CASE REPORT AND LITERATURE REVIEW

2D/3D Ultrasound Findings of Uterine Carcinosarcoma: A Case Report and Literature Review

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Abstract

Uterine carcinosarcoma is an infrequent, yet an invasive malignant tumor of the uterus. We presented the case of a 76-year-old menopausal woman with the first sparse bleeding and ultrasound findings of a large polypoid formation filling the uterine cavity. Ultrasound, specially more advanced techniques as 3D ultrasound and 3D Color Doppler ultrasound provide very useful data not only in the recognition of tumor mass, but also in terms of the structure, differentiation and stage of the malignancy.

Keywords: 2D ultrasound, 3D color Doppler transvaginal ultrasound, Uterine carcinosarcoma.

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Introduction

Uterine carcinosarcoma is a very rare tumor, only 5% of all malignant changes of the uterus belong to this type.[1] The characteristics of this malignant neoplasm are rapid extrauterine nodal and peritoneal spread, but also early distant metastases that can be detected in as much as 10% at initial examination.[2] This yields a very low 5-year survival rate, especially in the advanced stages of the disease.[3]

Symptoms and clinical presentation of this disease are nonspecific, namely abnormal bleeding and pain in the lower abdomen are the leading symptoms, and increased uterine mass and protrusion of polypoid formation through the cervix is the most frequent finding in the physical examination of the patient. Most women with uterine carcinosarcoma are of menopausal age.[4,5]

Ultrasound is the first line in detecting endometrial and uterine pathology. Important information in preoperative examination regarding the malignant potential of the tumor (endometroid or nonendometroid type), as well as the extensiveness of the operation, the size of the tumor mass, myometrial and cervical stromal invasion, as well as metastatic deposits.[6] The size of the mass larger than 15 mm is a strong predictor of the malignant potential of the tumor, whether it is detected by ultrasound, magnetic resonance imaging, or on the obtained postoperative material, and is correlated with lymph node metastases and disease-free survival in women with endometrial.[7,8]

Advances in imaging techniques with the introduction of color Doppler, as well as 3D ultrasound provide more useful information about potential malignancy and even the type of tumor change, noting that the golden standard is the pathohistological analysis of material obtained by curettage or biopsy.[9]

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3D ultrasound, especially new techniques like 3D color and power Doppler open new possibilities for the analysis of vascular morphology of tumor mass as well as the breakthrough of the endometrium–myometrium zone. This is a useful piece of information obtained during the initial examination and can provide insight not only into the nature of the tumor change but also about the tumor stage.[10]

In this study, we present a rare case of uterine carcinosarcoma with a concise review of the most prominent ultrasound and pathophysiologic characteristics of this unique entity.

Case Report

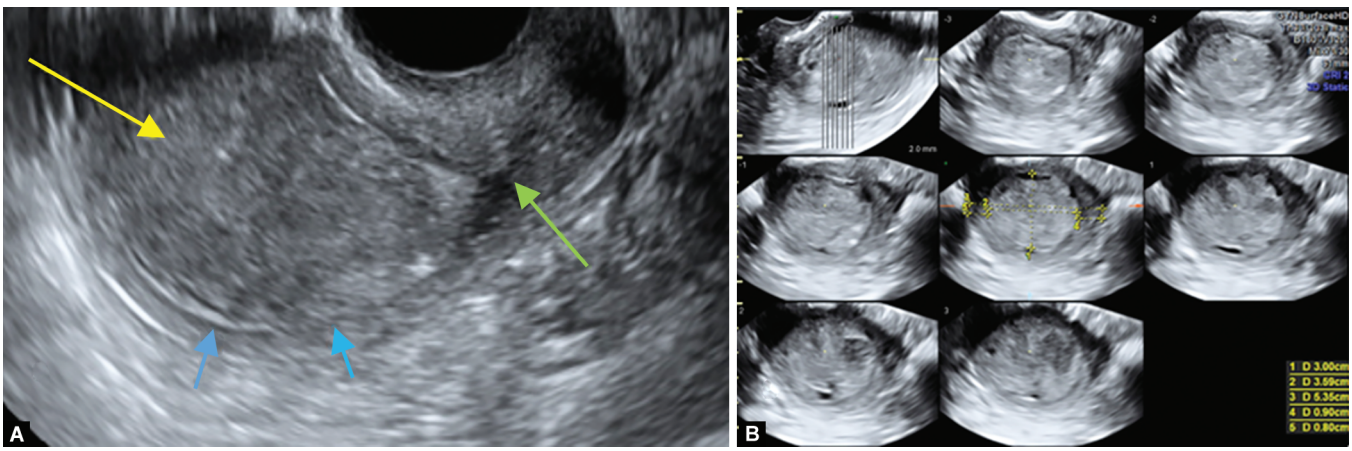
A 76-year-old menopausal patient appears for an examination due to minor genital bleeding in a previous couple of days. This is the first menopausal bleeding in this person. Reproductive history: two births. General history: over the

past years the patient has been regularly taking medication for treatment of high blood pressure and per oral therapy for type II diabetes. The body mass index of the patient is evidently elevated to 35.6, which puts her in the group of obese patients. There is no history of taking any oral contraceptives or hormone replacement therapy. Blood count is within reference values, there is no detection of anemia in the patient. The last cytological examination of the cervix, done couple of years ago, was normal without pathological changes. Gynecological examination: after application of the speculum, cervix preserved, scanty uterine bleeding, on palpation the uterus appears slightly enlarged, with absence of other adnexal masses.

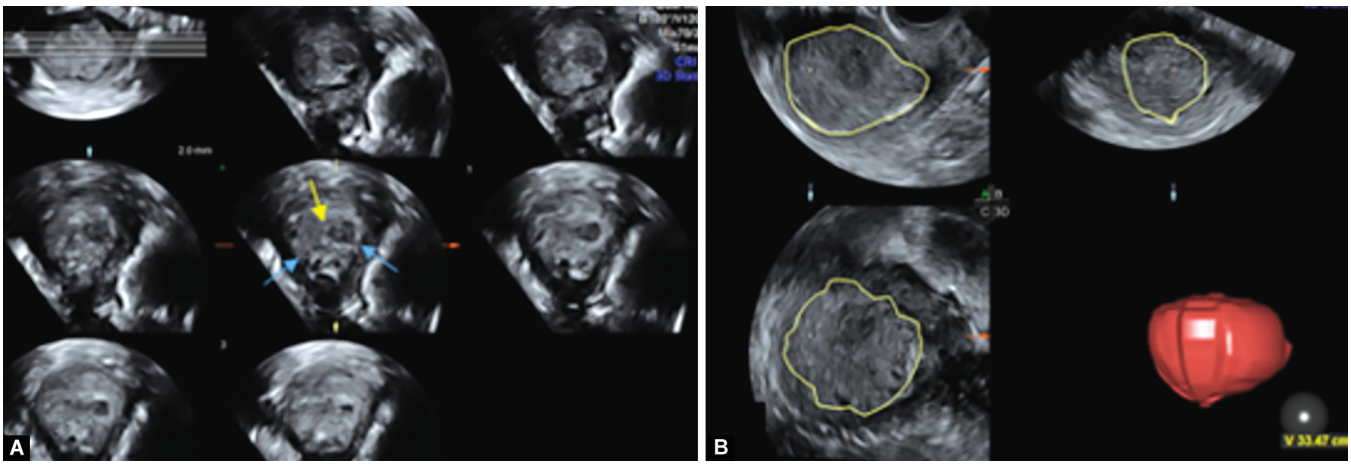
Ultrasound Findings

On initial 2D ultrasound, a round polypoid tumor lesion that fills and distends the uterine cavity was detected. There were no visible signs during the ultrasound detection that would indicate cervical involvement of the tumor tissue (Fig. 1A).

According to the International Endometrial Tumor Analysis classification of the endometrial and intrauterine lesions,[11] on 2D ultrasound, the endometrial midline appearance is not seen, but the interface between endometrial line and intracavitary lesions, also known as "bright edge," is visible referring that tumor formation is predominantly localized in the uterine cavity (Fig. 1A). The tumor thickness and width, as well as minimal tumor-free margin, were measured (Fig. 1B). Endometrial–myometrial junction is generally regular (intact) with a nonuniform heterogeneous morphology of the lesion (Fig. 2A), moderately large size and volume of the lesion (Fig. 2B). 2D color Doppler ultrasound detected "multifocal" origin of vascular pattern per lesion and moderate vascularity "color score 3" (Fig. 3). 3D power color Doppler, with rendered view, showed "circumferential like" vascularization with "multifocal" dispersion of blood vessels (Fig. 4). Fractionated exploratory curettage was performed, from which the pathohistological findings were in favor of nonendometroid endometrial cancer. Magnetic resonance imaging of the



Figs 1A and B: 2D and 3D high definition imaging transvaginal ultrasound: (A) Round polypoid tumor lesion that fills the uterine cavity (yellow arrow), "bright edge" is visible (blue arrows), free endocervical line (green arrow); (B) Measurement of distance: anteroposterior (tumor thickness) and laterolateral diameter of uterus (uterine width), laterolateral tumor diameter (tumor width), and minimal tumor-free margins in transverse plane



Figs 2A and B: 3D rendering ultrasound in coronal plane and volume acquisition by VOCAL of the tumorous mass: (A) Endometrial–myometrial junction is generally regular (blue arrows), nonuniform heterogeneous morphology of the lesion (yellow arrow); (B) Large size and volume of the lesion

pelvis and abdomen, gastrointestinal examinations, and lung X-rays ruled out the existence of metastatic nodules.

Total hysterectomy with bilateral adnexectomy and partial resection of the omentum was performed. According to the intraoperative findings, a decision was made by the whole professional team that there was no need for para-aortic lymphadenectomy. The operative material was collected and sent for further pathohistological examination. The patient was sent to the Oncology Institute for further therapeutic approaches.

Operative Material

The results from the examination of operative material revealed a polypoid mass, with large basis of implantation, which filled the uterine cavity. The polypoid mass had a soft consistency, white-gray to yellow in color, with hemorrhagic areas (Fig. 5).

The histopathological examination made on serial sections at different levels of the polypoid mass outlined a biphasic neoplasm (Figs 6A and B). One of the components of the neoplasm was carcinoma exhibiting papillary, adenoid, and tubular architecture.

The other component was sarcoma consisted of atypical mesenchymal cells, with large number of multinuclear cells.

Since carcinomatous component was positive for protein p53 (Fig. 7A) and Wilms tumor protein (WT1) (Fig. 7B), it was diagnosed as a serous carcinoma. The epithelial component was also positive for PAX8 (Fig. 7C). The sarcomatous component of the neoplasm was positive for vimentin (Fig. 7D) and partially for proteins p53 and WT1 (Figs 7A and B).

According to the histological characteristics and immunohistochemical results the neoplasm was diagnosed as carcinosarcoma, composed of serous carcinoma and homologous sarcomatous component [malignant mixed Müllerian tumor (MMMT)—homologous type].

The tumor was limited to the uterine corpus, without infiltration in myometrium, and there was no evidence of tumor in the ovaries or fallopian tubes (pT1A, pNx, pMx, and stage IA).[12]

Discussion

Uterine carcinosarcoma, or MMMT, a tumor composed of both epithelial and mesenchymal elements, is an aggressive malignant neoplasm of the endometrium, that typically occurs in postmenopausal women. The International Federation of Gynecology and Obstetrics staging guidelines suggested that uterine carcinosarcoma should be staged the same way as the endometrial carcinoma.[13]

Endometrial carcinosarcoma is a tumor with moderately large size and volume, compared to the same stage endometroid type of endometrial carcinomas.[7]

The sonographic detection and analysis of tumor vascularization by color Doppler is very important because it has the potential to distinguish uterine sarcoma from benign uterine lesions.[14] Angiogenesis plays the key/an important role in the prognosis of endometrial malignancy; vascular proliferation is closely related to the aggressiveness of malignancies and reduced chances of survival in this group of patients.[14–16]

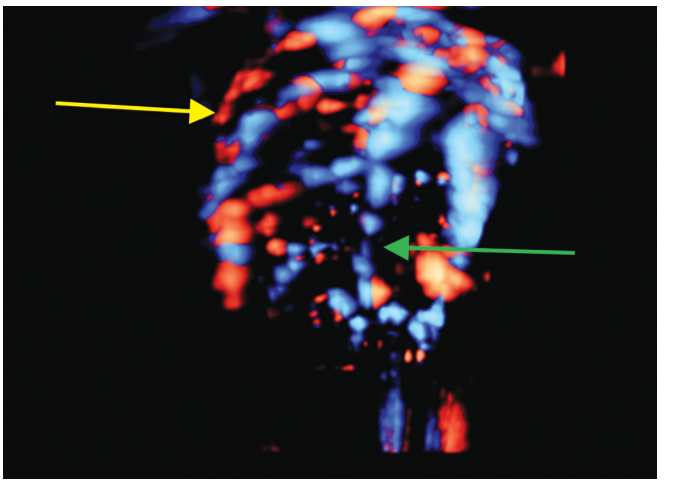


Fig. 4: 3D power color Doppler, with rendered view, showed circumferential like vascularization (yellow arrow) with "multifocal" dispersion of blood vessels (green arrow)

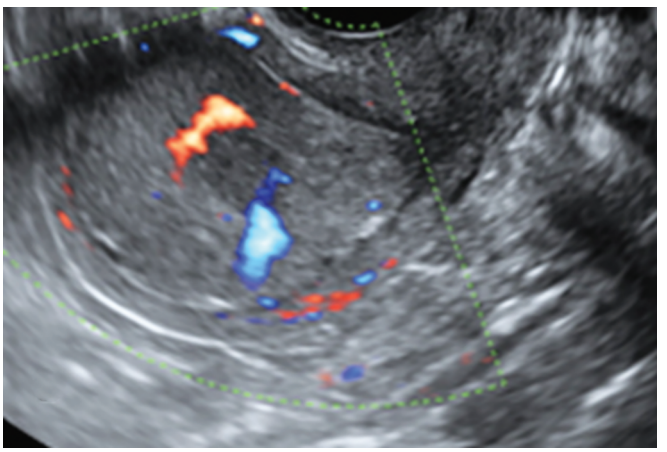


Fig. 3: 2D color Doppler ultrasound of the lesion detected moderate vascularity "color score 3"

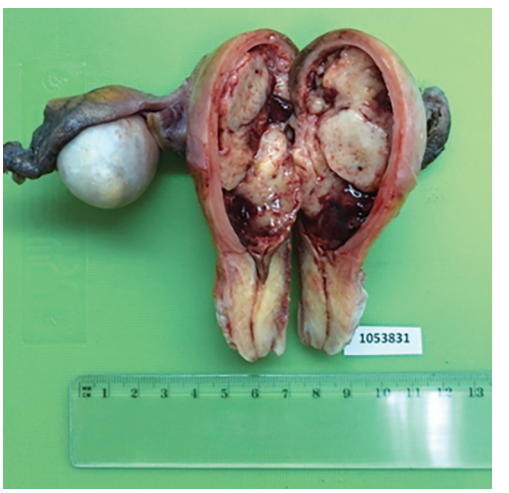
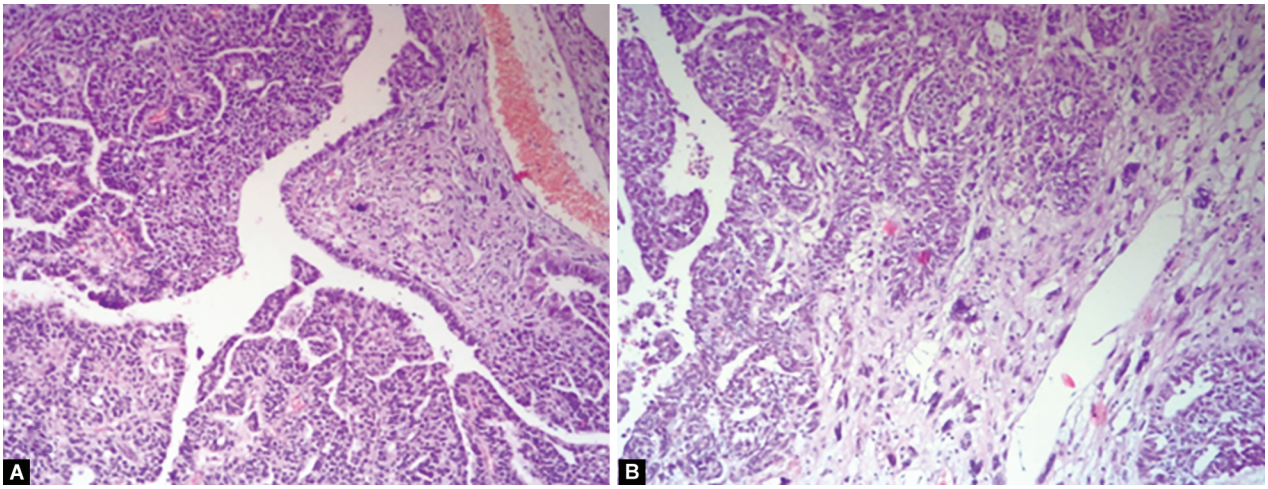
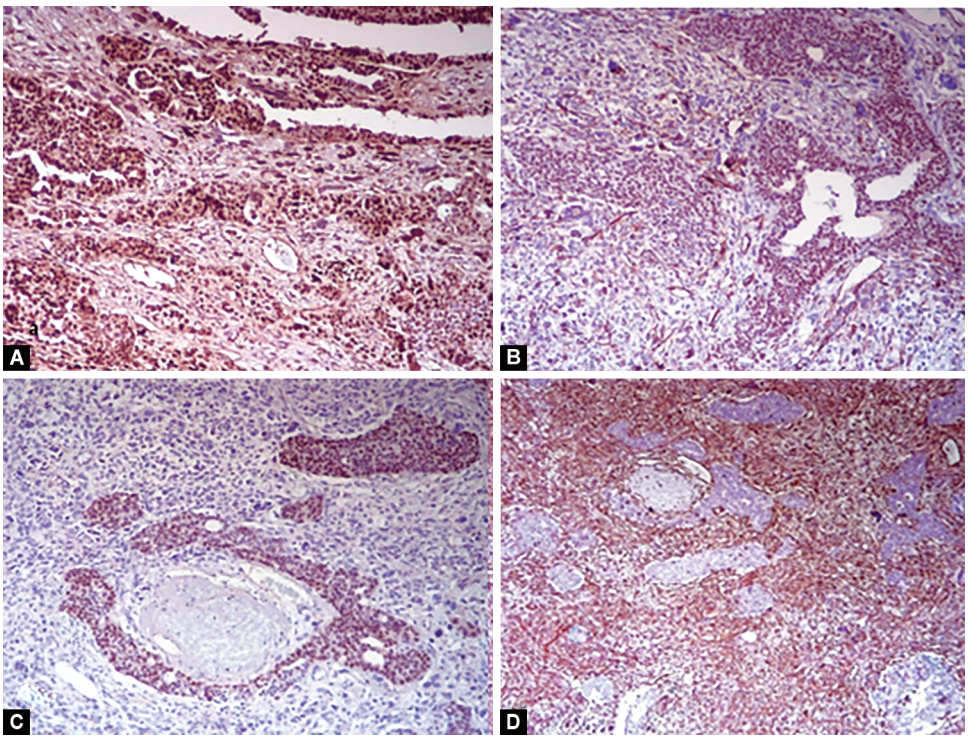


Fig. 5: Cut surface of the uterus showing polypoid mass



Figs 6A and B: Histopathological examination of the uterine carcinosarcoma. Hematoxylin and eosin staining at a magnification ×10 (A), and ×20 (B)



Figs 7A to D: Immunohistochemical analysis of the uterine carcinosarcoma. (A) p53—positive in both the carcinomatous and sarcomatous component; (B) WT1—positive in both the carcinomatous and sarcomatous component; (C) PAX8—positive in epithelial component; (D) vimentin—positive in sarcomatous component

The high color score and multiple vessels with multifocal origin are associated with higher tumor stage and higher grade of endometrial cancer, both for endometroid type and carcinosarcoma.[7]

3D color power Doppler provides an excellent visualization of the vascular network of the tumor. In uterine carcinosarcoma, 3D color Doppler flow imaging commonly shows strip or short-streak bloodstream signals[17] and rich color flow signals of multifocal origin,[10] detectable both in the peripheral and internal areas of the masses. Thus, carcinosarcoma, due to its pathohistological characteristics and involvement of different tissues, more closely resembles vascularization as in fibroids and might be misdiagnosed as uterine fibroids.[17]

Conclusion

Uterine carcinosarcoma is a rare, very aggressive tumor of the uterus. Ultrasound, in particular, new techniques like 3D ultrasound and 3D color Doppler ultrasound bring very useful data in the recognition of tumor mass, and also in terms of the structure, differentiation, and stage of the malignancy.

To improve the outcome for patients, physicians need to identify high-risk patients and tailor treatment appropriately to provide the best long-term survival and life quality.

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