Focal Therapy for Prostate Cancer Using I125 Seed Implantation: Hemiablative Brachytherapy for Patients Selected by Extended Biopsy and MRI Findings

Introduction and Objective: Focal therapy for localized prostate cancer could be a minimally invasive option to preserve genitourinary function. Since the optimal selection of patients is mandatory for this treatment, we have reported that our extended three-dimensional (3D) biopsy could indentify unilateral prostate cancer (Numao N, et al, Eur Urol supple, 2009). Among the ablative technologies for focal therapy, brachytherapy has potential for focal ablation due to its ability of dose and location adjustment by seed implantation under real-time monitoring. Based on the findings, we have started hemiablative brachytherapy using I-125 seed implantation for unilateral prostate cancer patients selected by extended biopsy as a focal therapy for prostate cancer. We aimed to describe the initial results of hemiablative brachytherapy.
Materials and Methods: The eligible criteria for hemiablative brachytherapy are as follows. Clinical stage is T2a or less. The positive cores of cancer are proven within unilateral lobe by extended 3D prostate biopsy. There was no cancerous lesion in contralateral lobe by multimetric MRI. Gleason score in positive cores was 7 or less. Maximum cancer length was 5 mm or less. PSA value is less than 20 ng/ml. On the treatment, I-125 seeds were implanted to deliver a dose of 160 Gy to the target lobe. The protocol has been approved by institutional ethical commit.
Results: At present, 6 patients were enrolled in this study and underwent hemiablative brachytherapy with written informed consents. Clinical stages were T1c in 4 patients and T2a in 2 patients. Median pretreatment PSA value was 6.0 ng/ml (range: 4.8–12.0 ng/ml). In all patients, Gleason 6 cancers were found in unilateral lobe with extended 3D biopsy. The median numbers of implanted seeds were 41 (range 39-44), 39, and 35 for each case, respectively. PSA levels decreased immediately after the ablation. During the follow-up period, a median of 8 months (range: 3 – 13 months), disease recurrence did not occur.
Conclusions: We demonstrated the initial results of focal therapy for prostate cancer with hemiablative brachytherapy. Hemiablative brachytherapy could show the initial good PSA response.