

Current attitudes of Canadian urologists towards surgical castration in the treatment of prostate cancer

Patrick T. Anderson, MD; Neal E. Rowe, MD

Department of Surgery, Division of Urology, The Ottawa Hospital, University of Ottawa, Ottawa, ON, Canada

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Introduction

Prostate cancer is the most common non-cutaneous malignancy and the third leading cause of cancer death amongst men in North America (1). There is an approximate 1 in 7 lifetime incidence within US males. The majority of these patients present with localized disease, however, approximately 1/3 of these men do progress to metastatic disease at some point within their lives (2,3). This has led to the current, and ongoing, research into novel treatments and regimens for metastatic prostate cancer (mPC) with emerging evidence advocating for additional second line androgen blocking agents to be used up front in addition to baseline androgen deprivation therapy (ADT) (4-6). Despite continued advancements in the management of metastatic prostate cancer, androgen deprivation therapy still plays an important foundational component of treatment regimens. Currently, the majority of cases of mPC in North America are treated with pharmacological androgen deprivation therapy, rather than the historical alternative of surgical castration (SC). The increased use of pharmacological ADT has likely contributed to dramatic increase in the cost of metastatic prostate cancer on a population level (7).

Surgical castration remains an important treatment modality of mPC across the world and is recommended as an alternative first-line ADT treatment in multiple practice guidelines (8,9). Additionally, a previous cost analysis by the same authors has identified the potential for significant cost-savings through increased use of SC in the treatment of mPC (10). We have previously shown the average cost of medical ADT drugs alone over 5 years to be approximately \$20,000 per patient. This does not include the cost of providing the injections or required travel for many patients and their family. The cost of a bilateral orchiectomy at our institution with general anesthesia can be performed for less than \$5,000.

Canadian urologists have a leadership role within our public healthcare system. This requires us to be stewards to the system and utilize resources efficiently. In fact, this responsibility has been enshrined in the CanMEDS Physician Competency Framework published by the Royal College of Physicians and Surgeons of Canada (11). Given the equal

treatment effect of surgical castration in mPC and the potential for significant cost-savings, it is important to identify barriers preventing wider use of this treatment. Here, we aimed to identify current practice patterns and attitudes of urologists practicing in Canada towards surgical castration in the treatment of prostate cancer.

Methods

In order to assess the current practice trends and attitudes of Canadian urologists towards the use of surgical castration in the treatment of metastatic prostate cancer, an electronic survey was developed. This survey was available in both French and English and was distributed to approximately 700 urologists across Canada. Inclusion criteria stipulated that respondent must be a FRCSC-certified urologist or Fellow-level trainee, who treats prostate cancer, and is currently practising in Canada. The survey (Appendix 1) was constructed using SurveyMonkey (San Mateo, California) and distributed via email. Responses were collected during a two-week window in March 2018. Information collected included practice demographics and current practices in the treatment of metastatic prostate cancer. Responses were then analyzed in a descriptive fashion with an aim of generating discussion around the use of surgical castration as ADT in prostate cancer. The study and survey received REB approval via the Ottawa Health Science Network Research Ethics Board.

Results

Demographics

Survey results were carefully analyzed to ensure each respondent met study inclusion criteria. Of all surveys returned, 108 (15%) were eligible for inclusion in the study. Responses were obtained from urologists practicing in all 10 Canadian provinces (Figure 1A). A variety of large, small, community, academic, and office-based practices were also represented in survey responses (Figure 1B, C).

Practice patterns

When asked how often survey respondents offered surgical castration to eligible patients, 38% reported never offering surgical castration and 51% indicated they only sometimes offered surgical castration. Only 11% of respondents indicated they routinely offer surgical castration as ADT for eligible patients (Figure 2).

When asked how many of their eligible patients have received surgical castration, 81% of respondents estimated this to be less than 5% (Figure 3). Common factors identified by survey respondents preventing wider offering and use of surgical castration are summarized in Table 1. The most commonly cited factor preventing survey respondents from routinely offering surgical castration to eligible patients reported was the respondents' perceived negative patient attitudes towards surgical castration. Other commonly reported barriers were lack of operating room availability, invasiveness, permanence, and the morbidity of the procedure.

Attitudes toward surgical castration

When asked about their overall attitudes towards surgical castration, the majority (78%) of survey respondents agreed that surgical castration is as effective as pharmacological ADT in the treatment of metastatic prostate cancer. Seventy-three percent of respondents indicated that they feel surgical castration is an underutilized treatment modality and 67% of respondents indicated that Canadian urologists should more actively offer surgical castration as an equally efficacious treatment option compared to pharmacologic ADT. Seventy-five percent of respondents indicated that they would like to see more data on the cost-effectiveness of surgical castration for the treatment of metastatic prostate cancer in the Canadian healthcare system.

Discussion

This qualitative survey-based study aims to identify the current practice-patterns and attitudes of Canadian urologists regarding the use of surgical castration in the treatment of metastatic prostate cancer. The importance of this question hinges on the concept that surgical castration has equal efficacy and is more cost-effective when compared to pharmacological ADT in the treatment of metastatic prostate cancer. In publicly-funded healthcare systems where physicians largely play the role of gate-keeper to treatments, it is important for physicians to be resource allocators and consider the cost-effectiveness of the treatments they are offering. A strong argument can therefore be made for Canadian urologists to offer and perform surgical castration more frequently.

As mentioned earlier, preliminary cost-studies by our group have identified the potential for significant cost-savings through increased use of surgical castration in the Canadian healthcare system (11). Similarly, increasing costs of prostate cancer has been associated with increased use of medical castration in the US (12,13,14). In addition to the treatment itself being more cost-effective, surgical castration also obviates the need for recurrent visits to the surgeon/physician office for ADT injections. This is even more advantageous when considering the impact on the population of patients who are dependent on family members, or other transportation services, to attend these appointments. Additionally, when the need for injection is negated this allows for increased use of telehealth in follow-up which has shown its utility with clinical restrictions during the current COVID pandemic. As indicated in this survey, the majority of respondents would like to see more data on the cost-effectiveness of surgical castration in the Canadian healthcare system.

Prior to the development of pharmacological ADT, surgical castration was the primary treatment for metastatic prostate cancer. Even after SC use has been widely replaced by pharmacological ADT in the western world over the past 30 years, SC remains recognized as an alternative first-line ADT method in CUA, AUA, SUO, and NCCN guidelines. Surgical castration remains a robust treatment which quickly achieves and maintains lasting castrate-levels of testosterone. It's equivalence to pharmacological ADT is well-recognized in the literature. This was agreed with by the majority of survey respondents. Additionally, the procedure can be performed in the outpatient setting under local, regional, or general

anesthetic. For these reasons, it remains a first-line ADT therapy for the treatment of metastatic prostate cancer in numerous society guidelines including the CUA, AUA, and NCCN.

Bilateral orchiectomy provides robust and permanent castration. It has been shown that fluctuations in testosterone are associated with worse prostate cancer-specific outcomes (15). Late dosing, interrupted schedules, incomplete castration, and microflares which can be associated with medical castration regimens are associated with worse outcomes and are avoided with surgical castration (16). In addition to prostate cancer-specific effects of ADT, there are important implications for other health outcomes including fracture risk, peripheral vascular disease, venous thromboembolism, coronary artery disease, and development of diabetes. Sun et al. (2016) showed through a 15 year cohort study that surgical castration was superior to GnRH-agonist therapy for treatment of metastatic prostate cancer in all these areas (17). Therefore, surgical castration may actually be more cost-effective and have a superior side effect profile when compared to pharmacological ADT for treatment of metastatic prostate cancer.

The majority of respondents in this survey indicated that they agree that surgical castration is an under-utilized treatment modality. Despite this, over half of respondents indicated they only sometimes offer surgical castration and nearly 40% indicated they never offer surgical castration to eligible patients. This poses the question of whether urologists are the main obstacle preventing wider use of surgical castration. The main barrier identified in this study preventing respondents from routinely offering surgical castration was a respondent (physician)-perceived negative patient attitude towards the treatment. It is important to reinforce that this represents the anticipated patient-response to being offered surgical castration and does not represent real patient attitudes towards the treatment. This preconception on the part of the physician may be due to past experience, personal attitude, or dogma as the exposure to surgical castration within urology residency training programs is unlikely to be more common than reported in this survey overall. While there is a paucity in the literature comparing psychological outcomes of surgical to medical castration, the available evidence does not support increased adjustment or mood disorders following bilateral orchiectomy for prostate cancer (18,19). Additionally, it has been shown that men with advanced prostate cancer treated with surgical castration report a higher quality of life compared to men receiving medical ADT (20). This is important information for a urologist to have when confronting their own biases and addressing patient concerns. There is no doubt a difficulty in counseling a patient on a permanent and disfiguring treatment, however, the urologist is better equipped to do so with the knowledge of equal efficacy, superior side effect profile, and superior quality of life experienced by men receiving surgical castration compared to injection-based medical ADT.

Surgical castration is a permanent form of ADT and is therefore not a suitable form of ADT in patients who may be candidates for intermittent ADT in the biochemical recurrence (BCR) setting. However, surgical castration can still play a role as eventually these patients progress and develop the requirement for life-long ADT. This serves as an opportunity to re-

address surgical castration as a durable form of baseline ADT. It is also important to note that surgical castration does not preclude, and can be used in conjunction with, chemotherapy and/or novel second-generation hormonal agents for control of metastatic disease (21).

In order to increase the utilization of surgical castration, appropriate counseling on the part of the treating urologist is required. This requires a familiarity with surgical castration and it is therefore important to ensure exposure to this treatment, and treatment discussion, in the training environment. In general, it has been shown that patients often have a poor understanding of metastatic prostate cancer, including their diagnosis, treatment options, and prognosis (22). Benidir et al. (2018) have also demonstrated that with appropriate counseling, including cost of treatment, patient treatment goals do change measurably and that patient's will often choose more cost-effective treatments when they understand the societal cost associated with various therapies (23). This highlights the need for appropriate and informative patient counseling in the clinical setting. Appropriate counseling of the patient should include risks of surgical castration in a patient-specific context, as well as the expected side-effect profile. When explaining the permanence of this procedure, it is important to also emphasize the similarity of anticipated side effects with pharmacologic ADT when a patient is expected to be on lifelong therapy.

As stated previously, this study aimed at describing the current attitudes and practice patterns of Canadian urologists regarding surgical castration. Limitations of this study include that it is self-reported and survey-based. Rates of surgical castration reflect self-estimates of practice patterns by responding urologists. Urologists with an interest in treating advanced prostate cancer may be over-represented in the survey responses. For those respondents who sometimes offer surgical castration, specific data was not collected regarding which patients are offered orchiectomy. This study did not include responses from medical or radiation oncologists who also manage mPC. As non-surgeons, these practitioners would not be expected to offer surgical castration.

Conclusions

This study indicates that surgical castration is likely an under-utilized form of ADT in the treatment of prostate cancer in Canada. The majority of Canadian urologists surveyed do not routinely offer surgical castration as a form of ADT despite majority agreement in the efficacy. There is a potential for significant cost-savings through the increased use of surgical castration and the majority of Canadian urologists would like to see more Canadian data on this.

The choice of treatment modality should ultimately be patient-driven. However, for a patient to make an informed choice of treatment they require appropriate counseling from their treating urologist. The authors feel that Urologists have a duty to offer surgical castration to their eligible patients both as part of informed decision-making and as stewards of the healthcare system. Future directions for this research include assessment of patient attitudes toward surgical castration, development of a patient decision aid, and detailed cost analyses of surgical castration within the Canadian healthcare system.

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Figures and Tables

Fig. 1. Distribution of practice demographics from responding urologists by: (A) province/territory; (B) community population; (C) practice-type.

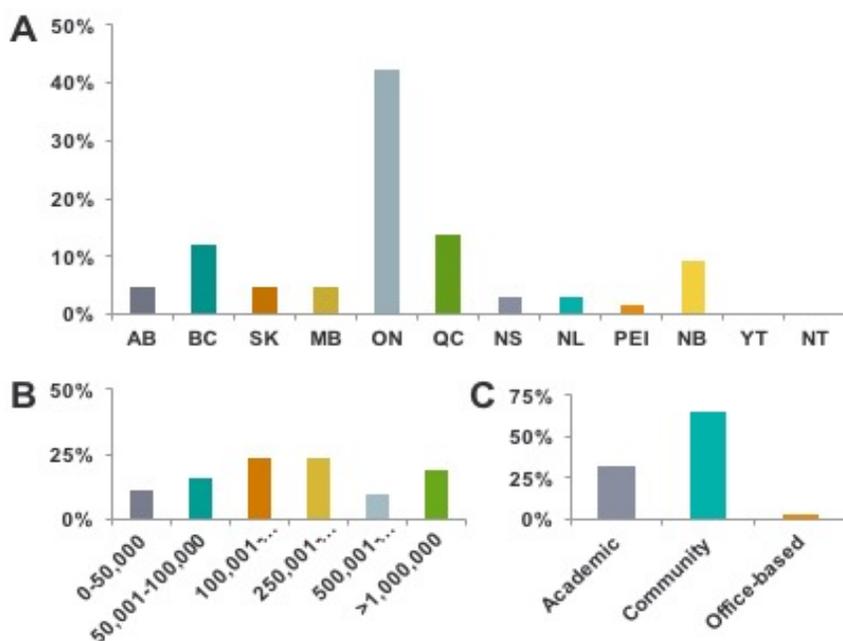


Fig. 2. Proportion of survey respondents routinely offering surgical castration as a form of androgen deprivation therapy.

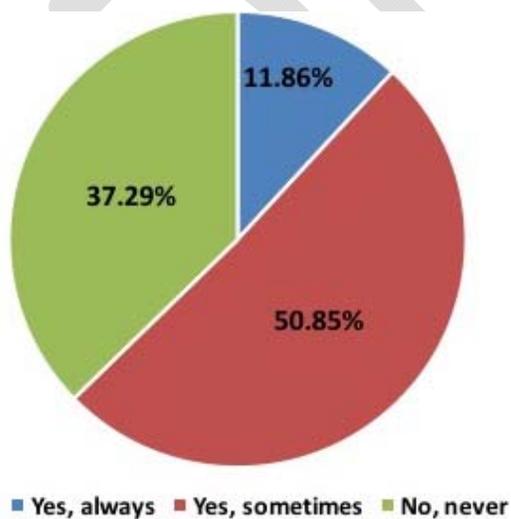


Fig. 3. Survey-respondent estimation of proportion of their patients receiving surgical castration for androgen deprivation therapy.

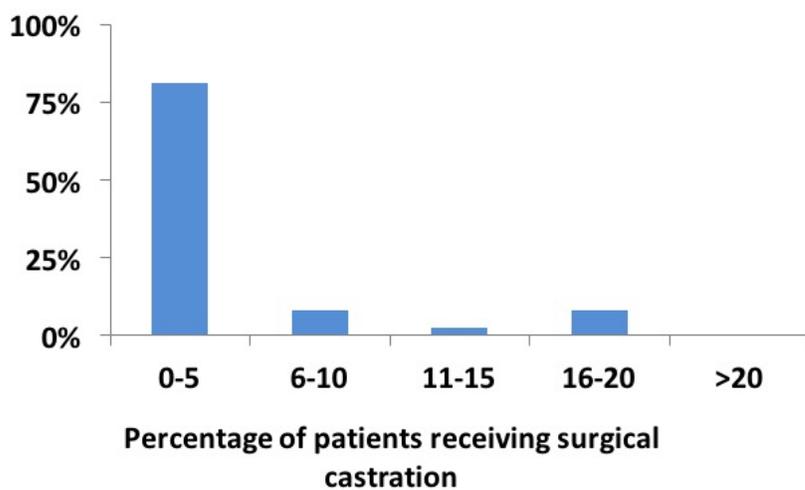


Table 1. Most common respondent-cited reasons for not routinely offering surgical castration as ADT treatment for metastatic prostate cancer

Factor	% of respondents
Perceived patient negative attitudes	85%
Invasiveness	56%
Lack of operating room availability	41%
Permanence	34%
Morbidity of surgery	25%

ADT: androgen-deprivation therapy.

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