

## FEASIBILITY STUDY USING PRE-OPERATIVE PRONE-POSITION VOLUMETRIC MODULATED ARC THERAPY AND CHEMOTHERAPY IN LOCALLY ADVANCED RECTAL CANCER

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**Purpose** : To evaluate the toxicity and treatment response of using volumetric modulated arc therapy (VMAT) and chemotherapy as neoadjuvant concurrent chemoradiotherapy (CCRT) for rectal cancer.

**Materials and Methods** : Ten patients with stage IIA-IV rectal adenocarcinoma who underwent neoadjuvant CCRT using prone-position VMAT from April 2010 to December 2010 were enrolled in this study. All patients were treated on a belly board with a full bladder. All VMAT plans were designed with the Pinnacle<sup>3</sup> 9.0 planning system with 45 Gy in 25 fractions. Setup errors were corrected using cone-beam computed tomography weekly or more frequently. Treatment toxicities were graded using the Common Terminology Criteria for Adverse Events v4.0. The chemotherapy regimens were 5-fluorouracil-based, combined with oxaliplatin or mitomycin. Five patients received bevacizumab as a part of the chemotherapy regimen.

**Results** : All patients completed neoadjuvant CCRT and received post-CCRT surgical resection. Two had pathological complete response (pCR), and both of these received bevacizumab. Nine of 10 patients had T or N downstaging. Only one patient had pathological nodal involvement. The most common toxicities were grade 1 or 2 anal skin reaction and diarrhea. No patient experienced more than grade 3 toxicity. There was no difference in toxicity between patients with or without bevacizumab. The average displacement in longitudinal, lateral, and vertical directions in the whole group was 0.24 cm, 0.21 cm, and 0.37 cm, respectively. The standard deviation of displacement at longitudinal, lateral, and vertical directions ranged from 0.09-0.34 cm, 0.06-0.20 cm, and 0.11-0.52 cm, respectively.

**Conclusions** : Using VMAT and prone position on a belly board in neoadjuvant CCRT with or without bevacizumab for rectal cancer is feasible and safe. The treatment-related toxicity was acceptable and the treatment response was satisfactory. Prone-position technique requires more attention in setup errors.

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Key words: Rectal cancer, Prone position, Volumetric modulated arc therapy