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(RESEARCH ARTICLE)

Uterine carcinosarcoma: Clinicopathological features, treatment patterns and outcomes in a retrospective cohort

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Abstract

Background: Uterine carcinosarcoma (UCS) is a rare and highly aggressive malignancy associated with poor prognosis and a high risk of recurrence. Data from low- and middle-income countries remain limited. This study aimed to evaluate the clinicopathological characteristics, treatment patterns, and outcomes of UCS in a Moroccan tertiary care center.

Methods: We conducted a retrospective, descriptive study including patients with histologically confirmed uterine carcinosarcoma treated between January 2012 and December 2022 at the Hassan II University Hospital in Fez. Clinical, pathological, therapeutic, and follow-up data were collected. Descriptive statistical analysis was performed.

Results: A total of 21 patients were included. The mean age at diagnosis was 61 years. Most patients presented with advanced disease, with 95.2% diagnosed at FIGO stage III–IV. All patients underwent surgery, and 95.2% received external beam radiotherapy, while all patients received vaginal brachytherapy. Chemotherapy was administered using various modalities, including concomitant (71.4%), adjuvant (33.3%), and palliative (57.1%) approaches. During follow-up, distant metastases were observed in 52.4% of patients, local recurrence in 28.6%, and disease progression in 19.0%. The overall mortality rate was 61.9%.

Conclusion: Uterine carcinosarcoma remains a highly aggressive malignancy characterized by advanced-stage presentation and poor outcomes. Despite multimodal treatment, distant metastases represent the predominant pattern of failure, highlighting the need for improved systemic therapeutic strategies.

Keywords: Uterine carcinosarcoma; Radiotherapy; Brachytherapy; Chemotherapy; Multimodal treatment; FIGO stage; Metastasis; Survival

1. Introduction

Uterine carcinosarcoma (UCS), historically referred to as malignant mixed Müllerian tumor, is a rare and highly aggressive malignancy of the uterus characterized by the coexistence of epithelial and mesenchymal components. Although previously classified among uterine sarcomas, current evidence supports its origin as a dedifferentiated carcinoma, reflecting its epithelial nature and metastatic behavior [1].

UCS accounts for less than 5% of uterine malignancies but contributes disproportionately to uterine cancer–related mortality due to its aggressive clinical course and high recurrence rate [2]. The incidence is estimated to be approximately 0.5–3 cases per 100,000 women per year, with a peak occurrence in postmenopausal women [3]. Several

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risk factors have been associated with its development, including advanced age, obesity, diabetes mellitus, prior pelvic irradiation, and prolonged estrogen exposure [4].

Clinically, patients most commonly present with abnormal uterine bleeding, and the disease is frequently diagnosed at an advanced stage. Lymph node involvement and distant metastases are commonly observed at diagnosis, reflecting the strong metastatic potential of this tumor [5]. Prognosis remains poor despite therapeutic advances, with reported 5-year overall survival rates ranging from 18% to 47%, depending on disease stage, and significantly lower survival in advanced stages [6].

The current management of UCS relies on a multimodal approach combining surgery, chemotherapy, and radiotherapy. Surgical resection remains the cornerstone of treatment, while adjuvant therapies are tailored according to stage and pathological risk factors [7]. However, outcomes remain suboptimal, mainly due to the high rate of distant relapse, highlighting the systemic nature of the disease and the need for improved therapeutic strategies.

Given the rarity of uterine carcinosarcoma and the limited availability of large prospective studies, most available data are derived from retrospective series. In addition, data from low- and middle-income countries remain scarce. Therefore, this study aimed to analyze the clinicopathological characteristics, treatment patterns, and outcomes of patients with uterine carcinosarcoma treated at a tertiary care center in Morocco.

2. Materials and Methods

2.1. Study design and setting

This was a retrospective, descriptive, monocentric study conducted at the Department of Radiation Oncology of Hassan II University Hospital in Fez, Morocco.

The study included patients diagnosed with uterine carcinosarcoma and managed between January 2012 and December 2022.

2.2. Participants and data collection

All patients with histologically confirmed uterine carcinosarcoma treated at our institution between 2012 and 2022 were included in the study. Patients with incomplete medical records precluding analysis or those lost to follow-up were excluded. Clinical, pathological, therapeutic, and follow-up data were retrospectively collected from medical records.

The variables analyzed included demographic and clinical data (age at diagnosis), pathological features (FIGO stage according to the 2009 classification**,** which was the staging system in use during the study period), treatment-related data (surgical management, lymph node assessment when performed, chemotherapy, and radiotherapy with or without brachytherapy), as well as outcome data (local recurrence, distant metastasis, and survival status at last follow-up).

2.3. Treatment protocols

Treatment strategies were individualized according to disease stage and pathological risk factors. All patients underwent primary surgical management consisting of total hysterectomy with bilateral salpingo-oophorectomy. Adjuvant therapy was administered in the majority of patients based on pathological findings. External beam radiotherapy was delivered to the pelvis using three-dimensional conformal radiotherapy (3D-CRT), with a total dose of 45–50 Gy in conventional fractionation. High-dose-rate vaginal brachytherapy was performed in selected patients, either as a complement to external beam radiotherapy or as a sole modality. Chemotherapy was administered in a substantial proportion of patients, particularly in those with advanced-stage disease, while palliative chemotherapy was offered to patients with metastatic or unresectable disease.

2.4. Statistical analysis

Statistical analysis was performed using descriptive methods. Continuous variables were expressed as mean and range, while categorical variables were reported as frequencies and percentages. Given the limited sample size, no inferential statistical analysis was performed.

3. Results

3.1. Patient characteristics

A total of 21 patients with histologically confirmed uterine carcinosarcoma were included in the study. The mean age at diagnosis was 61 years (range: 45–80 years), with the majority of patients being postmenopausal. Metabolic comorbidities were frequently observed in this cohort, with diabetes mellitus present in 6 patients (28.6%) and obesity identified in 5 patients (23.8%).

3.2. Stage distribution

According to the FIGO 2009 classification, the majority of patients were diagnosed at an advanced stage. Stage III disease was the most frequent, observed in 16 patients (76.2%), followed by stage IV in 4 patients (19.0%), while only 1 patient (4.8%) presented with stage II disease. No patients were diagnosed at stage I. Overall, advanced stages (FIGO III–IV) accounted for 20 cases (95.2%), highlighting the aggressive nature and late presentation of uterine carcinosarcoma in this cohort.

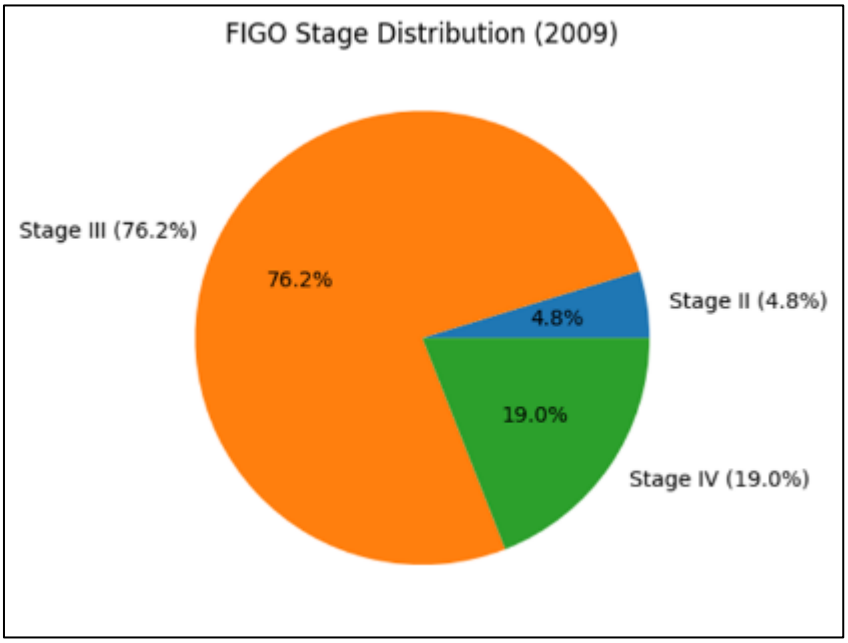

Figure 1 Distribution of patients according to FIGO stage (2009 classification). The majority of patients were diagnosed at advanced stages, with stage III representing 76.2% of cases, followed by stage IV (19.0%), while only one patient (4.8%) presented with stage II disease

3.3. Treatment

All patients underwent primary surgical treatment consisting of total hysterectomy with bilateral salpingo-oophorectomy. Five patients (23.8%) required secondary surgical intervention, mainly for completion of lymph node dissection, management of insufficient surgical margins, or treatment of postoperative complications.

External beam radiotherapy was delivered to the pelvis in 20 patients (95.2%) using three-dimensional conformal radiotherapy (3D-CRT), with a total dose ranging from 45 to 50 Gy, and was followed by high-dose-rate (HDR) vaginal brachytherapy. Lombo-aortic irradiation was performed in 9 patients (42.9%).

One patient (4.8%) received adjuvant brachytherapy alone without prior external beam radiotherapy.

Regarding brachytherapy dose, 10 Gy in 2 fractions was delivered in 5 patients (23.8%), while 21 Gy in 3 fractions was administered in 16 patients (76.2%).

Chemotherapy was delivered using different modalities, including concomitant chemotherapy in 15 patients (71.4%), sequential chemotherapy in 4 patients (19.0%), adjuvant chemotherapy in 7 patients (33.3%), and palliative chemotherapy in 12 patients (57.1%), with some patients receiving more than one modality.

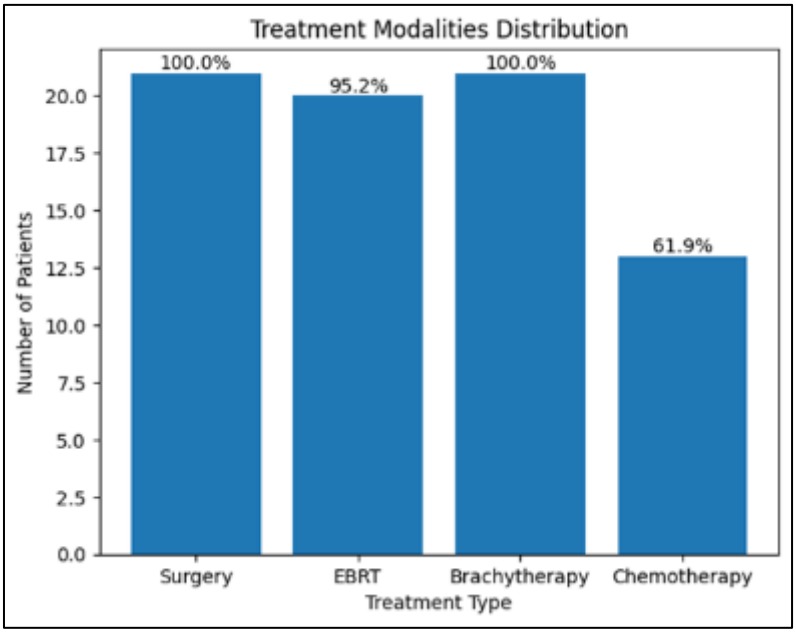

Figure 2 Distribution of treatment modalities. All patients underwent surgery and received brachytherapy. External beam radiotherapy was delivered in 95.2% of cases, while chemotherapy was administered in 61.9% of patients

3.4. Outcomes

During follow-up, disease progression was observed in 4 patients (19.0%). Local recurrence occurred in 6 patients (28.6%), while distant metastases were reported in 11 patients (52.4%). At last follow-up, 13 patients (61.9%) had died.

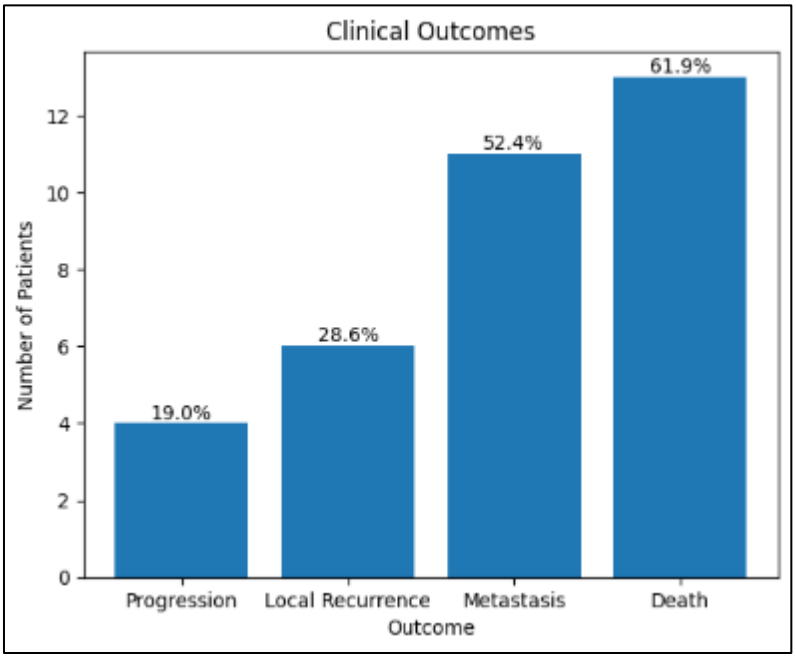

Figure 3 Clinical outcomes of patients with uterine carcinosarcoma

4. Discussion

4.1. Comparison with previous studies

In this cohort, uterine carcinosarcoma was characterized by a high proportion of advanced-stage disease (95.2% FIGO III–IV) and poor outcomes, with 52.4% distant metastases and 61.9% mortality. These findings are consistent with previous studies describing UCS as a highly aggressive malignancy with frequent extrauterine spread and poor survival, particularly in advanced stages [8–10].

The mean age at diagnosis (61 years) and the presence of metabolic comorbidities such as diabetes and obesity are also in line with the epidemiological profile reported in the literature [8,11].

The multimodal management observed in our study, combining surgery, radiotherapy, and chemotherapy, reflects current therapeutic standards [9,12,17]. However, despite systematic locoregional treatment, distant metastases remained more frequent than local recurrence, supporting the concept that UCS behaves predominantly as a systemic disease [8,9,13].

4.2. Clinical implications

Our findings highlight the importance of considering uterine carcinosarcoma as a high-risk malignancy requiring a multimodal approach. While radiotherapy contributes to locoregional control, the high rate of metastatic relapse underscores the need for effective systemic therapy. In addition, the predominance of advanced-stage disease at diagnosis suggests that earlier detection and improved referral pathways could potentially improve outcomes, particularly in resource-limited settings [11,14].

4.3. Future directions

Future research should focus on improving systemic treatment strategies and integrating molecular profiling into clinical practice. Recent advances in targeted therapies, including HER2-directed treatments, have shown promising results in advanced or recurrent disease and may help improve outcomes in selected patients [15]. Further studies are needed to better define the role of novel therapeutic approaches in this rare malignancy [9,15].

4.4. Strengths and limitations

The strengths of this study include its real-world nature and the detailed description of treatment modalities in a tertiary Moroccan center. However, the retrospective design, small sample size, and predominance of advanced-stage disease limit the generalizability of the findings. In addition, the absence of molecular data represents an important limitation in the current era of precision oncology [9,11,16].

5. Conclusion

Uterine carcinosarcoma remains a highly aggressive tumor associated with advanced-stage presentation and poor outcomes. Despite multimodal treatment, distant metastases remain the predominant pattern of failure, highlighting the need for improved systemic therapeutic strategies.

Compliance with ethical standards

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Disclosure of conflict of interest

All authors declare that there are no conflicts of interest regarding the publication of this manuscript. The authors declare no competing financial or non-financial interests.

Statement of ethical approval

This retrospective study was approved by the institutional review board of Hassan II University Hospital, which waived the requirement for informed consent due to anonymized data collection. The study adhered to the principles of the Declaration of Helsinki.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study."

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