Gynecologic Oncology xxx (2017) xxx–xxx

Contents lists available at ScienceDirect

Gynecologic Oncology

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

Endometrial cancer surveillance adherence reduces utilization and subsequent costs

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HIGHLIGHTS

- Single institution shows decline in CT's, CA125's, and Paps due to SGO guidelines.
- Adherence to SGO guidelines did not negatively impact patient outcomes.
- Cost of surveillance care declined secondary to adherence to these SGO guidelines.

ARTICLE INFO

Article history:
Received 2 May 2017
Received in revised form 16 June 2017
Accepted 19 June 2017
Available online xxxx

Keywords:
Endometrial cancer
Surveillance
Adherence
Cost
Cytology
Outcomes

ABSTRACT

Objectives. In June 2011, the SGO recommended that physical exam and symptoms be the primary surveillance methods in patients with endometrial cancer. We sought to evaluate adherence to these guidelines by comparing the use of CT scans, paps and serum CA125 ordered for endometrial cancer surveillance before and after publication of these guidelines.

Methods. A retrospective review was performed for all patients undergoing surveillance for endometrial cancer at a single institution between June 2009 and June 2013. We assessed the number of patients without symptoms or abnormal physical exam findings who underwent surveillance CT scans, paps and/or CA125 during the 2 years pre- and 2 years post-SGO guidelines.

Results. 92 patients ($n = 48$ pre-6/2011, $n = 44$ post-6/2011) were identified. Mean patient age was 58 years. No significant difference in age, ethnicity, body mass index, or disease grade or stage was noted. There was a significant decline in surveillance CT scans ($n = 13$, 27% vs. $n = 4$, 9%, $p = 0.03$), CA125 ($n = 14$, 29% vs. 5, 11%, $p = 0.035$) and paps ($n = 34$, 71% vs. $n = 8$ vs. 18%, $p < 0.001$). There was no significant difference in disease status at the last follow-up. Institutional cost of surveillance also declined ($14,102.46 2 years pre-guidelines, $3,054.99 2 years post-guidelines).

Conclusions. In a single urban academic public hospital, after only 2 years, clinical adherence to the 2011 SGO endometrial cancer surveillance guidelines resulted in a significant decline in the use of CT scans, CA125 and paps. This reduction does not appear to affect patient outcomes and led to an appreciable decrease in surveillance costs.

1. Introduction

Endometrial cancer remains one of the most common cancers for women in the United States. There are an estimated 61,380 new cases and 10,920 deaths in 2017 alone [1]. And endometrial cancer incidence continues to rise with recent models predicting an increase in incidence to 42.13 per 100,000 in 2030 – a 55% increase over incidence rates in 2010 [2]. While incidence continues to increase, five- and ten-year survival rates for endometrial cancer remain relatively high at 82% and 79%, respectively [1]. Thus, with this high disease incidence and high rate of long-term survival, there is a great need for a established, reliable and cost effective methods of surveillance. This is made all the more important in the context of efforts such as the ABIM Foundation's Choosing Wisely campaign to provide evidence based, effective care that reduces waste in healthcare and avoids unnecessary tests [3].

Prior to 2011, surveillance strategies in endometrial cancer varied amongst providers [4–5]. A recent analysis by Wright et al. [6] found

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http://dx.doi.org/10.1016/j.ygyno.2017.06.024
0090-8258/

that in 17,638 patients from 1992 to 2011, surveillance strategies such as CT scans and PET scans increased significantly, while vaginal cuff cytology remained a routinely utilized surveillance tool with 1.3 cytology samples per patient in 1992 and 2011. Multiple studies have addressed the efficacy of different screening methods – including routine vaginal cuff cytology [7–9], serial abdominal-pelvic CT scans [9–11] and serial CA-125 measurements [9,12]. However, in a review of the literature, Sartori et al. [4] found there to be no widely applicable, effective surveillance method that provided any survival benefit or early diagnosis of recurrence. The only mode of surveillance they found that had utility was the combination of physical exam (including speculum, pelvic, and rectovaginal) and patient symptoms. In a literature review sponsored by the SGO in 2011, Salani et al. [13] came to the same conclusion—recommending that physical exam and symptoms should be the primary tool in surveillance. CT scans and other such surveillance tools can be effective as a targeted diagnostic tool in the setting of suspected recurrence based on exam and history but they should not be used for surveillance. These findings were re-affirmed in a recently published update on post-treatment surveillance by Salani et al. in March 2017 [14].

There have been few, if any, studies looking at clinical adherence to recommendations and none in the United States specifically. One small UK study surveyed 117 providers caring for survivors of gynecologic cancer and found a varied adherence to different clinical guidelines [15]. As such, there is a paucity of information regarding how clinical practices have changed as a result of these recommendations, whether adherence to these guidelines changes outcomes, or whether adherence to these guidelines effects overall cost of care. Using abdominal-pelvic CT scans, vaginal cuff cytology, and CA125 levels as markers of prescription behavior, this study sought to compare the rate of each of these methodologies prescribed solely as surveillance tool for patients diagnosed with endometrial cancer 2 years prior to and 2 years post the June 2011 SGO guidelines. As a secondary outcome, this study sought to compare the outcomes of these two groups as well as evaluate the differences in cost of care between the two groups.

2. Methods and materials

Approval for this study was obtained from the institutional review board of the New York University School of Medicine. Institutional surgical records at Bellevue Hospital in New York City were reviewed and all patients older than or equal to 18 years old who had undergone surgical management for primary endometrial cancer between June 2009 and June 2013 were identified and included in the study. Each patient's electronic medical record was reviewed and the patient's age at diagnosis, ethnicity (defined as Caucasian, Hispanic, African American, Asian, and Other), body mass index, medical comorbidities (defined as hypertension, hyperlipidemia, diabetes, thyroid disease, obesity, cardiac disease, and pulmonary disease), cancer histology, FIGO (International Federation of Obstetrics and Gynecology) grade and stage were recorded. Following primary surgical management, all subsequent clinical notes were reviewed for each return visit. If the clinical note made no mention of abnormal subjective symptoms, abnormal physical exam findings or if it did not explain the targeted purpose for an order for vaginal cytology, abdomino-pelvic CT scan, or CA-125 tumor marker, then an order for each of these diagnostic tests was considered to be a test for surveillance only. All tests ordered following an abnormal subjective or objective finding were considered targeted tests and not included in this analysis. Each patient was followed for each clinical visit until the last recorded follow up visit. Status at last visit was also recorded as no evidence of disease, alive with disease, dead of disease, dead of other causes, and lost to follow-up.

All patients having undergone surgical management for primary endometrial cancer two years prior to the June 2011 SGO guidelines (between June 1, 2009 and May 31, 2011) were grouped within the pre-SGO guidelines group. Those who underwent primary surgery within two years following the new guidelines (between June 1, 2011 and May 31, 2013) were grouped within the post-SGO guidelines group. Each patient was followed from time of primary surgical management to the last follow up visit. The demographic information of both groups was compared. When demographic information was not available—specifically, ethnicity and grade of primary disease; six and 5% of the total sample, respectively—those patients were excluded from analysis of demographic group differences. However, all 94 cases were included in the analysis of primary and/or secondary outcomes.

The primary outcome of this study was to determine if the publication of the June 2011 SGO guidelines led to a change in prescriptions for surveillance tests; specifically, vaginal cytology, abdomino-pelvic CT scans, and CA-125 tumor markers. As such, the number of patients having had vaginal cytology, abdomino-pelvic CT and/or CA-125 tumor markers performed strictly as a method of surveillance in the pre-SGO guideline group was compared to the number of patients in the post-SGO guideline group. Chi-square analysis was performed to determine whether there was a significant difference between the two groups. Additionally, a univariate analysis of variance was used to compare the total numbers of surveillance vaginal cytology performed for the pre-SGO versus post-SGO guideline groups.

A secondary outcome of this study was to determine whether there was a difference in patient outcomes prior to and following implementation of the 2011 SGO guidelines. As such, the status at last follow up visit was compared between the two groups using chi-square analysis. Lastly, another secondary outcome was to determine whether the costs of surveillance changed pre and post the 2011 SGO guidelines. The total number of vaginal cytotology, abdomino-pelvic CT scans, and CA-125 tumor markers were summated for both groups. The numbers of tests performed were multiplied by the Medicare reimbursement rates for each test. This cost was then summated to determine the

Table 1
Demographics.

		Pre-June 2011 ($n = 48$)	Post-June 2011 ($n = 44$)	p value (95% CI)	p value (X^2 value, df)
Age[a]		Mean = 58.90 (SD = 10.11)	Mean = 57.84 (SD = 13.39)	0.669 (55.92–60.81)	
BMI (mean)[a]		Mean = 31.78 (SD = 8.23)	Mean = 34.51 (SD = 10.09)	0.161 (31.23–35.07)	
Ethnicity[b]		f=	f=		
	Caucasian	7 (14.6%)	8 (18.2%)		0.867
	Hispanic	19 (39.6%)	16 (36.4%)		(1.27, 4)
	Black	8 (16.7%)	10 (22.7%)		
	Asian	7 (14.6%)	4 (9.1%)		
	Other	7 (14.6%)	6 (13.6%)		
FIGO Grade[c]		f=	f=		
	Grade 1	18 (41.9%)	26 (61.9%)		0.170
	Grade 2	8 (18.6%)	6 (14.3%)		(3.54, 2)
	Grade 3	17 (39.5%)	10 (23.6%)		
FIGO Stage[d]		f=	f=		
	IA	16 (37.2%)	23 (54.8%)		0.525
	IB	7 (16.3%)	7 (16.7%)		(10.06, 11)
	IC	1 (2.3%)	0 (0.0%)		
	II	2 (4.7%)	4 (9.5%)		
	IIB	2 (4.7%)	0 (0.0%)		
	III	1 (2.3%)	0 (0.0%)		
	IIIA	4 (9.3%)	2 (4.8%)		
	IIIB	0 (0.0%)	1 (2.4%)		
	IIIC	2 (4.7%)	1 (2.4%)		
	IIIC1	3 (7.0%)	1 (2.4%)		
	IIIC2	1 (2.3%)	0 (0.0%)		
	IVB	4 (9.3%)	3 (7.1%)		

[a] Univariate analysis of variance performed.
[b] A 2 × 5 chi square test performed.
[c] A 2 × 3 chi square test performed.
[d] A 2 × 12 chi square test performed.

Please cite this article as: Z.P. Schwartz, et al., Endometrial cancer surveillance adherence reduces utilization and subsequent costs, Gynecol Oncol (2017), http://dx.doi.org/10.1016/j.ygyno.2017.06.024