

Scientific Letter

Prostate Brachytherapy Case Volumes by Academic and Nonacademic Practices: Implications for Future Residency Training



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Summary

With 73.7% of academic practices performing ≤ 12 brachytherapy implants per year, 24.8% performing 13 to 53 cases, and only 1.5% performing ≥ 53 cases per year, the question becomes whether academic training practices will have the ability to adequately teach future residents to perform prostate brachytherapy. Given these concerning trends, it must be determined how to reverse this trend to ensure this treatment modality is not lost in the future.

Purpose: The use of prostate brachytherapy has continued to decline in the United States. We examined the national practice patterns of both academic and nonacademic practices performing prostate brachytherapy by case volume per year to further characterize the decline and postulate the effect this trend might have on training the next generation of residents.

Methods and Materials: Men diagnosed with prostate cancer who had undergone radiation therapy in 2004 to 2012 were identified. The annual brachytherapy case volume at each facility was determined and further categorized into ≤ 12 cases per year (ie, an average of ≤ 1 cases per month), 13 to 52 cases per year, and ≥ 53 cases per year (ie, an average of ≥ 1 cases per week) in academic practices versus nonacademic practices.

Results: In 2004 to 2012, academic practices performing an average of ≤ 1 brachytherapy cases per month increased from 56.4% to 73.7%. In nonacademic practices, this percentage increased from 60.2% to 77.4% ($P < .0001$ for both). Practices performing an average of ≥ 1 cases per week decreased among both academic practices (from 6.7% to 1.5%) and nonacademic practices (from 4.5% to 2.7%).

Conclusions: Both academic and nonacademic radiation oncology practices have demonstrated a significant reduction in the use of prostate brachytherapy from 2004 to 2012. With the case volume continuing to decline, it is unclear whether we are prepared to train the next generation of residents in this critical modality. © 2016 Elsevier Inc. All rights reserved.

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Conflict of interest: Dr Nguyen consulted for Medivation, Ferring, Genome DX, and Nanobiotix.

Introduction

Although prostate brachytherapy is a well-established treatment for prostate cancer and has a role in the treatment of patients in all risk groups, its use has declined during the past decade (1-3). Monotherapy brachytherapy is effective for low-risk and appropriately identified intermediate-risk patients (4). Recent randomized control studies have also demonstrated significant improvement in biochemical disease-free survival when brachytherapy was used as a boost strategy for patients with higher risk disease (5, 6). Appreciating the evidence emphasizing the importance of brachytherapy, we sought to examine the national practice patterns using the National Cancer Database (NCDB) (7, 8) to determine the brachytherapy case volume stratified by academic and nonacademic practices to identify potentially decreasing training opportunities.

Methods and Materials

Men diagnosed with prostate cancer in 2004 to 2012 and receiving radiation therapy as the definitive treatment were identified from the NCDB. The annual brachytherapy case volume was defined as patients who had received brachytherapy (either alone or as a boost) at each facility. We further categorized the brachytherapy case volume into 3 groups: ≤ 12 brachytherapy cases per year (ie, ≤ 1 cases per month), 13 to 52 brachytherapy cases per year, and ≥ 53 brachytherapy cases per year (ie, ≥ 1 cases per week). Hospital types coded as academic and/or research programs (including National Cancer Institute-designated comprehensive cancer practices) in the NCDB were grouped as academic practices, and other hospitals were grouped as nonacademic practices. The Mantel-Haenszel χ^2 analysis for trend was used to examine brachytherapy use during the study period.

Results

The number of academic and nonacademic practices treating prostate cancer with radiation therapy in 2004 to 2012 are presented in Table 1. Examining the number of practices performing brachytherapy (≥ 1 cases per year)

from 2004 to 2012 demonstrated that the percentage of academic practices performing brachytherapy decreased from 80% to 65% and the percentage of nonacademic practices decreased from 75% to 55% (Table 1).

The annual median case volume is presented in Table 2. In 2004 to 2012, the median annual brachytherapy case volume decreased from 9 to 6 for academic practices and from 9 to 5 for nonacademic practices. Practices performing ≥ 53 cases per year were few and decreased in both academic practices (from 6.7% to 1.5%) and nonacademic practices (from 4.5% to 2.7%; Figs. 1 and 2). An increasing percentage of practices performing ≤ 12 cases per year was found in both settings (academic practices, 56.4%-73.7%; nonacademic practices, 60.2%-77.4%; Figs. 1 and 2; *P* value for trend, *P* < .0001 for both).

Discussion

The use of brachytherapy has decreased in both academic and nonacademic practices from 2004 to 2012. Of the practices still performing brachytherapy, a significant increase has occurred in those performing ≤ 12 cases per year. This finding is statistically significant compared with the number of practices performing 13 to 52 cases and ≥ 53 cases per year.

The declining use of brachytherapy during the past decade is likely secondary to many societal and economic factors, including the decrease in prostate-specific antigen screening, greater emphasis on active surveillance for appropriate patients, increasing use of robotic prostatectomy, and the greater sophistication of external beam technologies. The negative press associated with poor brachytherapy implants, decreasing reimbursement for brachytherapy, and increasing disparity between reimbursement for brachytherapy compared with competing treatment modalities have also affected the utilization of brachytherapy. The lack of knowledge of brachytherapy's efficacy, self-referral patterns of physicians with financial interest in external beam technologies, (9) and decreased training opportunities, in particular, at academic practices, are also factors in the decreased utilization.

Although hurdles exist to increase the utilization of brachytherapy, it remains a proven and cost-effective treatment

Table 1 Practices performing brachytherapy

Center	2004	2005	2006	2007	2008	2009	2010	2011	2012
Academic									
Performed brachytherapy	165	158	159	161	163	149	154	149	137
Total	205	207	211	209	208	211	211	213	212
Percentage	80	76	75	77	78	71	73	70	65
Nonacademic									
Performed brachytherapy	598	620	620	613	589	548	540	515	451
Total	797	809	825	838	838	832	843	837	816
Percentage	75	77	75	73	70	66	64	62	55

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