ORIGINAL ARTICLE

Orijinal Araştırma

Recurrence and Characteristics of Endometrial Cancer In Elderly Patients

Yaşlı Hastalarda Endometriyal Kanser Nüksü ve Özellikleri

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ABSTRACT

Objective:
This study evaluated the treatment options of patients of advanced age (≥70 years) with recurrence, and survival results were analyzed.

Material and Methods:
The data of patients diagnosed with endometrial cancer (EC) in the Gynecological Oncology Clinic between 2001 and 2020 were evaluated retrospectively. Seventy-six cases with advanced age and relapse were evaluated. Patients who underwent hysterectomy surgery in our center and continued their follow-up regularly were included in the study.

Results:
The mean age at the time of recurrence was 74.6 ± 3.9 years. The endometrioid type, seen in half of the patients, was the most common histological type. Pelvic paraaortic lymph node (LN) sampling/dissection was performed in 84.2% of the patients. Deep myometrial invasion was detected in 56 (73.7%) patients, and LVSI was found in 42 (56.8%) patients. The mean time to recurrence was found to be 25.1 ± 17.8 months. Total survival times were calculated as 47.2 ± 28.2 months. The five-year overall survival (OS) rate was analyzed as 35.7%. The most common site of recurrence was lung, and isolated lung recurrence was seen in 14 (18.5%) patients. There was no significant difference for OS among patients with pelvic recurrence and extra-pelvic/multiple recurrences (p= 0.723).

Conclusion:
Survival outcomes in recurrences are worse in advanced-age endometrial cancer patients. This may be due to more limited treatment options for recurrence due to additional internal problems.

Key Words:
Endometrial cancer, Elderly patients, Recurrence, Lymph node

ÖZ

Amaç:

Bu çalışmada nüks ile seyreden ileri yaş (≥70 yaş) hastaların tedavi seçenekleri değerlendirildi, sağkalım sonuçları analiz edildi.

Gereç ve Yöntemler:

Jinekolojik Onkoloji Kliniği'nde 2001-2020 yılları arasında endometrial kanser (EK) tanısı alan hastaların verileri retrospektif olarak değerlendirildi. İleri yaş ve nüks olan 76 olgu değerlendirildi. Merkezimizde histerektomi ameliyatı olan ve takiplerini düzenli olarak sürdüren hastalar çalışmaya dahil edildi.

Bulgular:

Nüks anındaki ortalama yaş 74,6 ± 3,9 idi. Hastaların yarısında görülen endometrioid tip en sık görülen histolojik tipti. Hastaların %84,2'sine pelvik paraaortik lenf nodu (LN) örnekleme/diseksiyon uygulandı. Elli altı (%73,7) hastada derin myometrial invazyon, 42 (%56,8) hastada lenfovasküler alan invazyonu (LVSI) saptandı. Ortalama nüks gelişme süresi 25,1 ± 17,8 ay bulundu. Toplam sağkalım süreleri 47,2 ± 28,2 ay olarak hesaplandı. Beş yıllık toplam sağkalım (TS) oranı %35,7 olarak analiz edildi. En sık nüks yeri akciğer olup, 14 (%18,5) hastada izole akciğer nüksü görüldü. Pelvik nüks ve ekstra pelvik/çoklu nüks olan hastalar arasında TS açısından anlamlı bir fark yoktu (p= 0,723).

Sonuç:

İleri yaş endometriyum kanseri hastalarında nükslerde sağkalım sonuçları daha kötüdür. Bunun nedeni, ek kronik hastalıklar nedeniyle nüks için daha sınırlı tedavi seçenekleri olabilir.

Anahtar Kelimeler:

Endometrial kanser, Yaşlı hastalar, Nüks, Lenf bezi

INTRODUCTION

Endometrial cancer (EC), which is the most common female genital tract malignancy, usually belongs to the postmenopausal advanced age (1). An increased incidence of EC was observed in both premenopausal and postmenopausal women (2). EC is usually diagnosed at an early stage and survival is excellent. However, the 5-year overall survival rates of women, especially those with distant metastatic disease, are as low as 15-20% (3, 4). Although the vagina is the most common site of recurrence, distant organ metastases occur in approximately 40-50% of patients (5). Relapses usually occur within the first 3 years.

Often oophorectomy and lymph node (LN) dissection can be added to the hysterectomy procedure, which is the cornerstone of treatment at the time of initial diagnosis. A significant portion of patients receive adjuvant radiotherapy treatment. Survival rates are high (80-90%) thanks to accurate determination of the stage of the disease and adjuvant treatments that reduce the risk of recurrence (6, 7). However, these treatments have the potential to cause serious problems that reduce the quality of life. As a result of the treatments, it can lead to important problems such as lymphocyst, wound infection, delay in healing and returning to normal life, damage to neighboring organs in the short term, and lymphedema and fistula in the long term. Especially in elderly patients, serious healing problems may occur after these morbidities.

In this study, the potential to evaluate the treatment options of patients of advanced age (≥70 years) with recurrence, as long as their general health conditions allow, morbidities and survival results were analyzed.

MATERIAL and METHODS

The data of patients diagnosed with EC in the Tepecik Training and Research Hospital Gynecological Oncology Clinic between 2001 and 2020 were evaluated retrospectively. Seventy six cases with advanced age (≥70 years) and relapse were evaluated retrospectively. Patients who underwent hysterectomy surgery in our center and continued their follow-up regularly were included in the study. Patients younger than 70 years of age, patients with concurrent malignancy in another organ, patients previously treated for another malignancy, and patients who could not undergo hysterectomy for medical reasons in the initial treatment were excluded from the study. Ethics committee approval for the study was approved by our local committee (Date: 22.02.2021, Decision no: 2021/02-04). All procedures performed comply with the ethical standards of the institutional and/or national research committee and the 1964 Helsinki declaration and its subsequent amendments or comparable ethical standards.

The patients' ages at the time of initial diagnosis and at the time of recurrence, cancer antigen 125 (Ca125) values, hemoglobin and albumin values were examined retrospectively from the files. The histological type and grade of the tumor, myometrial invasion depth, cervical involvement, lymphovascular space invasion (LVSI), tumor size, and the number and status of the lymph nodes were evaluated from the pathology reports. After the surgical procedure, patients were staged according to the International Federation of Obstetrics and Gynecology (FIGO) 2023 staging system (8). The type and doses of adjuvant treatment (radiotherapy and/or chemotherapy) administered to the patients after the recovery period were noted.

All surgical procedures were performed by experienced gynecological oncology surgeons. During the procedure, first of all, intra-abdominal exploration was performed in detail. Exploration of the abdominal cavity includes the systematic examination and palpation of the peritoneal surfaces, omentum, colon and small intestine, and paracolic, pelvic, mesenteric, and para-aortic regions to find suspicious lesions. Peritoneal washing was performed to obtain a cytology sample. All patients underwent hysterectomy and oophorectomy. In addition to the hysterectomy procedure, pelvic and para-aortic LN sampling and omentectomy can be added according to the medical conditions and prognostic factors of the patients. Prognostic

factors evaluated for the application of systematic pelvic and paraaortic LN dissection are deep myometrial invasion, cervical stromal involvement, non-endometrioid histological type, high grade (grade 3) tumor. Pelvic lymphadenectomy consisted of removal of lymphatic tissue over the external and common iliac vessels and in the obturator fossa. Para-aortic LN dissection was defined as the removal of the aorta starting from the bifurcation, above the inferior vena cava and below the left renal vein.

The diagnosis of recurrence was made during follow-up in patients without residual tumor. The diagnosis was made by taking biopsy from patients with suspected recurrence in the region where histopathological samples could be taken (vagina, lung, etc.). In the presence of suspected metastasis in areas not suitable for biopsy, the diagnosis was made according to imaging methods (computerized tomography or magnetic resonance imaging or positron emission tomography).

All cases were invited to follow up every 3-4 months for the first 2 years, every 6 months for the next 3 years, and once a year thereafter. Vaginal physical examination with speculum was performed in the control. A cytology sample was taken at least once a year with a smear. The pelvis was examined by ultrasonography. Computed tomography or magnetic resonance imaging was performed annually. Disease-free survival (DFS) was defined as the time from the date of initial surgery to the detection of recurrence or the last observation. Total survival (OS) was defined as the time from the date of primary surgery to death or last observation.

Statistical Analysis

Numerical parameters were expressed as mean ± standard deviation and analyzed using One Way ANOVA. Categorical data were evaluated as numbers and percentages and compared with the help of the Chi-square test. Survival analysis was evaluated by Kaplan-Meier method and results were compared with the log-rank test. Data recording and statistical analyses were performed using SPSS (statistical package for the social sciences) software (version 17, SPSS, Inc, Chicago, IL). A p value of <0.05 was considered significant to indicate statistical significance.

RESULTS

Seventy-six elderly patients who underwent hysterectomy for endometrial cancer and relapsed during follow-up were included in the study. The mean age of the patients at the time of initial diagnosis was calculated as 72.4 ± 3.9. The mean age at the time of recurrence was 74.6 ± 3.9 years. Among the co-morbidities, hypertension was present in 85% of the patients and diabetes mellitus in 54%. The mean hemoglobin values of the patients at the time of diagnosis were analyzed as 12.5 ± 1.5. Demographic data of the patients are given in Table I. The endometrioid type, seen in half of the patients, was the most common histological type. Pelvic paraaortic LN sampling/dissection was performed in 84.2% of the patients. Eighteen (24.3%) patients had pelvic LN metastases and 2 (3.1%) had paraaortic LN metastases. Deep myometrial invasion was detected in 56 (73.7%) patients, and LVSI was found in 42 (56.8%) patients. The mean tumor size in the uterus was calculated as 5.1 ± 2.9 cm. Considering the stages, 6 (7.9%) patients were determined as stage IA2, 12 (15.8%) patients as stage IB, 10 (13.2%) patients as stage IIB, 30 (39.5%) as stage IIC and 18 (23.7%) as stage IIIC. It was reported that 54 (71.1%) patients received postoperative adjuvant radiotherapy and 38 (50.0%) patients received postoperative adjuvant chemotherapy. The mean time to recurrence was found to be 25.1 ± 17.8 months. Total survival times were calculated as 47.2 ± 28.2 months. The five-year OS rate was analyzed as 35.7%. In Table II, information about relapse localizations and treatments is given.

Table I. Clinical and demographic characteristics of the patients

Data	Patients (n=76)
Age at diagnosis (years), mean ± StD	72.4 ± 3.9
Age at recurrence (years), mean ± StD	74.6 ± 3.9
Ca125 (U/ml), mean ± StD	50.8 ± 99.9
Hemoglobin (g/dL), mean ± StD	12.5 ± 1.5
Albumin (g/dL), mean ± StD	3.9 ± 0.4
Histological type	
- Endometrioid	38 (50.0%)
▪ Low grade (I-II)	30 (78.9%)
▪ High grade (III)	8 (21.1%)
- Serous	32 (42.1%)
- Clear cell	6 (7.9%)
Pelvic lymph node dissection	74 (97.4%)
Para-aortic lymph node dissection	64 (84.2%)
İnvolvement of Pelvic lymph node	18 (24.3%)
İnvolvement of Para-aortic lymph node	2 (3.1%)
Deep myometrial invasion	56 (73.7%)
Cervical invasion	24 (31.6%)
Lymphovascular space invasion	42 (56.8%)
Size of tumor (cm), mean ± StD	5.1 ± 2.9
Stage	
- IA2	6 (7.9%)
- IB	12 (15.8%)
- IIB	10 (13.2%)
- IIC	30 (39.5%)
- IIIC1	16 (21.1%)
- IIIC2	2 (2.6%)
Adjuvant Radiotherapy	54 (71.1%)
Adjuvant Chemotherapy	38 (50.0%)

StD= Standard deviation

Table II. Relapse sites and treatments of patients

Data	Patients (n=76)
Recurrence localization	
- Lung	14 (18.5%)
- Liver	4 (5.3%)
- Bone	4 (5.3%)
- Lymph nodes	12 (15.8%)
- Pelvic	12 (15.8%)
- Multiple	30 (39.4%)
Pelvic recurrence treatment	
- Surgery + radiotherapy	2 (16.7%)
- Radiotherapy	10 (83.3%)
Extrapelvic or multiple relapse treatment	
- Surgery + radiotherapy	2 (3.1%)
- Chemotherapy + radiotherapy	4 (6.2%)
- Radiotherapy	4 (6.2%)
- Surgery + chemotherapy	4 (6.2%)
- Surgical	4 (6.2%)
- Chemotherapy	46 (71.8%)
Five-year survival rate; (P= 0.723)	
- Pelvic recurrence	44.4%
- Extrapelvic or multiple recurrence	34.9%

The most common site of recurrence was lung, and isolated lung recurrence was seen in 14 (18.5%) patients. Afterwards, isolated local pelvic recurrence was detected in 12 (15.8%) patients and lymph node metastasis in 12 (15.8%) patients. Multiple metastases were seen in 30 (39.4%) patients. Chemotherapy treatment [46 patients (71.8%)] was the most common treatment for extrapelvic or multiple recurrences. The most commonly used treatment procedure in the treatment of pelvic recurrence was radiotherapy in 10 (83.3%) patients. Figure 1 shows the OS curves of patients with pelvic recurrence and extra-pelvic or multiple recurrences. The 5-year OS rates were 44.4% in patients with pelvic relapse and 34.9% in patients with extrapelvic/multiple relapse, and the result was not found to be statistically significant (p= 0.723).

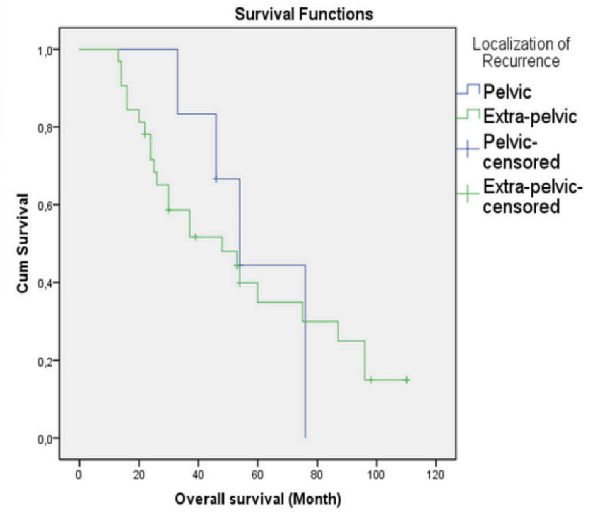

Figure 1. The overall survival curves of patients with pelvic and extra-pelvic/multiple recurrences

DISCUSSION

In this study, patients with recurrence of EC in elderly patients were examined. Treatments used in the treatment of relapse were limited due to the co-morbidities of the patients and their poor performance due to advanced age. Patients with extrapelvic or multiple recurrences were found to have lower survival than patients with pelvic recurrence. The fact that patients with isolated pelvic recurrence have a much lower survival rate than the literature may be due to the low general health performance of the patients and their advanced age.

The recurrence rate due to EC is around 8-10%, and most (about 90%) of recurrences occur in the first three years (9). Local recurrences (median duration 11.5 months) usually occur sooner than distant organ recurrences (median duration 20.5 months) (10). The three-year survival rate was approximately 50% for those with local relapse, compared with 20% for those with distant organ or multiple relapses (6, 11-13). In our study, the mean time to develop recurrence was found to be 25.1 ± 17.8 months. The five-year OS rate was analyzed as 35.7%. The five-year OS rate was 44% for pelvic recurrence and 34% for extrapelvic or multiple recurrence (p= 0.723). The most common site of recurrence in the literature is the vaginal cuff or pelvis (14). The lung is the most common site of distant metastasis in patients with EC (2, 15). In our study, the lung was the most common distant organ metastasis, consistent with the literature. The reason why the rate of pelvic recurrence (15%) is slightly lower than in the literature may be that the necessary adjuvant treatments could not be given due to the advanced age of the patients. Although 60% of patients with relapse were shown to be stage III-IV tumors in previous studies, patients with stage III-IV tumors (23.7%) were found to be less frequent in our study (11). This may be due to the fact that patients with advanced age-related advanced stage tumors die in the early period without relapse.

EC patients are divided into risk groups for treatment management based on patient age, tumor size, FIGO staging, histological type and grade, and LVSI (5). Adjuvant treatment management is selected according to these risk groups. Radiotherapy has been shown to reduce local recurrence, while systemic therapy can prolong progression-free survival (5). For the treatment of recurrence, the patient's site of recurrence, previous radiotherapy history, disease-free interval, and general health status are considered (16). Local pelvic or vaginal recurrence can be successfully treated with radiotherapy and/or surgery (16). Surgical resection appears to be effective in patients with solitary or fewer than five metastases in resectable organs (such as the lung) (16). Due to the low general performance status of elderly patients, as well as comorbidities, the surgical option cannot be preferred and their survival may be worse than younger patients. This may be the possible reason why surgery was performed in only 15% of patients with extrapelvic or multiple relapses in our study.

With increasing age, more patients present with non-endometrioid histology, high-grade tumor, and deep myometrial invasion (17, 18). In our study, in accordance with the literature, 50% of non-endometrioid histology and 73.7% of deep myometrial invasion were found. Although older women with endometrial cancer are almost equally likely to undergo oncologic surgery compared to non-elderly women, they are less likely to potentially receive adjuvant radiotherapy (18, 19). Specific guidelines for management are needed to improve the prognosis of patients with advanced-age endometrial cancer. There are significant differences in the management of patients who are in good and poor general condition.

Limitations of the study

There are some limitations of the study. First of all, it can be considered that it is of a retrospective nature. There may be missing data in the file and remembering difficulties that occur in retrospective examinations. Secondly, it can be said that the number of patients is low. However, patients with a collection of homogeneous cases in a specific age group for a specific disease still talk about important results.

CONCLUSION

In conclusion, it can be said that survival outcomes are worse in recurrences in advanced-age endometrial cancer patients. This may be due to more limited treatment options for recurrence due to additional internal problems. Prospective studies with more patients are needed on this subject.

Ethics Committee Approval:
This research complies with all the relevant national regulations, institutional policies and is in accordance with the tenets of the Helsinki Declaration, and has been approved by the Tepecik Education and Research Hospital Ethical Committee (Date: 22.02.2021, Decision no: 2021/02-04).

Informed Consent:
All the participants' rights were protected and Informed Consent Statement was "not applicable" for retrospective study nature.

Author Contributions:
Concept - V.G., K.G.; Design - İ.A.Ö., O.K., M.G.; Supervision - A.Ö., M.S.; Resources - Z.E.Ç. ; Materials - ; Data Collection and/or Processing - Z.E.Ç., A.Ö.; Analysis and/or Interpretation - O.K., M.G.; Literature Search - V.G., İ.A.Ö., M.S.; Writing Manuscript - V.G., K.G.; Critical Review - K.G., İ.A.Ö.

Conflict of Interest:
The authors have no conflict of interest to declare.

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REFERENCES

1. Siegel R, Ma J, Zou Z, Jemal A. Cancer statistics, 2014. CA Cancer J Clin 2014; 64(1):9-29.

2. Ignatov T, Eggemann H, Costa SD, Ortmann O, Ignatov A. Endometrial cancer subtypes are associated with different patterns of recurrence. J Cancer Res Clin Oncol 2018; 144(10):2011-7.

3. Makker V, Green AK, Wenham RM, Mutch D, Davidson B, Miller DS. New therapies for advanced, recurrent, and metastatic endometrial cancers. Gynecol Oncol Res Pract 2017; 4:19.

4. National Cancer Institute Surveillance, Epidemiology, and End Rsults Program. Cancer stat facts: Uterine cancer 2017.

5. Laban M, El-Swaify ST, Ali SH, Refaat MA, Sabbour M, Farrag N, Hassanin AS. The Prediction of Recurrence in Low-Risk Endometrial Cancer: Is It Time for a Paradigm Shift in Adjuvant Therapy? Reprod Sci 2022; 29(4):1068-85.

6. Creutzberg CL, van Putten WL, Koper PC, Lybeert ML, Jobsen JJ, Wárlám-Rodenhuis CC, De Winter KA, Lutgens LC, van den Bergh AC, van der Steen-Banasik E, Beerman H, van Lent M; PORTEC Study Group. Survival after relapse in patients with endometrial cancer: results from a randomized trial. Gynecol Oncol 2003; 89(2):201-9.

7. Creasman WT, Odicino F, Maisonneuve P, Quinn MA, Beller U, Benedet JL, Heintz AP, Ngan HY, Pecorelli S. Carcinoma of the corpus uteri. FIGO 26th Annual Report on the Results of Treatment in Gynecological Cancer. Int J Gynaecol Obstet 2006; 95 Suppl 1:S105-43.

8. Berek JS, Matias-Guiu X, Creutzberg C, Fotopoulou C, Gaffney D, Kehoe S, Lindemann K, Mutch D, Concin N; Endometrial Cancer Staging Subcommittee, FIGO Women's Cancer Committee. FIGO staging of endometrial cancer: 2023. Int J Gynaecol Obstet. 2023; 162(2):383-94.

9. Takahashi A, Matsuura M, Matoda M, Nomura H, Okamoto S, Kanao H, Kondo E, Omatsu K, Kato K, Utsugi K, Takeshima N. Clinicopathological Features of Early and Late Recurrence of Endometrial Carcinoma After Surgical Resection. Int J Gynecol Cancer 2017; 27(5):967-72.

10. Sohaib SA, Houghton SL, Meroni R, Rockall AG, Blake P, Reznek RH. Recurrent endometrial cancer: patterns of recurrent disease and assessment of prognosis. Clin Radiol 2007; 62(1):28-34; discussion 35-6.

11. Kaewpangchan P, Cheewakriangkrai C. Relapse patterns and outcomes following recurrence of endometrial cancer in northern Thai women. Asian Pac J Cancer Prev 2015; 16(9):3861-6.

12. Vargo JA, Kim H, Houser CJ, Berhane H, Sukumvanich P, Olawaiye AB, Kelley JL, Edwards RP, Comerci JT, Huang M, Courtney-Brooks M, Beriwal S. Definitive salvage for vaginal recurrence of endometrial cancer: the impact of modern intensity-modulated-radiotherapy with image-based HDR brachytherapy and the interplay of the PORTEC 1 risk stratification. Radiother Oncol 2014; 113(1):126-31.

13. Lin LL, Grigsby PW, Powell MA, Mutch DG. Definitive radiotherapy in the management of isolated vaginal recurrences of endometrial cancer. Int J Radiat Oncol Biol Phys 2005; 63(2):500-4.

14. Fung-Kee-Fung M, Dodge J, Elit L, Lukka H, Chambers A, Oliver T; Cancer Care Ontario Program in Evidence-based Care Gynecology Cancer Disease Site Group. Follow-up after primary therapy for endometrial cancer: a systematic review. Gynecol Oncol 2006; 101(3):520-9.

15. Kurra V, Krajewski KM, Jagannathan J, Giardino A, Berlin S, Ramaiya N. Typical and atypical metastatic sites of recurrent endometrial carcinoma. Cancer Imaging 2013; 13(1):113-22.

16. Iwase H, Furukawa S, Hirasawa T, Asai S, Ohara T, Hosonuma S, Endo S, Tazo Y, Sato H, Takada T, Arai M, Ikeda M, Shida M, Yoshioka N, Tozawa-Ono A, Suzuki N, Mikami M, Onda T. The Clinical Features of Recurrent Endometrial Cancer in Japan: Chemotherapy Instead of Radiotherapy as Postoperative Adjuvant Treatment. Int J Gynecol Cancer 2018; 28(8):1616-23.

17. Alemdaroglu S, Durdag GD, Baran SY, Simsek SY, Yetkinel S, Yaginc DA, Guler OC, Celik H. Prognostic factors of endometrial cancer in elderly patient group and their effects on survival. North Clin Istanb 2021; 8(4):345-53.

18. Wright JD, Lewin SN, Barrena Medel NI, Sun X, Burke WM, Deutsch I, Herzog TJ. Endometrial cancer in the oldest old: Tumor characteristics, patterns of care, and outcome. Gynecol Oncol 2011; 122(1):69-74.

19. Torgeson A, Boothe D, Poppe MM, Suneja G, Gaffney DK. Disparities in care for elderly women with endometrial cancer adversely effects survival. Gynecol Oncol 2017; 147(2):320-8.