J Gynecol Oncol. 2017 Jan;28(1):e12
https://doi.org/10.3802/jgo.2017.28.e12
pISSN 2005-0380·eISSN 2005-0399

JOURNAL OF GYNECOLOGIC ONCOLOGY

Practice Guideline

Practice guidelines for management of uterine corpus cancer in Korea: a Korean Society of Gynecologic Oncology Consensus Statement

Received: Oct 7, 2016
Accepted: Oct 16, 2016

Correspondence to
Taek Sang Lee
Department of Obstetrics and Gynecology, Seoul Metropolitan Government Seoul National University Borame Medical Center, Seoul National University College of Medicine, 20 Boramae-ro 5-gil, Dongjak-gu, Seoul 07061, Korea.
E-mail: tslee70@gmail.com

ORCID
Shin-Wha Lee
http://orcid.org/0000-0002-5088-1905
Taek Sang Lee
http://orcid.org/0000-0001-8119-5601
Jae Hong No
http://orcid.org/0000-0002-2389-6757
Dong Choon Park
http://orcid.org/0000-0001-9485-4987
Jae Man Bae
http://orcid.org/0000-0001-7453-1443
Seok Ju Seong
http://orcid.org/0000-0003-3820-3412
Keun Ho Lee
http://orcid.org/0000-0001-9005-7796
Yoo Kyung Lee
http://orcid.org/0000-0002-0621-8030

Shin-Wha Lee,[1] Taek Sang Lee,[2] Dae Gy Hong,[3] Jae Hong No,[4] Dong Choon Park,[5] Jae Man Bae,[6] Seok Ju Seong,[7] So-Jin Shin,[8] Woong Ju,[9] Keun Ho Lee,[10] Yoo Kyung Lee,[11] Hanbyoul Cho,[12] Chulmin Lee,[13] Jiheum Paek,[14] Hyun-Jung Kim,[15] Jeong-Won Lee,[16] Jae-Weon Kim,[17] Duk-Soo Bae[16]

[1]Department of Obstetrics and Gynecology, Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea
[2]Department of Obstetrics and Gynecology, Seoul Metropolitan Government Seoul National University Boramae Medical Center, Seoul National University College of Medicine, Seoul, Korea
[3]Department of Obstetrics and Gynecology, Kyungpook National University Medical Center, Kyungpook National University School of Medicine, Daegu, Korea
[4]Department of Obstetrics and Gynecology, Seoul National University Bundang Hospital, Seoul National University College of Medicine, Seongnam, Korea
[5]Department of Obstetrics and Gynecology, St. Vincent's Hospital, College of Medicine, The Catholic University of Korea, Suwon, Korea
[6]Department of Obstetrics and Gynecology, Hanyang University Medical Center, Seoul, Korea
[7]Department of Obstetrics and Gynecology, CHA Gangnam Medical Center, CHA University, Seoul, Korea
[8]Department of Obstetrics and Gynecology, Keimyung University School of Medicine, Daegu, Korea
[9]Department of Obstetrics and Gynecology, Ewha Womans University School of Medicine, Seoul, Korea
[10]Department of Obstetrics and Gynecology, Seoul St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea
[11]Department of Obstetrics and Gynecology, Cheil General Hospital & Women's Healthcare Center, Dankook University College of Medicine, Seoul, Korea
[12]Department of Obstetrics and Gynecology, Gangnam Severance Hospital, Yonsei University College of Medicine, Seoul, Korea
[13]Department of Obstetrics and Gynecology, Sanggye Paik Hospital, Inje University, Seoul, Korea
[14]Department of Obstetrics and Gynecology, Ajou University School of Medicine, Suwon, Korea
[15]Department of Preventive Medicine, Korea University College of Medicine, Seoul, Korea
[16]Department of Obstetrics and Gynecology, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, Korea
[17]Department of Obstetrics and Gynecology, Seoul National University Hospital, Seoul, Korea

ABSTRACT

Clinical practice guidelines for gynecologic cancers have been developed by many organizations. Although these guidelines have much in common in terms of the practice of standard of care for uterine corpus cancer, practice guidelines that reflect the characteristics of patients and healthcare and insurance systems are needed for each country. The Korean Society of Gynecologic Oncology (KSGO) published the first edition of practice guidelines for gynecologic cancer treatment in late 2006; the second edition was released in July 2010 as an evidence-based recommendation. The Guidelines Revision Committee was established in 2015 and decided to produce the third edition of the guidelines as an

Jiheum Paek
http://orcid.org/0000-0003-3964-5925
Jeong-Won Lee
http://orcid.org/0000-0002-6945-0398
Jae-Weon Kim
http://orcid.org/0000-0003-1835-9436

Funding
All costs related to the consensus conference were covered from the Korean Society of Gynecologic Oncology (KSGO) central funds. There was no external funding of the event or manuscript production.

Conflict of Interest
Jae-Weon Kim serves as editors of the Journal of Gynecologic Oncology (JGO), but have no role in the decision to publish this article. No other conflict of interest relevant to this article was reported.

advanced form based on evidence-based medicine, considering up-to-date clinical trials and abundant qualified Korean data. These guidelines cover screening, surgery, adjuvant treatment, and advanced and recurrent disease with respect to endometrial carcinoma and uterine sarcoma. The committee members and many gynecologic oncologists derived key questions from the discussion, and a number of relevant scientific literatures were reviewed in advance. Recommendations for each specific question were developed by the consensus conference, and they are summarized here, together with other details. The objective of these practice guidelines is to establish standard policies on issues in clinical areas related to the management of uterine corpus cancer based on the findings in published papers to date and the consensus of experts as a KSGO Consensus Statement.

Keywords: Uterine Corpus Neoplasms; Practice Guideline; Consensus; Surgery; Chemotherapy; Irradiation

INTRODUCTION

Uterine corpus cancer is a general term for cancer that occurs in the uterus, excluding cervical cancer. Uterine corpus cancer is histopathologically classified into endometrial cancer and uterine sarcoma; however, endometrial cancer is the most common and uterine sarcoma is rare, accounting for 2%–6% of uterine corpus cancer cases [1]. In Korea, although the incidence of uterine cancer is low in comparison with that in western countries [2], it has been steadily increasing recently. In data from the Korea Central Cancer Registry, the incidence of endometrial cancer demonstrated the rapid increase, since 1999 (619 cases in 1999) and 2010 (1,616 cases in 2010) [3]. Since most of the patients are diagnosed at an early-stage, endometrial cancer has a good prognosis. However, in some patients with high risk factors for recurrence of early-stage endometrial cancer and in approximately 20% of patients diagnosed at an advanced stage, various adjuvant therapies after surgery have been suggested. Therefore, standardized practice guidelines are required in the clinical setting. Because uterine sarcoma is less responsive to several different treatments and because of the difficulty of diagnosis before surgery and the rapid progression, the prognosis is very poor. In addition, owing to its relatively low incidence, it has been difficult to develop effective practice guidelines through various clinical trials.

The purpose of these practice guidelines is to establish standard policies on clinical issues related to the diagnosis and treatment of uterine corpus cancer on the basis of the research results published to date and the consensus of experts.

MATERIALS AND METHODS

The Korean Society of Gynecologic Oncology (KSGO) has revised the previously published practice guidelines for management of gynecologic cancer. The first edition of the practice guidelines for gynecologic cancer treatment was published in late 2006 and the second was released in July 2010 as an evidence-based recommendation. In 2015, the Guidelines Revision Committee, which was established within the KSGO, decided to produce the third edition of the guidelines. In doing so, they: 1) considered the rapidly advancing developments in precision medicines and analyzed and applied the results of up-to-date clinical trials, including target therapies; 2) accepted and included the recently revised World Health

Organization histological classification; and 3) applied, as evidence, the data obtained from a number of Korean studies of gynecologic cancer surgery.

These guidelines were designed according to the principles of evidence-based medicine, which is the international standard method for building clinical practice guidelines. These guidelines went through a process of: 1) selecting key questions; 2) searching for evidence; 3) evaluating the level of evidence and determining the grade of recommendation; 4) deduction of the agreements; and 5) review and approval. Key questions were selected through discussion among the members of the uterine corpus cancer team after analysis of previous recommendations, consensus for revision, and confirmation of the recent significant reports. Data and literature published before 2015 in Korea and overseas were searched using Cochrane Central Register of Controlled Trials (CENTRAL) in the Cochrane Library, MEDLINE, and EMBASE, and then a meta-analysis and systematic literature review were conducted. The collected evidence was evaluated for quality using Cochrane methodology for randomized controlled trials, the Newcastle-Ottawa Scale for nonrandom studies, and the quality assessment of studies of diagnostic accuracy included in systematic reviews (QUADAS-2) for diagnosis research. The level of evidence was divided into four categories using the methodology suggested by the grade group based on the research design, consistency among the research results, immediacy of the research subject and intervention, possibility of publishing bias, and accuracy of the research results (**Table 1**). The grade of recommendation was decided by the methodology suggested by the grade group based on the level of evidence, considering the application subject, hazard and benefit, social and individual cost of the intervention, and patients' preference. The grades of recommendation were divided into strong recommendation and weak recommendation. The draft form and grades of recommendation were established through consultation that included all members of the revision committee. Guidelines development process in accordance with evidence-based medicine was summarized in **Supplementary 1**.

After debates in a public hearing with all members of the KSGO and invited representatives of related academies, a draft version of the guidelines was evaluated and supplemented. For an internal and external review, the KSGO sent the final version of the guidelines to related organizations, including the Korean Society for Radiation Oncology (KOSRO), Korean Society of Pathologists (KSP), Korean Cancer Study Group (KCSG), Korean Society of Urogenital Radiology (KSUR), Korean Society of Nuclear Medicine (KSNM), Korean Society of Obstetrics and Gynecology (KSOG), and Korean Gynecologic Oncology Group (KGOG). Subsequent to these reviews, there were no objections or requests for revision.

The histopathological classification recommended by the Gynecological Pathology Study Group of the KSP was used as the histopathological classification of these guidelines on

Table 1. Levels of evidence and grades of recommendation

Definition	
Levels of evidence	
A	High-quality evidence
B	Moderate-quality evidence
C	Low-quality evidence
D	Very low-quality evidence
E	No evidence or difficult to analyze
Grades and recommendation strength	
1	Strong recommendation
2	Weak recommendation

https://doi.org/10.3802/jgo.2017.28.e12

uterine corpus cancer. Regarding the staging system of endometrial cancer, the Fédération Internationale de Gynécologie et d'Obstétrique (FIGO) stage classification, revised in early 2009, was applied in these revised guidelines.

CLINICAL CONSIDERATIONS AND RECOMMENDATIONS

1. Endometrial carcinoma

1) Screening and diagnosis

Most patients with endometrial cancer represent symptoms from the initial stage of the disease; common clinical profiles are vaginal bleeding in postmenopausal women and excessive menstrual bleeding or irregular spotting in premenopausal women. If endometrial cancer is suspected, it is necessary to identify the risk factors of infertility, ovulation status, the presence of obesity or diabetes, the use of estrogen or tamoxifen, and genetic factors and to conduct fundamental tests, followed by endometrial biopsy, to confirm the diagnosis. Endometrial curettage (dilatation and curettage) is a standardized test, but an endometrial sampling method has recently been reported with equivalent accuracy [4,5]. Ultrasonography is commonly used because of the advantage of noninvasiveness. If clinically indicated, computed tomography (CT), magnetic resonance imaging (MRI), and positron emission tomography (PET) scans can be performed for preoperative clinical staging and planning for treatment. Although the tumor marker cancer antigen 125 (CA-125) has been reported to reflect the myometrial invasion and lymph node metastasis [6,7], it has not yet been established as a standard diagnostic tool.

2) Primary treatment

(1) Primary treatment for early endometrial cancer

The standard surgical treatment for early-stage (stage I and II) endometrial cancer is total abdominal hysterectomy (TAH) and bilateral salpingo-oophorectomy (BSO) with or without lymphadenectomy. Peritoneal cytology should be considered for its prognostic value, although it is no longer a precondition for surgical staging. Definitive radiation therapy (RT) can be performed primarily for patients not suitable for standard surgical treatment due to medical problems.

Lymphadenectomy is an essential in the comprehensive surgical staging procedure for endometrial cancer. However, in early-stage endometrial cancer, the importance of lymphadenectomy is unclear because the survival benefit is still debated [8-11]. Indeed, in recently published studies, there were no differences in survival among patients with endometrial cancer who underwent lymphadenectomy and those who did not [9-12]. In contrast, a number of studies, including a large-scale retrospective cohort study published in 2010, reported therapeutic benefits of pelvic lymph node dissection (LND) and aortic lymphadenectomy [8-14]. According to a recent studies from Korea, a preoperative prediction model for lymph node metastasis was established from CA-125 levels and preoperative MRI findings including myometrial invasion, extension beyond the corpus, and enlarged lymph nodes [15,16]. In addition, the volume index and myometrial invasion on preoperative MRI were indicated as predictive factors for identifying lymph node metastasis in endometrial cancer [17]. Therefore, we recommend a lymphadenectomy is an important section of the comprehensive surgical staging of endometrial cancer. However, pelvic lymphadenectomy may be omitted in patients who are predicted to have a very low risk of lymph node

metastasis and, in some cases, who show a low-grade tumor of the endometrioid histologic type that is confined to the endometrium or invading only the superficial myometrium. Para-aortic lymphadenectomy can be performed if deep myometrial invasion is observed or high-grade lesions, including serous or clear cell carcinoma, are identified.

KQ 01. Is the survival rate similar between laparoscopic staging surgery and open surgery in early-stage endometrial cancer?

An open laparotomy was the traditional way in surgical staging for endometrial cancer. In recent randomized controlled trials comparing laparoscopic surgery and open surgery, good results of laparoscopic surgery have been reported in endometrial cancer [18-22]. The results of laparoscopy or laparotomy for surgical staging were analyzed in the Gynecologic Oncology Group (GOG) LAP2 study which allocated 2,616 women with randomly 2:1 fashion [18]. The rate of moderate-to-severe postoperative adverse events was lower in laparoscopy than in laparotomy (14% vs. 21%; p<0.001) and intraoperative complications were similar. Although the operative time was longer in laparoscopic surgery, the length of hospital stay was significantly shorter in the laparoscopy group; especially the incidence of more than 2 days hospitalization was significantly less compared with laparotomy (52% vs. 94%; p<0.001). The 5-year overall survival (OS) rate was almost the same in both groups at 89.8%. In five randomized controlled trials [18-22], the 5-year OS rate was not different between laparoscopy and laparotomy. In the meta-analysis of 5-year OS from these five randomized trials, a survival difference was not shown according to the surgical approaches (risk ratio [RR], 1.00; 95% confidence interval [CI], 0.83–1.21). In a review article, laparoscopy was evaluated as a reasonable method to surgically treat patients with early-stage uterine cancer [23].

Recommendation: Laparoscopic staging surgery is recommended for the surgical staging of early-stage endometrial cancer.
Level of evidence: A (high).
Strength of recommendation: 1 (strong).
Consensus: 88.9% (16) yes, 11.1% (2) abstain (18 voters).

KQ 02. Does ovarian preservation affect survival in patients with early-stage endometrial cancer?

BSO has been routinely performed with hysterectomy in the surgical management of patients with endometrial cancer. This practice is performed because it is possible that the ovaries may have occult metastatic lesions, and that estrogen produced by the ovaries might increase the recurrence rate. Endometrial cancer has been rapidly increasing recently, especially in young women. In premenopausal endometrial cancer patients who want to keep the ovarian function, ovarian preservation can be considered at the time of hysterectomy. In a retrospective Korean study, investigators examined 176 premenopausal women with stage I–II endometrial cancer who did not undergo BSO, comparing them to 319 premenopausal women who underwent BSO [24]. There was no difference in recurrence-free survival (p=0.742) or OS (p=0.462). The 5-year OS was 94.5% for those who had ovarian preservation compared with 97.8% for patients who underwent BSO. In addition, the 10-year OS was 94.5% for those who had ovarian preservation compared with 91.3% for patients who underwent BSO. The ovarian preservation for women ≤45 years of age with stage I endometrial cancer was safe and did not increase cancer-related mortality from Surveillance, Epidemiology, and End Results (SEER) database [25]. Our

meta-analysis of three studies [24-26], including the results of another retrospective study, did not show a survival difference between ovarian preservation and BSO in early-stage endometrial cancer (hazard ratio [HR], 0.83; 95% CI, 0.47–1.47).

Recommendation: Ovarian preservation is recommended at the time of hysterectomy for young women with early-stage endometrial cancer that is confined to the uterus without evidence of extrauterine spread.
Level of evidence: C (low).
Strength of recommendation: 2 (weak).
Consensus: 100% yes (20 voters).

KQ 03. Is progestin therapy for fertility-sparing treatment effective for young women with early-stage endometrial cancer?

Although hysterectomy is a highly effective and definitive management, it also causes a permanent loss of fertility in young women of childbearing age. Conservative management of endometrial cancer consists of a medical treatment based on oral progestins instead of hysterectomy. Patients who are considering fertility-sparing treatment should be precisely evaluated to detect advanced or high-risk disease before deciding on treatment. The most commonly used progestins are medroxyprogesterone acetate (MPA) and megestrol acetate [27]. A Korean study (KGOG 2002) revealed that fertility-sparing management using oral progestins was highly effective and safe in 148 patients (age ≤40 years) with stage IA, grade 1, endometrioid adenocarcinoma [28]. The 5-year recurrence-free survival was 68% (95% CI, 58.5–76.9); however, 33 patients (22.3%) did not achieve a complete response and underwent definitive surgery. In a phase II prospective study, the medical treatment with oral MPA for 26 weeks was performed for 28 women less than 40 years of age who had either presumed stage IA endometrial cancer or endometrial intraepithelial neoplasia [29]. Although the complete response rate was 67% and 12 pregnancies and 7 deliveries were achieved after MPA therapy, 47% of those who accomplished a complete response subsequently experienced a recurrence during the 3-year follow-up period. The recurrence rate after a complete response was similar at 50.0% in a recent retrospective study in 37 patients with grade 1 endometrioid endometrial carcinoma at presumed stage IA who underwent fertility-sparing treatment of megestrol acetate (160 mg/day) [30].

Patients considering fertility-sparing treatment should be carefully counseled considering that data on cancer progression and pregnancy outcomes are limited. Investigators should explain the option of surgical management, including hysterectomy after the completion of childbearing or if conservative treatments are judged to be ineffective or lesion progression occurs through the entire consultation. MPA, megestrol acetate, or an intrauterine system including levonorgestrel can be considered in progestin-based therapy [31-33]. Although there are various methods and durations of treatment, a repeat endometrial biopsy should be performed every 3–6 months during progestin therapy and surgery, including hysterectomy, should be recommended if patients do not respond to conservative treatment 6–9 months later.

Recommendation: Fertility-sparing treatment through progestin-based therapy is recommended in early-stage endometrial cancer if the tumor is grade 1 endometrioid adenocarcinoma and limited to the endometrium if the patient strongly desires pregnancy.
Level of evidence: D (very low).

Strength of recommendation: 1 (strong).
Consensus: 90.9% (20) yes, 9.1% (2) abstain (22 voters).

(2) Primary treatment for advanced endometrial cancer

Comprehensive staging, including TAH, BSO, pelvic/para-aortic lymphadenectomy, peritoneal cytology, and debulking surgery, followed by adjuvant therapy, should be performed in advanced endometrial cancer. If deemed optimal and cytoreductive surgery is not possible, RT could be selected as an initial management, followed by surgery or chemotherapy.

(3) Primary treatment for papillary serous adenocarcinoma/clear cell carcinoma/ carcinosarcoma

Patients with uterine papillary serous, clear cell carcinoma or carcinosarcoma have a worse prognosis than those with endometrioid-type carcinoma and have a tendency to show advanced disease at diagnosis. If suspected, comprehensive staging and cytoreduction is necessary, regardless of intrauterine disease state. The standardized surgery should be performed, including TAH, BSO, pelvic/para-aortic lymphadenectomy, peritoneal cytology, omentectomy, peritoneal biopsy, and cytoreductive surgery [34].

3) Adjuvant treatment

(1) Adjuvant treatment for early endometrial cancer

The adjuvant treatment in patients with early-stage endometrial cancer is considered according to the presence of clinicopathologic factors associated with the risk of recurrence. However, it is difficult to decide the appropriate adjuvant therapy for patients with early-stage endometrial cancer because other complicated decision processes, in addition to considering FIGO stage, are necessary for individual patients, including identifying: 1) those who are comprehensively staged including appropriate nodal evaluation; and 2) those who have risk factors for recurrence, including age, tumor size, lymphovascular space invasion, and expansion to the lower corpus. Although the value of adjuvant RT in early-stage endometrial cancer remains unclear, general recommendations can be made for adjuvant treatment. In patients with stage IA/grade 1 endometrial cancer without risk factors, no adjuvant treatment is recommended. In patients with stage IA/grade 2–3 endometrial cancer without risk factors or stage IA/grade 1 endometrial cancer with risk factors, no adjuvant treatment or adjuvant vaginal brachytherapy is possible. In patients with stage IA/grade 2–3 endometrial cancer with risk factors, no adjuvant treatment or adjuvant brachytherapy and/or pelvic RT is possible. In patients with stage IB/grade 1–2 endometrial cancer without risk factors, no adjuvant treatment or adjuvant brachytherapy is possible. In patients with stage IB/grade 1–2 endometrial cancer with risk factors, no adjuvant treatment or adjuvant brachytherapy and/or pelvic RT is possible, and in patients with stage IB/grade 3 endometrial cancer without risk factors, adjuvant brachytherapy and/or pelvic RT is recommended and no adjuvant treatment is an option.

KQ 04. Does adjuvant radiotherapy improve survival in patients with stage IB/grade 3 endometrial cancer with risk factors after surgery?

There is no level I evidence supporting improved OS, therefore, it is difficult to select proper adjuvant therapy for patients with early-stage endometrial cancer. To identify recurrence risk patients who may benefit from adjuvant therapy clinicopathologic prognostic factors are crucial. Well-known clinicopathologic prognostic factors predicting recurrence are FIGO stage, tumor grade, histologic type (endometrioid vs. serous and

clear cell), age (≥60 years), tumor size, depth of myometrial invasion, and lymphovascular space invasion [35]. Although RT is most commonly used in adjuvant therapy after surgery, in the GOG 99 trial, a large randomized trial evaluating the role of RT, whole pelvic RT (WPRT) reduced pelvic and vaginal recurrences of endometrial cancer, but the estimated 4-year survival was not significantly different between the group who had no additional therapy (86%) and the group receiving RT (92%) (relative hazard 0.86; p=0.557) [36]. Other large randomized trials (Post-Operative Radiation Therapy in Endometrial Carcinoma [PORTEC]-1, ASTEC/EN.5) revealed that adjuvant RT for high- to intermediate-risk stage I or stage II endometrial cancer did not improve OS [37,38]. In the PORTEC-2 study, there was no difference in relapse rates and the improvement of quality of life with brachytherapy instead of pelvic RT in patients with endometrial cancer with a high risk and moderate risk factors [39,40]. However, in Korea, institutions that can perform vaginal brachytherapy are relatively limited [41]. In view of these points, the practice guidelines for management of uterine corpus cancer in Korea (V2.0, KSGO 2016 edition; KSGO, Seoul, Korea) include observation (no adjuvant therapy), vaginal brachytherapy, and pelvic RT as the appropriate adjuvant therapy for patients with early-stage endometrial cancer and risk factors. However, 51% of patients included in the observation group in the ASTEC/EN.5 trial underwent additional vaginal brachytherapy, and pelvic and para-aortic lymphadenectomy in primary surgery may or may not have been performed, depending on the individual patient, in the ASTEC/EN.5 and PORTEC-1 and -2 studies; in other words, surgery and RT were not consistently performed in the patient groups. Furthermore, the most frequent sites of relapse in recurrent cases in the GOG 99 and PORTEC-1 studies were confirmed to be over the vaginal stump, implying the need for adjuvant RT after surgery.

Therefore, in the revised practice guidelines (V3.0, KSGO 2016 edition; KSGO), a large-scale retrospective cohort study and other randomized controlled trials, which clearly divided surgical methods and RT in patients with stage IB, grade 3 endometrial cancer with risk factors, were selected and analyzed [38-44]. The large-scale retrospective cohort study was performed through the SEER dataset for stage I endometrial cancer treated with comprehensive staging; subjects were stratified into low-, intermediate-, and high-risk cohorts using modifications of the GOG 99 and PORTEC trial criteria [42]. In patients with high-risk disease who underwent LND, RT was associated with increased 5-year survival, without significant differences between the radiation modalities (78.9% in brachytherapy only, 69.9% in WPRT only, 71.4% in both brachytherapy and WPRT vs. 63.5% in no RT; p<0.001); if LND was not performed, brachytherapy alone was inferior to WPRT (p=0.01). Two randomized trials reported improved 5-year disease-free survival in high-risk patients with early-stage endometrial cancer who underwent LND [43,44].

Recommendation: Pelvic RT and/or vaginal brachytherapy with (or without) chemotherapy is recommended as the adjuvant treatment in patients with stage IB, grade 3 endometrial cancers with risk factors after surgery.
Level of evidence: D (very low).
Strength of recommendation: 2 (weak).
Consensus: 63.2% (12) yes, 36.8% (7) abstain (19 voters).

(2) Adjuvant treatment for advanced endometrial cancer

KQ 05. Is adjuvant treatment with concurrent chemoradiotherapy or sequential chemotherapy and radiotherapy effective in patients with advanced-stage endometrial cancers?

Advanced endometrial cancer is defined according to its presentation as vaginal or pelvic invasion, lymph node metastasis, intra-abdominal metastasis, and distant inoperable metastasis. These different patient populations are considered as one group, therefore, it is difficult to select optimal adjuvant treatment strategies. Although optimal cytoreductive surgery is related to good therapeutic results, patients with local or distant metastatic endometrial cancer have an increased risk of pelvic recurrence and distant metastases that causes the unfavorable outcomes [45]. Adjuvant pelvic RT with or without external beam RT in advanced endometrial cancer has been proven to reduce pelvic recurrence; however, the limits of radiation field results in a long-term survival failure [46]. Chemotherapy reduces the risk of recurrence in the treatment of advanced endometrial cancer. Therefore, chemotherapy combined with RT may improve outcomes compared with single-modality treatment. Several studies have investigated the efficacy of combining chemotherapy with RT, although randomized trials are rare, and the treatment strategies from retrospective cohort studies were heterogeneous.

In the Gynecologic Oncology Group at the Mario Negri Institute (MaNGO) study, sequential chemotherapy and RT were associated with a 12% reduction in the risk for relapse and 5% reduction in the risk for death compared with radiotherapy alone, but the difference was not statistically significant (HR for progression-free survival [PFS], 0.61; 95% CI, 0.33–1.12) (HR for OS, 0.74; 95% CI, 0.36–1.52) [47]. These results agree with those in several prospective and retrospective studies [46-50]. In a retrospective analysis of 356 patients with stage III and IV endometrial cancer, combined adjuvant chemotherapy and RT was associated with improved PFS and OS compared with either modality alone [51]. The recently completed GOG 258 trial for stage III–IV endometrial cancer may show whether the combination of external beam RT and chemotherapy has benefits reducing the recurrence or death compared with chemotherapy alone.

Recommendation: Combined chemotherapy and radiotherapy in a concurrent or sequential approach is recommended for patients with advanced-stage endometrial cancers after surgery.
Level of evidence: C (low).
Strength of recommendation: 2 (weak).
Consensus: 66.7% (12) yes, 33.3% (6) abstain (18 voters).

(3) Adjuvant treatment for papillary serous adenocarcinoma/clear cell carcinoma/carcinosarcoma

If the lesion is limited to the endometrium, no adjuvant treatment or chemotherapy or pelvic RT is possible. In patients with myometrial invasion or a more advanced stage, adjuvant chemotherapy and/or pelvic RT is recommended. Whole abdomen RT is not recommended because of the toxicity and risk of complications [52-54].

4) Follow-up

The recommended surveillance schedule after primary and adjuvant treatment of endometrial cancer is a follow-up visit every 3–6 months for 2 years, then every 6 months for 3 years, and annually thereafter. Radiologic evaluation, such as chest radiography, ultrasonography, or CT, MRI, or PET/CT, should be used to detect recurrent disease selectively only when considered necessary. There is a lack of evidence for the use of CA-125 for routine surveillance, although there are some reports that it is helps in the follow-up of endometrial cancer [55]. It is very important to educate the patient about the possible symptoms of suspected treatable recurrent disease.

5) Treatment for metastasis and recurrence

Endometrial cancer recurrence often occurs locally in the pelvis, most commonly in the vagina. If the relapsed lesion is limited to the pelvis with no evidence of distant metastasis in radiologic evaluation, the choice of treatment strategy depends on whether or not the RT was performed on the recurrent site. In patients who did not have RT previously, RT is preferentially recommended for recurrent endometrial cancer with or without surgery. In solitary metastasis of endometrial cancer, surgical removal of the relapsed lesion with or without radiotherapy is considered. The majority of patients with disseminated metastatic disease need systemic palliative therapy. Hormonal therapy or chemotherapy can be considered preferentially; however, if there is no response to these two treatments, the best supportive care is necessary, and clinical studies are encouraged.

(1) Chemotherapy

KQ 06. Does paclitaxel/carboplatin therapy show a similar survival rate compared with doxorubicin combination therapy in patients with advanced and recurrent endometrial cancers?

To date, the most studied chemotherapeutic agents in endometrial cancer are doxorubicin and cisplatin. The response rate of these agents used as monotherapy has been reported as 24%–48% for doxorubicin and 21%–25% for cisplatin [56-61]. Carboplatin has been reported to exhibit similar response rates of 17%–33% [62-64]. Other drugs, paclitaxel, cyclophosphamide and topotecan, also showed a similar response rate of approximately 20% [57-68]. A combination therapy of cisplatin and doxorubicin has been used widely, showing a response rate of 30%–40% [58-70]. Two randomized studies reported that the combination of cisplatin and doxorubicin produced a survival benefit comparable with doxorubicin alone in terms of response rate (42%–43% vs. 17%–25%), but with no benefit in terms of OS [60,70]. In another GOG trial, the addition of paclitaxel to cisplatin and doxorubicin (TAP regimen) significantly improved the response rate, PFS, and OS compared with cisplatin and doxorubicin (AP regimen) [71]. The objective response (57% vs. 34%; $p<0.01$), PFS (median, 8.3 vs. 5.3 months; $p<0.01$), and OS (median, 15.3 vs. 12.3 months; $p<0.04$) were higher with the TAP compared with the AP regimen. Treatment was hematologically well tolerated in the TAP-treated group; however, toxicity, especially peripheral neuropathy, was significantly higher compared with the AP group. TAP has not been chosen as a standard of care by clinicians because of serious toxicity.

The combination of paclitaxel and carboplatin has been approved as a standard regimen because of fewer side effects [66-69]. A phase II study of the Southwest Oncology Group (SWOG) reported a response rate of 40% (95% CI, 26%–56%), a median OS of 14 months (95% CI, 12–17 months), and tolerable toxicity with a regimen of paclitaxel (175 mg/m^2) and carboplatin (AUC 6) [72]. Recently, a randomized phase III noninferiority trial (GOG 209), has reported preliminary results of comparing the combination of paclitaxel (160 mg/m^2), cisplatin (60 mg/m^2) and doxorubicin (50 mg/m^2) (TAP) with paclitaxel (175 mg/m^2) and carboplatin (AUC 6) (TC) in 1,305 patients with metastatic or recurrent endometrial cancer [73]. There were no differences in response rate (51.3% vs. 51.2%) or PFS (median, 13.5 vs. 13.3 months). The median OS for TC (36.5 months) was not significantly inferior to that of TAP (40.3 months). TC had a more favorable toxicity profile than TAP in this trial. Sensory neuropathy occurred in significantly more patients treated with TAP (26% vs. 19%; $p<0.01$). Other toxic events (grade ≥3) that occurred more often with TAP were neutropenia, thrombocytopenia, nausea, vomiting, diarrhea, and

stomatitis. In addition, 17.6% of patients in the TAP arm discontinued treatment because of toxicity compared with 11.9% in the TC arm.

Recommendation: The combination of paclitaxel and carboplatin is recommended in patients with advanced and recurrent endometrial cancer. This is supported by the preliminary results of a randomized trial showing similar efficacy and less toxicity compared with cisplatin/doxorubicin/paclitaxel.
Level of evidence: C (low).
Strength of recommendation: 1 (strong).
Consensus: 100% yes (19 voters).

The combination of paclitaxel and carboplatin was adopted for papillary serous adenocarcinoma [74,75]. In patients with carcinosarcoma, the combination of ifosfamide and cisplatin has been the first choice of regimen [76-79], although there is no benefit regarding OS [80]. Paclitaxel alone showed a response rate of 18% in the GOG study [81]. Finally, the combination of paclitaxel and ifosfamide was associated with higher OS compared with ifosfamide alone [82].

(2) Hormonal therapy

Hormonal therapy is a progestin treatment, including megestrol acetate and MPA. The response rate of hormonal therapy was 15%–25% in recurrent, metastatic endometrial cancer, and there was no correlation between the hormonal dosage and response rate. In a GOG study, the response rate in a group receiving low-dose MPA (200 mg) was 25% and that in the group receiving high-dose MPA (1,000 mg) was 15%. In addition, the median PFS was similar in the two groups (2–3 months) [83]. Moore et al. [84] reported a 22% response rate in metastatic endometrial cancer using tamoxifen. Goserelin and danazol are also known to have some effect [85,86].

2. Uterine sarcomas

1) Screening and diagnosis

Uterine sarcomas are rare malignancies of the uterus, including endometrial stromal sarcoma (ESS), leiomyosarcoma (LMS), and undifferentiated uterine sarcoma (UUS) [84]. Clinical symptoms of uterine sarcoma are similar to those of uterine fibroids, with uterine bleeding and lower abdominal pain or a palpable mass being typical. A history of previous radiation is a well-known risk factor. If there is a history of pelvic RT, irradiation can increase the risk of developing uterine sarcoma, which can occur 10–20 years after the irradiation, up to 5.4 times [87]. Because uterine sarcoma is, in most cases, diagnosed after hysterectomy or myomectomy, pathologic review of a specimen and imaging (CT, MRI, and/or PET) are required to determine if the sarcoma is confined to the uterus or if extrauterine disease is present. In patients with suspected uterine sarcoma based on clinical symptoms and history, basic tests such as whole blood examination, chemical examination, chest radiography, electrocardiography, and urinalysis can be performed preoperatively. Although an endometrial biopsy may be performed to confirm the pathologic result, this is not useful for most cases of uterine sarcoma because the lesions are only in the uterine muscle layer. CT, MRI, and/or PET scans can be obtained to assist in preoperative diagnosis and staging, but they are not included in the basic tests for diagnostic purposes.

2) Primary treatment

KQ 07. Does power morcellation affect survival in patients with uterine sarcoma?

The standard surgical treatment for uterine sarcoma is TAH with (or without) BSO. Uterine sarcoma should be removed en bloc to improve outcomes; morcellation is contraindicated. In these practice guidelines, three retrospective cohort studies were analyzed to evaluate the impact of power morcellation [88-90]. They compared 5-year OS between a morcellation group and a no-morcellation group with uterine LMS and found a significant difference in 5-year OS rates (37.5%–57.9% vs. 61.9%–83.9%, respectively). In a meta-analysis of survival from these three nonrandomized studies, a survival difference was detected according to the use of power morcellation (HR, 1.66; 95% CI, 1.08–2.53).

Recommendation: In patients suspected to have uterine sarcoma, power morcellation should be avoided through laparoscopic surgery because power morcellation has been found to decrease the survival of patients with uterine sarcoma.
Level of evidence: D (very low).
Strength of recommendation: 1 (strong).
Consensus: 100% yes (22 voters).

Therefore, if the uterine sarcoma is diagnosed after hysterectomy and especially when the uterus is fragmented by morcellation, or the cervix or ovaries remain, additional surgery should be considered after a pathologic review and imaging work-up for detecting extrauterine disease. If the uterine sarcoma is diagnosed through biopsy or myomectomy, additional surgery should be determined considering the disease extension and operability through an imaging work-up; then, the standard surgical treatment is TAH with (or without) BSO and resection of metastatic lesions. In patients with suspected uterine sarcoma based on clinical symptoms and history, preoperative evaluation is important and standard surgical treatment is TAH with (or without) BSO and resection of metastatic lesions. Ovarian preservation can be considered when hysterectomy is performed for early-stage uterine sarcoma [91]. Additional surgery should be individualized based on the patient's condition and operative findings. Extrauterine lesions should be removed if possible, but lymphadenectomy is not recommended because uterine sarcomas tend to spread by hematogenous metastasis [92-95]. For medically inoperable patients, pelvic RT with (or without) brachytherapy and/or chemotherapy is performed and hormonal therapy can be considered.

3) Adjuvant treatment

Uterine sarcomas have a high recurrence rate and often show distant metastasis. Therefore, postoperative adjuvant treatment is often required, but the effects of adjuvant treatment are controversial. In patients with stage I, low-grade ESS, no adjuvant treatment is recommended. In patients with stage I LMS and UUS, chemotherapy with (or without) RT is recommended, and no adjuvant treatment can be considered [96-98]. In patients with stage II–IVA sarcoma, hormonal therapy with (or without) pelvic RT is recommended for ESS [92-100], and chemotherapy and/or pelvic RT can be considered for LMS and UUS [101,102]. In patients with stage IVB ESS, hormonal therapy is considered, and in some cases, palliative RT can be added. Chemotherapy with (or without) palliative RT is recommended in patients with stage IVB LMS and UUS. The regimens for hormonal therapy used for ESS are MPA, megestrol acetate, tamoxifen, and gonadotropin-releasing hormone analogs.

4) Treatment for metastasis and recurrence

(1) Management for locally recurred uterine sarcoma

Management for locally recurred uterine sarcoma is determined by the presence or absence

of previous RT. If patients did not receive previous radiotherapy, surgery with (or without) radiotherapy or pelvic RT with brachytherapy is recommended. If the local recurrence is limited to the vagina, confirmed through surgery, pelvic RT with (or without) brachytherapy can be considered postoperatively. If the recurrence is in the pelvis outside of the vagina, confirmed through surgery, pelvic RT is recommended. If recurrence is confirmed to be outside of the pelvis, chemotherapy is recommended, and in patients with ESS, hormonal therapy can be recommended [103-105].

(2) Management for distant metastatic uterine sarcoma

If a solitary metastatic lesion is removable, surgical resection is performed and postoperative chemotherapy or hormonal therapy or RT can be considered. For medically or surgically inoperable patients, chemotherapy with (or without) palliative RT or hormonal therapy is recommended. When identified with disseminated metastasis, hormonal therapy or supportive care is recommended for patients with ESS and chemotherapy with (or without) palliative RT or supportive care is recommended for other uterine sarcomas.

(3) Systemic treatment for advanced, recurrent uterine sarcoma

Most patients with advanced or recurrent uterine sarcoma require chemotherapy. Unfortunately, no combined or single agent has shown a survival advantage in several clinical trials [106]. For LMS, doxorubicin has been approved as the most effective single therapy, and ifosfamide has been reported to have a similar efficacy [107,108]. Combination therapy with doxorubicin and ifosfamide has often been used. In recent years, a high response rate has been reported in several studies that evaluated the efficacy of gemcitabine/docetaxel combination therapy for uterine LMS [109-112].

KQ 08. Does pazopanib therapy improve survival in recurrent uterine LMS?

In a phase III trial, the Pazopanib for metastatic soft-tissue sarcoma (PALETTE) study, which reported interim results in 2012, in patients with metastatic and recurrent uterine LMS, PFS was improved using pazopanib compared with the placebo group (36.5% vs. 12.0% at the cutoff date of October 24, 2011) [113]. Meta-analysis showed improvement of PFS with pazopanib treatment over placebo (HR, 0.72; 95% CI, 0.61–0.86). Thus, pazopanib as monotherapy can be recommended for patients with metastatic and recurrent uterine LMS that previously failed to respond to standard chemotherapy.

Recommendation: In patients with metastatic and recurrent LMS that previously failed to respond to standard chemotherapy, pazopanib is recommended as monotherapy.
Level of evidence: D (very low).
Strength of recommendation: 1 (strong).
Consensus: 81.8% (18) yes, 18.2% (4) abstain (22 voters).

SUMMARY OF RECOMMENDATION AND CONCLUSIONS

The following recommendations and conclusions are based on four levels of evidence (A, high; B, moderate; C, low; D, very low) and two strengths of recommendation (1, strong; 2, weak).

https://doi.org/10.3802/jgo.2017.28.e12

1. Endometrial carcinoma

- Lymphadenectomy is recommended as an integral part in the surgical staging of endometrial cancer. However, pelvic lymphadenectomy may be omitted in patients who are predicted to have a very low risk of lymph node metastasis and, in some cases, show low-grade tumor with endometrioid histologic type confined to the endometrium or invaded to the superficial myometrium (2A).

- Para-aortic lymphadenectomy is recommended if deep myometrial invasion is considered or high-grade lesions including serous or clear cell carcinoma are identified (2A).

- Laparoscopic staging surgery is recommended for the surgical staging of early-stage endometrial cancer (1A).

- Ovarian preservation is recommended at the time of hysterectomy for young women with early-stage endometrial cancer that is confined to the uterus without evidence of extrauterine spread (2C).

- Fertility-sparing treatment through progestin-based therapy is recommended in early-stage endometrial cancer if the tumor is grade 1 endometrioid adenocarcinoma and limited to the endometrium if the patient strongly desires pregnancy (1D).

- Cervical biopsy before surgery is recommended to determine whether infiltration is present, if it is clinically suspected. In patients with uterine cervical invasion confirmed by cervical biopsy, a radical hysterectomy, BSO, pelvic/para-aortic lymphadenectomy, and pelvic and abdominal wash cytology are recommended. Preoperative RT followed by hysterectomy, BSO, and pelvic and para-aortic LND can be considered (1D).

- In patients with stage IA/grade 1 endometrial cancer with risk factors, no adjuvant treatment or adjuvant brachytherapy is possible. In patients with stage IA/grade 2–3 endometrial cancer with risk factors, no adjuvant treatment or adjuvant brachytherapy and/or pelvic RT is possible (1A).

- In patients with stage IB/grade 1–2 endometrial cancer without risk factors, no adjuvant treatment or adjuvant brachytherapy is possible (1A).

- Pelvic RT and/or vaginal brachytherapy with (or without) chemotherapy is recommended as the adjuvant treatment in patients with stage IB, grade 3 endometrial cancers with risk factors after surgery (2D).

- In early-stage grade 3 endometrial cancer with positive peritoneal cytology, no adjuvant treatment or adjuvant brachytherapy or pelvic RT and/or brachytherapy and/or chemotherapy is possible (2C).

- Combined chemotherapy and radiotherapy in a concurrent or sequential approach is recommended for patients with advanced-stage endometrial cancers after surgery (2C).

- If the lesion of papillary serous adenocarcinoma/clear cell carcinoma/carcinosarcoma is limited to the endometrium, no adjuvant treatment or chemotherapy or pelvic RT is

possible. In patients with myometrial invasion or a more advanced-stage carcinoma, adjuvant chemotherapy and/or pelvic RT is recommended (1C).

- The combination of paclitaxel and carboplatin is recommended in patients with advanced and recurrent endometrial cancer. This is supported by the preliminary results of a randomized trial showing similar efficacy and less toxicity compared with cisplatin/doxorubicin/paclitaxel (1C).

- In patients with carcinosarcoma, the combination of ifosfamide and cisplatin has been the first choice of regimen, but the combination of paclitaxel and ifosfamide is recommended to improve OS (2B).

2. Uterine sarcomas

- In patients suspected to have uterine sarcoma, power morcellation should be avoided through laparoscopic surgery because power morcellation has been found to decrease the survival of patients with uterine sarcoma (1D).

- In patients with stage I, low-grade ESS, no adjuvant treatment is recommended. In patients with stage I LMS and UUS, chemotherapy with (or without) RT is recommended, and no adjuvant treatment can be considered (1C).

- In patients with stage II–IVA, hormonal therapy with (or without) pelvic RT is recommended for ESS, and chemotherapy and/or pelvic RT can be considered for LMS and UUS (1C).

- For LMS, doxorubicin has been approved as the most effective single therapy, and combination therapy with doxorubicin and ifosfamide has often been used. In recent years, gemcitabine/docetaxel combination therapy is recommended in uterine LMS because of the high response rate (1C).

- In patients with metastatic and recurrent LMS that previously failed to respond to standard chemotherapy, pazopanib is recommended as monotherapy (1D).

ACKNOWLEDGMENTS

The authors thank the Korean Society for Radiation Oncology (KOSRO), Korean Society of Pathologists (KSP), Korean Cancer Study Group (KCSG), Korean Society of Urogenital Radiology (KSUR), Korean Society of Nuclear Medicine (KSNM), Korean Society of Obstetrics and Gynecology (KSOG), and Korean Gynecologic Oncology Group (KGOG) for their support. Further, the authors thank all Korean Society of Gynecologic Oncology (KSGO) staff for their support throughout the whole consensus process. The authors would like to thank Enago (http://www.enago.co.kr) for medical writing assistance and English language review.

SUPPLEMENTARY MATERIAL

Supplementary 1

Guideline development process in accordance with the evidence-based medicine.

Click here to view

REFERENCES

1. Harlow BL, Weiss NS, Lofton S. The epidemiology of sarcomas of the uterus. J Natl Cancer Inst 1986;76:399-402.
PUBMED
2. Parkin DM, Pisani P, Ferlay J. Estimates of the worldwide incidence of 25 major cancers in 1990. Int J Cancer 1999;80:827-41.
PUBMED | CROSSREF
3. Lim MC, Moon EK, Shin A, Jung KW, Won YJ, Seo SS, et al. Incidence of cervical, endometrial, and ovarian cancer in Korea, 1999-2010. J Gynecol Oncol 2013;24:298-302.
PUBMED | CROSSREF
4. Dijkhuizen FP, Mol BW, Brölmann HA, Heintz AP. The accuracy of endometrial sampling in the diagnosis of patients with endometrial carcinoma and hyperplasia: a meta-analysis. Cancer 2000;89:1765-72.
PUBMED | CROSSREF
5. Hatasaka H. The evaluation of abnormal uterine bleeding. Clin Obstet Gynecol 2005;48:258-73.
PUBMED | CROSSREF
6. Hsieh CH, ChangChien CC, Lin H, Huang EY, Huang CC, Lan KC, et al. Can a preoperative CA 125 level be a criterion for full pelvic lymphadenectomy in surgical staging of endometrial cancer? Gynecol Oncol 2002;86:28-33.
PUBMED | CROSSREF
7. Chung HH, Kim JW, Park NH, Song YS, Kang SB, Lee HP. Use of preoperative serum CA-125 levels for prediction of lymph node metastasis and prognosis in endometrial cancer. Acta Obstet Gynecol Scand 2006;85:1501-5.
PUBMED | CROSSREF
8. Kilgore LC, Partridge EE, Alvarez RD, Austin JM, Shingleton HM, Noojin F 3rd, et al. Adenocarcinoma of the endometrium: survival comparisons of patients with and without pelvic node sampling. Gynecol Oncol 1995;56:29-33.
PUBMED | CROSSREF
9. ASTEC study groupKitchener H, Swart AM, Qian Q, Amos C, Parmar MK. Efficacy of systematic pelvic lymphadenectomy in endometrial cancer (MRC ASTEC trial): a randomised study. Lancet 2009;373:125-36.
PUBMED | CROSSREF
10. Mariani A, Webb MJ, Keeney GL, Calori G, Podratz KC. Role of wide/radical hysterectomy and pelvic lymph node dissection in endometrial cancer with cervical involvement. Gynecol Oncol 2001;83:72-80.
PUBMED | CROSSREF
11. Panici PB, Maggioni A, Hacker N, Landoni F, Ackermann S, Campagnutta E, et al. Systematic aortic and pelvic lymphadenectomy versus resection of bulky nodes only in optimally debulked advanced ovarian cancer: a randomized clinical trial. J Natl Cancer Inst 2005;97:560-6.
PUBMED | CROSSREF
12. Massi G, Savino L, Susini T. Vaginal hysterectomy versus abdominal hysterectomy for the treatment of stage I endometrial adenocarcinoma. Am J Obstet Gynecol 1996;174:1320-6.
PUBMED | CROSSREF
13. Mariani A, Webb MJ, Galli L, Podratz KC. Potential therapeutic role of para-aortic lymphadenectomy in node-positive endometrial cancer. Gynecol Oncol 2000;76:348-56.
PUBMED | CROSSREF
14. Todo Y, Kato H, Kaneuchi M, Watari H, Takeda M, Sakuragi N. Survival effect of para-aortic lymphadenectomy in endometrial cancer (SEPAL study): a retrospective cohort analysis. Lancet 2010;375:1165-72.
PUBMED | CROSSREF

15. Kang S, Kang WD, Chung HH, Jeong DH, Seo SS, Lee JM, et al. Preoperative identification of a low-risk group for lymph node metastasis in endometrial cancer: a Korean Gynecologic Oncology Group Study. J Clin Oncol 2012;30:1329-34.
PUBMED | CROSSREF
16. Son JH, Kong TW, Kim SH, Paek J, Chang SJ, Lee EJ, et al. Prediction of lymph node metastasis in patients with apparent early endometrial cancer. Obstet Gynecol Sci 2015;58:385-90.
PUBMED | CROSSREF
17. Todo Y, Choi HJ, Kang S, Kim JW, Nam JH, Watari H, et al. Clinical significance of tumor volume in endometrial cancer: a Japan-Korea cooperative study. Gynecol Oncol 2013;131:294-8.
PUBMED | CROSSREF
18. Walker JL, Piedmonte MR, Spirtos NM, Eisenkop SM, Schlaerth JB, Mannel RS, et al. Recurrence and survival after random assignment to laparoscopy versus laparotomy for comprehensive surgical staging of uterine cancer: Gynecologic Oncology Group LAP2 Study. J Clin Oncol 2012;30:695-700.
PUBMED | CROSSREF
19. Lu Q, Liu H, Liu C, Wang S, Li S, Guo S, et al. Comparison of laparoscopy and laparotomy for management of endometrial carcinoma: a prospective randomized study with 11-year experience. J Cancer Res Clin Oncol 2013;139:1853-9.
PUBMED | CROSSREF
20. Malzoni M, Tinelli R, Cosentino F, Perone C, Rasile M, Iuzzolino D, et al. Total laparoscopic hysterectomy versus abdominal hysterectomy with lymphadenectomy for early-stage endometrial cancer: a prospective randomized study. Gynecol Oncol 2009;112:126-33.
PUBMED | CROSSREF
21. Zullo F, Palomba S, Falbo A, Russo T, Mocciaro R, Tartaglia E, et al. Laparoscopic surgery vs laparotomy for early stage endometrial cancer: long-term data of a randomized controlled trial. Am J Obstet Gynecol 2009;200:296.e1-9.
22. Tozzi R, Malur S, Koehler C, Schneider A. Laparoscopy versus laparotomy in endometrial cancer: first analysis of survival of a randomized prospective study. J Minim Invasive Gynecol 2005;12:130-6.
PUBMED | CROSSREF
23. Sonoda Y. Surgical treatment for apparent early stage endometrial cancer. Obstet Gynecol Sci 2014;57:1-10.
PUBMED | CROSSREF
24. Lee TS, Lee JY, Kim JW, Oh S, Seong SJ, Lee JM, et al. Outcomes of ovarian preservation in a cohort of premenopausal women with early-stage endometrial cancer: a Korean Gynecologic Oncology Group Study. Gynecol Oncol 2013;131:289-93.
PUBMED | CROSSREF
25. Wright JD, Buck AM, Shah M, Burke WM, Schiff PB, Herzog TJ. Safety of ovarian preservation in premenopausal women with endometrial cancer. J Clin Oncol 2009;27:1214-9.
PUBMED | CROSSREF
26. Sun C, Chen G, Yang Z, Jiang J, Yang X, Li N, et al. Safety of ovarian preservation in young patients with early-stage endometrial cancer: a retrospective study and meta-analysis. Fertil Steril 2013;100:782-7.
PUBMED | CROSSREF
27. Erkanli S, Ayhan A. Fertility-sparing therapy in young women with endometrial cancer: 2010 update. Int J Gynecol Cancer 2010;20:1170-87.
PUBMED | CROSSREF
28. Park JY, Kim DY, Kim JH, Kim YM, Kim KR, Kim YT, et al. Long-term oncologic outcomes after fertility-sparing management using oral progestin for young women with endometrial cancer (KGOG 2002). Eur J Cancer 2013;49:868-74.
PUBMED | CROSSREF
29. Ushijima K, Yahata H, Yoshikawa H, Konishi I, Yasugi T, Saito T, et al. Multicenter phase II study of fertility-sparing treatment with medroxyprogesterone acetate for endometrial carcinoma and atypical hyperplasia in young women. J Clin Oncol 2007;25:2798-803.
PUBMED | CROSSREF
30. Wang CJ, Chao A, Yang LY, Hsueh S, Huang YT, Chou HH, et al. Fertility-preserving treatment in young women with endometrial adenocarcinoma: a long-term cohort study. Int J Gynecol Cancer 2014;24:718-28.
PUBMED | CROSSREF
31. Baker J, Obermair A, Gebski V, Janda M. Efficacy of oral or intrauterine device-delivered progestin in patients with complex endometrial hyperplasia with atypia or early endometrial adenocarcinoma: a meta-analysis and systematic review of the literature. Gynecol Oncol 2012;125:263-70.
PUBMED | CROSSREF

32. Gunderson CC, Fader AN, Carson KA, Bristow RE. Oncologic and reproductive outcomes with progestin therapy in women with endometrial hyperplasia and grade 1 adenocarcinoma: a systematic review. Gynecol Oncol 2012;125:477-82.
PUBMED | CROSSREF
33. Trimble CL, Method M, Leitao M, Lu K, Ioffe O, Hampton M, et al. Management of endometrial precancers. Obstet Gynecol 2012;120:1160-75.
PUBMED
34. Bristow RE, Duska LR, Montz FJ. The role of cytoreductive surgery in the management of stage IV uterine papillary serous carcinoma. Gynecol Oncol 2001;81:92-9.
PUBMED | CROSSREF
35. Creasman WT, Morrow CP, Bundy BN, Homesley HD, Graham JE, Heller PB. Surgical pathologic spread patterns of endometrial cancer. A Gynecologic Oncology Group Study. Cancer 1987;60:2035-41.
PUBMED | CROSSREF
36. Keys HM, Roberts JA, Brunetto VL, Zaino RJ, Spirtos NM, Bloss JD, et al. A phase III trial of surgery with or without adjunctive external pelvic radiation therapy in intermediate risk endometrial adenocarcinoma: a Gynecologic Oncology Group Study. Gynecol Oncol 2004;92:744-51.
PUBMED | CROSSREF
37. Creutzberg CL, van Putten WL, Koper PC, Lybeert ML, Jobsen JJ, Wárlám-Rodenhuis CC, et al. Surgery and postoperative radiotherapy versus surgery alone for patients with stage-1 endometrial carcinoma: multicentre randomised trial. PORTEC Study Group. Post Operative Radiation Therapy in Endometrial Carcinoma. Lancet 2000;355:1404-11.
PUBMED | CROSSREF
38. ASTEC/EN.5 Study Group , Blake P, Swart AM, Orton J, Kitchener H, Whelan T, et al. Adjuvant external beam radiotherapy in the treatment of endometrial cancer (MRC ASTEC and NCIC CTG EN.5 randomised trials): pooled trial results, systematic review, and meta-analysis. Lancet 2009;373:137-46.
PUBMED | CROSSREF
39. Nout RA, Smit VT, Putter H, Jürgenliemk-Schulz IM, Jobsen JJ, Lutgens LC, et al. Vaginal brachytherapy versus pelvic external beam radiotherapy for patients with endometrial cancer of high-intermediate risk (PORTEC-2): an open-label, non-inferiority, randomised trial. Lancet 2010;375:816-23.
PUBMED | CROSSREF
40. Nout RA, Putter H, Jürgenliemk-Schulz IM, Jobsen JJ, Lutgens LC, van der Steen-Banasik EM, et al. Quality of life after pelvic radiotherapy or vaginal brachytherapy for endometrial cancer: first results of the randomized PORTEC-2 trial. J Clin Oncol 2009;27:3547-56.
PUBMED | CROSSREF
41. Kim H, Kim JY, Kim J, Park W, Kim YS, Kim HJ, et al. Current status of brachytherapy in Korea: a national survey of radiation oncologists. J Gynecol Oncol 2016;27:e33.
PUBMED | CROSSREF
42. Chino JP, Jones E, Berchuck A, Secord AA, Havrilesky LJ. The influence of radiation modality and lymph node dissection on survival in early-stage endometrial cancer. Int J Radiat Oncol Biol Phys 2012;82:1872-9.
PUBMED | CROSSREF
43. Soderini A, Anchezar JP, Sardi JE. Role of adjuvant radiotherapy (RT) in intermediate risk (IB G2-3-IC) endometrial carcinoma (EC) after extended staging surgery (ESS). Preliminary reports of a randomized trial. Int J Gynecol Cancer 2003;13:78.
44. Aalders J, Abeler V, Kolstad P, Onsrud M. Postoperative external irradiation and prognostic parameters in stage I endometrial carcinoma: clinical and histopathologic study of 540 patients. Obstet Gynecol 1980;56:419-27.
PUBMED
45. Barlin JN, Puri I, Bristow RE. Cytoreductive surgery for advanced or recurrent endometrial cancer: a meta-analysis. Gynecol Oncol 2010;118:14-8.
PUBMED | CROSSREF
46. Klopp AH, Jhingran A, Ramondetta L, Lu K, Gershenson DM, Eifel PJ. Node-positive adenocarcinoma of the endometrium: outcome and patterns of recurrence with and without external beam irradiation. Gynecol Oncol 2009;115:6-11.
PUBMED | CROSSREF
47. Hogberg T, Signorelli M, de Oliveira CF, Fossati R, Lissoni AA, Sorbe B, et al. Sequential adjuvant chemotherapy and radiotherapy in endometrial cancer--results from two randomised studies. Eur J Cancer 2010;46:2422-31.
PUBMED | CROSSREF

48. Marchetti C, Pisano C, Mangili G, Lorusso D, Panici PB, Silvestro G, et al. Use of adjuvant therapy in patients with FIGO stage III endometrial carcinoma: a multicenter retrospective study. Oncology 2011;81:104-12.
PUBMED | CROSSREF
49. Nakayama K, Nagai Y, Ishikawa M, Aoki Y, Miyazaki K. Concomitant postoperative radiation and chemotherapy following surgery was associated with improved overall survival in patients with FIGO stages III and IV endometrial cancer. Int J Clin Oncol 2010;15:440-6.
PUBMED | CROSSREF
50. Lee LJ, Viswanathan AN. Combined chemotherapy and radiation improves survival for node-positive endometrial cancer. Gynecol Oncol 2012;127:32-7.
PUBMED | CROSSREF
51. Alvarez Secord A, Havrilesky LJ, Bae-Jump V, Chin J, Calingaert B, Bland A, et al. The role of multimodality adjuvant chemotherapy and radiation in women with advanced stage endometrial cancer. Gynecol Oncol 2007;107:285-91.
PUBMED | CROSSREF
52. Goldberg H, Miller RC, Abdah-Bortnyak R, Steiner M, Yildiz F, Meirovitz A, et al. Outcome after combined modality treatment for uterine papillary serous carcinoma: a study by the Rare Cancer Network (RCN). Gynecol Oncol 2008;108:298-305.
PUBMED | CROSSREF
53. Hamilton CA, Cheung MK, Osann K, Balzer B, Berman ML, Husain A, et al. The effect of adjuvant chemotherapy versus whole abdominopelvic radiation on the survival of patients with advanced stage uterine papillary serous carcinoma. Gynecol Oncol 2006;103:679-83.
PUBMED | CROSSREF
54. Havrilesky LJ, Secord AA, Bae-Jump V, Ayeni T, Calingaert B, Clarke-Pearson DL, et al. Outcomes in surgical stage I uterine papillary serous carcinoma. Gynecol Oncol 2007;105:677-82.
PUBMED | CROSSREF
55. Fanning J, Piver MS. Serial CA 125 levels during chemotherapy for metastatic or recurrent endometrial cancer. Obstet Gynecol 1991;77:278-80.
PUBMED | CROSSREF
56. Edmonson JH, Krook JE, Hilton JF, Malkasian GD, Everson LK, Jefferies JA, et al. Randomized phase II studies of cisplatin and a combination of cyclophosphamide-doxorubicin-cisplatin (CAP) in patients with progestin-refractory advanced endometrial carcinoma. Gynecol Oncol 1987;28:20-4.
PUBMED | CROSSREF
57. Horton J, Begg CB, Arseneault J, Bruckner H, Creech R, Hahn RG. Comparison of adriamycin with cyclophosphamide in patients with advanced endometrial cancer. Cancer Treat Rep 1978;62:159-61.
PUBMED
58. Thigpen JT, Blessing JA, DiSaia PJ, Yordan E, Carson LF, Evers C. A randomized comparison of doxorubicin alone versus doxorubicin plus cyclophosphamide in the management of advanced or recurrent endometrial carcinoma: a Gynecologic Oncology Group Study. J Clin Oncol 1994;12:1408-14.
PUBMED
59. Thigpen JT, Blessing JA, Homesley H, Creasman WT, Sutton G. Phase II trial of cisplatin as first-line chemotherapy in patients with advanced or recurrent endometrial carcinoma: a Gynecologic Oncology Group Study. Gynecol Oncol 1989;33:68-70.
PUBMED | CROSSREF
60. Thigpen JT, Brady MF, Homesley HD, Malfetano J, DuBeshter B, Burger RA, et al. Phase III trial of doxorubicin with or without cisplatin in advanced endometrial carcinoma: a Gynecologic Oncology Group Study. J Clin Oncol 2004;22:3902-8.
PUBMED | CROSSREF
61. Thigpen JT, Vance RB, Khansur T. Second-line chemotherapy for recurrent carcinoma of the ovary. Cancer 1993;71:1559-64.
PUBMED | CROSSREF
62. Burke TW, Munkarah A, Kavanagh JJ, Morris M, Levenback C, Tornos C, et al. Treatment of advanced or recurrent endometrial carcinoma with single-agent carboplatin. Gynecol Oncol 1993;51:397-400.
PUBMED | CROSSREF
63. Green JB 3rd, Green S, Alberts DS, O'Toole R, Surwit EA, Noltimier JW. Carboplatin therapy in advanced endometrial cancer. Obstet Gynecol 1990;75:696-700.
PUBMED
64. Long HJ, Pfeifle DM, Wieand HS, Krook JE, Edmonson JH, Buckner JC. Phase II evaluation of carboplatin in advanced endometrial carcinoma. J Natl Cancer Inst 1988;80:276-8.
PUBMED | CROSSREF

65. Ball HG, Blessing JA, Lentz SS, Mutch DG. A phase II trial of paclitaxel in patients with advanced or recurrent adenocarcinoma of the endometrium: a Gynecologic Oncology Group Study. Gynecol Oncol 1996;62:278-81.
PUBMED | CROSSREF
66. Lincoln S, Blessing JA, Lee RB, Rocereto TF. Activity of paclitaxel as second-line chemotherapy in endometrial carcinoma: a Gynecologic Oncology Group Study. Gynecol Oncol 2003;88:277-81.
PUBMED | CROSSREF
67. Lissoni A, Zanetta G, Losa G, Gabriele A, Parma G, Mangioni C. Phase II study of paclitaxel as salvage treatment in advanced endometrial cancer. Ann Oncol 1996;7:861-3.
PUBMED | CROSSREF
68. Holloway RW. Treatment options for endometrial cancer: experience with topotecan. Gynecol Oncol 2003;90:S28-33.
PUBMED | CROSSREF
69. Muss HB. Chemotherapy of metastatic endometrial cancer. Semin Oncol 1994;21:107-13.
PUBMED
70. van Wijk FH, Aapro MS, Bolis G, Chevallier B, van der Burg ME, Poveda A, et al. Doxorubicin versus doxorubicin and cisplatin in endometrial carcinoma: definitive results of a randomised study (55872) by the EORTC Gynaecological Cancer Group. Ann Oncol 2003;14:441-8.
PUBMED | CROSSREF
71. Fleming GF, Brunetto VL, Cella D, Look KY, Reid GC, Munkarah AR, et al. Phase III trial of doxorubicin plus cisplatin with or without paclitaxel plus filgrastim in advanced endometrial carcinoma: a Gynecologic Oncology Group Study. J Clin Oncol 2004;22:2159-66.
PUBMED | CROSSREF
72. Scudder SA, Liu PY, Wilczynski SP, Smith HO, Jiang C, Hallum AV 3rd, et al. Paclitaxel and carboplatin with amifostine in advanced, recurrent, or refractory endometrial adenocarcinoma: a phase II study of the Southwest Oncology Group. Gynecol Oncol 2005;96:610-5.
PUBMED | CROSSREF
73. Miller D, Filiaci V, Fleming G, Mannel R, Cohn D, Matsumoto T, et al. Randomized phase III noninferiority trial of first line chemotherapy for metastatic or recurrent endometrial carcinoma: a Gynecologic Oncology Group Study. Gynecol Oncol 2012;125:771.
CROSSREF
74. Eltabbakh GH, Moody J, Garafano LL, Hammond JM. The combination paclitaxel, carboplatin and megestrol acetate is effective in women with recurrent uterine papillary serous adenocarcinoma. Eur J Gynaecol Oncol 1999;20:18-9.
PUBMED
75. Hoskins PJ, Swenerton KD, Pike JA, Wong F, Lim P, Acquino-Parsons C, et al. Paclitaxel and carboplatin, alone or with irradiation, in advanced or recurrent endometrial cancer: a phase II study. J Clin Oncol 2001;19:4048-53.
PUBMED
76. Sutton GP, Blessing JA, Rosenshein N, Photopulos G, DiSaia PJ. Phase II trial of ifosfamide and mesna in mixed mesodermal tumors of the uterus (a Gynecologic Oncology Group Study). Am J Obstet Gynecol 1989;161:309-12.
PUBMED | CROSSREF
77. Thigpen JT, Blessing JA, Beecham J, Homesley H, Yordan E. Phase II trial of cisplatin as first-line chemotherapy in patients with advanced or recurrent uterine sarcomas: a Gynecologic Oncology Group Study. J Clin Oncol 1991;9:1962-6.
PUBMED
78. Thigpen JT, Blessing JA, Orr JW Jr, DiSaia PJ. Phase II trial of cisplatin in the treatment of patients with advanced or recurrent mixed mesodermal sarcomas of the uterus: a Gynecologic Oncology Group Study. Cancer Treat Rep 1986;70:271-4.
PUBMED
79. Wolfson AH, Brady MF, Rocereto T, Mannel RS, Lee YC, Futoran RJ, et al. A gynecologic oncology group randomized phase III trial of whole abdominal irradiation (WAI) vs. cisplatin-ifosfamide and mesna (CIM) as post-surgical therapy in stage I-IV carcinosarcoma (CS) of the uterus. Gynecol Oncol 2007;107:177-85.
PUBMED | CROSSREF
80. Sutton G, Brunetto VL, Kilgore L, Soper JT, McGehee R, Olt G, et al. A phase III trial of ifosfamide with or without cisplatin in carcinosarcoma of the uterus: a Gynecologic Oncology Group Study. Gynecol Oncol 2000;79:147-53.
PUBMED | CROSSREF

81. Curtin JP, Blessing JA, Soper JT, DeGeest K. Paclitaxel in the treatment of carcinosarcoma of the uterus: a Gynecologic Oncology Group Study. Gynecol Oncol 2001;83:268-70.
PUBMED | CROSSREF
82. Homesley HD, Filiaci V, Markman M, Bitterman P, Eaton L, Kilgore LC, et al. Phase III trial of ifosfamide with or without paclitaxel in advanced uterine carcinosarcoma: a Gynecologic Oncology Group Study. J Clin Oncol 2007;25:526-31.
PUBMED | CROSSREF
83. Thigpen JT, Brady MF, Alvarez RD, Adelson MD, Homesley HD, Manetta A, et al. Oral medroxyprogesterone acetate in the treatment of advanced or recurrent endometrial carcinoma: a dose-response study by the Gynecologic Oncology Group. J Clin Oncol 1999;17:1736-44.
PUBMED
84. Moore TD, Phillips PH, Nerenstone SR, Cheson BD. Systemic treatment of advanced and recurrent endometrial carcinoma: current status and future directions. J Clin Oncol 1991;9:1071-88.
PUBMED
85. Asbury RF, Brunetto VL, Lee RB, Reid G, Rocereto TFGynecologic Oncology Group. Goserelin acetate as treatment for recurrent endometrial carcinoma: a Gynecologic Oncology Group Study. Am J Clin Oncol 2002;25:557-60.
PUBMED | CROSSREF
86. Covens A, Brunetto VL, Markman M, Orr JW Jr, Lentz SS, Benda JGynecologic Oncology Group. Phase II trial of danazol in advanced, recurrent, or persistent endometrial cancer: a Gynecologic Oncology Group Study. Gynecol Oncol 2003;89:470-4.
PUBMED | CROSSREF
87. Cześnin K, Wronkowski Z. Second maligancies of the irradiated area in patients treated for uterine cervix cancer. Gynecol Oncol 1978;6:309-15.
PUBMED | CROSSREF
88. George S, Barysauskas C, Serrano C, Oduyebo T, Rauh-Hain JA, Del Carmen MG, et al. Retrospective cohort study evaluating the impact of intraperitoneal morcellation on outcomes of localized uterine leiomyosarcoma. Cancer 2014;120:3154-8.
PUBMED | CROSSREF
89. Park JY, Park SK, Kim DY, Kim JH, Kim YM, Kim YT, et al. The impact of tumor morcellation during surgery on the prognosis of patients with apparently early uterine leiomyosarcoma. Gynecol Oncol 2011;122:255-9.
PUBMED | CROSSREF
90. Perri T, Korach J, Sadetzki S, Oberman B, Fridman E, Ben-Baruch G. Uterine leiomyosarcoma: does the primary surgical procedure matter? Int J Gynecol Cancer 2009;19:257-60.
PUBMED | CROSSREF
91. ESMO / European Sarcoma Network Working Group. Soft tissue and visceral sarcomas: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. Ann Oncol 2012;23 Suppl 7:vii92-9.
PUBMED
92. Amant F, Coosemans A, Debiec-Rychter M, Timmerman D, Vergote I. Clinical management of uterine sarcomas. Lancet Oncol 2009;10:1188-98.
PUBMED | CROSSREF
93. Barney B, Tward JD, Skidmore T, Gaffney DK. Does radiotherapy or lymphadenectomy improve survival in endometrial stromal sarcoma? Int J Gynecol Cancer 2009;19:1232-8.
PUBMED | CROSSREF
94. Shah JP, Bryant CS, Kumar S, Ali-Fehmi R, Malone JM Jr, Morris RT. Lymphadenectomy and ovarian preservation in low-grade endometrial stromal sarcoma. Obstet Gynecol 2008;112:1102-8.
PUBMED | CROSSREF
95. Signorelli M, Fruscio R, Dell'Anna T, Buda A, Giuliani D, Ceppi L, et al. Lymphadenectomy in uterine low-grade endometrial stromal sarcoma: an analysis of 19 cases and a literature review. Int J Gynecol Cancer 2010;20:1363-6.
PUBMED
96. Reed NS, Mangioni C, Malmström H, Scarfone G, Poveda A, Pecorelli S, et al. Phase III randomised study to evaluate the role of adjuvant pelvic radiotherapy in the treatment of uterine sarcomas stages I and II: an European Organisation for Research and Treatment of Cancer Gynaecological Cancer Group Study (protocol 55874). Eur J Cancer 2008;44:808-18.
PUBMED | CROSSREF
97. Sampath S, Schultheiss TE, Ryu JK, Wong JY. The role of adjuvant radiation in uterine sarcomas. Int J Radiat Oncol Biol Phys 2010;76:728-34.
PUBMED | CROSSREF

98. Mahdavi A, Monk BJ, Ragazzo J, Hunter MI, Lentz SE, Vasilev SA, et al. Pelvic radiation improves local control after hysterectomy for uterine leiomyosarcoma: a 20-year experience. Int J Gynecol Cancer 2009;19:1080-4.
PUBMED | CROSSREF
99. Reichardt P. The treatment of uterine sarcomas. Ann Oncol 2012;23 Suppl 10:x151-7.
PUBMED | CROSSREF
100. Thanopoulou E, Judson I. Hormonal therapy in gynecological sarcomas. Expert Rev Anticancer Ther 2012;12:885-94.
PUBMED | CROSSREF
101. Ricci S, Giuntoli RL 2nd, Eisenhauer E, Lopez MA, Krill L, Tanner EJ 3rd, et al. Does adjuvant chemotherapy improve survival for women with early-stage uterine leiomyosarcoma? Gynecol Oncol 2013;131:629-33.
PUBMED | CROSSREF
102. Hensley ML, Wathen JK, Maki RG, Araujo DM, Sutton G, Priebat DA, et al. Adjuvant therapy for high-grade, uterus-limited leiomyosarcoma: results of a phase 2 trial (SARC 005). Cancer 2013;119:1555-61.
PUBMED | CROSSREF
103. Bernstein-Molho R, Grisaro D, Soyfer V, Safra T, Merimsky O. Metastatic uterine leiomyosarcomas: a single-institution experience. Int J Gynecol Cancer 2010;20:255-60.
PUBMED | CROSSREF
104. Sharma S, Takyar S, Manson SC, Powell S, Penel N. Efficacy and safety of pharmacological interventions in second- or later-line treatment of patients with advanced soft tissue sarcoma: a systematic review. BMC Cancer 2013;13:385.
PUBMED | CROSSREF
105. Dhakal S, Corbin KS, Milano MT, Philip A, Sahasrabudhe D, Jones C, et al. Stereotactic body radiotherapy for pulmonary metastases from soft-tissue sarcomas: excellent local lesion control and improved patient survival. Int J Radiat Oncol Biol Phys 2012;82:940-5.
PUBMED | CROSSREF
106. Nordal RR, Thoresen SO. Uterine sarcomas in Norway 1956-1992: incidence, survival and mortality. Eur J Cancer 1997;33:907-11.
PUBMED | CROSSREF
107. Omura GA, Major FJ, Blessing JA, Sedlacek TV, Thigpen JT, Creasman WT, et al. A randomized study of adriamycin with and without dimethyl triazenoimidazole carboxamide in advanced uterine sarcomas. Cancer 1983;52:626-32.
PUBMED | CROSSREF
108. Sutton GP, Blessing JA, Barrett RJ, McGehee R. Phase II trial of ifosfamide and mesna in leiomyosarcoma of the uterus: a Gynecologic Oncology Group Study. Am J Obstet Gynecol 1992;166:556-9.
PUBMED | CROSSREF
109. Hensley ML, Blessing JA, Degeest K, Abulafia O, Rose PG, Homesley HD. Fixed-dose rate gemcitabine plus docetaxel as second-line therapy for metastatic uterine leiomyosarcoma: a Gynecologic Oncology Group phase II study. Gynecol Oncol 2008;109:323-8.
PUBMED | CROSSREF
110. Hensley ML, Blessing JA, Mannel R, Rose PG. Fixed-dose rate gemcitabine plus docetaxel as first-line therapy for metastatic uterine leiomyosarcoma: a Gynecologic Oncology Group phase II trial. Gynecol Oncol 2008;109:329-34.
PUBMED | CROSSREF
111. Hensley ML, Ishill N, Soslow R, Larkin J, Abu-Rustum N, Sabbatini P, et al. Adjuvant gemcitabine plus docetaxel for completely resected stages I-IV high grade uterine leiomyosarcoma: Results of a prospective study. Gynecol Oncol 2009;112:563-7.
PUBMED | CROSSREF
112. Maki RG, Wathen JK, Patel SR, Priebat DA, Okuno SH, Samuels B, et al. Randomized phase II study of gemcitabine and docetaxel compared with gemcitabine alone in patients with metastatic soft tissue sarcomas: results of sarcoma alliance for research through collaboration study 002 [corrected]. J Clin Oncol 2007;25:2755-63.
PUBMED | CROSSREF
113. van der Graaf WT, Blay JY, Chawla SP, Kim DW, Bui-Nguyen B, Casali PG, et al. Pazopanib for metastatic soft-tissue sarcoma (PALETTE): a randomised, double-blind, placebo-controlled phase 3 trial. Lancet 2012;379:1879-86.
PUBMED | CROSSREF