



Original article

Establishment of the optimal follow-up schedule after radical prostatectomy

Kazuhiro Matsumoto, M.D.*, Naoya Niwa, M.D., Seiya Hattori, M.D.,
Toshikazu Takeda, M.D., Ph.D., Shinya Morita, M.D., Takeo Kosaka, M.D., Ph.D.,
Ryuichi Mizuno, M.D., Ph.D., Toshiaki Shinojima, M.D., Ph.D., Eiji Kikuchi, M.D., Ph.D.,
Hiroshi Asanuma, M.D., Ph.D., Mototsugu Oya, M.D., Ph.D.

Keio University School of Medicine, Department of Urology, Shinanomachi 35, Shinjuku-ku, Tokyo, Japan

Received 13 October 2017; received in revised form 19 March 2018; accepted 5 April 2018

Abstract

Purpose: Monitoring the serum level of prostate specific antigen (PSA) is indispensable for surveillance after radical therapy, and the aim of this study was to establish the optimal follow-up schedule.

Materials and methods: We retrospectively reviewed the clinicopathological data of 1,010 consecutive patients who underwent radical prostatectomy. After excluding patients who received neoadjuvant or adjuvant therapy and those without a nadir PSA level <0.2 ng/ml, the remaining 779 patients were enrolled. Biochemical recurrence (BCR) was defined as elevation of PSA to >0.2 ng/ml. We investigated the PSA doubling time (PSA-DT) following BCR at various times after surgery.

Results: During a mean follow-up of 8.8 years, BCR occurred in 180/779 patients. The annual BCR rate was 6% in the first year after surgery, 6% between 1 and 2 years, 3% between 2 and 3 years, 3% between 3 and 5 years, and 2% at >5 years postoperatively. During these periods, the minimum PSA-DT after BCR was 1.6, 2.4, 3.1, 6.1, and 6.4 months, respectively. These minimum PSA-DTs were used to determine the optimal follow-up interval during each period after surgery. If the baseline level is 0.1 ng/ml, PSA should be measured at approximately 3-month intervals for the first year, at 4-month intervals between 1 and 2 years, at 6-month intervals between 2 and 3 years, and annually thereafter to definitely detect BCR before the serum PSA level exceeds 0.4 ng/ml.

Conclusion: The PSA-DT following BCR varies according to the time after surgery. Our data on minimum PSA-DT values after BCR are useful for setting the optimal follow-up schedule. © 2018 Elsevier Inc. All rights reserved.

Keywords: Radical prostatectomy; PSA monitoring; Follow-up; Biochemical recurrence; PSA doubling time

1. Introduction

Radical prostatectomy is widely performed as the primary treatment for clinically localized prostate cancer and recurrence is most commonly diagnosed by detecting asymptomatic elevation of the serum level of prostate specific antigen (PSA). Since serum PSA is exclusively produced by prostatic epithelial cells and its half-life is known to be around 3 days, it usually reaches <0.2 ng/ml within a month after radical prostatectomy [1]. As a result, persistent higher level or

subsequent re-elevation of the serum PSA after radical prostatectomy inevitably indicates either residual cancer or recurrence. Therefore, the sensitivity of PSA monitoring after radical prostatectomy is extremely high because all patients who develop distant metastasis and die of prostate cancer inevitably show biochemical recurrence (BCR) first. Pound et al. [2] reported that metastasis was detected a median of 8 years after elevation of PSA, and that the median time to death after development of metastatic disease was slightly less than 5 years. Therefore, monitoring serum PSA is essential for surveillance after radical therapy in order to identify patients who might need additional treatment for recurrence. Since early salvage therapy for recurrence

* Corresponding author. Tel.: +81 3 5363 3825; fax: +81 3 3225 1985.
E-mail address: kazz_matsumoto@yahoo.co.jp (K. Matsumoto).

achieves better results [3–6], it is important to detect elevation of PSA without delay.

If radical treatment of prostate cancer fails, this usually occurs at an early stage, so patients should be followed more closely during the first few years after radical prostatectomy. While the risk of BCR gradually declines over time, a significant number of patients still show progression more than 5 years after surgery [7]. However, unnecessarily intensive PSA monitoring is undesirable, considering both medical costs and the burden on physicians and patients. According to the NCCN guideline, serum PSA levels should be measured every 3 months in men with a high risk of recurrence, and every 6 to 12 months in other patients for the first 5 years after surgery and then should be monitored annually [8]. In the EAU guideline, measurement of PSA, taking a disease-specific history, and digital rectal examination are recommended at 3, 6, and 12 months postoperatively, every 6 months thereafter until 3 years, and then annually [9]. However, these recommended schedules are empirical rather than being based on evidence.

The PSA doubling time (PSA-DT) is defined as the number of months it takes for the PSA level to double from a baseline value [10]. Elevation of PSA after surgery is thought to reflect growth of the residual tumor, so the PSA-DT approximates the time required for the number of tumor cells to double. It is known that the PSA-DT remains relatively constant over time after BCR [11], and it can be used to estimate future PSA values. In this study, in order to determine the optimal interval for measurement of PSA after surgery, we focused on the PSA-DT following BCR at various times after radical prostatectomy.

2. Patients and Methods

After receiving institutional review board approval, we retrospectively reviewed the clinicopathological data of 1,010 consecutive patients who underwent radical prostatectomy between 1995 and 2008. Both open and laparoscopic radical prostatectomy were performed by the retroperitoneal approach. After we excluded patients who received neoadjuvant or adjuvant therapy and those without a nadir PSA level <0.2 ng/ml, the remaining 779 patients were enrolled in this study.

BCR was defined as elevation of PSA to >0.2 ng/ml after radical prostatectomy. PSA has been measured with an ultrasensitive assay (detection limit of 0.01 ng/ml) since 2002 and the conventional PSA assay (detection limit of 0.1 ng/ml) was performed before that. Consequently, PSA was measured with an ultrasensitive assay from the initial examination in 593 patients (76.1%). All patients underwent the first PSA measurement at 1 to 2 months after surgery. To detect BCR, PSA was generally measured at 3-month intervals for the first 2 years after surgery, at 6-months intervals for the next 3 years, and annually

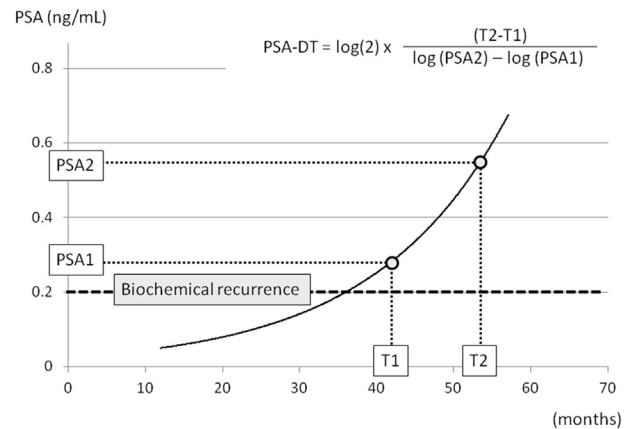


Fig. 1. PSA-DT after BCR. When the serum PSA level increased above 0.2 ng/ml, the PSA-DT for each patient was calculated as the natural logarithm of 2 divided by the slope of the relationship between log PSA and the time of PSA measurement.

thereafter. The pathological diagnosis of each prostatectomy specimen and PSA data were determined by review of the medical records. We focused on the BCR rate and the PSA-DT following BCR at various times after radical prostatectomy. PSA-DT was calculated with a formula that employs the natural logarithm of 2 divided by the slope obtained from fitting linear regression of the natural log of PSA to time (Fig. 1) [10]. Patients were divided into 5 groups by setting multiple cut points at clinically convenient times of 1, 2, 3, and 5 years after surgery.

The start time of this study was the date of radical prostatectomy, and Kaplan-Meier curves were drawn to examine postoperative BCR-free survival. Patients without BCR were censored at the last follow-up visit. The PSA-DT

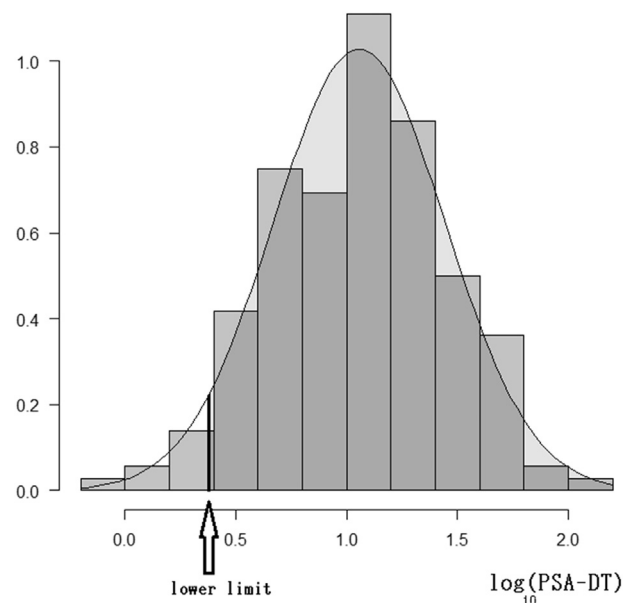


Fig. 2. Histogram of the PSA-DT distribution. PSA-DT values showed a log-normal distribution. The minimum PSA-DT was defined by the one-sided lower 95% confidence limit.

Download English Version:

<https://daneshyari.com/en/article/8789959>

Download Persian Version:

<https://daneshyari.com/article/8789959>

[Daneshyari.com](https://daneshyari.com)