

Works in Progress Submission

Dosimetric Evaluation of Conventional 3DCRT and IMRT of Prostate Cancer.

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Six conventional 3DCRT patient plans and nine IMRT plans were evaluated for dosimetric comparison.

3DCRT was delivered using conventional four fixed ports. BEV is used to design blocks and dose calculations were performed utilizing a 3D planning system. The mean CTV dose was 70.4Gy. The **rectal** volume receiving (\Rightarrow) 65Gy was 34%, while (\Rightarrow) 70Gy was only 17%. The volume of the **bladder** receiving the same doses were 37% and 15%, respectively.

Nine patients were treated with IMRT using inverse planning method. Five of these patients' treatment plans and daily patient set-up utilized the BAT (an ultrasound prostate localization technique), which allowed for tighter conformal coverage around the CTV. Mean CTV dose was 77Gy. The **rectal** volume receiving doses (\Rightarrow) 65, 70 and 75Gy was 13%, 8% and 2% with ultrasound localization and 24%, 16% and 5% without ultrasound localization. The **bladder** volume receiving doses (\Rightarrow) 65, 70 and 75Gy were 9%, 5% and 2% with ultrasound localization and 17%, 11% and 3% without ultrasound localization.

Conclusion: 3DCRT rectal and bladder dose volumes are significantly higher than IMRT. Hence, dose escalation techniques with conventional 3DCRT may be limited by the increased rectal and bladder toxicity. Ultrasound localization in IMRT allowed tighter conformality around the target, helping to reduce rectal and bladder dose toxicity by **one half**.