

## THE IMPACT OF PRONE POSITION WITH BELLY-BOARD DEVICE ON THREE-DIMENSIONAL CONFORMAL RADIOTHERAPY OF PROSTATE CANCER: DECREASING THE RECTUM COMPLICATION PROBABILITY

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**Background and Purpose :** To investigate the impact of supine position versus prone position with belly-board on prostate radiotherapy by evaluation the geometric parameter change between internal organs and treatment dose-volume histograms (DVHs).

**Materials and Methods :** Fifteen patients with prostate cancer underwent pelvic CT scan in position of both prone with belly-board device and supine without immobilization. Four-field box three-dimensional conformal radiotherapy (3DCRT) treatment planning was planned for each patient in both positions. Geometric change including diameter of rectum, distant between critical organs and treatment DVHs were investigated. Wilcoxon signed-rank test was used for statistical analysis.

**Results :** Patients in prone treatment position had both larger antero-posterior diameters and transverse diameter of rectum ( $p = 0.003$  and  $p = 0.031$ ), and larger distance between the centers of prostate and rectum ( $p=0.002$ ) than those of patients in supine position. In regard to the DVHs data, prone treatment position resulted in larger rectal volume ( $p = 0.015$ ), lower mean rectal dose ( $p = 0.002$ ) and smaller rectal volume receiving high radiation dose ( $p = 0.001$ ).

**Conclusions :** Patients in prone treatment position with belly-board immobilization had both larger antero-posterior diameters, transverse diameter of rectum, and larger distance between the centers of prostate and rectum than those of patients in supine position. Prone treatment position with belly-board device can reduce rectum dose, which may in turn decrease the risk of radiation-induced complications.

[Therapeut Radiol Oncol 2013; 20(2): 107-114 ]

Key words: Prostate cancer, Three-dimensional conformal radiotherapy, Treatment position, Belly-board, Dose-Volume Histogram.

### INTRODUCTION

The capability of 3D conformal radiotherapy (3DCRT) in increasing radiation dose

to the prostate and reducing dose to the adjacent normal organs has been well established in patients with localized prostate cancer [1, 5, 11, 12, 15, 13, 18]. The optimal treatment position

Received: 2013, 1, 15. Accepted: 2013, 2, 20.

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