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Long-term assessment of bladder and bowel dysfunction after radical hysterectomy☆,☆☆

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ABSTRACT

Objective. To determine the long-term effects of radical hysterectomy on bladder and bowel function.

Methods. Subjects included women who underwent radical hysterectomy for early stage cervical cancer between 1993 and 2003. Two contemporary controls who underwent extrafascial abdominal hysterectomy for benign disease were identified for each subject. Identified subjects and controls were surveyed. The Urogenital Distress Inventory (UDI) was used to assess symptoms of incontinence, and the Incontinence Impact Questionnaire (IIQ) was used to examine the impact of incontinence on quality of life. The Manchester Health Questionnaire and Fecal Incontinence Quality of Life Scale (FIQL) were used to assess anorectal symptoms.

Results. Surveys were returned by 66 of 209 (32%) subjects and 152 of 428 (36%) controls. Overall, 50% of subjects and 42% of controls reported mild incontinence symptoms; 34% of subjects and 35% of controls reported moderate–severe symptoms ($p=0.72$). Incontinence was associated with moderate–severe impairment in 18% of subjects and 14% of controls ($p=0.74$). Fecal incontinence symptoms were uncommon, not differing between subjects and controls.

Conclusion. Urinary incontinence is relatively common after radical hysterectomy, but severe anorectal dysfunction is uncommon. Radical hysterectomy does not appear to be associated with more long-term bladder or anorectal dysfunction than simple hysterectomy.

Introduction

Cervical cancer remains the second most common malignancy among women worldwide and over 11,070 cases of invasive cervical cancer will be diagnosed in the United States in 2008 [1]. Radical surgery or radiotherapy is used for the treatment of localized cervical carcinoma [2]. The most common form of radical hysterectomy used in treating cervical cancer (Type III radical hysterectomy) involves removal of the uterus, upper vagina, uterosacral ligaments and parametrial tissue [3]. Although radical hysterectomy results in high rates of cure, the procedure also carries with it significant morbidity [4]. The most frequently reported complication associated with radical hysterectomy is bladder dysfunction, though the procedure also carries the risk of lymphedema, infection, and bowel dysfunction [5–7]. The incidence of postoperative voiding dysfunction reported in the literature varies from 8% to 80%, likely reflecting differences in instrumentation and/or operative technique [8].

The disruption of normal bladder and bowel function associated with radical hysterectomy likely results from disruption of the fibers of the autonomic nervous system, carried in the pelvic plexus, that supply these pelvic organs. These fibers track along the inferior portion of the cardinal and uterosacral ligaments and are at risk during dissection of the parametrial soft tissue and uterosacral ligaments during extended hysterectomy [5,6,8–11]. Loss of sympathetic innervation can lead to low bladder compliance and excitatory parasympathetic dominance of the detrusor, resulting in a number of bowel and bladder related complaints including urinary urgency, incontinence, constipation, incomplete stool evacuation, fecal incontinence, and irritable bowel syndrome [5–9,12,13].

Although early, transient changes in bowel and bladder function are common after radical hysterectomy, the long-term prevalence of

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symptoms and extent of morbidity associated with the procedure has not been well established. We assessed the long-term effects of radical hysterectomy on bowel and bladder dysfunction in patients undergoing radical hysterectomy for early stage cervical cancer.

Materials and methods

The Washington University School of Medicine Human Studies committee approved this study. Women with stage Ib-IIa cervical cancer who underwent type III radical hysterectomy for invasive cervical cancer between 1993 and 2003 were identified from a review of hospital databases. Two patients who underwent abdominal type I extra-fascial hysterectomy for benign indications excluding prolapse or incontinence issues during the same time period were used as controls for each subject. All hysterectomies were performed by 5 attending surgeons within the division of gynecologic oncology using a relatively standardized surgical approach, with few individual nuances. A two to one control to case ratio was used to increase the strength of the comparison given a limited number of cases available, though formal matching was not possible. Symptoms of urinary and anal incontinence were evaluated using two previously validated instruments. Surveys were mailed to cancer patients and matched controls, including a cover letter indicating the voluntary nature of the study, its objectives and design. Voluntary return of the survey was considered informed consent. A second mailing was sent to nonresponders to maximize patient response.

Symptoms of urinary incontinence were evaluated using the Urogenital Distress Inventory (UDI). This survey lists 19 symptoms associated with incontinence and asks patients to grade their degree of bother from them [14]. Sample statements included, “do you experience, and if so, how much are you bothered by: frequent urination, urine leakage related to the feeling of urgency” etc. The Incontinence Impact Questionnaire (IIQ), a 30-question instrument, was utilized to examine the effect of urinary incontinence on quality of life [14,15]. Patients were asked to quantify on a scale ranging from 0 to 3 the extent to which urinary incontinence affects their daily life and emotional well being. Sample statements included, “Has urine leakage and/or vaginal prolapse affected your: ability to do household chores, physical recreation, or other exercise?” etc. The Manchester Health Questionnaire is a validated instrument for assessing health-related quality of life in women with anorectal dysfunction. Patients were asked to grade the extent to which they modified their behavior due to accidental bowel leakage with respect to social activities, travel, dietary modification, and sexual activity. The Fecal Incontinence Quality of Life Scale (FIQL) is a valid and reliable instrument used to evaluate health-related quality of life associated with fecal incontinence [16]. Patients were asked to grade the frequency of fecal related behavioral modifications and associated feelings on a scale from 0 to 3 from “never” to “always”, such as “Due to accidental bowel leakage: I am afraid to go out; I avoid visiting friends, I avoid traveling, etc.” [17].

Aggregate analysis was preformed by calculating a cumulative severity score for each survey (IIQ, UDI, FIQL, Manchester health survey) by combining responses for all individual questions. This data was then stratified by numerical score into no, mild, moderate, and severe distress categories based on the total numerical score divided into lower, middle, and upper thirds to reflect each severity category. Individual questions were analyzed using Fisher's exact or student *t*-test (Mann–Whitney test if normality assumption violated) as appropriate. For purposes of data analysis, a p value of <0.05 was considered statistically significant. To control for any potential confounding influence of radiation, a separate analysis was performed excluding cancer patients who received adjuvant radiation therapy.

Results

Surveys were sent to 637 patients, including 209 subjects and 428 controls. Responses were returned by 66 (32%) subjects and by 152 (36%) controls. Demographic data is displayed in Table 1. The mean age of cancer patients was 44, that of the controls 49 ($p=0.02$). Though median gravidity for cancer patients was higher than for controls (2.9 vs 2.1, $p=0.01$) median parity was relatively similar (2.3 vs 1.8, $p=0.04$). Among cancer patients, 76% reported no previous chemotherapy and 93% reported never receiving radiation treatment. None of the cancer patients had recurrent disease at the time of survey.

The summated UDI scores were stratified into distress categories for analysis (0 = no symptoms, 1–5 = mild symptoms, 6–12 = moderate symptoms, >12 = severe symptoms). No symptoms of urinary incontinence (UDI) were reported by 17% of the cancer patients and 22% of the controls (Table 2). Mild incontinence symptoms were reported by 50% of cancer patients and 43% of controls, while moderate to severe symptoms were noted by 33% of cancer patients and 36% of controls. ($p=0.72$) Although symptoms of incontinence were relatively common, they did not appear to impair the overall quality of life as assessed by the Incontinence Impact Questionnaire (Table 3). Fifty-seven percent of cancer patients and 65% of controls reported no impairment in quality of life attributable to urinary incontinence. Mild to moderate symptoms were noted in 25% of cancer patients and 28% of control subjects, while severe impairment was reported in 9% of cancer patients and 7% of controls ($p=0.74$). No statistically significant difference was found between cancer patients and controls with regard to any individual questions or combined severity groups for either survey component.

Manchester Health Questionnaire responses were stratified into distress categories as described above (None = 0, Mild = 1–8, Moderate = 9–18, Severe = >18) (Table 4). Seventy-six percent of cancer patients and 72% of controls reported no alteration of behavior as a result of anorectal symptoms. Mild changes in behavior were noted in 13% of cancer patients and 17% of controls; and moderate to severe modification in behavior related to fecal incontinence was found in 11% of both cancer patients and controls. No statistically significant difference was present regarding any individual questions or with respect to the overall severity score (overall $p=0.69$).

Psychologic impairment due to anal incontinence was assessed using the cumulative FIQL score stratified into severity categories (none = 56, mild = 44–55, moderate = 31–43, and severe = <30). Seventy-seven percent of subjects and 74% of controls reported no psychologic impairment. Fifteen percent of cancer patients and 20% of controls acknowledged mild to moderate levels of psychologic impairment due to bowel leakage, while 8% of subjects and 5% of controls indicated severe impairment as a result of these symptoms.

Table 1
Patient characteristics.

Demographic data	Cancer patients	Controls	p value
Number of patients selected	209	428	–
Initial and secondary surveys returned	66 (31.5%)	152 (35.5%)	–
Mean age at surgery	44	49	0.018
Gravidity	2.9	2.1	0.007
Parity	2.3	1.8	0.043
Treatment history (if applicable)			
Radiation treatment received	16 (7.7%)	–	–
Prior chemotherapy received	5 (2.4%)	–	–
Recurrent disease	0 (0%)	–	–
Performance status			
Very good–excellent health on FIQL	30 (56.6%)	71 (47.7%)	0.3967
Good health	16 (30.2%)	47 (31.5%)	
Poor health	7 (13.2%)	31 (20.8%)	

Demographic variables for cancer patients and controls. Treatment history pertains to patients with cervical cancer only. Performance status per patient self reporting in the Fecal Incontinence and Quality of Life Questionnaire (FIQL).
Data analyzed for the number of patients completing the survey.