Gynecologic Oncology 136 (2015) 365–372

Contents lists available at ScienceDirect

Gynecologic Oncology

journal homepage: www.elsevier.com/locate/ygyno

Review

The role of vaginal cuff brachytherapy in endometrial cancer

Matthew M. Harkenrider, Alec M. Block, Zaid A. Siddiqui, William Small Jr. *

Department of Radiation Oncology, Stritch School of Medicine, Loyola University Chicago, 2160 S. First Avenue, Maywood, IL 60153, United States

HIGHLIGHTS

- A thorough review of the literature, rationale, and recommendations of vaginal brachytherapy in the post-operative treatment of endometrial cancer patients
- A practical review that practitioners can use to help guide treatment of their patients.
- Emphasis on vaginal brachytherapy as a discussion with the patient reviewing risks and benefits of adjuvant therapy

ARTICLE INFO

Article history:
Received 2 November 2014
Accepted 26 December 2014
Available online 31 December 2014

Keywords:
Endometrial cancer
Vaginal brachytherapy
Vaginal cylinder
Vaginal cuff

ABSTRACT

Objective. The purpose of this article is to review the data, rationale, and recommendations of vaginal brachytherapy (VBT) in the post-operative treatment of endometrial cancer patients.

Methods. The authors performed a thorough review of the medical literature regarding the use of adjuvant VBT in the treatment of endometrial cancer. Relevant data are presented in this review. Additionally, personal and institutional practices from the authors are incorporated where relevant.

Results. VBT for the adjuvant treatment of early stage endometrial cancer patients results in a low rate of recurrence (0–3.1%) with very low rates of toxicity. PORTEC-2 supports the use of adjuvant VBT versus external beam radiotherapy specifically for high-intermediate risk endometrial cancer patients. VBT has low rates of acute and chronic gastrointestinal and genitourinary toxicity and very low rates of second primary malignancy. The primary toxicity of VBT is vaginal atrophy and stenosis with controversy regarding the use of vaginal dilators for prevention. Data support that patients prefer to be involved in the decision making process for their adjuvant therapy, and patients have a lower minimal desired benefit of adjuvant VBT than do physicians. Guidelines exist from the American Brachytherapy Society and American Society of Radiation Oncology with support from the Society for Gynecologic Oncologists regarding the use of adjuvant VBT.

Conclusions. VBT decreases the risk of recurrence with minimal toxicity in the adjuvant treatment of endometrial cancer. Adjuvant therapy should be discussed in a multi-disciplinary setting with detailed counseling of the risks and benefits with the patient so that she ultimately makes an informed decision regarding her adjuvant therapy.

Contents

* Corresponding author at: Department of Radiation Oncology, Stritch School of Medicine, Loyola University Chicago, 2160 S. First Avenue, Maguire Building Room 2944, Maywood, IL 60153, United States. Fax: +1 708 216 6076.
E-mail address: wmsmall@lumc.edu (W. Small).

http://dx.doi.org/10.1016/j.ygyno.2014.12.036
0090-8258/

Introduction

Endometrial cancer is the most common gynecologic malignancy in the United States. In 2014, it is estimated that 52,630 were diagnosed and 8590 died of endometrial cancer [1]. The gold standard management of endometrial cancer is surgery, consisting of a total abdominal hysterectomy and bilateral salpingo-oophorectomy (TAH-BSO) with or without pelvic and paraaortic lymph node dissection [2–4]. The recommendation for adjuvant therapy is quite controversial and is often individualized based on disease stage and risks for recurrence. The purpose of this review is to discuss the role of vaginal brachytherapy (VBT) in the postoperative management of endometrial cancer.

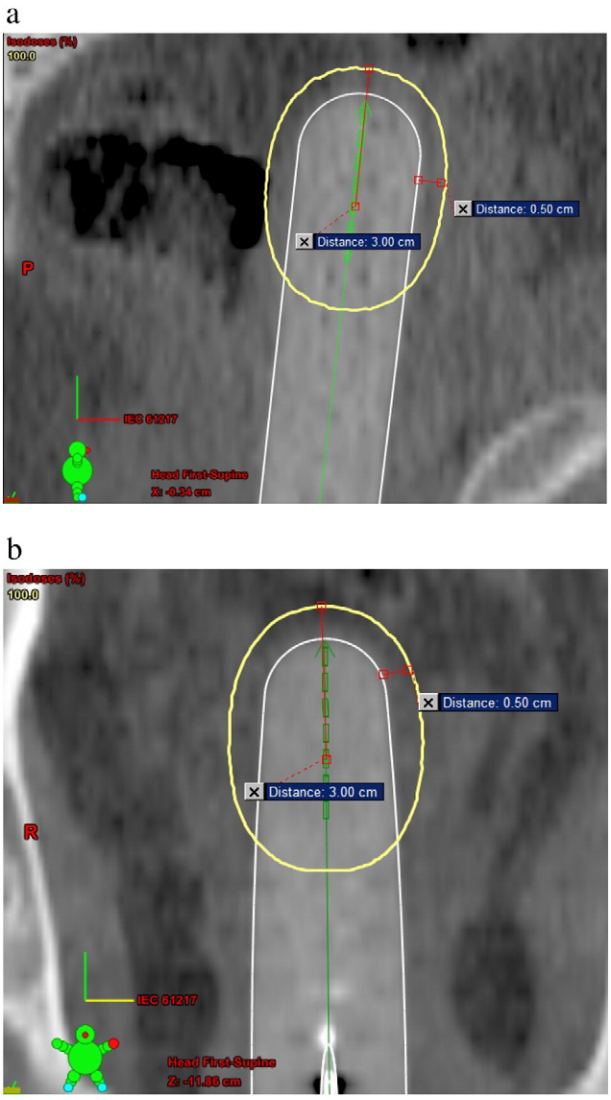

Fig. 1. Coronal (a) and sagittal (b) views of an HDR VBT plan for a 65 year old female with stage IB, grade 1, endometrial cancer with 54% MMI and 5.9 cm tumor size following TAH-BSO and negative pelvic and paraaortic lymph node dissection who chose adjuvant VBT.

Patients with early stage endometrial cancer should undergo TAH-BSO by an experienced surgeon with pathology reviewed for risk factors for recurrence. Early studies showed that higher grade and deeper myometrial invasion (MMI) increased the risk of vaginal failure [5] and increased pelvic and paraaortic node positivity upon surgical exploration [2]. The Gynecologic Oncology Group (GOG) 99 study and the first Post Operative Radiation Therapy in Endometrial Cancer (PORTEC-1) study showed that adjuvant external beam radiotherapy (EBRT) for intermediate risk endometrial cancer patients decreases the recurrence rate from 12–15% to 3–6%. Both the GOG 99 and PORTEC-1 studies established subgroups of patients at greatest risk for recurrence, which were deemed the high-intermediate (H-I) risk group. The H-I risk group is based on several factors, namely, stage and depth of MMI, higher grade, presence of lymphovascular space invasion (LVSI), and older age (Table 1). In the H-I risk groups, adjuvant EBRT decreased the risk of recurrence from 18–26% to 5–6%. All other patients from these studies are classified as low-intermediate (L-I) risk, and EBRT decreased recurrence rate from 5–6% to 2% [3,4,6,7]. However, the use of EBRT is not without potential toxicity. PORTEC-1 showed g (grades) 1–4 toxicity to be 26% with EBRT vs 4% without ($p < 0.0001$) which was primarily gastrointestinal in nature [8]. Additionally, GOG 99 noted a significant increase in hematologic, gastrointestinal (GI), genitourinary (GU), and cutaneous toxicities with adjuvant EBRT [4]. In a long-term (15 year) quality of life (QOL) survey, the patients in PORTEC-1 receiving EBRT reported poorer urinary and bowel functions as well as declined physical functioning [9].

The ability to successfully salvage a patient with disease recurrence who was not treated with adjuvant radiotherapy can help guide recommendations regarding the use of adjuvant therapy. The vagina was the only site of recurrence in 15 of 21 patients (71.4%) in GOG 99 and 37 of 51 patients (72.4%) in PORTEC-1, making the vagina the most common site of failure [3,4]. In GOG 99, 12 of 13 patients with vaginal recurrence in the observation arm were treated with salvage radiotherapy. Crude observation suggested that 5 of those 13 patients died from endometrial cancer [4]. Retrospective studies indicate a local control

Table 1
Comparison of high-intermediate risk groups in stage I endometrial cancer as defined by PORTEC-1 and GOG 99.

	PORTEC-1	GOG 99
Age	>60	See below
Grade	3	2–3
Myometrial invasion	>50% (outer 1/2)	>66% (outer 1/3)
Lymphovascular space invasion	N/A	Present
High intermediate risk group	2 of 3 above risk factors	Any age, all 3 above risk factors Age > 50, 2 above risk factors Age > 70, 1 above risk factor