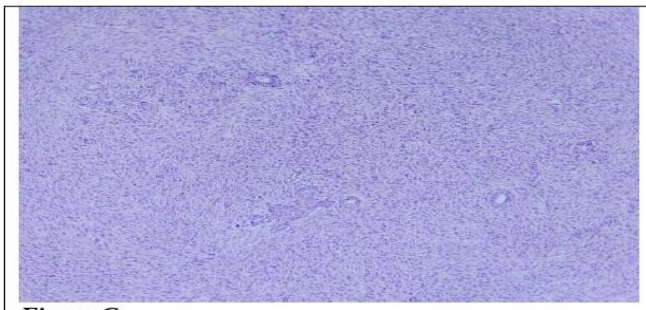

Figure G

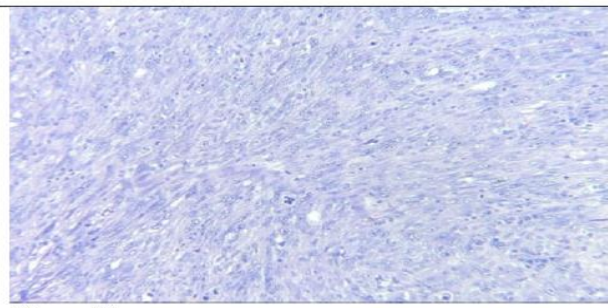

Figure H

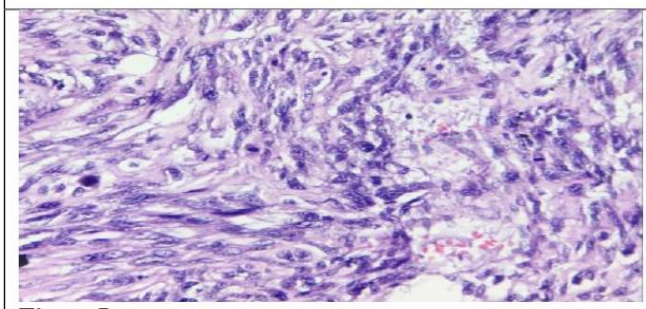

Figure I

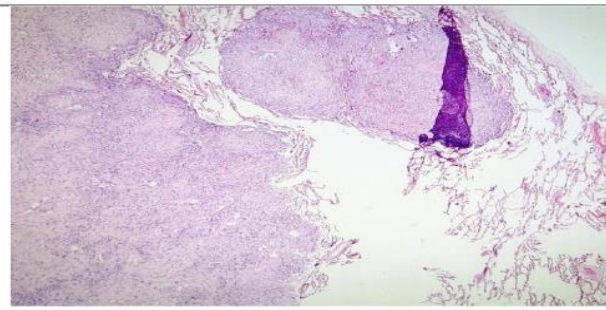

Figure J

Figure-G: Proliferation of spindle cells with entrapped normal ducts, breast. (H&E, 10X). Figure-H: Plump spindle cells with mitoses, breast (H&E, 20X). Figure-I: Plump spindle cells with mitoses, small intestine (H&E, 40X). Figure-J: Lung parenchyma with metastatic spindle cell tumor. (H&E, 20X)

Discussion

Though the small intestine is the site of predilection of metastatic tumors, metastatic sarcomas are extremely rare and their incidence is unknown.[4,5] Common primary malignant spindle cell tumors of the small intestine are gastrointestinal stromal tumors (GIST) and leiomyosarcoma(LMS), which can come under close differentials for metastatic spindle cell sarcoma to the small intestine.

Small intestinal GIST are large more than 5cm in size and predominantly show more homogenous spindle cell morphology, often with distinctive extracellular collagen globules (skeinoid fibres) as well as nuclear palisading and perivascular hyalinisation. Nearly all cases of small intestinal GISTs are immunoreactive for c-kit and DOG1. 60% of these tumors are positive for CD34 and 30–35% for smooth muscle actin, with almost uniform negativity for desmin. S100(Solubility in 100% ammonium sulfate) protein is detected in 10–20% of cases.[6]

Gastrointestinal LMS are very rare [7] and show plump spindle cells with blunt-ended nuclei, and moderate

to abundant bright eosinophilic cytoplasm set in long intersecting fascicles. Diffuse hypercellularity, myxoid areas, fibrotic areas, marked nuclear pleomorphism, atypical mitoses, and necrosis are commonly seen. By immunohistochemistry, at least one myogenic marker (SMA, desmin, h-caldesmon) is positive in 100% of cases.[8]

Our case on histology showed plump spindle cells (without evident fascicular pattern) with markedly pleomorphic nuclei and atypical mitoses. Tumour giant cells and focal areas of necrosis were evident. On IHC, these cells were immunonegative for AE1, CD 34, c-kit, DOG1, h-caldesmon, Desmin, SMA, and ER. The tumor cells were immunoreactive for vimentin and the Ki67 index was 30%. As IHC revealed negativity for SMA, desmin, and h caldesmon, the possibility of LMS is unlikely. Marked pleomorphism in nuclei and immunonegatitivity for CD117 and DOG1 showed GIST as the second primary is unlikely. Though PDGFRA mutant GISTs often show limited or negative expression of CD117; DOG1 is positive in the majority of cases and they commonly occur in the stomach and show epithelioid morphology (round nuclei and abundant eosinophilic cytoplasm). SDH-deficient GIST characteristically shows epithelioid morphology (uniform nuclei and cytoplasmic vacuoles) and is typically multinodular with plexiform mural involvement. They show lymphovascular invasion and lymph node metastasis. SDH-deficient GIST is more common in the young population.[9]

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