

Techniques and Procedures Developed to Improve the Quality of Total Body Irradiation

Purpose

Half-standing position has been used in our clinic for Total Body Irradiation (TBI) treatment for better patient comfort and dose uniformity. Several compensation techniques and diodes calibration procedures were developed to improve the quality of total body irradiation (TBI) treatment.

Methods and Materials

A frame was designed to stand on the linac couch and to hold the Cerrobend lung blocks. The blocks were mounted on a polystyrene board, which was screwed on the frame. The position of the blocks could be adjusted with the vertical movement and certain rotation of the board. It could then be fine tuned by moving the couch vertically and laterally. The source to patient's mid-plane distance is 400 cm, and the block to patient's mid-plane distance is 200 cm. An house-made rice bag was used to compensate the thickness of the patient's neck, and the linac jaws were partially closed during the treatment to compensate the dose to patient's lower legs. The dose distribution was monitored by in-vivo diodes, which were calibrated at Dmax with treatment distance.

Result

Since the blocks were halfway in-between the source and the patient's mid-plane, they were not heavy and their penumbra was small. It was easy for therapists to positioning the blocks. The thickness of the neck was well compensated by the rice bag, the deviation of the dose measured at the neck to the prescription was reduced from 8-9% to 2-3%. The Dmax dose measured at the prescription site was in good agreement with the calculated Dmax dose. The differences were usually within 5%. No corrections of the diode's readings were necessary for the variation of patients' separations.

Conclusion

The TBI technique provides a simple and efficient method to deliver high quality treatments.