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*Original Article*

# Superior diagnostic performance of computed tomography over abdominal ultrasound for ovarian cancer detection

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**Abstract:** Objective: To evaluate the clinical use of computed tomography (CT) in diagnosis of ovarian cancer. Methods: This retrospective study included 120 patients diagnosed with ovarian cancer between January 2021 and June 2024. All patients underwent both abdominal ultrasound and computed tomography (CT) examinations. Diagnostic performance, including sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and overall accuracy, were compared between the two modalities. Results: CT demonstrated superior diagnostic performance compared to abdominal ultrasound in all evaluated criteria. Specifically, CT exhibited higher sensitivity, specificity, PPV, and NPV. In addition, CT demonstrated superior performance for assessing tumor characteristics, a solid component, peritoneal involvement, lymph node metastasis, tumor vascularity, metastasis, and ovarian cystic lesions. Statistically significant differences were observed in the diagnostic accuracy for both early- and advanced-stages of ovarian cancer, highlighting CT's ability to deliver more accurate, reliable, and comprehensive information compared to ultrasound. Conclusion: CT outperformed abdominal ultrasound in diagnosing ovarian cancer, demonstrating superior sensitivity, specificity, and definition of tumor characteristics, metastasis, peritoneal involvement, and lymph node detection.

**Keywords:** Computed tomography, ovarian cancer, diagnostic value

## Introduction

Ovarian cancer remains one of the most lethal gynecologic malignancies, contributing substantially to morbidity and mortality among women globally. Recent data indicate that ovarian cancer ranks the fifth leading cause of cancer-related death among women, with approximately 300,000 new cases diagnosed annually worldwide [1]. The high mortality rate of ovarian cancer is primarily attributed to late-stage diagnosis, as the disease often presents vague, nonspecific symptoms, delaying clinical detection [2]. Despite advancements in early detection techniques and molecular profiling, the majority of cases are still diagnosed at an advanced stage, when metastasis has already occurred and treatment options are limited. This underscores a critical need for improved diagnostic strategies capable of identifying the disease at earlier stages, when the prognosis is more favorable and therapeutic interventions are more effective. In this context, imaging, particularly computed tomography (CT), has been widely explored [3-5]. CT is one of the most commonly used ways to diagnose and stage ovarian cancer due to its ability to generate high-resolution images that delineate tumor size, morphology, localization, and the extent of peritoneal or distant spread [6].

Several studies have demonstrated the use of CT in identifying large ovarian masses, ascites, and metastatic lesions, making it an essential tool for staging ovarian cancer and guiding therapeutic decisions [7-10]. However, despite its widespread use, CT has limitations for detecting early-stage ovarian cancer and differentiating benign from malignant lesions. While CT effectively identifies large tumors, its sensi-

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tivity diminishes for small, early-stage lesions confined to the ovaries. Furthermore, CT's ability to distinguish between cystic and solid masses remains suboptimal, a critical distinction for tumor characterization and clinical decision-making. This limitation is particularly evident when ovarian lesions are heterogeneous or when benign and malignant features overlap. Another consideration is the use of CT in high-risk populations, such as women with a family history of ovarian or breast cancer, or those carrying BRCA1/2 mutations [11, 12]. For these patients, the need for early and accurate diagnosis is greater; however, the risks associated with repeated CT scans, such as cumulative ionizing radiation exposure remain concerning. Although advances in CT technology have reduced radiation doses, potential long-term effects, particularly in younger women, continue to be debated [13]. These challenges underscore the need for alternative, non-ionizing imaging modalities, such as magnetic resonance imaging (MRI) or ultrasound, which provide comparable diagnostic accuracy without the risks of ionizing radiation.

Furthermore, while CT imaging has proven to be an invaluable tool in the staging of advanced ovarian cancer, its role in early detection remains less clear. Most studies assessing CT's diagnostic performance have focused on its use for staging and evaluating advanced cases, with limited data on its sensitivity for detecting early-stage ovarian cancer [14, 15]. Research by Lim et al. [16] revealed that CT often fails to detect small, confined ovarian tumors, particularly those measuring less than 2 cm. This limitation is partly due to the nature of ovarian cancer, which often disseminates diffusely within the peritoneal cavity, rendering small primary lesions difficult to identify before metastasis occurs. Thus, there is a growing need for more sensitive imaging techniques capable of detecting early-stage disease with higher sensitivity and specificity.

Given these limitations, the current study seeks to further explore the diagnostic value of CT in ovarian cancer, focusing on early detection and diagnostic accuracy. The study aimed to provide more robust data regarding the sensitivity and specificity of CT for early-stage ovarian cancer detection. The findings are expected to build upon previous research and provide a more comprehensive evaluation of CT's diagnostic capabilities, particularly when integrated into a multimodal diagnostic approach for ovarian cancer.

## Patients and methods

### *Patient selection*

This retrospective study included 120 patients diagnosed with ovarian cancer between January 2021 and June 2024. All patients underwent abdominal ultrasound and CT examinations. The process of patient selection in this study is shown in **Figure 1**. This study was approved by the ethics committee of The First Hospital of Jiujiang City.

Inclusion criteria: 1) Age ≥ 18 years; 2) Histopathologic confirmation of ovarian cancer following surgical treatment [17]; 3) Completion of both abdominal ultrasound and CT imaging, with complete datasets available; 4) Pathological specimens containing solid tumor components to ensure accurate diagnostic evaluation; 5) Availability of complete clinical data.

Exclusion criteria: 1) Presence of other active malignancies; 2) Pregnancy; 3) Severe hepatic or renal dysfunction; 4) Significant comorbidities, including cardiovascular diseases, diabetes, or hematological disorders, that could affect study outcomes; 5) Incomplete clinical or imaging data precluding accurate diagnostic outcomes; 6) Severe emphysema, pulmonary embolism, or pulmonary arterial hypertension that could complicate imaging procedures.

### *Data extraction*

All patients underwent abdominal ultrasound and CT examinations.

CT examination: Patients were instructed to fast for 6-8 hours prior to the CT scan. Scanning was performed without the use of contrast agents using a Siemens Sensation 64-slice CT scanner. Patients were instructed to hold their breath during the scan. The scanning range extended from the lower ribs to the upper lumbar vertebrae. The following scan parameters were applied: matrix 512 × 512, slice thickness 1.0 mm, tube current 250 mA, and tube

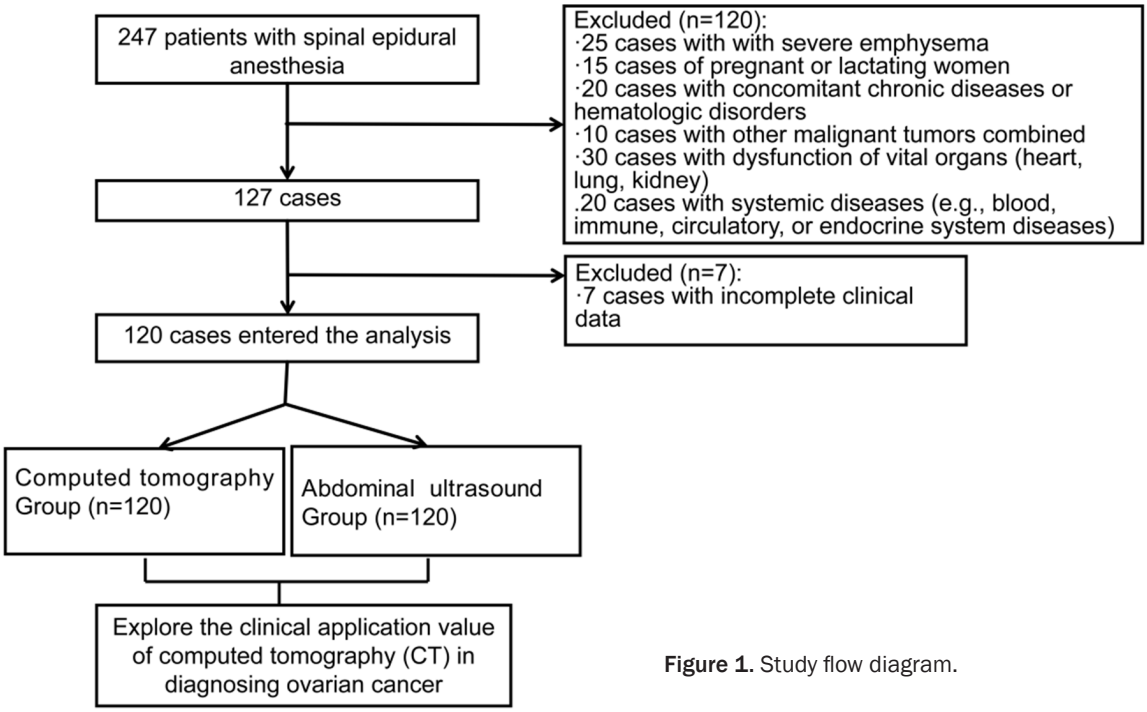


**Figure 1.** Study flow diagram.

voltage 120 kV. Post-processing of the images included image reconstruction with a slice thickness of 6.0 mm and an interslice gap of 1 mm.

Abdominal ultrasound (AU) examination: Patients fasted for at least 6 hours prior to the examination. A coupling gel was applied to the abdomen to ensure adequate acoustic contact. Patients were positioned in the supine or lateral decubitus position, depending on the area of interest. A high-frequency transducer was used to obtain real-time images, with adjustments in transducer position, angle, and pressure made as necessary to optimize image quality. The scan region typically covered the liver, kidneys, spleen, pancreas, and other abdominal organs. No contrast agent was used. The examination lasted approximately 20-30 minutes, depending on case complexity and patient condition. Images were reviewed immediately to assess organ size, parenchymal texture, and detect abnormalities such as tumors, cysts, or stones.

*Outcome measures*

The primary outcome of this study was to evaluate the diagnostic accuracy of CT and AU in detecting ovarian cancer, evaluated by comparing sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and overall accuracy. Secondary outcomes included a comparative analysis of the two modalities in detecting tumor characteristics, including size, shape, enhancement patterns, vascularity, lymph node involvement, solid components, peritoneal involvement, tumor metastasis, and ovarian cystic lesions. Additionally, the diagnostic performance for early- and advanced-stage ovarian cancer and the ability to differentiate between benign and malignant masses, was assessed.

*Statistical analysis*

Statistical analyses were performed using SPSS software (version 22.0, IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean ± standard deviation (SD) and compared between groups using independent t-tests. Categorical variables were presented as frequencies and percentages, with differences between groups assessed using the chi-square test. Diagnostic performance metrics, including sensitivity, specificity, PPV, NPV, and overall accuracy, were calculated for both CT and AU. Comparisons of diagnostic data between the two imaging modalities were performed using chi-square test with con-

**Table 1.** Pathological results of the included patients

| Item | Value |
|---|---|
| Histologic Type | |
| Serous Adenocarcinoma | 45 (37.50%) |
| Mucinous Adenocarcinoma | 25 (20.83%) |
| Endometrioid Carcinoma | 18 (15.00%) |
| Clear Cell Carcinoma | 12 (10.00%) |
| Transitional Cell Carcinoma | 8 (6.67%) |
| Other | 12 (10.00%) |
| Tumor Stage | |
| Stage I | 24 (20.00%) |
| Stage II | 36 (30.00%) |
| Stage III | 42 (35.00%) |
| Stage IV | 18 (15.00%) |
| Histopathologic Features | |
| High-grade | 70 (58.33%) |
| Low-grade | 50 (41.67%) |

tinuity correction. Differences in the detection rates of tumor metastasis, ovarian cystic lesions, lymph node involvement, tumor vascularity, and peritoneal involvement were also evaluated using the chi-square test. Statistical significance was defined as a *p*-value < 0.05. Comparisons of diagnostic accuracy between early- and advanced-stage ovarian cancer were similarly assessed using chi-square tests, with a significance threshold set at 0.05.

## Results

*Pathologic findings of the included patients*

The study included 120 patients with pathologically confirmed ovarian cancer. Serous adenocarcinoma was the most common histologic subtype, accounting for 37.50% (45 cases), followed by mucinous adenocarcinoma (20.83%, 25 cases) and endometrioid carcinoma (15.00%, 18 cases). Other histologic types, including clear cell carcinoma and transitional cell carcinoma, constituted 16.67% of cases. Regarding tumor staging, 20% (24 cases) were classified as Stage I, 30% (36 cases) as Stage II, 35% (42 cases) as Stage III, and 15% (18 cases) as Stage IV. High-grade tumors were present in 58.3% (70 cases), while low-grade tumors were found in 41.7% (50 cases) (**Table 1**). These findings highlight a predominance of high-grade, advanced-stage ovarian cancer in this cohort.

*Comparison of diagnostic accuracy between CT and abdominal ultrasound*

A comparison of the diagnostic performance of CT and AU for ovarian cancer detection showed that CT outperformed AU across all evaluated criteria. CT exhibited significantly higher sensitivity (90% vs. 75%, P = 0.005), specificity (85% vs. 70%, P = 0.011), PPV (87% vs. 75%, P = 0.031), and NPV (90% vs. 75%, P = 0.005). Additionally, the overall diagnostic accuracy of CT was superior to that of ultrasound (92% vs. 80%, P = 0.014) (**Table 2**; **Figure 2**). These results underscore CT as a reliable diagnostic tool for ovarian cancer detection.

*Imaging characteristics of ovarian cancer on CT and abdominal ultrasound*

A comparison of imaging characteristics between CT and abdominal ultrasound revealed significant differences (**Table 3**). The mean tumor size measured by CT, was 10.34 ± 3.53 cm, significantly smaller than that measured by ultrasound (14.14 ± 2.67 cm) (P < 0.001). CT detected a higher proportion of irregularly shaped tumors (73.33%) compared to ultrasound (49.17%), while ultrasound identified a higher proportion of regularly shaped tumors (50.83% vs. 26.67%, P < 0.001). Additionally, peritoneal implants were more frequently detected by CT (49.17%) than by ultrasound (25%).

*Comparison of diagnostic performance in early-stage and advanced ovarian cancer*

The diagnostic performance of abdominal ultrasound and CT in detecting early-stage and advanced ovarian cancer was compared. CT exhibited significantly higher sensitivity in both early-stage (90.2%) and advanced-stage (95.7%) ovarian cancer cases compared to abdominal ultrasound, which demonstrated sensitivities of 72.3% and 85.3%, respectively. The specificity of CT (80.6%) was slightly higher than that of abdominal ultrasound (75.0%). Statistical analysis revealed significant difference in sensitivity between the two modalities for both early-stage (P = 0.001) and advanced-stage (P = 0.008) ovarian cancer (**Table 4**). These findings indicate that CT provides superior diagnostic accuracy in both early- and

**Table 2.** Comparison of diagnostic accuracy for ovarian cancer between CT and abdominal ultrasound

| Item | CT (Value) | Abdominal Ultrasound (Value) | $X^2$ | P |
|---|---|---|---|---|
| Sensitivity | 90.00% | 75.00% | 7.792 | 0.005 |
| Specificity | 85.00% | 70.00% | 6.452 | 0.011 |
| Positive Predictive Value (PPV) | 87.00% | 75.00% | 4.678 | 0.031 |
| Negative Predictive Value (NPV) | 90.00% | 75.00% | 7.792 | 0.005 |
| Accuracy | 92.00% | 80.00% | 5.980 | 0.014 |

Note: CT: computed tomography.

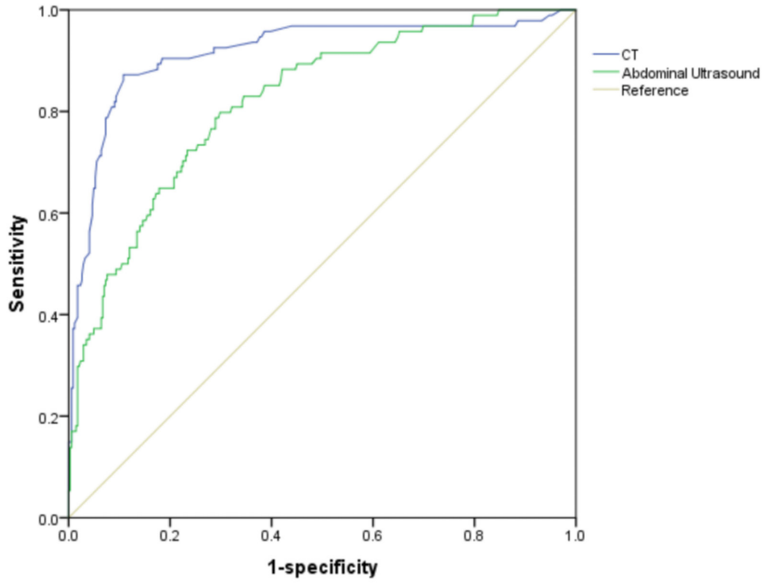


**Figure 2.** Diagnostic performance of CT and abdominal ultrasound for ovarian cancer analyzed by ROC curve. Note: CT: computed tomography; ROC: Receiver Operating Characteristic.

advanced-stage ovarian cancer compared to abdominal ultrasound.

*Comparison of detection rates for solid components and peritoneal involvement*

The detection rates of solid components and peritoneal involvement by abdominal ultrasound and CT were evaluated. CT demonstrated superior performance in both parameters. The detection rate for solid components was 95.5% with CT, significantly higher than the 85.0% observed with abdominal ultrasound. Similarly, CT demonstrated a higher detection rate for peritoneal involvement (64.2%) compared to abdominal ultrasound (40.0%). In addition, CT showed higher specificity for detecting solid components (92.5%) and peritoneal involvement (92.5%) than AU (80.2% for both). Statistical analysis confirmed the superiority of CT in detecting solid components (P = 0.008) and peritoneal involvement (P = 0.001), highlighting the significant diagnostic advantage of CT over abdominal ultrasound in these aspects (**Table 5**).

*Comparison of detection rates for lymph node involvement and tumor vascularity*

The diagnostic performance of abdominal ultrasound and CT for detecting lymph node involvement and evaluating tumor vascularity was compared. CT showed superior detection rates for both criteria. The lymph node involvement detection rate was 50.0% for CT, significantly higher than the 29.2% observed with abdominal ultrasound. Additionally, CT exhibited a higher sensitivity (88.5%) and specificity (93.0%) for lymph node involvement detection compared to ultrasound, which had a sensitivity of 72.0% and specificity of 84.3%. Regarding tumor vascularity, CT again outperformed ultrasound, with a detection rate of 86.7%, compared to 74.2% for ultrasound. Statistical analysis revealed significant differences between the two modalities for lymph node detection (P = 0.002), lymph node sensitivity (P = 0.002), and tumor vascularity (P = 0.020) (**Table 6**), further supporting the diagnostic superiority of CT for these critical aspects of ovarian cancer evaluation.

*Comparison of detection rates for tumor metastasis and ovarian cystic lesions*

The diagnostic performance of abdominal ultrasound and CT for detecting tumor metastasis and ovarian cystic lesions was assessed.

**Table 3.** CT and abdominal ultrasound imaging characteristics of ovarian cancer

| Tumor characteristic | CT | Abdominal ultrasound | $t/X^2$ | P |
|---|---|---|---|---|
| Tumor Size (cm) | 10.34 ± 3.53 | 14.14 ± 2.67 | 9.400 | 0.000 |
| Tumor Shape | | | 14.764 | 0.000 |
| Irregular | 88 (73.33%) | 59 (49.17%) | | |
| Regular | 32 (26.67%) | 61 (50.83%) | | |
| Peritoneal implants | 59 (49.17%) | 30 (25%) | 15.019 | 0.000 |

Note: CT: computed tomography.

**Table 4.** Comparison of diagnostic performance between the two modalities in early-stage and advanced ovarian cancer

| Modality | Stage I & II Sensitivity (%) | Stage III & IV Sensitivity (%) | Specificity (%) |
|---|---|---|---|
| Abdominal Ultrasound | 72.3 | 85.3 | 75.0 |
| Computed Tomography (CT) | 90.2 | 95.7 | 80.6 |
| $X^2$ | 10.526 | 7.037 | 1.049 |
| P | 0.001 | 0.008 | 0.306 |

**Table 5.** Comparison of detection rates for solid components and peritoneal involvement between the two modalities

| Modality | Detection of solid components (%) | Detection of peritoneal involvement (%) | Specificity (%) |
|---|---|---|---|
| Abdominal Ultrasound | 85.0 | 40.0 | 80.2 |
| Computed Tomography (CT) | 95.5 | 64.2 | 92.5 |
| $X^2$ | 7.037 | 11.538 | 7.236 |
| P | 0.008 | 0.001 | 0.007 |

**Table 6.** Comparison of detection rates for lymph node involvement and tumor vascularity evaluation between the two modalities

| Modality | Lymph node detection (%) | Sensitivity (%) | Specificity (%) | Tumor Vascularity Detection (%) |
|---|---|---|---|---|
| Abdominal Ultrasound | 29.2 | 72.0 | 84.3 | 74.2 |
| Computed Tomography (CT) | 50.0 | 88.5 | 93.0 | 86.7 |
| $X^2$ | 9.227 | 9.205 | 3.979 | 5.383 |
| P | 0.002 | 0.002 | 0.046 | 0.020 |

For tumor metastasis, CT showed a detection rate of 89.2%, compared to 73.5% for abdominal ultrasound. CT also exhibited significantly higher sensitivity (93.5%) and specificity (91.7%) than ultrasound (sensitivity 78.0%, specificity 85.0%). Statistical analysis revealed a significant difference in tumor metastasis detection between the two modalities ($\chi^2$ = 7.461, P = 0.006). In detecting ovarian cystic lesions, CT also outperformed abdominal ultrasound, achieving a detection rate of 95.3%, compared to 82.0% of ultrasound. CT demonstrated superior sensitivity (97.8%) and specificity (94.2%) compared to ultrasound (sensitivity 75.4%, specificity 88.9%). Statistical comparison for cystic lesion detection showed a significant difference ($\chi^2$ = 8.303, P = 0.004) (**Table 7**). These results highlighted the superior diagnostic capability of CT for detecting both tumor metastasis and ovarian cystic lesions, demonstrating its value in clinical practice.

## Discussion

This study emphasizes the significant diagnostic advantages of computed tomography (CT)

**Table 7.** Comparison of detection rates for tumor metastasis and ovarian cystic lesions between the two modalities

| | Modality | Detection rate (%) | Sensitivity (%) | Specificity (%) |
|---|---|---|---|---|
| Detecting Tumor Metastasis | Abdominal Ultrasound (Metastasis) | 73.5 | 78.0 | 85.0 |
| | Computed Tomography (CT) (Metastasis) | 89.2 | 93.5 | 91.7 |
| | $X^2$ | 7.461 | 10.631 | 2.407 |
| | P | 0.006 | 0.001 | 0.121 |
| Detecting Ovarian Cystic Lesions | Abdominal Ultrasound (Cystic Lesions) | 82.0 | 75.4 | 88.9 |
| | Computed Tomography (CT) (Cystic Lesions) | 95.3 | 97.8 | 94.2 |
| | $X^2$ | 8.303 | 22.650 | 1.607 |
| | P | 0.004 | 0.000 | 0.205 |

over abdominal ultrasound for the detection of ovarian cancer. The results clearly demonstrated that CT provides superior sensitivity and accuracy, especially in identifying critical features such as tumor characteristics, metastasis, and peritoneal involvement. The findings support broader use of CT in clinical practice, particularly for preoperative staging and assessment of advanced ovarian cancer, where precise imaging is crucial for optimizing treatment planning and improving patient prognosis.

The primary strength of CT over abdominal ultrasound lies in its higher sensitivity and specificity. As ovarian cancer is often diagnosed at advanced stages, accurate detection is paramount for timely initiation of appropriate treatment. The enhanced ability of CT to detect small lesions, which may be overlooked by ultrasound due to its operator dependence and limitations in image resolution, contributes to its superior sensitivity [18]. This advantage is particularly critical in early-stage ovarian cancer, where timely intervention is associated with improved survival rates [19]. Additionally, the higher specificity of CT reduces the rate of false-positive findings, minimizing unnecessary interventions and facilitating more accurate clinical decision-making. Unlike abdominal ultrasound, which is subject to variability based on operator skill and patient factors, CT consistently provides high-resolution, anatomically detailed images. This capability improves the visualization of complex ovarian tumors, including those with irregular margins or heterogeneous internal architecture, features often associated with malignancy [20-22]. CT's capability to assess both the primary tumor and the adjacent structures, including potential sites of metastasis, contributes to a more comprehensive understanding of disease extent, which is crucial for accurate staging and treatment planning.

CT offers substantial benefits over ultrasound in evaluating ovarian cancer tumor characteristics, such as size, shape, and vascularity. Accurate tumor size measurement is essential in clinical practice, as it directly informs surgical planning. CT provides superior visualization of tumor margins, especially in cases with irregular shapes or complex internal structures, allowing for more precise size assessment [23]. This is important not only for delineating the extent of resection but also for predicting potential complications related to tumor location or invasion into adjacent organs. Additionally, CT excels in detecting tumor vascularity and enhancement patterns, features commonly associated with malignancy [24]. Enhanced tumors, characterized by increased blood supply, are indicative of aggressive biological behavior. CT's ability to detect enhancement enables better prediction of tumor aggressiveness and facilitates appropriate treatment planning [25]. These features are more challenging with ultrasound, particularly for heterogeneous tumors or lesions located deep within the abdomen or pelvis, where ultrasound performance may be compromised by technical limitations such as bowel gas interference.

Another critical finding in this study is the superiority of CT in detecting peritoneal involvement and tumor metastasis. Metastatic spread is a major concern in ovarian cancer, given that the

disease is often diagnosed at an advanced stage when peritoneal implants or distant metastases are already present [26]. CT's higher sensitivity in detecting small peritoneal deposits and distant metastases provides a significant advantage in accurate disease staging [27]. These capabilities are essential for selecting optimal treatment strategies, including whether to proceed with aggressive surgery or focus on chemotherapy. Ultrasound, on the other hand, has limited capacity to detect peritoneal implants and distant metastasis due to its restricted field of view and lower contrast resolution [28]. The contrast resolution offered by CT allows for the identification of small metastases in critical areas such as the liver, lungs, and abdominal cavity, significantly influencing treatment decisions. Furthermore, CT's ability to simultaneously assess the primary tumor and metastatic spread provides a comprehensive assessment, aiding in more informed and individualized clinical management.

The ability of CT to detect lymph node involvement and assess tumor vascularity further distinguishes it from abdominal ultrasound. Lymph node involvement is a key indicator of ovarian cancer spread and is crucial for accurate staging and treatment planning [29]. CT's higher sensitivity and specificity in detecting lymph node metastasis are vital for determining the extent of disease and informing the need for lymphadenectomy or other treatment interventions [30]. Accurate lymph node assessment is particularly relevant in ovarian cancer, as regional lymph node involvement is associated with worse prognosis and can necessitate more aggressive treatment regimens [31]. Additionally, the evaluation of tumor vascularity through CT is instrumental in understanding tumor biology. Increased vascularity often signifies aggressive tumor behavior, and early detection of these vascular changes can guide therapeutic decision-making [32]. Tumors with high vascularity are more likely to be invasive and metastatic, and CT's ability to visualize tumor perfusion offers crucial insight into the tumor's potential growth and response to therapy.

The findings of this study provide robust evidence supporting the use of CT as the preferred imaging modality in the diagnosis and staging of ovarian cancer, especially in complex or advanced cases. While abdominal ultrasound remains valuable for initial screenings and follow-up monitoring due to its accessibility and lack of radiation exposure, CT provides significantly greater diagnostic precision. Its ability to detect small lesions, provide detailed assessment of tumor morphology, and evaluate metastases and peritoneal involvement positions CT as the optimal imaging method for preoperative staging and disease evaluation. A key advantage of CT in clinical practice is its ability to provide a comprehensive evaluation of the primary tumor and its surrounding structures within a single imaging session. This can significantly streamline the diagnostic process and provide clinicians with a more complete picture of the disease. However, it is important to balance CT's superior diagnostic performance with its higher cost and radiation exposure. Future research should focus on strategies to reduce radiation exposure without compromising diagnostic accuracy, as well as evaluating the benefits of combining CT with other imaging modalities, such as magnetic resonance imaging (MRI) or positron emission tomography (PET), to further enhance diagnostic capability.

Despite its significant advantages, CT is not without limitations. Exposure to ionizing radiation is a concern, particularly for younger patients and those requiring frequent imaging over time. While the risk associated with a single CT scan is relatively low, cumulative radiation exposure must be carefully considered, especially during long-term surveillance. Strategies such as adopting low-dose CT protocols or using alternative imaging modalities like MRI may help mitigate this risk while maintaining diagnostic accuracy. Furthermore, the integration of artificial intelligence (AI) and machine learning into imaging interpretation holds promise for enhancing diagnostic accuracy by detecting subtle lesions, reducing observer variability, and improving workflow efficiency. Additionally, multi-modality imaging approaches, combining CT with MRI or positron emission tomography (PET), may provide a more comprehensive assessment of ovarian cancer, potentially improving staging accuracy and treatment planning.

However, several limitations should be acknowledged. First, the retrospective design may have introduced selection and recall bias-

es, which may affect the validity of the findings. Second, the relatively small sample size (n = 120) and the single-center nature of the study may limit the generalizability of the findings. Third, although CT demonstrated superior diagnostic accuracy compared to abdominal ultrasound, its performance in detecting early-stage ovarian cancer remains less well-defined, as this study primarily focused on advanced-stage disease. Additionally, the potential risks associated with ionizing radiation exposure, particularly for younger patients or those requiring serial imaging, should not be overlooked.

In conclusion, this study highlights the significant diagnostic superiority of CT over abdominal ultrasound in detecting ovarian cancer, particularly in terms of sensitivity, specificity, and the ability to characterize tumors, detect solid components, assess peritoneal involvement, and identify metastases. These findings advocate for the broader implementation of CT in clinical practice, especially for preoperative staging and comprehensive evaluation of ovarian cancer.

## Disclosure of conflict of interest

None.

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