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Original Research Paper

Radio-Diagnosis

RARE VASCULAR AND METASTATIC PRESENTATION OF HIGH-GRADE SEROUS OVARIAN CARCINOMA: MULTIORGAN SPREAD WITH SPLENIC VEIN TUMOR THROMBOSIS

Dr Nitin Bhutada Assosiate Professor, Department Of Radiodiagnosis, Government Medical College, Nagpur, India

Dr Rahul Agarwal Junior Resident, Department Of Radiodiagnosis, Government Medical College, Nagpur, India

Dr Suraj Chavhan Junior Resident, Department Of Radiodiagnosis, Government Medical College, Nagpur, India

ABSTRACT High-grade serous ovarian carcinoma (HGSOC) typically presents with peritoneal dissemination. However, hematogenous and vascular spread involving the spleen and splenic vein tumor thrombosis are exceedingly rare. We present the case of a 55-year-old female with bilateral ovarian carcinoma complicated by splenic metastasis, hepatic metastasis, and tumor thrombosis of the splenic vein extending to the porto-splenic confluence. The case highlights the importance of imaging in identifying rare patterns of spread and vascular complications in advanced ovarian malignancy.

KEYWORDS :

INTRODUCTION

Epithelial ovarian carcinoma is notorious for its silent progression and late diagnosis, with peritoneal dissemination being the most common route of spread. High-grade serous ovarian carcinoma accounts for nearly 70% of all ovarian cancers [Prat 2012]. Hematogenous metastases, although uncommon, may involve liver, lungs, and spleen. Isolated splenic metastasis and splenic vein tumor thrombosis represent very rare metastatic patterns in ovarian carcinoma [Tuoheti 2004; Silpa Kumar 2020]. Here we report an extremely rare combination of splenic and hepatic metastases along with splenic vein tumor thrombosis in a patient with HGSOC.

Case Presentation

A 55-year-old postmenopausal woman presented with progressive abdominal fullness, early satiety, and vague lower abdominal discomfort more marked on the left side for 3 month. There was history of loss of appetite since 15 days with constipation since last 3 months & significant weight loss. There was no History of any urinary complaints. She had no personal or family history of malignancy or thromboembolic events.

On examination, a firm, ill-defined midline abdominopelvic mass was palpable. No ascites, pedal edema, or lymphadenopathy was noted. Respiratory and cardiovascular examinations were normal.

Investigations

Laboratory Findings

Laboratory studies revealed a hemoglobin level of 10.5 g/dL, white blood cell count of 8,900/mm^3, and platelet count of 194,000/mm^3. Liver and renal function tests were within normal limits. Coagulation parameters were normal. The serum CA-125 was significantly elevated at 2256U/mL.

Ultrasound Findings

Ultrasound revealed a large 13 cm midline complex solid-cystic abdominopelvic mass with heterogeneous internal echoes, irregular thickened septations, and increased vascularity on Doppler study. The bilateral ovaries were not visualized separately. The mass displaced the uterus laterally, with indistinct fat planes suggesting uterine serosal infiltration. Minimal free fluid was noted in the pelvis.

In the upper abdomen, the liver showed mild enlargement with two hypoechoic lesions in segments II and V suggestive of hepatic metastases. The spleen appeared moderately enlarged with a hypoechoic lesion near the hilum (~5.5 cm), suspicious for metastasis. Doppler evaluation of the splenic vein revealed reduced flow with partial luminal filling defect suggesting thrombosis.

CT Findings

Contrast-enhanced CT demonstrated a large lobulated heterogeneously enhancing abdominopelvic mass (14.8 x 10.9 x 9.6 cm) with central necrosis, inseparable from the left adnexa, and compressing pelvic vessels. The right ovary appeared bulky. Minimal ascites and nodular peritoneal thickening were seen. Subcapsular liver metastases were identified in segments II and V (up to 2.2 cm). The spleen measured 15.8 cm, with a hypoenhancing lesion (5.2 x 4.6 x 5.9 cm) extending into the splenic vein, resulting in complete occlusion and expansion of the vein up to 2.5 cm. Wedge-shaped peripheral infarcts were also present. The portal vein remained patent. A periesophageal thoracic lymph node (17 mm) was noted. CT confirmed multiorgan metastasis and vascular invasion.

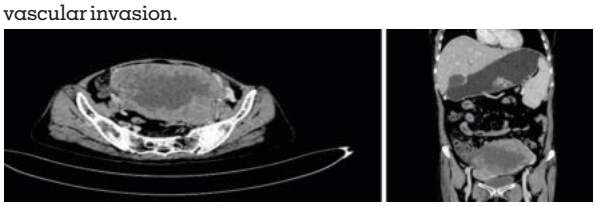

Figure 1: Contrast CT scan in axial and coronal view image depicting well-defined, lobulated, heterogeneously enhancing mass in the pelvic cavity, containing central non-enhancing necrotic areas likely arising from the left ovary .

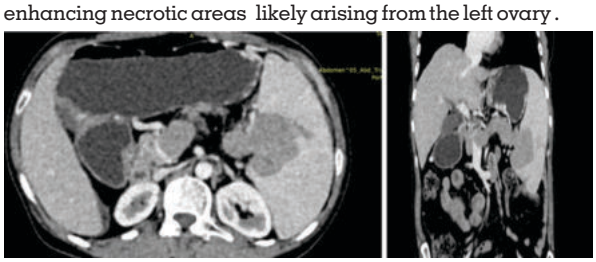

Figure 2: contrast CT scan in axial and coronal view depicting a hypoenhancing lesion in the mid pole of the spleen near the splenic hilum which is seen further extending into the spinning queen causing its complete luminal occlusion .

Histopathology

Ultrasound-guided biopsy confirmed high-grade serous adenocarcinoma consistent with ovarian primary.

DISCUSSION

Peritoneal dissemination is the hallmark of advanced-stage ovarian carcinoma; however, hematogenous spread to solid organs like the liver and spleen occurs less commonly [Nougaret 2022]. Splenic metastasis remains rare, seen in less than 1-3% of ovarian carcinoma cases, and generally reflects disseminated advanced disease [Tuoheti 2004; Cormio 2009]. The rarity of splenic metastasis has been attributed to its rhythmic contraction, sharp arterial angulation, phagocytic activity, and absence of afferent lymphatics [Compérat 2008].

Splenic vein tumor thrombosis represents an extremely rare vascular complication. In most cases, splenic vein thrombosis occurs secondary to pancreatitis or pancreatic tumors; involvement by ovarian carcinoma is exceedingly rare [Silpa Kumar 2020; PMC2943678]. The proposed mechanisms for splenic vein tumor thrombosis include direct invasion from adjacent splenic metastasis, hypercoagulability, and tumor emboli [PMC2943678; ScienceDirect S2352578921001223].

Cancer patients frequently exhibit a hypercoagulable state due to tumor-associated cytokines, procoagulant factors, and endothelial injury, which together contribute to thromboembolic complications [Khorana 2012; Hisada 2017]. While venous thromboembolism is commonly observed in deep venous systems or pulmonary arteries, splanchnic venous thrombosis remains underreported.

Our patient's unique presentation involved hepatic, splenic, and vascular metastases, along with minimal ascites and peritoneal thickening. Subcapsular hepatic lesions are typical for hematogenous metastasis in ovarian cancer, as seen in this case [Nougaret 2022]. The detection of thoracic nodal metastasis indicated systemic dissemination beyond the peritoneal cavity.

CT remains the primary modality for complete staging, surgical planning, and identifying unusual metastatic and vascular spread patterns [Nougaret 2022; Science Direct S1048891X2414769X]. The combination of hepatic and splenic metastases with splenic vein tumor thrombosis clearly places this patient in FIGO stage IV.

Previous case reports have documented splenic metastasis with or without splenectomy in ovarian carcinoma patients [Silpa Kumar 2020; PMC2943678; Karni 2014]. However, splenic vein tumor thrombosis combined with splenic metastasis, hepatic metastasis, and thoracic nodal involvement, as presented here, represents one of the rarest metastatic profiles described in the literature.

CONCLUSION

This case highlights an extremely rare vascular and metastatic spread pattern in high-grade serous ovarian carcinoma, with multiorgan hematogenous dissemination, splenic metastasis, and splenic vein tumor thrombosis. Advanced cross-sectional imaging plays a crucial role in identifying such unusual disease extensions, ensuring proper staging and multidisciplinary management.

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