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Original Research Article

Pattern of high-risk histopathological features among surgically treated endometrial cancer patients in Bangladesh

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ABSTRACT

Background: Endometrial cancer shows heterogeneous biological behavior, and postoperative risk stratification depends strongly on histopathological findings. Conventional features such as International Federation of Gynecology and Obstetrics (FIGO) stage, tumor grade, histological subtype, tumor size, deep myometrial invasion, lymphovascular space invasion, and lymph node metastasis remain clinically important, particularly in settings where molecular classification is not routinely available. The aim of this study was to describe the pattern of high-risk histopathological features among surgically treated endometrial cancer patients at a tertiary cancer center in Bangladesh.
Methods: This observational cross-sectional study included 31 histologically confirmed endometrial cancer patients who underwent primary surgical treatment at the Department of Gynecological Oncology, National Institute of Cancer Research and Hospital, Dhaka, Bangladesh, between January and December 2020.
Results: The mean age of the patients was 58.6±9.8 years, and 27 patients (87.1%) were postmenopausal. Stage I disease was the most frequent individual stage, present in 18 patients (58.1%); however, advanced-stage disease, FIGO stage III–IV, was present in 12 patients (38.7%). The most frequent high-risk feature was tumor size >2 cm, observed in 21 patients (67.7%), followed by deep myometrial invasion in 16 patients (51.6%). Lymph node metastasis was present in 12 patients (38.7%), grade 3 tumor in 11 patients (35.5%), papillary serous adenocarcinoma in 11 patients (35.5%), and lymphovascular space invasion in 9 patients (29.0%).
Conclusions: High-risk histopathological features were common in this cohort, emphasizing the importance of detailed histopathological assessment for postoperative risk stratification in surgically treated endometrial cancer.

Keywords: Endometrial cancer, Histopathology, High-risk features, Lymphovascular space invasion

INTRODUCTION

Endometrial cancer is a major gynecological malignancy with increasing clinical relevance across both high-income and low- and middle-income settings. Although many patients are diagnosed at an apparently early stage, the biological behavior of endometrial cancer is heterogeneous, and postoperative risk stratification depends strongly on histopathological findings. Conventional histopathological variables, including International Federation of Gynecology and Obstetrics (FIGO) stage, histological subtype, tumor grade, tumor size, depth of myometrial invasion, lymphovascular space invasion (LVSI), and lymph node metastasis, remain central to clinical decision-making, even as molecular classification is increasingly incorporated into modern staging and risk assessment.[1,2] In many resource-limited oncology settings, molecular testing is not uniformly available, and treatment planning continues to rely heavily on surgically derived pathological features. Therefore, describing the local pattern of high-risk histopathological features remains clinically relevant. Several recent studies

have reinforced the prognostic importance of conventional pathological features in endometrial cancer. Tumor size is one such feature. Jin et al in a meta-analysis of 40 studies including 53,276 patients, reported that tumor size greater than 20 mm was significantly associated with deep myometrial invasion, LVSI, lymph node metastasis, recurrence, and poorer survival.[3]

Similarly, deep myometrial invasion is consistently associated with adverse pathological and clinical outcomes. Wang et al., in a meta-analysis of 79 studies including 68,870 patients, found that myometrial invasion was significantly associated with LVSI, lymph node metastasis, recurrence, and reduced overall survival.[4] These findings support the continued use of tumor size and myometrial invasion as important markers of pathological risk. LVSI and lymph node metastasis are also important components of high-risk disease. Kim et al showed that tumor diameter, tumor grade, depth of myometrial invasion, and cervical stromal involvement could predict LVSI in endometrial cancer.[5] Oliver-Perez et al in a multicenter cohort study of early-stage endometrial cancer, found that LVSI was associated with recurrence patterns and that deep myometrial invasion, high-grade tumor, cervical stromal invasion, and tumor diameter ≥2 cm were independent predictors of positive LVSI.[6]

Dai et al also reported that LVSI was associated with other adverse pathological features, including lymph node metastasis and deep myometrial invasion.[7] In a large SEER-based analysis, Li et al found that tumor size, histological type, myometrial invasion, cervical stromal invasion, and tumor grade were significant predictors of lymph node metastasis.[8] A more recent systematic review and meta-analysis by Han et al further identified pelvic lymph node metastasis, myometrial invasion ≥50%, LVSI, cervical invasion, and non-endometrioid carcinoma as risk factors for para-aortic lymph node metastasis.[9] Regional and local data also support the importance of these variables. Olatunde et al in a tertiary hospital study from North-West Nigeria, reported that endometrioid adenocarcinoma was the predominant histological pattern, while serous carcinoma represented a substantial non-endometrioid subset.[10] From Bangladesh, Sultana et al reported LVSI in surgically treated endometrial carcinoma patients and found that LVSI was associated with deep myometrial invasion, FIGO stage, histological type, tumor grade, and positive pelvic lymph nodes.[11]

Khanam et al also reported that grade 3 tumor, myometrial invasion ≥50%, LVSI, advanced FIGO stage, and lymph node positivity were independent predictors of recurrence among endometrial cancer patients treated surgically in Bangladesh.[12] In a tertiary referral hospital study from Northeast Thailand, Wannasin et al observed that stage III–IV disease and non-endometrioid histopathology were associated with poorer survival outcomes.[13] These studies indicate that high-risk pathological features are clinically meaningful across different settings, including South and Southeast Asia. Despite the importance of these features, local descriptive data from Bangladesh remain limited. A clear description of the pattern of high-risk histopathological features among surgically treated endometrial cancer patients can help define the burden of adverse pathology encountered in tertiary cancer care and may support future risk-stratified research. The present study was therefore conducted to describe the pattern of high-risk histopathological features, including tumor size >2 cm, grade 3 tumor, non-endometrioid histology, advanced-stage disease, lymph node metastasis, deep myometrial invasion, and LVSI, among surgically treated endometrial cancer patients at a tertiary cancer center in Bangladesh.

METHODS

This descriptive observational cross-sectional study included 31 histologically confirmed endometrial cancer patients who underwent primary surgical treatment at the Department of Gynecological Oncology, National Institute of Cancer Research and Hospital, Dhaka, Bangladesh, between January and December 2020.

Eligible patients were women aged 30-70 years with histologically diagnosed endometrial cancer who were selected for surgery. Patients with recurrent malignancy, multiple malignancies, or prior neoadjuvant chemotherapy were excluded. Of 37 initially assessed patients with apparent endometrial carcinoma, 31 were finally confirmed histopathologically and included through purposive sampling. Data were collected using a predesigned structured data collection sheet and medical records. Demographic and clinical variables included age, marital status, parity, menopausal status, body mass index, hemoglobin level, diabetes mellitus, and hypertension. Surgical-pathological variables included FIGO stage, tumor size, tumor grade, histological subtype, lymph node metastasis, deep myometrial invasion, and lymphovascular space invasion.

High-risk histopathological features were defined for this manuscript as tumor size >2 cm, grade 3 tumor, non-endometrioid histology, advanced-stage disease, lymph node metastasis, deep myometrial invasion, and lymphova scular space invasion. Deep myometrial invasion was defined as invasion involving 50% or more of the myometrial thickness. Advanced-stage disease was defined as FIGO stage III or IV. Surgical specimens were examined histopathologically, and final tumor characteristics were extracted from the histopathology reports.

Data were analyzed using SPSS version 22.0. Continuous variables were summarized as mean and standard deviation, while categorical variables were summarized as frequencies and percentages. Written informed consent was obtained from all participants, and ethical approval was granted by the Institutional Ethics Committee of NICRH.

RESULTS

A total of 31 surgically treated patients with histologically confirmed endometrial cancer were included in this study. The mean age of the study participants was 58.6±9.8 years, with an age range of 34 to 70 years. Most patients were aged 51 years or above, including 12 patients, 38.7%, in the 51–60-year age group and 12 patients, 38.7%, in the 61–70-year age group. The majority of patients were married, 27 patients, 87.1%, multiparous, 25 patients, 80.6%, and postmenopausal, 27 patients, 87.1%. Regarding clinical characteristics, 17 patients, 54.8%, had BMI within 18.5–24.9 kg/m², while 11 patients, 35.5%, had BMI >25 kg/m². Diabetes mellitus was present in 16 patients, 51.6%, and hypertension was present in 11 patients, 35.5%.

Table 1: Baseline demographic, reproductive, and clinical profile of the study participants, (n=31).

Variables	N (%)
Age group (years)	
31–40	2 (6.5)
41–50	5 (16.1)
51–60	12 (38.7)
61–70	12 (38.7)
Mean ± SD	58.6±9.8
Marital status	
Married	27 (87.1)
Widow	3 (9.7)
Divorced	1 (3.2)
Parity	
Multiparous	25 (80.6)
Nulliparous	6 (19.4)
Menopausal status	
Postmenopausal	27 (87.1)
Premenopausal	4 (12.9)
BMI	
<18.5 kg/m²	3 (9.7)
18.5–24.9 kg/m²	17 (54.8)
>25 kg/m²	11 (35.5)
Hemoglobin	
10–12 g/dl	8 (25.8)
8–10 g/dl	22 (71.0)
<8 g/dl	1 (3.2)
Diabetes mellitus	
Present	16 (51.6)
Absent	15 (48.4)
Hypertension	
Present	11 (35.5)
Absent	20 (64.5)

The surgical-pathological profile showed that stage I disease was the most frequent stage, observed in 18 patients, 58.1%. However, a substantial proportion of patients had advanced-stage disease; stage III was present in 11 patients, 35.5%, and stage IV in 1 patient, 3.2%. Overall, early-stage disease, stage I–II, was observed in 19 patients, 61.3%, while advanced-stage disease, stage III–IV, was present in 12 patients, 38.7%. Tumor size was >2 cm in 21 patients, 67.7%. Grade 2 tumor was the most frequent histological grade, 14 patients, 45.2%, followed by grade 3 tumor in 11 patients, 35.5%. Endometrioid adenocarcinoma was the predominant histological subtype, present in 20 patients, 64.5%, while papillary serous adenocarcinoma was present in 11 patients, 35.5%.

Table 2: Surgical-pathological tumor characteristics of endometrial cancer patients (n=31).

Variables	N (%)
FIGO stage	
Stage I	18 (58.1)
Stage II	1 (3.2)
Stage III	11 (35.5)
Stage IV	1 (3.2)
Stage group	
Early stage, I–II	19 (61.3)
Advanced stage, III–IV	12 (38.7)
Tumor size	
<2 cm	10 (32.3)
>2 cm	21 (67.7)
Tumor grade	
Grade 1	6 (19.4)
Grade 2	14 (45.2)
Grade 3	11 (35.5)
Histological subtype	
Endometrioid adenocarcinoma	20 (64.5)
Papillary serous adenocarcinoma	11 (35.5)
Lymph node metastasis	
Present	12 (38.7)
Absent	19 (61.3)
Deep myometrial invasion	
Present	16 (51.6)
Absent	15 (48.4)
Lymphovascular space invasion	
Present	9 (29.0)
Absent	22 (71.0)

FIGO: International Federation of Gynecology and Obstetrics

High-risk histopathological features were common in the study cohort. The most frequent high-risk feature was tumor size >2 cm, observed in 21 patients, 67.7%, followed by deep myometrial invasion in 16 patients, 51.6%. Advanced-stage disease and lymph node metastasis were each present in 12 patients, 38.7%. Grade 3 tumor and non-endometrioid histology, represented by papillary serous adenocarcinoma, were each observed in 11 patients, 35.5%. Lymphovascular space invasion was identified in 9 patients, 29.0%. These findings indicate that although most patients had stage I–II disease, a considerable proportion of surgically treated endometrial cancer patients had adverse histopathological features relevant to risk stratification.

Table 3: Pattern of high-risk histopathological features among surgically treated endometrial cancer patients (n=31).

High-risk feature	Operational definition used in this manuscript	N (%)
Tumor size >2 cm	Tumor size greater than 2 cm in surgical specimen	21 (67.7)
Deep myometrial invasion	Myometrial invasion involving ≥50% of myometrial thickness	16 (51.6)
Advanced-stage disease	FIGO stage III or IV	12 (38.7)
Lymph node metastasis	Any lymph node metastasis identified histopathologically	12 (38.7)
Grade 3 tumor	Histological grade 3 endometrial carcinoma	11 (35.5)
Non-endometrioid histology	Papillary serous adenocarcinoma	11 (35.5)
Lymphovascular space invasion	Presence of tumor emboli in lymphovascular spaces	9 (29.0)

DISCUSSION

This descriptive cross-sectional study showed a considerable burden of high-risk histopathological features among surgically treated endometrial cancer patients at a tertiary cancer center in Bangladesh. Although stage I disease was the most common individual stage, 58.1%, several adverse features were frequent, including tumor size >2 cm in 67.7%, deep myometrial invasion in 51.6%, advanced-stage disease in 38.7%, lymph node metastasis in 38.7%, grade 3 tumor in 35.5%, papillary serous adenocarcinoma in 35.5%, and lymphovascular space invasion (LVSI) in 29.0%. These findings indicate that a substantial proportion of surgically managed patients had pathological features relevant to postoperative risk stratification.

The demographic pattern in the present cohort was consistent with the established profile of endometrial cancer as a disease predominantly affecting older and postmenopausal women. The mean age was 58.6 years and 87.1% of patients were postmenopausal. Olatunde et al in a tertiary hospital study from North-West Nigeria, reported a similar mean age of approximately 59 years and found that most patients were postmenopausal.[10] Pandey et al from Nepal, also reported a mean age of approximately 58 years and postmenopausal status in 86% of patients.[14] This similarity supports the external consistency of the present cohort despite its small sample size. Tumor size >2 cm was the most frequent high-risk feature in the present study. This finding is comparable with Sultana et al who reported tumor size >2 cm in 71.4% of surgically treated Bangladeshi endometrial carcinoma patients. The clinical importance of tumor size is supported by Jin et al whose meta-analysis of 40 studies found that tumor size >20 mm was significantly associated with deep myometrial invasion, LVSI, lymph node metastasis, recurrence and poorer survival.[3]

Therefore, the high frequency of tumor size >2 cm in this cohort should not be considered only a descriptive measurement, but as a marker that may coexist with other adverse pathological features. Deep myometrial invasion was present in 51.6% of patients, which is close to the rate reported by Sultana et al where approximately 48.6% had ≥50% myometrial invasion.[11] Wang et al in a large meta-analysis, showed that myometrial invasion was associated with LVSI, lymph node metastasis, recurrence, and reduced overall survival.[4] In the present study, the high proportion of deep myometrial invasion, together with frequent tumor size >2 cm, suggests that many patients had locally extensive disease at the time of surgical treatment. Advanced-stage disease and lymph node metastasis were each present in 38.7% of patients. This is closely aligned with Sultana et al who reported stage III–IV disease in 37.1% and positive pelvic lymph nodes in 34.3% of patients.[11]

Pradhan et al in an Eastern Indian tertiary-care cohort, also reported a notable burden of advanced-stage disease and found that adverse immunohistochemical findings were associated with high grade, advanced stage, and lymph node metastasis.[15] Larger predictive studies also support the relationship between nodal spread and conventional pathological variables. Li et al found that tumor size, histological type, myometrial invasion, cervical stromal invasion, and tumor grade predicted lymph node metastasis, while Han et al identified myometrial invasion ≥50%, LVSI, cervical invasion, and non-endometrioid carcinoma as risk factors for para-aortic nodal metastasis.[8,9] The histological pattern in this study showed predominance of endometrioid adenocarcinoma, 64.5%, but the proportion of papillary serous adenocarcinoma was relatively high, 35.5%. This differs from several published histopathological-pattern studies.

Olatunde et al. reported endometrioid adenocarcinoma in 80% and type II tumors in 20%, while Pradhan et al. reported endometrioid carcinoma in 132 of 168 cases and serous carcinoma in 17 cases.10,15 Pandey et al reported endometrioid carcinoma in 96% of patients. The higher proportion of papillary serous carcinoma in the present cohort may reflect the small sample size, referral-center case mix, or selective inclusion of surgically treated patients at a national cancer institute.[14] This finding should therefore be interpreted cautiously, but it remains clinically important because non-endometrioid histology is widely recognized as an adverse pathological feature. LVSI was present in 29.0% of patients. This rate is similar

to the Bangladeshi study by Sultana et al which reported LVSI in 34.3%, but higher than selected early-stage or endometrioid-only cohorts such as Dai et al and Yalcin et al.[7,11,16] This difference is expected because the present cohort included patients with advanced-stage disease, nodal metastasis, deep myometrial invasion, and papillary serous carcinoma. Oliver-Perez et al and Kim et al also showed that LVSI is closely related to other pathological variables, including tumor size, grade, depth of myometrial invasion, and cervical stromal involvement.[5,6]

Overall, the findings suggest that high-risk histopathological features were common among surgically treated endometrial cancer patients in this tertiary Bangladeshi setting. The study does not assess recurrence, disease-free survival, or overall survival, so no direct prognostic conclusion can be drawn. However, the observed burden of large tumors, deep myometrial invasion, advanced stage, nodal metastasis, grade 3 disease, papillary serous histology and LVSI supports the need for careful postoperative risk assessment and highlights the continuing relevance of conventional histopathological evaluation in settings where molecular classification may not be uniformly available.

Limitations

This study was limited by its small sample size and single-center design, which may restrict the generalizability of the findings. The study was descriptive and did not include recurrence, disease-free survival, or overall survival follow-up. Molecular classification was not available, so risk assessment was based on conventional histopathological features.

CONCLUSION

This study showed that high-risk histopathological features were common among surgically treated endometrial cancer patients at a tertiary cancer center in Bangladesh. Tumor size >2 cm and deep myometrial invasion were the most frequent adverse features, while advanced-stage disease, lymph node metastasis, grade 3 tumor, papillary serous histology, and LVSI were also observed in substantial proportions of patients. These findings highlight the continuing importance of conventional histopathological evaluation for postoperative risk assessment, particularly in settings where molecular classification may not be uniformly available.

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