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Case Report

Rare encounter: A case report of primary carcinosarcoma of fallopian tube

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Abstract

Carcinosarcoma of the fallopian tube is a rare and aggressive malignancy accounting for less than 4% of all gynecologic carcinosarcomas. This case report details a 65-year-old woman with primary fallopian tube carcinosarcoma who presented with abdominal distension and discomfort. Diagnostic imaging revealed bilateral hypermetabolic ovarian masses with peritoneal and mesenteric metastasis. Histopathological analysis showed a biphasic neoplasm with high-grade serous papillary areas and chondrosarcomatous regions with brisk mitotic activity and Serous Tubal Intraepithelial Carcinoma (STIC) in the tubal lining. The patient underwent neoadjuvant chemotherapy, cytoreductive surgery, and follow-up chemotherapy. The rarity and aggressive nature of fallopian tube carcinosarcomas emphasize the importance of documenting and sharing cases to enhance understanding of diagnosis and treatment. Future research should focus on improving diagnostic techniques and exploring more effective treatment options.

Keywords: Carcinosarcoma, Fallopian tube, Serous tubal intraepithelial carcinoma.

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1. Introduction

In the female genital tract, primary carcinoma of the fallopian tube is rare, making it the least common location for carcinosarcomas, which represent less than 4% of all gynecologic carcinosarcomas.[1] Carcinosarcomas, previously called Malignant Mixed Müllerian tumors (MMMT), consist of a mix of malignant glands and malignant mesenchymal components. The endometrium is the most common site for carcinosarcoma, followed by the ovaries, fallopian tubes, cervix, and vagina.[2] Diagnosing fallopian tube malignancy before surgery is uncommon because its features are similar to hydrosalpinx, tubo-ovarian abscess, and ovarian tumors.[1] The definitive diagnosis of carcinosarcoma involves immunohistochemical staining of the carcinomatous and sarcomatous components for cytokeratin and vimentin, respectively. Cytokeratin-positive or vimentin-positive staining confirms carcinoma or sarcoma, respectively, though sometimes the diagnosis may present as sarcomatoid carcinoma or epithelioid sarcomas.[3] The treatment of primary carcinosarcomas of the fallopian tube typically includes comprehensive cytoreductive surgery and adjuvant chemotherapy. Therefore, these tumors are of low incidence but are highly aggressive, with significant metastatic potential and a poor prognosis.[4]

2. Case Presentation

The case involves a 65-year-old woman with comorbidities who reported abdominal distension and discomfort with moderate ascites for 20 days. An ultrasound showed an ill-defined heteroechoic mass in the right adnexa, inseparable from the uterus? ovarian mass and multiple hypoechoic peritoneal nodules along with moderate ascites. A positron emission tomography (PET) scan indicated bilateral hypermetabolic ovarian masses suggesting ovarian carcinoma, with extensive hypermetabolic omental thickening indicating peritoneal metastasis. Nodules were also found in the mesentery, right subdiaphragmatic region, on the surface of the uterus, adnexa, urinary bladder, bowel loops, and liver, pointing to metastasis with hypermetabolic epiphrenic lymph nodes suggesting possible metastasis.

Grossly we received an atrophic uterus with cervix, with attached bilateral tubo-ovarian masses and pelvic

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peritoneum. The endometrial lining was 0.1 cm thick. The uterus showed no unusual features upon sectioning, while bilateral tubo-ovarian masses exhibited friable, variegated, papillary grey-white to grey-tan lesions across the entire adnexa with some spread onto the uterine serosa (**Figure 1**). The attached peritoneum showed multiple nodules of varying sizes and congestion.

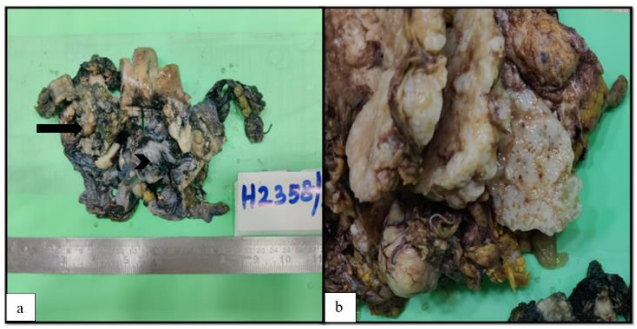

Figure 1: a); Hysterectomy specimen with friable bilateral tuboovarian masses (arrow) with attached pelvic peritoneum (arrow head). **b)**; Omental deposits

Microscopic analysis revealed a biphasic tumor comprising high-grade serous papillary areas mixed with chondrosarcomatous regions. Brisk mitotic activity reaches up to 12 to 14 mitoses per 10 high-power fields, with some atypical mitoses. No other heterologous components were observed. The tumor infiltrated the wall of both fallopian tubes and adjacent ovarian tissue, extending beyond the serosa of both organs. Serous tubal intraepithelial carcinoma (STIC) was observed in the tubal lining (**Figure 2**). The tumor also extended onto the uterine serosa and infiltrated the superficial myometrium.

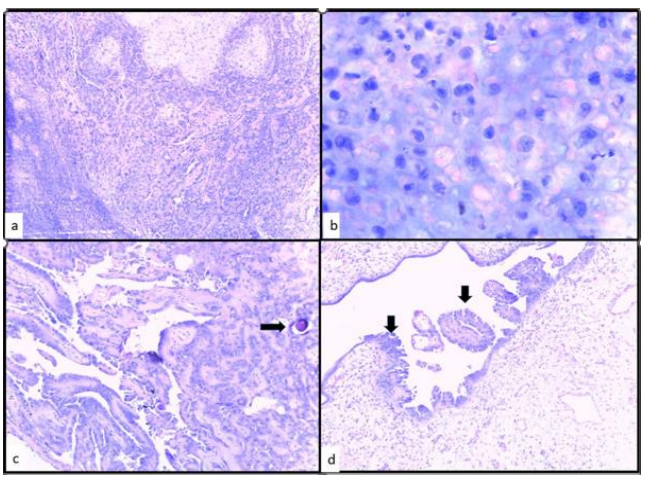

Figure 2: **a**); Low power view showing biphasic neoplasm comprising of high grade serous carcinoma and chondrosarcomatous areas, 40x. **b**); Malignant cartilage, 400x. H&E; **c**); High grade serous papillary areas with psammomatous calcification (arrow), 100x. **d**); Serous Tubal Intraepithelial Carcinoma in the fimbrial end of tube (arrow), (100x)

On Immunohistochemistry, the carcinomatous portion was positive for Pancytokeratin and showed diffuse vimentin positivity. p16 and WT1 showed focal positivity, while p53 had a null staining pattern. The chondrosarcomatous component was positive for S100 (**Figure 3**). The tumor cells were negative for Desmin and MyoD1. The MIB-1 proliferative index was 15-20%.

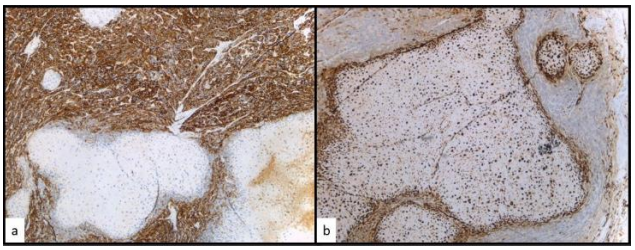

Figure 3: **a**): Diffuse positivity of Pancytokeratin (AE1/AE3) in the carcinomatous areas (arrow), 40x. **b**): S100 positivity in the chondrosarcomatous areas (arrow), 100x.

Given the evidence of a biphasic neoplasm featuring serous tubal intraepithelial carcinoma in the adjacent tubal mucosa, along with immunohistochemistry revealing diffuse Pan cytokeratin (AE1/AE3) positivity in the carcinomatous regions and S100 positivity in the chondrosarcomatous regions, a diagnosis of primary fallopian tube carcinosarcoma was established.

3. Discussion

Primary fallopian tube sarcoma is rare, and a combined tubal malignancy is even rarer.[5] Carcinosarcomas combine poorly differentiated adenocarcinoma and sarcoma in the same tissue. Carcinosarcomas can be either homologous or heterologous, depending on whether the sarcomatous components arise from the normal components of the Müllerian or non-Müllerian system.[2] Carcinosarcomas are of epithelial origin, and molecular studies have proved a monoclonal origin by demonstrating concordant p53 mutations within the carcinoma and sarcoma components. Tubo-ovarian carcinosarcomas usually harbour the same genetic alterations seen in uterine carcinosarcomas.[6] Initially, it was thought that heterologous carcinosarcomas had a worse prognosis, but recent evidence suggests this is not the case.[7]

Primary carcinosarcomas of the fallopian tube typically occur in postmenopausal women in their 50s or 60s, with a mean age of 59.7 years. Globally, around 90 cases have been reported. The first case of carcinosarcoma from the fallopian tube was reported by Ferrando in 1950.[8] Reports on imaging of fallopian tube carcinosarcomas are scarce, however, MRI tends to show heterogeneous signals compared to the homogenous signals seen in carcinoma, suggesting that MRI might be preferable to CT for localizing pelvic masses and potentially aiding in preoperative diagnosis.[9]

No specific tumor markers predict carcinosarcomas reliably, although serum CA-125 can sometimes be elevated. There is no direct correlation between CA-125 and carcinosarcomas.[2] STIC areas may appear adjacent to the main tumor mass, especially at the fimbrial end.[10] Coexisting

intraepithelial carcinoma is a prerequisite for a diagnosis of primary tubal carcinoma, though it is rarely reported in serous carcinomas attributed to the ovary or peritoneum.

Akiki et al documented three cases of primary fallopian tube carcinosarcomas, with two featuring heterologous components and one featuring homologous carcinosarcoma. All tumors tested positive for CK, and two cases were S100-positive. One case exhibited p53-positive intraepithelial neoplasia in the contralateral fimbriae.[7]

Yakoyama et al examined four cases and reviewed 59 cases of fallopian tube carcinosarcoma, comparing platinum-based and non-platinum-based combination therapies across disease stages. Although the limited sample size restricted conclusive comparisons, platinum-based regimens may be effective in treating carcinosarcoma of the fallopian tube.[12]

Our patient underwent six cycles of neoadjuvant Taxol/Carbo chemotherapy with bevacizumab, followed by cytoreductive surgery and additional chemotherapy. The patient had widespread disease with tumor nodules scattered across the peritoneum and omentum. Follow-up PET scans indicated a positive response to therapy. Due to the difficulty of diagnosing early-stage disease and the aggressive nature of carcinosarcomas, the prognosis is typically poor, with an average survival of around 16.1 months.[2] The prognosis depends on the disease stage. Studies of comprehensively staged and clinically staged patients agree that carcinosarcoma outcomes are significantly worse than FIGO Grade 3 endometrial carcinomas, serous carcinomas, and clear cell carcinomas.[10] As demonstrated in studies and our case, tubal carcinosarcoma is often bilateral, highly malignant, rapidly growing, forms metastases, and causes death early.

4. Conclusion

Given the rarity of fallopian tube carcinosarcoma, sharing cases and follow-up details as they arise will contribute to a better understanding of diagnostic and treatment effectiveness.

5. Source of Funding

None.

6. Conflict of Interest

None.

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