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ORIGINAL ARTICLE

Assessment of an onco-sexology support and follow-up program in cervical or vaginal cancer patients undergoing brachytherapy

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Abstract

Purpose Women's sexual health and wellbeing with cervical or vaginal cancer may be largely affected by complications from external beam radiotherapy (EBRT) and utero-vaginal brachytherapy (BT), of which vaginal stenosis is the main complication. The objective of this study was to assess the impact of support by a nurse sexologist on sexuality, vaginal side-effects, and the quality of clinical follow-up in patients treated with brachytherapy for cervical or vaginal cancer.

Methods We performed a retrospective study of the sexuality of women treated for cervical or vaginal cancer. Data from patients with cervical or vaginal cancer who underwent brachytherapy between 2013 and 2017 were collected at Institut Universitaire de Cancer de Toulouse-Oncopôle (IUCT-Oncopôle). Patients were divided into two groups: group A (intervention group) received support from a nurse sexologist and group B (control group) did not. The chi-square test and a logistic multivariate model were used for data analysis.

Results A total of 156 patients were included in this study, including 57.7% who were followed by a nurse sexologist. We observed low compliance in using vaginal dilators after brachytherapy and/or radiotherapy over time regardless of the group, and patients' sexual activity was inadequately addressed. Information regarding the resumption of sexuality 2 months after treatment was missing in 1.1% of patients in group A and in 36.4% of patients in group B. Multivariate analysis showed that patients in group A had a lower risk of developing vaginal stenosis with $OR_{crude} = 0.5$ (95% CI = 0.25–0.92) and $OR_{adj.} = 0.5$ (95% CI = 0.26–1.09) compared with those in group B.

Conclusion This retrospective study highlights the lack of information collected by physicians during follow-up concerning the sexuality of patients with cervical or vaginal cancer treated by EBRT and BT. The support offered by nurse sexologists in improving patients' sexual activity and reducing their physical side-effects such as vaginal stenosis is likely to be beneficial. A prospective study is currently being conducted to validate the present findings.

Keywords Cervical · Supportive care · Cancer · Sexuality · Brachytherapy

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Introduction

Cervical and vaginal cancers are among the most common cancers in women with approximately 500,000 women affected worldwide [1]. This incidence is comparatively higher in developed countries than in resource-limited ones. In the USA, 12,200 cervical cancer cases are diagnosed each year with 4100 deaths [2]. The incidence of cervical cancer varies from 10 to 40 cases per 100,000 women in Europe and the USA, but it is more than 40 cases per 100,000 women in Asia and South America [3]. In France, 3000 new cases are diagnosed each year. Cervical cancer is ranked 10th in terms of incidence and 15th in terms of mortality [4, 5].

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Sexual disorders are known to be frequent after cancer, particularly in gynecological cancer patients. Locally advanced cervical cancer treatments combine external beam radiotherapy (EBRT) with concomitant chemotherapy and utero-vaginal brachytherapy (BT). If these treatments fail, surgery may be considered essential. Acute and chronic side-effects can include vaginal dryness, dyspareunia, sexual desire disorder, loss of vaginal elasticity, vaginal fibrosis, and stenosis. Nevertheless, in the main studies, these sexual effects are not described as frequently as urinary or digestive effects.

Some studies have shown that patients treated with external radiotherapy develop long-term vaginal mucosal reshaping and vaginal narrowing [6–8]. In addition to these physical impairments, women can be emotionally and psychologically affected by the diagnosis announcement and by the sexual disorders that may occur after treatment [9–12]. Pelvic irradiation can cause ovarian endocrine disruption, characterized by decreased secretion of estrogen and progesterone, leading to early menopause and possibly to a decline in libido [13]. Few studies have described the effect of chemotherapy on the sexuality of women with cervical and vaginal cancer. Regarding surgery, hysterectomy is known to affect the length and elasticity of the vagina [14, 15]. EBRT and BT induce vaginal fibrosis, which leads to dryness and vaginal stenosis, and the anatomy and physiology of the whole female reproductive system may be impacted whatever the treatment. These changes result in sexual disorders such as decreased sexual desire, dyspareunia, vaginal dryness, loss of orgasm, and reduction of sexual attractiveness. These symptoms may last for several months depending on the type of treatment given and are frequently definitive [16–18].

Krumm et al. showed in a prospective study in the USA that patients who were encouraged to use of dilators and to have regular sexual intercourse after BT to prevent adhesive flanges that could lead to vaginal stenosis were more likely not to have sexual problems compared with those who were not encouraged to do so [19]. The sexuality of patients is often discussed little in consultations with physicians, and data is sparse on this issue, especially in women [20]. However, patients consider it to be important [21].

To reduce the incidence of the side-effects of cervical and vaginal cancer treatments and to propose more supportive care in sexology, a sex therapy support program was set up in 2015 at the EBRT and BT department at Institut Universitaire de Cancer de Toulouse-Oncopôle (IUCT-Oncopôle).

The objective of this study was to evaluate the impact of support from a nurse sexologist on the sexuality, late vaginal effects, and quality of clinical monitoring in patients treated with EBRT and BT for cervical or vaginal cancer.

Materials and methods

This retrospective study concerned patients with cervical and/or vaginal cancer treated with BT at IUCT-Oncopôle from 2013 to 2017. A total of 156 patients with a primary locally advanced tumor of the cervix and vagina with more than 6-month clinical follow-up were included. We analyzed data from patients treated from 2015 to 2017 (group A) who received sexual therapy (followed by a nurse sexologist) and patients treated from 2013 to 2015 (group B) who did not. All patients in group A were seen in consultation by the same person, i.e., a dedicated nurse with a university degree in sexology.

Therapy was conducted in three steps. At the first consultation just after the consultation with the radiation oncologist, the sexologist presented the BT service and care pathway to the patient and collected the first personal and sexual information. Then, during the hospital stay, the sexologist explained the side-effects of BT to the patient and their impact on sexuality. She also discussed the concept of vaginal re-education and the use of vaginal dilators. Finally, at the 2-month follow-up visit, she evaluated the sexual function and body image of the participants and reiterated the importance of vaginal dilatation. Women in group B received a standard explanation about the different side-effects of BT and about using a dilator from the physician at the first consultation and during BT in hospital. According to their personal practice, some physicians asked the patients about sexual effects at the 2-month follow-up consultation.

A structured data collection form was used to collect data. Women were divided into two groups: group A with sexual support, group B without. The following information was collected: socio-demographic characteristics (age, menopause, living in couple, children), tumor characteristics (classification of the International Federation of Obstetrics Gynecology stage, WHO stage), sexological characteristics (sexual activity, lubrication, and sexual desire), tumor treatment (surgery, adjuvant chemotherapy, and radiotherapy), vaginal rehabilitation (use of vaginal dilator, duration of use), and adverse effects of EBRT and BT (vaginal dryness, vaginal elasticity, dyspareunia, metrorrhagia, vaginal fibrosis, vaginal stenosis, and magnetic resonance imaging yes/no). Adverse effects were evaluated according to common terminological criteria for adverse events (CTCAE v5) [22].

Statistical analysis

Descriptive analysis was performed to describe the overall data. A bivariate analysis was used to analyze the relationship between specific sexual and follow-up support. It concerned sexual activities, vaginal rehabilitation, and long-term vaginal late effects, at 2 months, 6 months, and at last medical

consultation. The chi-square test was used in bivariate analysis (categorical or dichotomous variables) or Fisher's exact test when sizes were less than 5. Odds ratio with 95% confidence interval was estimated with a logistic multivariate analysis model, and significance was set at 0.05. Adjusted variables were sexual activities, vaginal stenosis, pelvic pain, vaginal dryness, and sexual desire. Missing data (unknown data) were added for women who answered "No" in bivariate and multivariate analysis. All analyses were performed using Stata 12.0 software (StataCorp, College Station, TX, USA).

Results

Socio-demographic characteristics

A total of 156 patients with cervical (92.3%) or vaginal cancer (7.7%) treated by EBRT and BT were included in the present study (Table 1). Among them, 57.7% of patients were followed by a nurse sexologist. The median age was 55 years (range 27–85) in the whole population, 57 years (range 27-85) in group A, and 51.5 years (range 28–81) in group B. The median follow-up was 23 months (range 6.4–55.2). More than half of the participants were menopausal (57.7%) and lived with spouses (60.3%). All patients were treated by EBRT and BT, 21.8% had uterine surgery after BT, and 6.4% had adjuvant chemotherapy. The details can be found in Table 1.

Table 1 Description of study population

Characteristics	Patients $N = 156$	Group A $N = 90$ (57.7)	Group B $N = 66$ (42.3)
Age (Years)*	55 (27–85)	57 (27–85)	51.5 (28–81)
Menopause			
Yes	90 (57.7)	52 (57.8)	38 (57.6)
No	50 (32.0)	27 (30.0)	23 (34.8)
Unknown	16 (10.3)	11 (12.2)	5 (7.6)
Couple			
Yes	94 (60.3)	64 (71.1)	30 (45.5)
No	28 (17.9)	18 (20.0)	10 (15.1)
Unknown	34 (21.8)	08 (8.9)	26 (39.4)
Tumor localization			
Cervix	144 (92.3)	80 (88.9)	64 (97.0)
Vagina	12 (7.7)	10 (11.1)	02 (3.0)
Uterine or vaginal surgery			
Yes	34 (21.8)	13 (14.4)	21 (31.8)
No	122 (78.2)	77 (85.6)	45 (68.2)
Adjuvant chemotherapy			
Yes	10 (6.4)	08 (8.9)	02 (3.0)
No	146 (93.6)	82 (91.1)	64 (97.0)

Age* : median (min-max), min: minimum, max: maximum

Much information was lacking in the patients' medical records. The marital status of patients in group B was unknown for 39.4% of patients, compared with only 8.9% of patients in group A. Information regarding the resumption of sexuality 2 months after treatment was missing in 36.4% of patients in group B, and in only 1.1% of patients in group A. Six months after BT, 28.8% of women in group B had no data on sexual activity vs 15.6% in group A.

Sexual behavior

Sexual activities: 33.3% of patients had sexual activity and 37.8% of patients had no sexual activity at the last follow-up. The information was unknown in 28.5% of patients (Table 2). In group A, patients had more sexual intercourse (chi2 = 40.75 with a $P = 0.0001$) 2 months after BT than in group B. However, we found no significant difference between patients in group A and B after 6 and 23 months of follow-up (chi2 = 4.11 and chi2 = 5.15, respectively). (Table 3)

Use of dilators: 13.5% of patients used dilators 2 months after BT (Table 4), and only 10.2% used them 6 months after it (Table 5). The bivariate analysis shows that patients in group A used vaginal dilators more than those in group B after 2 and 6 months, chi2 = 24.27, $P = 0.0001$ and chi2 = 17.93, $P = 0.0001$, respectively (Table 3).

Side-effects of EBRT and brachytherapy

Pelvic pain: Two months after BT, the frequency of pelvic pain was approximately the same in group A (10%) and group B (9.1%) with a $P = 0.849$. However, the frequency of pelvic pain was slightly higher in group A (17.8%) than in group B (7.6%) but without significance, with a $P = 0.065$ after 6 months of follow-up (Table 6).

Vaginal dryness: The rate of vaginal dryness was higher in group A (20%) than in group B (7.6%) 2 months after BT, with a significant difference between the two groups ($P = 0.031$). The difference was not statically significant 6 months after BT (17.8% in group A and 12.1% in group B with a $P = 0.333$) (Table 6).

Vaginal stenosis: The rate of vaginal stenosis was similar in both groups 2 months after BT (24.4% in group A and 22.7% in group B), but the frequency of vaginal stenosis was significantly higher in group B (54.5%) than in group A (36.7%) with a $P = 0.026$, 6 months after BT. This difference was no longer significant at the last visit ($P = 0.052$) (Table 6). In multivariate analysis, patients in group A had less risk to develop vaginal stenosis than those in group B, with (OR_{crude} =

Table 2 Description of vaginal stenosis and sexual activity of patients at the latest news at 23 months of median follow-up

Characteristics	Patients $N = 156$	Group A $N = 90$ (57.7)	Group B $N = 66$ (42.3)
Vaginal stenosis (CTCAE)			
No stenosis	85 (54.5)	55 (61.1)	30 (45.4)
Grade 1	5 (3.2)	02 (2.2)	03 (4.6)
Grade 2	10 (6.4)	05 (5.6)	05 (7.6)
Grade 3	49 (31.4)	24 (26.7)	25 (37.9)
Unknown	7 (4.5)	04 (4.4)	03 (4.5)
Sexual activities			
Yes	52 (33.3)	36 (40.0)	16 (24.2)
No	59 (37.8)	33 (36.7)	26 (39.4)
Unknown	45 (28.9)	21 (23.3)	24 (36.4)

0.5 with 95% CI = 0.25–0.92 and $P = 0.027$, $OR_{adj.} = 0.5$ with 95% CI = 0.26–1.09 and $P = 0.083$) (Table 7).

MRI: Medical resonance imaging is not clinically indicated or systematic in the follow-up after BT. It is systematically performed in non-examinable women because of their complete vaginal stenosis. MRI was performed in 20% of women in group A and 33.3% in women from group B, without significant difference ($P = 0.06$).

Sexual desire

In multivariate analysis, women in group A were more likely to experience sexual desire than those in group B ($OR_{crude} = 2.2$ with 95% CI = 1.10–4.40 and $P = 0.025$, $OR_{adj.} = 4.6$ with 95% CI = 1.08–19.24 and $P = 0.038$). There was no significant difference in sexual activity, pelvic pain, or vaginal dryness (Table 7).

Discussion

This descriptive retrospective study assessed the impact of support from a sexologist nurse on the sexual behavior, side-effects, and quality of clinical follow-up of patients with cervical or vaginal cancer who received BT.

The main finding is that information about the sexual behavior of such patients is lacking. Even very important information like marital status was sometimes not reported, so it is not possible to know which information is given to them regarding sexual side-effects and preventive actions, like the use of vaginal dilators. Yet the management of sexuality has always been a requirement in French Cancer plans, which recommend rehabilitation into psychosocial life through early and easy access to supportive care. Patients seem to request this type of support or at least are ready to receive information on it, and they are able to contact a sex therapist whenever they feel the need or the desire [21]. A questionnaire administered to 200 patients in our radiotherapy department upon diagnosis revealed that half of them, irrespective of their sex, would be interested in a consultation with a sex therapist at the same time as their cancer treatment [23]. The main reason for this lack of information is that in general, the sexuality of patients with cancer is discussed with their oncologist only partially and is still taboo in 2020. Therefore, dedicated support appears to be essential to improve the follow-up of patients with vaginal and cervical cancer. The same team found that the quality of sexual life after radiotherapy was mostly unsatisfactory [23].

The main side-effects after BT are vaginal fibrosis and stenosis, pelvic pain, and vaginal dryness. Our results are comparable with others. For example, a UK study showed that among women with cervical cancer and treated by

Table 3 Bivariate analysis of the distribution of patients according to their sexual behavior and a sexology support

Characteristics	Sexological support (Yes or not) and follow-up											
	Evaluation at 2 months				Evaluation at 6 months				Last evaluation at 23 months			
	Yes	No	Chi2	*P* value	Yes	No	Chi2	*P* value	Yes	No	Chi2	*P* value
	90 (57.7)	66 (42.3)			90 (57.7)	66 (42.3)			90 (57.7)	66 (42.3)		
Sexual activities			40.75	***0.0001***			4.11	0.128			5.15	0.076
Yes	26 (28.9)	04 (6.1)			38 (42.2)	22 (33.3)			36 (40.0)	16 (24.2)		
No	63 (71.1)	38 (57.5)			38 (42.2)	25 (37.9)			33 (36.7)	26 (39.4)		
Unknown	01 (1.1)	24 (36.4)			14 (15.6)	19 (28.8)			21 (23.3)	24 (36.4)		
Use of dilator			24.27	***0.0001***			17.93	***0.0001***			-	-
Yes	20 (22.2)	01 (1.5)			10 (11.1)	06 (9.1)			-	-		
No	60 (66.7)	65 (98.5)			57 (63.3)	59 (89.4)			-	-		
Unknown	10 (11.1)	00 (0.0)			23 (25.6)	01 (1.5)			-	-		

P-value <0.05

Table 4 Distribution of factors related to the sexuality of patients, 2 months after brachytherapy

Characteristics	Patients $N = 156$	Group A $N = 90$ (57.7)	Group B $N = 66$ (42.3)
Sexual activities			
Yes	30 (19.3)	26 (28.9)	04 (6.0)
No	101 (64.7)	63 (70.0)	38 (57.6)
Unknown	25 (16.0)	01 (1.1)	24 (36.4)
Pelvic pain (CTCAE)			
No pain	141 (84.8)	81 (90.0)	60 (90.9)
Grade 1 Mild pain	6 (5.7)	04 (4.4)	02 (3.0)
Grade 2 Moderate pain	9 (7.6)	05 (5.6)	04 (6.1)
Use of vaginal lubricant			
Yes	9 (5.8)	08 (8.9)	01 (1.5)
No	4 (2.5)	02 (2.2)	02 (3.0)
NA	51 (32.7)	42 (46.7)	09 (13.6)
Unknown	92 (59.0)	38 (42.2)	54 (81.8)
Use of dilator			
Yes	21 (13.5)	20 (22.2)	01 (1.5)
No	125 (80.1)	60 (66.7)	65 (98.5)
Unknown	10 (6.4)	10 (11.1)	00 (0.0)
Vaginal stenosis (CTCAE)			
No stenosis	119 (76.3)	68 (75.6)	51 (77.3)
Grade 1 Mild	7 (4.5)	03 (3.3)	04 (6.1)
Grade 2 Moderate	15 (9.6)	10 (11.1)	05 (7.6)
Grade 3 Severe	15 (9.6)	09 (10.0)	06 (9.1)
Vaginal dryness (CTCAE)			
No dryness	113 (72.4)	71 (78.9)	42 (63.6)
Grade 1 Mild	13 (8.4)	09 (10.0)	04 (6.1)
Grade 2 Moderate	10 (6.4)	09 (10.0)	01 (1.5)
Unknown	20 (12.8)	01 (1.1)	19 (28.8)
Dyspareunia			
Yes	09 (5.8)	07 (7.8)	02 (3.0)
No	30 (19.2)	20 (22.2)	10 (15.1)
Unknown	117 (75.0)	63 (70.0)	54 (81.8)
Sexual desire			
Yes	49 (31.4)	40 (44.5)	09 (13.6)
No	34 (21.8)	29 (32.2)	05 (7.6)
Unknown	73 (46.8)	21 (23.3)	52 (78.8)
Vaginal fibrosis (CTCAE)			
No fibrosis	85 (54.5)	44 (48.9)	42 (62.1)
Grade 1 Mild	31 (19.9)	20 (22.2)	11 (16.7)
Grade 2 Moderate	31 (19.9)	21 (23.3)	10 (15.1)
Grade 3 Severe	08 (5.1)	05 (5.6)	03 (4.6)

Common Terminology Criteria for Adverse Events (CTCAE): dénomination anglaise de la terminologie des critères de classification des effets secondaires du traitement post curiethérapie

Table 5 Distribution of factors related to the sexuality of patients, 6 months after brachytherapy

Characteristics	Patients $N = 156$	Group A $N = 90$ (57.7)	Group B $N = 66$ (42.3)
Sexual activities			
Yes	60 (38.5)	38 (42.2)	22 (33.3)
No	63 (40.4)	38 (42.2)	25 (37.9)
Unknown	33 (21.1)	14 (15.6)	19 (28.8)
Pelvic pain (CTCAE)			
No pain	135 (86.5)	74 (82.2)	61 (92.4)
Grade 1	95.7	08 (8.9)	01 (1.5)
Grade 2	12 (7.7)	08 (8.9)	04 (6.1)
Use of vaginal lubricant			
Yes	14 (9.0)	10 (11.1)	04 (6.1)
No	5 (3.2)	03 (3.3)	02 (3.0)
NA	27 (17.3)	21 (23.3)	06 (9.1)
Unknown	110 (70.5)	56 (62.2)	54 (81.8)
Use of dilator			
Yes	16(10.2)	10(11.1)	06(9.1)
No	116(74.4)	57(63.3)	59(89.4)
Unknown	24(15.4)	23(25.6)	01(1.5)
Vaginal stenosis (CTCAE)			
No stenosis	87 (55.8)	57 (63.3)	30 (45.5)
Grade 1	7 (4.5)	03 (3.3)	04 (6.1)
Grade 2	14 (9.0)	05 (5.6)	09 (13.6)
Grade 3	42 (26.9)	20 (22.2)	22 (33.3)
Unknown	6 (3.8)	05 (5.6)	01 (1.5)
Vaginal dryness (CTCAE)			
No dryness	103(66.0)	68(75.6)	35(53.0)
Grade 1	7(4.5)	06(6.7)	01(1.5)
Grade 2	14(9.0)	08(8.8)	06(9.1)
Grade 3	3(1.9)	02(2.2)	01(1.5)
Unknown	29(18.6)	06(6.7)	23(34.9)
Dyspareunia			
Yes	15 (9.6)	09 (10.0)	06 (9.1)
No	38 (24.4)	24 (26.7)	14 (21.2)
Unknown	103 (66.0)	57 (63.3)	46 (69.7)
Sexual desire			
Yes	56 (35.9)	39 (43.3)	17 (25.8)
No	27 (17.3)	21 (23.3)	06 (9.1)
Unknown	73 (46.8)	30 (33.4)	43 (65.1)
Vaginal fibrosis (CTCAE)			
No fibrosis	73 (46.8)	39 (43.3)	34 (51.5)
Grade 1 Mild	24 (15.4)	11 (12.2)	13 (19.7)
Grade 2 Moderate	38 (24.4)	24 (26.7)	14 (21.2)
Grade 3 Severe	21 (13.4)	16 (17.8)	05 (7.6)

Common Terminology Criteria for Adverse Events (CTCAE): dénomination anglaise de la terminologie des critères de classification des effets secondaires du traitement post curiethérapie

Table 6 Bivariate analysis of the distribution of patients according to the side effects of brachytherapy

Characteristics	Sexological support (Yes or not)											
	Evaluation at 2 months				Evaluation at 6 months				Last evaluation at 23 months			
	Yes	No	Chi2	*P* value	Yes	No	Chi2	*P* value	Yes	No	Chi2	*P* value
	90 (57.7)	66 (42.3)			90 (57.7)	66 (42.3)			90 (57.7)	66 (42.3)		
Vaginal stenosis			0.06	0.803			4.93	***0.026***			3.80	0.051
Yes	22 (24.4)	15 (22.7)		-	33 (36.7)	36 (54.5)			31 (34.4)	33 (50.0)		
No	68 (75.6)	51 (77.3)			57 (63.3)	30 (45.5)			59 (65.6)	33 (50.0)		
Pelvic pain			0.036	0.849			3.40	0.065				
Yes	09 (10.0)	06 (9.1)			16 (17.8)	05 (7.6)						
No	81 (90.0)	60 (90.9)			74 (82.2)	61 (92.4)						
Vaginal irritation			1.53	0.698			0.017	0.894				
Yes	03 (3.3)	03 (4.5)			05 (5.6)	04 (6.1)						
No	87 (96.7)	63 (95.5)			85 (94.4)	62 (93.9)						
Vaginal dryness			4.67	***0.031***			0.935	0.333				
Yes	18 (20.0)	05 (7.6)			16 (17.8)	08 (12.1)						
No	72 (80.0)	61 (92.4)			74 (82.2)	58 (87.9)						
Fibrosis			3.35	0.067			1.02	0.312				
Yes	46 (51.1)	24 (36.4)			51 (56.7)	32 (48.5)						
No	44 (48.9)	42 (63.6)			39 (43.3)	34 (51.5)						
Systematic MRI			-	-			3.55	0.060				
Yes	-	-			18 (20.0)	22 (33.3)						
No	-	-			72 (80.0)	44 (66.7)						

P-value <0.05

Table 7 Multivariate analysis of the distribution of patients according to the side effects of brachytherapy after 6 months

Characteristics	Sexological support		Univariate		Multivariate	
	Yes	No	OR (95%CI)	*P* value	OR* (95%CI)	*P* value
	90 (57.7)	66 (42.3)				
Sexual activities				*0.26*		*0.100*
Yes	38 (42.2)	22 (33.3)	01		01	
No	52 (57.8)	44 (66.7)	1.5 (0.75–2.83)		0.3 (0.74–1.25)	
Vaginal stenosis				***0.027***		*0.083*
Yes	33 (36.7)	36 (54.5)	01		01	
No	57 (63.3)	30 (45.5)	0.5 (0.25–0.92)		0.5 (0.26–1.09)	
Pelvic pain				*0.073*		*0.107*
Yes	16 (17.8)	05 (7.6)	01		01	
No	74 (82.2)	61 (92.4)	2.6 (0.91–7.61)		2.4 (0.82–7.33)	
Vaginal dryness				0.336		*0.712*
Yes	16 (17.8)	08 (12.1)	01		01	
No	74 (82.2)	58 (87.9)	1.6 (0.63–3.92)		1.2 (0.45–3.16)	
Sexual desire				***0.025***		***0.038***
Yes	39 (43.3)	17 (25.8)	01		01	
No	51 (56.7)	49 (74.2)	2.2 (1.10–4.40)		4.6 (1.08–19.24)	

OR odd ratio, *CI* confidence interval, *OR** adjusted OR

P-value <0.05

EBRT, 34.2% had sexual desire disorders, 16.3% had orgasm disorders, 13% had vaginal dryness and dyspareunia, and 21.1% experienced a loss of sexual pleasure after 12 months of follow-up [24]. In their literature review on pelvic EBRT and sexual function in women, Jensen P.T. et al. reported that women treated for cervical cancer declared having lost their femininity, their sexual attraction, and confidence in themselves because of metrorrhagia, dyspareunia, vaginal dryness, and vaginal shortening by loss of vaginal elasticity. This led to the fear of having sex and a decrease in sexual pleasure [25].

Very few patients in our series reported using vaginal dilators, regardless of the sexual support, but this information was lacking in 70% of patients after 6 months of follow-up. Shover et al. found that only 14% of women treated for cervical cancer used a dilator at the recommended frequency of three times a week [26]. This is in line with our finding that 22.2% of our patients were suing dilators 2 months after BT and 11.1% after 6 months. In contrast, Davidson et al. found that 78% of patients used dilators frequently after beginning radiotherapy [27]. Furthermore, Bakker et al. reported that 88% of their patients were using dilators at least twice a week at 6 months, and 75% at 12 months [28]. Our finding highlights the need for support from a specialist to provide therapeutic rehabilitation and reassurance to women with cervical cancer who are undergoing BT.

A significantly greater proportion of the patients in group A had sexual intercourse (28.9%) than in those in group B (6.1%) 2 months after BT. This proportion increased in both groups after 6 and 23 months of follow-up. This finding is consistent with other studies. In a study of 57 patients with cervical cancer treated with radiotherapy, Lasnik E et al. found that only 33.3% had resumed sexual intercourse 3 months after irradiation. They explained this sexual abstinence by the fear that they still might have cancer, the fear of pain and a lack of libido [29].

Bivariate analysis showed that the proportion of vaginal stenosis (36.7%) was lower in group A than in group B (54.5%). This difference was statistically significant after 6 months of follow-up in logistic multivariate analysis. At the last visit, the difference was at the borderline of statistical significance with 34.4% for vaginal stenosis in group A and 50% in group B ($P = 0.051$). While our data were limited and do not allow firm conclusions to be drawn, we believe that early sexual intercourse after BT can help to reduce the risk of vaginal stenosis, which would explain the lower proportion of vaginal stenosis in group A. This would be consistent with observational studies which examined the effect of dilation therapy after radiotherapy. They suggested that use of a vaginal dilatator is associated with a low risk of developing vaginal stenosis and improved sexual activity [30–32].

In addition, MRI tended to be prescribed less frequently in patients followed by the nurse sexologist, maybe because of lower vaginal stenosis in that group. This could have an economic impact on health expenditure.

The main limitation of this study is its retrospective nature: some data was missing, especially regarding information given to the patients by the medical team, and the sexual behavior of the patients. Second, data collection was not exhaustive so the findings concerning the side-effects of BT should be interpreted with caution. Third, the proportion of unavailable (NA) or "unknown" data exceeded 50% for some of the variables. For this reason, some side-effects were not analyzed such as bleeding, vaginal elasticity, vaginal lubrication, dyspareunia, and using vaginal lubrication. Fourth, we did not use a questionnaire to collect data, so some important variables like psychological variables and the impact on the spouse were not collected. Finally, this is a single-center study with a small sample, which may impact the strength of the statistical associations.

Conclusion

This study highlights the lack of discussion between physicians and patients concerning the impact of cancer and treatments on sexuality. Issues related to women sexuality are not systematically addressed during medical consultations either before, during or after treatment.

Support from a sex therapist to patients with cervical or vaginal cancer treated by BT could improve the resumption of sexual activity and reduce the physical side-effects, especially vaginal stenosis. However, rehabilitation with dilators is rare, regardless of the information received. Dedicated follow-up and better communication and therapeutic training for patients are necessary.

A single-center prospective study is ongoing (NCT03956498) to analyze in detail the impact of this type of assistance on the evolution of patients' sexual quality of life, their overall quality of life, and vaginal effects in patients treated by EBRT and BT for cervical cancer.

Authors' contributions All authors contributed to the study conception and design. Material preparation, data collection, and analysis were performed by MAK, MG, and AD. The first draft of the manuscript was written by MAK, and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Data availability All data of this study were collected from the medical record of Toulouse University Institute for Cancer.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interests.

Ethic approval Ethical approval was waived by the National ethic committee in view of the retrospective nature of the study and all the procedures being performed were part of the routine care.

Consent to participate Informed consent was obtained from all patients included in this study.

Consent for publication Patients signed informed consent regarding publishing their data.

Code availability N/A

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