A B S T R A C T

Aim: The purpose of this study was to examine the usefulness of using Simultaneous Integrated Boost (SIB) radiotherapy for thyroid cancer treatment.

Background: At our hospital a 3D Conformal RadioTherapy (3D-CRT) technique involving photon and electron beams for the treatment of thyroid cancer was often used. High dose to the spinal canal was limiting the total dose of such a treatment. After investigation of Intensity Modulated Radiotherapy (IMRT) technique involving seven photon beams for first course of treatment we decided to examine possibility of reducing treatment fractions by using SIB radiotherapy.

Material and methods: Plans for 10 patients were studied. For each patient, IMRT plan for the first course of treatment (50 Gy for PTV), two plans for the second course of treatment (10 Gy for BOOST) and a SIB plan (50 Gy for PTV, 56 Gy for BOOST) were prepared. For all plans, comparisons of dose statistics for the PTV, BOOST, PTV without BOOST (defined as PTV without BOOST with 1 cm margin), spinal canal and Patient Outline (Body) was done.

Results: Minimum dose for BOOST is higher in the SIB technique than in the two course treatment. PTV without BOOST receives the same average dose in SIB and the 1st course IMRT – 50.10 Gy and 49.84 Gy, respectively. In the SIB technique, higher reduction of dose delivered to the spinal canal is possible (27 Gy compared with 30 Gy).

Conclusion: SIB therapy for thyroid cancer with relation to typical two course treatment is a good proposal of reducing the number of fractions with the same dose for BOOST and PTV without BOOST. Additionally, better sparing of the spinal canal is achieved.

Keywords: SIB, IMRT, Thyroid, TCI