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Impact of COVID-19 on Gynecologic Oncology Care: A Survey of Practicing Gynecologic Radiation Oncologists in the United States

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Running Title: Impact of COVID-19 on Gynecologic Oncologic Care

Abstract

Purpose: The COVID-19 pandemic has placed demands and limitations on the delivery of healthcare. Here we sought to assess the impact of COVID-19 on the delivery of gynecologic oncologic care, from the perspective of practicing radiation oncologists in the United States.

Materials and Methods: An anonymous online survey was created and distributed to pre-identified U.S. radiation oncologists with clinical expertise in the management of gynecologic patients. The survey consisted of demographic questions followed by directed questions to assess specific patterns of care related to the COVID-19 pandemic.

Results: A total of 47 of 96 invited radiation oncologists responded to the survey for a response rate of 49%. 56% of respondents reported an increase in locally advanced cervical cancer with no similar increase for endometrial, vulvar or vaginal patients. The majority (66%) reported a pause in surgical management with a duration of 1-3 months being most common (61%). There was a reported increased utilization of shorter brachytherapy regimens during the pandemic. Most (61%) providers reported caring for at least one COVID positive patient. A pause or delay in treatment due to COVID-19 positivity was reported by 45%, with 55% reporting that patients chose to delay their own care because of COVID related concerns. Total treatment times of greater than 8 weeks for cervical cancer patients were observed by 33%, but this occurred in less than 25% of their cervical cancer patients.

Conclusion: Data from this prospectively collected anonymous survey of practice patterns among radiation oncologists reveal that the COVID pandemic resulted in delays initiating care, truncated brachytherapy treatment courses and a reported increase in locally advanced cervical cancer cases at presentation. These data can be utilized as a means of “self-assessment” to ensure appropriate decision making for gynecologic patients during the endemic phase of COVID.

Introduction

The COVID-19 pandemic placed unprecedented, extraordinary demands and constraints on the healthcare systems. During the pandemic, healthcare resources were prioritized in order to save the most lives and maximize improvements in patients' length of life.^{1,2} To conserve valuable resources and minimize disease transmission, routine hospital and healthcare services were disrupted including routine health maintenance as well as non-emergent and elective surgeries.³⁻⁸ Consequently, cancer screening, referral of symptomatic patients, diagnosis and definitive treatments were hindered or delayed.⁹⁻¹¹ Patients with limited access to telemedicine may have been disproportionately impacted by the disruption in routine medical care and cancer screening.

Patients with gynecologic cancers, including cervical, endometrial, vaginal, and vulvar cancers, may have been particularly impacted by the COVID-19 pandemic due to their complex clinical management and socioeconomical factors. For example, one study conducted in 6 New York City hospitals found the fatality rate in gynecologic oncology patients with a COVID-19 infection to be 14.0%, while another study showed more than a third of gynecologic cancer patients in New York City experienced treatment delay, change, or cancellation during the first two months of the pandemic.^{12,13}

Patients diagnosed with cancer are often more vulnerable to COVID-19 infections and severe complications due to their underlying illness and often immunosuppressed status.¹⁴⁻¹⁶ They have experienced cancellation or postponement of scheduled appointments, cancer treatment, and operations due to fears of going to the hospital, mandated quarantine for active infection, resources being prioritized for those seriously ill with COVID-19, or guideline recommendations to minimize immune compromise.^{10,17-20} Many cancer centers used non-standard approaches such as

neoadjuvant chemotherapy, radiotherapy, or hormonal therapy while surgeries were being delayed. However, these difficult decisions involved risk of disease progression or emergent complications.¹⁰ The American Society of Clinical Oncology, European Society for Medical Oncology, and the American Brachytherapy Society and other brachytherapy experts published several guidelines to inform systemic cancer treatment, while some guidelines outlined delaying, abbreviating, or omitting radiation therapy where appropriate.²¹⁻²⁵

Gynecological cancers frequently require radiation treatment, yet many radiation oncology clinics saw a large decline in patient volume during the pandemic due to voluntary or mandated rollbacks in treatment volume to limit patient exposure.^{26,27} It is well established that delays in timely completion of chemoradiation and brachytherapy can negatively impact oncologic outcomes in cancer of the cervix.²⁵ However, limited data exist on the perceived impact of the pandemic on gynecologic cancer treatment. In this study, we performed a survey of practicing radiation oncologists to assess how the COVID-19 pandemic has impacted radiation therapy in gynecologic cancer treatment.

Methods

An anonymous online survey was created using Qualtrics (SAP, Provo, UT), an online platform for the creation, distribution and tracking of surveys and responses. The survey consisted of a section of demographic questions followed by directed questions to assess specific patterns of care related to the COVID-19 pandemic within practitioners' respective practices (supplemental 1). The survey consisted of a total of 67 questions and was designed using a multi-step process, during which appropriate revisions were made by a pre-selected group of practicing academic and community radiation oncologists with expertise in gynecologic care, across various career stages, geographic locations, and practice settings.

The survey was distributed to pre-identified U.S. radiation oncologists with clinical expertise in the management of gynecologic patients based upon

NRG/ASTRO/ABS participation or clinical scope of practice. These represent individuals actively engaged in the discussion of research related to, and clinical care of, patients with gynecologic malignancies. In addition to individuals included on the above NRG/ASTRO/ABS lists, the authors provided emails for individuals known to participate in the delivery of gynecologic care within radiation oncology. Responses were recorded and analyzed using the Qualtrics platform. The survey remained open for 5 weeks (October 18th - November 29th 2021) and two reminder emails were sent. There was no financial incentive for completing the survey. The study was deemed exempt by our Institutional Review Board in accordance with 45 CFR 46. Descriptive statistics were utilized for data interpretation and exported using the Qualtrics platform.

Results

Demographics

A total of 47 of 96 invited Radiation Oncologists with expertise in the management of patients with gynecologic cancer responded to the survey for a response rate of 49%. Demographic data of the respondents are summarized in table 1. The majority of respondents characterized their practices as academic and within an urban setting (66%). Seventy percent of respondents cared for patients at a designated comprehensive cancer center (70%). All geographic regions were represented and there was a roughly equal distribution of responses from male (42.6%) and female (55.3%) radiation oncologists. Only 17% of respondents had participated in formal brachytherapy fellowships. Most respondents were > 5 years out from the completion of training with only 17% < 5 years into independent practice.

Pause in Care and Telemedicine

During the pandemic, 66% of respondents reported a pause in surgical management of patients with gynecologic cancers at their institution. For the majority of respondents, the delay in surgical management was 1-3 months (61%) with a minority <

(29%) reporting a <1 month delay (table 2). Approximately one-quarter (28%) of radiation oncologists reported a complete transition to telemedicine for new patient visits; most commonly for a duration of 1-3 months (54%) or < 1 month (31%). Similarly, only 32% reported a complete switch to telemedicine for follow-up visits and the duration was 1-3 months in 47% and < 1 month in 40%.

Observed Increase in Locally Advanced Gynecologic Cancer

During the pandemic, 56% of respondents reported a subjective increase in patients presenting with locally advanced cervical cancer in comparison to pre-pandemic presentation (Table 3). There was no similar observed increase in advanced stage endometrial or vaginal/vulvar cancer during the pandemic, with 82% of respondents reporting no change in the presentation of these patients.

Radiation Fractionation Prior to and then During the Pandemic

Prior to the COVID-19 pandemic, amongst respondents, the most commonly utilized brachytherapy regimens in the curative intent treatment of cervical cancer were 5.5 Gy x 5, 6 Gy x 5, and 7 Gy x 4 (Table 4). During the pandemic, these remained the most common regimens in the setting of curative intent brachytherapy for cervical cancer; however, there was an increased use of 7 Gy x 4 during the pandemic (33% vs 49% prior and during, respectively). For adjuvant brachytherapy in the management of endometrial cancer the most common regimens were 5.5 Gy x 4, 6 Gy x 5 and 7 Gy x 3 being the most commonly utilized regimens both prior to and during the pandemic. There was , however, an increased utilization of 7 Gy x 3 during the pandemic (51% vs 35%).

Impact on Clinical Care

Sixty-five percent of respondents reported caring for at least one patient with a positive COVID-19 test during the pandemic. Sixty-five percent reported institutional protocol of testing for COVID-19 prior to initiation of treatment (14% prior to EBRT, 25% prior to brachytherapy, and 25% prior to anesthesia use only). All respondents reported that less than 25% of patients' care was delayed by COVID testing. Sixty percent of providers reported continuing radiation treatments during COVID-19 positivity (19.5% EBRT alone, 34% EBRT + brachytherapy) (Table 5). A pause or delay in treatment due to COVID-19 positivity was reported in 45% of respondents. Sixteen percent reported having at least one patient die while under radiation treatment as a result of COVID-19 related complications. Fifty-five percent of respondents reported that patients chose to delay their own care because of COVID related concerns; however, 91% reported that this occurred in less than 25% of their patients. Total treatment times of greater than 8 weeks for cervical cancer patients were observed by 33% of providers, but report that this occurred in less than 25% of their cervical cancer patients (Table 5).

Discussion

The COVID-19 pandemic has and will continue to have far reaching impacts on social interaction, global economies, and healthcare delivery. In addition to strains placed on the healthcare industry as a direct result of COVID-19 related medical care, the management of unrelated medical conditions have been impacted indirectly. Cancer care has been significantly affected, with the long-term implications of such anticipated to be appreciated for years to come, particularly with respect to stage migration, increased early mortality, delay in cancer-related research, and decreased screening.²⁸⁻

³³ Similar to other areas of medicine, gynecologic oncology care has been impacted due to both patient and provider related factors.^{34,35}

Recognizing the potential impacts of COVID-19 on the delivery of gynecologic oncology care, key stakeholder groups formulated recommendations to maximize radiation oncology care during the pandemic.^{24,25} Expert consensus statements focused on the prioritization of patient care based on tiered categorization of cancer severity, emphasis on curative intent therapies, appropriate timing of treatment, use of hypofractionation and appropriateness of palliation.²⁴ Similarly, recommendations regarding gynecologic brachytherapy were devised and included the importance of timely treatments, adoption of shortened fractionation regimens, and options for the delivery of temporizing therapies in the event that brachytherapy could not be immediately delivered as a result of clinic-related COVID-19 related limitations.²⁵

Several investigators performed survey-based analyses of the impact of COVID-19 on Gynecologic care, focusing on the perspective of gynecologic oncologists.^{36,37} The Society of Gynecologic Oncology surveyed its members to assess the impacts of COVID-19 on the delivery of gynecological care.³⁸ They reported a decrease in surgical and clinical productivity with 83% of respondents experiencing a 50% or greater reduction in surgical volume. Seventy-two percent reported utilizing more neoadjuvant chemotherapy. Telehealth care dramatically increased with over 50% of SGO respondents completing >75% of visits via telemedicine. Clinical trials were also dramatically impacted, with 61% reporting that they stopped enrolling patients on trials. In addition to clinical concerns, COVID affects the treating physician as well, with only 25% reporting no compromise on their individual well-being during the pandemic.

In our survey, we assessed the impact on the radiation management of gynecologic malignancies during the COVID-19 pandemic. A significant number of respondents reported experiencing a pause in surgical management, however for most, it lasted only 1-3 months. In addition, a minority reported a complete transition to telemedicine during the pandemic. Greater than 50% of respondents reported an increase in presentations of locally advanced cervical cancer but did not observe this for other gynecologic malignancies. Most respondents reported the delay in seeking care to be due to patients having COVID-related fears. Despite greater than half of

respondents reporting caring for at least one COVID positive patient during the pandemic, most respondents reported completing external beam and brachytherapy for cervical cancer patients within 8 weeks. The increased use of shorter brachytherapy regimens during the pandemic likely helped to avoid prolongation of overall treatment time.

These findings suggest that the COVID pandemic has impacted the timely delivery of care for gynecologic patients from a radiation oncology standpoint. Most notably, providers experienced delays in care as a result of pauses in surgical management, a subjective increase in locally advanced presentations of cervical cancer and a transition to shorter courses for brachytherapy delivery. It is anticipated that delays in care as a result of COVID as well as ongoing patient fears, may have contributed to the increase in locally advanced cervical cancer patients. In addition, while not surveyed, the transition to shorter courses for brachytherapy may have been two-fold, to expedite care which may have already been delayed and also to reduce exposure for both patients and providers during the pandemic. The transition to shorter courses for brachytherapy included well established fractionation regimens and is not anticipated to impact the oncologic or toxicity related outcomes of treatment.

There are a number of limitations to the current study. While the response rate of 49% is relatively high for this type of survey study, it still only represents a response from a limited number of practicing radiation oncologists. Despite an attempt to obtain responses from a relatively equal amount of academic and private practice radiation oncologists, the majority of response in this study were obtained from academic radiation oncologists, limiting the generalizability of these results. In addition, as with most questionnaire-based survey studies, there can be subjectivity in responses.

As the global impact of the COVID-19 pandemic continue to be present in all aspects of life, the effect on clinical care is an ongoing concern and will evolve over time. An awareness of the issues is critical to inform efforts to minimize the impact on cancer diagnosis and treatments. Furthermore, as we shift into a “maintenance phase” of the pandemic, COVID-related clinical care delivery limitations may have an increasing

impact on physician burnout. This will likely further contribute to adequacy of delivery of care concerns.^{39,40}

These data represent an assessment of the impacts of COVID-19 on gynecologic care, specifically within radiation oncology. These data can be utilized as a means of ongoing self-assessment to be leveraged to ensure that the adequacy of clinical care is minimally impacted and inform future discussions about resource allocation.

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Table 1. Demographic Characteristics of Respondents

Question		# of Respondents	
		%	n
		100.0	47
Gender	Male	42.6	20
	Female	55.3	26
	Non-binary	0.0	0
	Prefer not to answer	2.1	1
Practice Type	Academic	66.0	31
	Private Practice	34.0	16
	Government	0.0	0
Practice Community Setting	Urban	66.0	31
	Suburban	29.8	14
	Rural	4.3	2
Designated Cancer Center	Yes	70.2	33
	No	29.8	14
Geographic Location	Northeast	27.7	13
	Southeast	21.3	10
	Midwest	14.9	7
	Southeast	10.6	5
	West	25.5	12
Years in Practice Post-Residency	<5	17	8
	5-10	29.8	14
	10-15	27.7	13
	>15	25.5	12
Fellowship Trained in Brachytherapy	Yes	17	8
	No	83	39

Table 2. Pause in Care and Telemedicine Visits for Gynecologic Patients During the Pandemic

Question		# of Respondents	
		%	n
Pause in Surgical Management	Yes	66.0	31
	No	34.0	16
Duration of Pause in Surgical Management	<1 months	29.0	9
	1-3 months	61.3	19
	3-6 months	3.2	1
	>6 months	6.5	2
Complete Switch to Telemedicine for New Patient Visits	Yes	27.7	13
	No	72.3	34
	Hybrid	0.0	0
Duration of Complete Switch to Telemedicine for New Patient Visits	<1 months	30.8	4
	1-3 months	53.8	7
	3-6 months	15.4	2
	>6 months	0.0	0
Complete Switch to Telemedicine for Follow-Up Visits	Yes	31.9	15
	No	68.1	32
	Hybrid	0.0	0
Duration of Complete Switch to Telemedicine for Follow-Up Visits	<1 months	40.0	6
	1-3 months	46.7	7
	3-6 months	6.7	1
	>6 months	6.7	1

Table 3. Observed Increase in Locally Advanced Cancer

Question		# of Respondents	
		%	n
Cervical Cancer	Yes	55.6	25
	No	44.4	20
Endometrial Cancer	Yes	18.2	8
	No	81.8	36
Vaginal or Vulvar Cancer	Yes	18.2	8
	No	81.8	36

Table 4. Fractionation Used Prior to and During the Pandemic

Question		# of Respondents			
		Prior		During	
		%	n	%	n
Fractionation Used for Curative Intent Brachytherapy for Cervical Cancer	5.5 Gy x 5	23.3	10	11.6	5
	6 Gy x 5	32.6	14	23.3	10
	7 Gy x 4	32.6	14	48.8	21
	8 Gy x 3	9.3	4	14.0	6
	Other	2.3	1	2.3	1
Fractionation Used for Adjuvant Vaginal Cuff Brachytherapy for Endometrial Cancer	5.5 Gy x 4	18.6	8	16.3	7
	6 Gy x 5	41.9	18	25.6	11
	7 Gy x 3	34.9	15	51.2	22
	Other	4.7	2	7.0	3

Table 5. COVID's Impact on Gynecologic Patients

Question		# of Respondents	
		%	n
Positive COVID Test During Treatment	Yes	65.1	28
	No	34.9	15
Active Treatment of Patients with COVID	No	39.0	16
	Yes, EBRT only	19.5	8
	Yes, brachytherapy only	7.3	3
	Yes, EBRT and brachytherapy	34.1	14
Pause or Delay in Treatment Due to Positive COVID Test	Yes	45.2	19
	No	54.8	23
Passing Away Due to COVID or Related Causes	Yes	16.3	7
	No	83.7	36
Total Treatment Time >8 Weeks for Cervical Cancer	Yes, <25% of patients	32.6	14
	Yes, 25-50% of patients	0.0	0
	Yes, >50% of patients	0.0	0
	No	67.4	29
Required COVID Test Prior to Treatment	Yes	65.1	28
	No	34.9	15
When is COVID Test Required	Prior to EBRT	14.3	4
	Prior to brachytherapy	25.0	7
	Prior to EBRT and brachytherapy	35.7	10
	Prior to anesthesia only	25.0	7
% Delayed by Testing	<25% of patients	100.0	28
	25-50% of patients	0.0	0
	>50% of patients	0.0	0
Did Patients Self Delay Due to COVID Risk	Yes	55.8	24
	No	44.2	19
% Self Delay	<25% of patients	91.7	22
	25-50% of patients	8.3	2
	>50% of patients	0.0	0