

**Post radical-prostatectomy radiotherapy: a new technique for
minimization of the bladder dose.**

Tsvang, Lev; Pfeffer, Raphael; Symon, Zvi

**Oncology Department, Chaim Sheba Medical Center,
Ramat Gan, Israel.**

Purpose: Patients undergoing either rescue or adjuvant post radical-prostatectomy radiation therapy are exposed to significant potential toxicities of both surgery and radiation. The inclusion of the bladder neck and anastomoses in the CTV may result in significant dose to the entire bladder due to prolapse of the bladder into the prostatic fossa following surgery. Thus we compared five 3-D conformal planning strategies to minimize bladder dose.

Methods and Materials: CT scans of 20 patients treated with post prostatectomy radiation with three-dimensional conformal (**3D-CRT**) were utilized for this study. Patients were immobilized in the supine position with a knee rest. The following structures were contoured: CTV expanded by 1 cm for PTV-I and 0.5cm to rectum direction for PTV-II, bladder, rectum, penile bulb, femurs and testis. Prescription dose was 54 Gy to PTV-I and 16Gy to PTV-II. All patients were planned by a single physicist. Five treatment techniques were compared: a bladder sparing 6 field non-coplanar plan developed in our department, 4 and 6 field coplanar plans, Dynamic arc therapy and IMRT. The mean dose for each structure normalized to the prescription dose were calculated for each technique.

Results: A correlation between a critical organs dose and CTV, bladder and rectum volumes was detected in used treatment planes. The non-coplanar 6 field provided the lowest dose to the bladder compared to the other techniques. Overall this technique offers excellent target coverage a favorable dose profile to the rectum and femur compared with other treatment techniques.

Conclusions: A 6 field non-coplanar technique offers the best therapeutic ratio for 3-D prostatic fossa radiation providing the best bladder sparing radiation compared to other conformal treatment plans.