



Original Article

Australian patterns of prostate cancer care: Are they evolving?

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ABSTRACT

Background: Approaches to prostate cancer (PCa) care have changed in recent years out of concern for overdiagnosis and overtreatment. Despite these changes, many patients continue to undergo some form of curative treatment and with a growing perception among multidisciplinary clinicians that more aggressive treatments are being favored. This study examines patterns of PCa care in Australia, focusing on current rates of screening and aggressive interventions that consist of high-dose-rate (HDR) brachytherapy and pelvic lymph node dissection (PLND).

Methods: Health services data were used to assess Australian men undergoing PCa screening and treatment from 2001 to 2014. Age-specific rates of prostate-specific antigen (PSA) screening were calculated. Ratios of radical prostatectomy (RP) with PLND to RP without PLND, and HDR brachytherapy to low-dose-rate (LDR) brachytherapy were determined by state jurisdictions.

Results: From 2008, the rate of PSA screening trended downward significantly with year for all age ranges ($P < 0.02$) except men aged ≥ 85 ($P = 0.56$). PLND rates for 2008–2014 were lower than rates for 2001–2007 across all states and territories. From 2008 to 2014, PLND was performed ≥ 2.7 times more frequently in New South Wales and the Australian Capital Territory than in other jurisdictions. Since 2007, brachytherapy practice across Australia has evolved towards a relatively low use of HDR brachytherapy (ratio of HDR to LDR brachytherapy < 0.5 for all jurisdictions except the Australian Capital Territory).

Conclusion: Rates of PLND and HDR brachytherapy for PCa have declined in Australia, providing evidence for the effect of stage migration due to widespread PSA screening. Currently, PSA screening rates remain high among older men, which may expose them to unnecessary investigations and treatment-related morbidity.

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1. Introduction

The prostate cancer (PCa) landscape has been transformed over the past decade with a focus on limiting overdiagnosis and reducing overtreatment. In particular, the use of mainstay curative treatments, such as radical prostatectomy (RP) and radiotherapy, for low-risk men has been questioned because of the significant morbidity,¹ quality-of-life impact,² and economic burden³ associated with these treatments. PCa care has been further transformed by the emergence of active surveillance, which aims to delay or

prevent treatment by closely monitoring disease progression. Active surveillance is an effective option for men with localized PCa¹ and, encouragingly, active surveillance uptake from a state-based registry of Australian PCa patients has been shown to be higher than in many international registries.⁴ Widespread prostate-specific antigen (PSA) testing has resulted in increased PCa detection, as well as a 'stage migration' towards an earlier diagnosis and a reduced incidence of metastatic disease.^{5,6} This has led to growing concern for the overdiagnosis in younger men at low risk of clinically significant disease⁷ and older men at low prostate-specific mortality risk.⁸

Despite these transformations in PCa care, a majority of men with newly diagnosed PCa undergo some form of curative treatment, regardless of their disease risk.⁵ Additionally, studies examining the impact of uro-oncology multidisciplinary meetings over

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the past decade have suggested a favoring of aggressive interventions for PCa management.^{9,10} This includes a greater volume of high-dose-rate (HDR) brachytherapy,¹⁰ which is used primarily as 'boost' therapy [with either external beam radiotherapy (EBRT) or surgery] for higher-risk PCa than what is typically treated with low-dose-rate (LDR) brachytherapy.⁵ Furthermore, there is the potential for an increased uptake of pelvic lymph node dissection (PLND), the most reliable and accurate staging method for prostate cancer metastases.¹¹ Therefore, the objective of our current study was to analyze for temporal trends in these key indicators of PCa care, in particular, the rates of screening and aggressive interventions for PCa.

2. Materials and methods

2.1. Study population

The study population consisted of all Australian men who underwent a screening PSA test, RP, or brachytherapy for PCa between 2001 and 2014. The study period commenced from when a dedicated PSA screening test was first incorporated into the Australian Government's Medicare Benefits Schedule (MBS) in 2001.

2.2. Data selection

A number of studies have analyzed the impact of uro-oncology multidisciplinary meetings on PCa management decisions over the past decade. Notable trends have been: (1) a shift towards greater active surveillance of lower risk disease;¹⁰ and (2) the utilization of aggressive interventions, such as HDR brachytherapy.^{9,10} The present study uses health services data to analyze trends in PSA screening and aggressive interventions. Future registries will be able to account for the number and characteristics of men on active surveillance.¹²

2.3. Data extraction

Data on services defined by specific item numbers were sourced from the MBS website.¹³ This captures all tests and treatments performed in the community. Delivery of HDR brachytherapy to the prostate uses the MBS billing code of '37227' and was first introduced to the MBS in 2007. HDR brachytherapy must be performed 'by a urologist or radiation oncologist' in 'association with a radiation oncologist', with no limitations on tumor staging or grade. Counts of HDR brachytherapy include both the insertion and removal of catheters for radiation delivery. Seed implantation of low-dose-rate brachytherapy has been billed under code '37220' since 2001, and must also be performed in 'association with a radiation oncologist'. LDR brachytherapy is restricted to patients with localized PCa, Gleason ≤ 7 (Gleason ≤ 6 prior to 2008) and PSA ≤ 10 ng/mL at the time of diagnosis. Only LDR brachytherapy data from 2007 were analyzed to enable comparisons with HDR brachytherapy over the same time period.

A dedicated item code ('66655') for an initial 'screening' PSA test was introduced in 2001 and is defined as a single PSA test performed during a 12-month period in previously undiagnosed prostatic disease. Radical prostatectomy with 'sparing of nerves around the bladder and bladder neck reconstruction' is billed under code '37211' when PLND is performed or '37210' when PLND omitted. Both RP item codes were introduced prior to 2001. EBRT was excluded from this study because of different radiation field settings and dosimetry, along with poor capture of the actual treatment received when using MBS item codes.¹⁴ All population data were obtained from the Australian Bureau of Statistics.¹⁵

2.4. Statistical analysis

Age-specific rates of PSA-based screening were calculated from 2001 to 2014. Trends of annual change in PSA screening rates from 2008 were analyzed using Cuzick's nonparametric test for trend. Mean 7-year ratios (2001–2007 and 2008–2014) of RP with PLND compared to RP without PLND were determined for state jurisdictions. Annual ratios of HDR brachytherapy to LDR brachytherapy were determined for state jurisdictions from 2007.

3. Results

3.1. Radical prostatectomy

The average annual Australian male population was 10,529,409 between 2001 and 2014. A total of 64,824 RPs were performed over this period, of which 36,829 involved a PLND. The mean ratio of RP with PLND to RP without PLND from 2001 to 2007 and 2008 to 2014 for each state jurisdiction is shown in Fig. 1. Overall, PLND was performed more often than not, however, there was a considerable decrease between 2001 and 2007 (when the mean ratio of RP with PLND to RP without PLND was 1.9) and between 2008 and 2014 (when the same ratio was 1.1). This reduction in rate of PLND occurred for all state jurisdictions. From 2008 to 2014, relatively high rates of PLND were recorded in the Australian Capital Territory (ACT) (mean ratio of 5.6) and New South Wales (NSW) (mean ratio of 2.3), whereas rates were relatively low (< 0.9) across all other jurisdictions.

3.2. Brachytherapy

Between 2007 and 2014, 2,326 HDR brachytherapy procedures (either implant insertion or removal) were performed across Australia. Most cases arose from NSW (1,123), Queensland (512), Western Australia (357), Victoria (191), and South Australia (77). Between 2007 and 2014, 5,060 LDR brachytherapy implantation procedures were performed, with most occurring in Victoria (1,555), NSW (1,163), Queensland (1,111), South Australia (673), Western Australia (317) and Tasmania (201). The ratio of HDR to LDR brachytherapy across state jurisdictions is shown in Fig. 2.

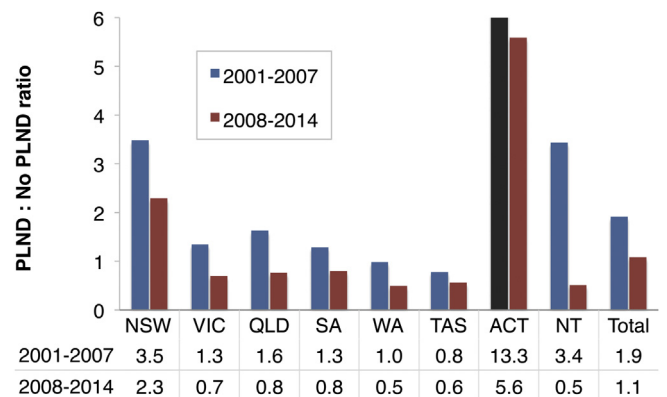


Fig. 1. The graph shows the ratio of radical prostatectomy (RP) with pelvic lymph node dissection (PLND) to RP without PLND across state jurisdictions between 2001–2007 and 2008–2014 (all years inclusive). The ratio of the Australian Capital Territory for 2001–2007 (black) exceeds the maximum y-axis.

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