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Incidental gynecological findings on computed tomographic colonography: Prevalence and outcomes ☆

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ABSTRACT

Objectives. Computed tomographic colonography (CTC) is an investigational method for detecting colorectal polyps. Our objectives were to determine the prevalence of gynecologic findings found incidentally on CTC, and to determine the incidence of additional radiological studies and surgical procedures.

Methods. An electronic database identified female patients who underwent CTC at Walter Reed Army Medical Center from January 2002 to July 2005. CTC reports were pared down using gynecologic keywords. Subsequent radiological studies and pathology reports were evaluated for women with gynecological findings.

Results. Gynecologic extracolonic findings (ECF) were identified in 71 (9.5%) of the 749 women who underwent CTC. Of these 71 women, 14 (20%) underwent additional radiological and/or surgical evaluation. Nine (13%) of these women underwent surgical evaluation; all pathologic diagnoses were benign.

Conclusion. Gynecologic extracolonic findings are common in women undergoing CTC. These gynecologic ECF identified on CTC may lead to additional investigative studies and procedures.

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Introduction

Colorectal cancer is the second leading cause of cancer related deaths and accounts for over 60,000 deaths per year [1]. Screening with colonoscopy and removal of benign adenomatous polyps (which can progress to malignancy over time) have been shown to reduce both the incidence of colorectal cancer and its related mortality [1]. CT colonography (CTC), also known as virtual colonoscopy (VC), is a non-invasive alternative to traditional colonoscopy for colorectal cancer screening [2]. This modality is being more commonly utilized as many patients are averse to traditional colonoscopy due to its duration, its need for conscious sedation, and its invasive nature with risk of colonic perforation. CTC utilizes computed tomography thereby avoiding these risks. Furthermore, its efficacy compares favorably to conventional (optical) colonoscopy; CTC's specificity and sensitivity for detection of colonic polyps >1 cm is 96% and 94%, respectively [1,2].

Since CTC employs computed tomography, it has the additional ability to detect "extra-luminal" lesions in the abdomen and pelvis. This is of particular interest to physicians in many subspecialties, to include gynecology, given the potential of CTC to detect both significant and insignificant, asymptomatic extracolonic disease. Several studies have reported the prevalence of extracolonic findings (ECF) on CTC to be in the range of 15–85% [3–9], and most of these ECF arise from the genitourinary, gastrointestinal, or pulmonary systems. No prior study has specifically evaluated the prevalence of gynecologic findings.

As almost all females undergoing CTC are either peri- or postmenopausal, abnormal gynecologic findings usually result in referral to a gynecologic oncologist. Given that CTC is a new method of colon cancer screening that can yield incidental gynecologic findings, our objective was to determine the prevalence of gynecologic findings in women undergoing CTC in an asymptomatic screening population. Furthermore, we wanted to assess the impact of the identification of these gynecologic ECF, as measured by the incidence of additional follow up radiologic studies and subsequent surgical procedures.

Materials and methods

After obtaining the Institutional Review Board approval, a review of electronic medical records was performed at Walter Reed Army Medical Center. All female patients who underwent CTC colonography from January 2002 to July 2005 were included in the study.

CTC utilizes traditional spiral computed tomographic scanned images and computer processing software to generate a two- and three-dimensional endoluminal perspective of the entire colon. After

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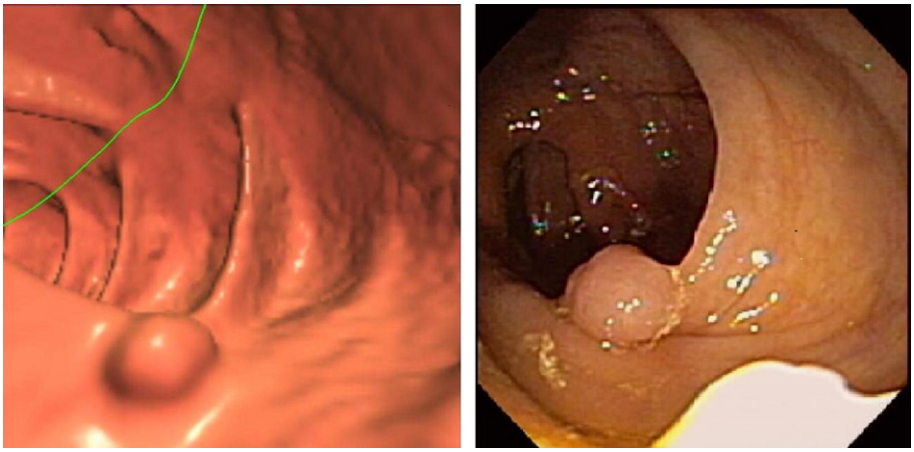

Fig. 1. A three-dimensional endoluminal virtual colonographic image (left) and photograph from optical colonoscopy from the same patient. The images show the same 6 mm sessile polyp within the transverse colon. The pathology proved to be a tubovillous adenoma.

undergoing a standard bowel cleansing, a thin rectal tube is placed and the colon is insufflated with carbon dioxide or air. The patient is then scanned with a low-dose CT technique in both the supine and prone positions. Workstations process the source images to produce both multiplanar two-dimensional images and three-dimensional "fly-through" images (Fig. 1).

CTC reports were queried for gynecologic keywords (i.e. ovary, fibroid, and adnexa) to identify the women who had extracolonic gynecologic findings. From this group of patients, records were reviewed to determine if any subsequent radiologic studies or surgical procedures were performed. Descriptive statistics are reported.

Results

During our study period, 749 women underwent CTC. Our patient population had a mean age of 61.2 ± 10.0 years and displayed an expected racial distribution (Table 1). Gynecologic ECF were identified in 71 (9.5%) patients. The most common findings were uterine (54.9%) and adnexal (40.8%) in origin. Other findings included thrombosed pelvic vein, IUD, Bartholin's cyst, thickened endometrial stripe, and cervical mass (Table 2). Fourteen of the 71 (20%) women underwent additional evaluations to include imaging and/or surgery/tissue sampling. Of these, thirteen patients underwent further imaging, and eleven patients had surgery/tissue sampling (Table 3). The remaining 57 patients had gynecologic ECF that did not warrant additional evaluation since they had benign diagnoses clearly delineated by CTC (most commonly uterine leiomyoma and dominant ovarian follicle).

Of those undergoing tissue sampling, two patients had endometrial biopsies for CTC findings suggestive of a thickened endometrial stripe. Nine patients underwent surgical evaluation by gynecologic oncologists at Walter Reed Army Medical Center for adnexal masses. Their inpatient records were reviewed, and all patients were noted to be asymptomatic prior to their evaluation. Surgical procedures included both exploratory laparotomy and laparoscopy. Four patients underwent exploratory laparotomy, four patients had operative laparoscopy, and one patient had an attempted laparoscopy converted to laparotomy (Table 4). All specimens were benign. One patient, whose medical history included diabetes mellitus and obesity, had a complicated wound infection that required three admissions. Finally, of the original 749 patients, 14 (1.9%) patients ultimately underwent additional testing due to CTC gynecologic findings.

Discussion

This is the first study to specifically evaluate the impact of CTC colon cancer screening with respect to gynecologic ECF. As managers of primary care, it is important for obstetricians/gynecologists to know the potential outcomes of different cancer screening modalities. Our study found that incidental gynecologic findings occur in almost 10% of patients undergoing CTC, and 20% of these patients with gynecologic findings required additional tests and/or procedures.

The most common benign finding in our study was uterine leiomyoma. Not surprisingly, African–American women represented 32% of patients with ECF given their higher prevalence of fibroids (Table 1). African–American women, however, only represented 7% of patients who required additional testing. This reflects the fact that additional imaging was only required for patients with adnexal findings, for which one would not expect a racial disparity.

Several studies evaluating CTC have separated ECF into those of high, moderate, or low-importance [4–11]. Among peri- and post-menopausal patients, an adnexal mass is a highly important finding. Any incidental CT finding of a cystic adnexal mass (simple or complex) warrants further evaluation given the morbidity of ovarian cancer and its poor prognosis. Other studies have reported the prevalence of ovarian cysts in postmenopausal patients to range from 2.5% [12] to

Table 1
Demographics of patients who underwent CT colonography.

Demographic	All patients ($n=749$)	Patients with gynecologic ECF ($n=71$)	Patients with gynecologic ECF who underwent subsequent studies ($n=14$)
Age (year)	61.2 ± 10.0	57.8 ± 8.6	59.3 ± 8.8
Race			
African–American	17%	32%	7%
Caucasian	45%	28%	43%
Other/unknown	38%	39%	50%

ECF, extracolonic findings.

Table 2
Gynecologic ECF in patients undergoing CT colonography.

Gynecologic ECF	Patients with finding (%)
Fibroids	33 (46.5%)
Adnexal/ovarian findings	29 (40.8%)
Uterine enlargement	6 (8.5%)
IUD (intrauterine)	2 (2.8%)
Thrombosed pelvic vein	2 (2.8%)
Thickened endometrial stripe	2 (2.8%)
Bartholin's cyst	1 (1.4%)
Cervical mass	1 (1.4%)

ECF, extracolonic findings. Total finding equals more than 100% since five patients had more than one finding.