Intraoperative radiotherapy for locally advanced prostate cancer: treatment technique and ultrasound-based analysis of dose distribution.

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Abstract

BACKGROUND: To present the technique and dose distribution of intraoperative radiotherapy (IORT) for prostate cancer.

PATIENTS AND METHODS: Pelvic lymphadenectomy, prostate IORT and radical retropubic prostatectomy was performed in 11 prostate cancer patients. Prostate thickness and rectum depth were measured with intraoperative ultrasound. IORT was delivered by a mobile linear accelerator in the operating room (electron beam, 12 Gy at 90% isodose).

RESULTS: The mean preoperative probability of organ-confined disease was 10% (Memorial Sloan Kettering Cancer Center nomograms). Mean prostate thickness, width and length were 3.4 cm, 4.6 and 4.9 cm, respectively. Mean rectum depth was 3.3 cm. Mean doses to the posterior prostate capsule, 5-mm lateral prostate margins and at the subsequent urethral stump area were 4.6 Gy, 8.7 Gy and 11.3 Gy, respectively. Maximum mean rectal dose was 4.9 Gy.

CONCLUSION: IORT appeared a feasible approach for prostate cancer, showing a satisfactory dose coverage to the prostate bed with relatively low rectal dose. However, high variability in dose distribution calls for further study of patient selection criteria and dosimetry.