External-Beam Radiotherapy for Clinically Localized Prostate Cancer in Osaka, Japan, 1995–2006

Time Trends, Outcome, and Risk Stratification

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Purpose: To establish an initial database of external-beam radiotherapy (EBRT) for clinically localized prostate cancer used in Osaka, Japan, and, by analyzing the results of the Osaka multicenter cooperative study, to determine time trends, outcome, and applicability of existing and the authors’ original risk stratification methods.

Patients and Methods: Data of 652 patients with clinically localized prostate cancer (T1–4 N0 M0) were accrued from July to December 2007. These patients had been treated from 1995 through 2006 with consecutive definitive EBRT of ≥ 60 Gy at eleven institutions, mainly in Osaka. Altogether, 436 patients were eligible for analysis using several risk stratification methods, namely, those of D’Amico et al., the National Comprehensive Cancer Network (NCCN), and Seattle, as well as the authors’ original Prostate Cancer Risk Index (PRIX).

Results: The number of patients showed a tenfold increase over 10 years, together with a rapid spread of the use of Gleason Score from 0% to > 90% of cases. The dominant RT dose fractionation was 70 Gy/35 fractions (87%). Hormone therapy had been administered to 95% of the patients and the higher PRIX corresponded to the higher rate of hormone usage. 3- and 5-year biochemical relapse-free survival (bRFS) rates were 85% and 70%, respectively. The D’Amico (p = 0.132), NCCN (p = 0.138), Seattle (p = 0.041) and PRIX (p = 0.044) classifications showed weak or no correlation with bRFS, while the own modified three-class PRIX (PRIX 0, 1–5, 6) showed a strong correlation (p = 0.002).

Conclusion: The use of prostate EBRT in Japan is still in its infancy, but is rapidly expanding. The short-term outcomes have been satisfactory considering the moderate RT dose. A very high rate of hormone usage may affect the outcome favorably, but also may compromise the usefulness of current risk stratification.

Key Words: Prostate cancer · Clinically localized · Risk classification · Radiation therapy · Prostate Cancer Risk Index (PRIX)
which fully corresponds to the Partin Table [15] in terms of which we termed the Prostate Cancer Risk Index (PRIX), and to patients or the mass media via the internet. As a result, the application of this procedure in Japan is still in its infancy.

One special characteristic of prostate cancer treatment in Japan is the extremely high rate and long term of hormone therapy use. The main reason for this is likely to be the fact that there is no limit on the reimbursement by the Japanese health insurance system for the cost of hormone therapy once the patient is diagnosed with prostate cancer, regardless of any kind of accompanying therapy. In other words, one can receive hormone therapy from initial diagnosis until death, regardless of whether the therapy is administered pre- or postprostatectomy or of RT status. Moreover, medical insurance in Japan is based on a system of universal health coverage.

We recently proposed a new risk stratification method which we termed the Prostate Cancer Risk Index (PRIX), and which fully corresponds to the Partin Table [15] in terms of probability of pathologic lymph node involvement, and also corresponds to the other nomograms better than any existing risk-grouping method [20]. In this study, we accumulated as many data as possible of patients consecutively treated at main institutions in Osaka in an effort to establish an initial database for prostate external-beam radiotherapy (EBRT) in Japan, and to examine the time trends, outcome, and relative applicability of existing and our original risk stratification methods.

Patients and Methods
Collection of Data and Patient Characteristics
Between July and December 2007, eleven institutions, mainly in Osaka (eight in Osaka and one each in Kyoto, Hyogo and Aichi), Japan, participated in this study and their data were sent to Osaka University. The data thus collected were for 652 consecutive patients with clinically localized prostate cancer (T1–4 N0 M0), who had been treated with definitive EBRT of ≥ 60 Gy at one of the participating institutions from 1995 through 2006. Patients had been followed up every 3 months. No patient had received intensity-modulated radiotherapy (IMRT). Patients with postprostatectomy status were excluded. The data included age, T-classification (according to UICC 2002), pretreatment prostate-specific antigen (PSA) level, Gleason Score (GS), biochemical and clinical outcome, definition of biochemical failure, hormone therapy, EBRT dose and field, and acute and late toxicity. Data for 436 of the 652 patients were considered to meet the following criteria: T-classification was detailed as in “T2a” (“T2” was therefore ineligible) in terms of UICC 2002; all of the aforementioned data were complete except for those for clinical outcome and acute and late toxicity; the follow-up period was at least 6 months. The most frequent reason for ineligibility was omis-