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REDUCTION IN RECTAL DOSE WITH USE OF SPACEOAR® HYDROGEL TO TREAT PROSTATE CANCER ADENOCARCINOMA WITH HDR BRACHYTHERAPY

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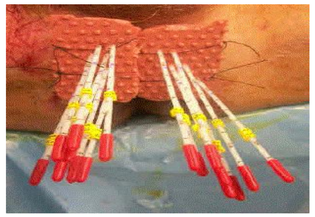
PURPOSE

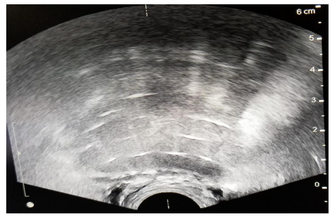
The probability of rectal toxicity is higher in patients treated with HDR brachytherapy for prostate adenocarcinoma. The SpaceOAR® hydrogel is of interest to clinicians since it creates space between the prostate and rectum. This study quantifies the impact of SpaceOAR® hydrogel by evaluating the radiation doses to the rectum with and without the hydrogel.

METHOD

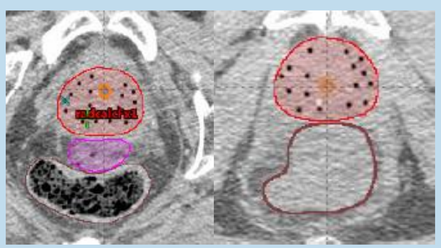
- 38 patients with low-intermediate risk prostate cancer, total of 76 cases from March 2017 treated to a total dose of 27Gy.
- 14 patients opted for SpaceOAR® hydrogel to be inserted with a needle through the rectourethralis muscle to the peri-rectal fat.
- Insertion of the hydrogel is performed in the department, couple weeks prior to HDR procedure, with patient in transurethral position with the help of bk3000 ultrasound machine.
- 16 flexi needles (25 or 30cm) from Best medical are used for the prostate implant.
- Dosimetric analysis was done by obtaining rectum max, mean and V75 dose.
- Treatment planning is done on with a patient CT using Eclipse brachyvision TPS and treatment delivered by VariSource iX remote afterloader.



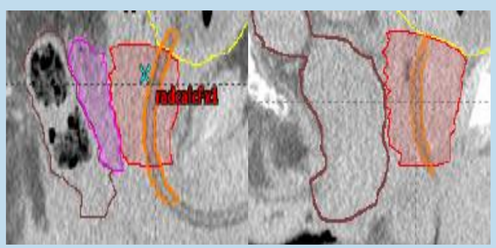
16 interstitial needle implant in the prostate



Axial US image of SpaceOAR® below prostate

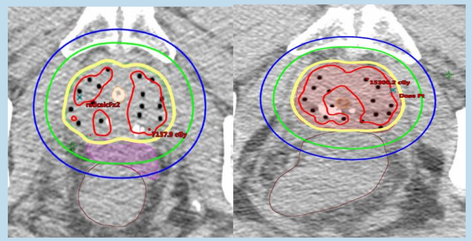


Axial view of patient with spaceOAR® (left, magenta) and without spaceOAR® (right). Prostate (red), Rectum (brown), Urethra (orange)

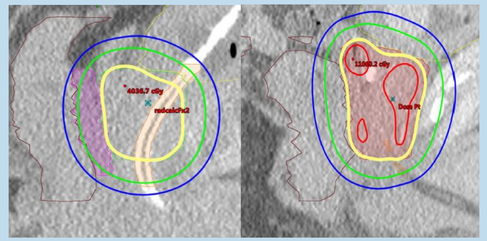


Sagittal view of patient with spaceOAR® (left, magenta) and without spaceOAR® (right). Prostate (red), Rectum (brown), Urethra (orange)

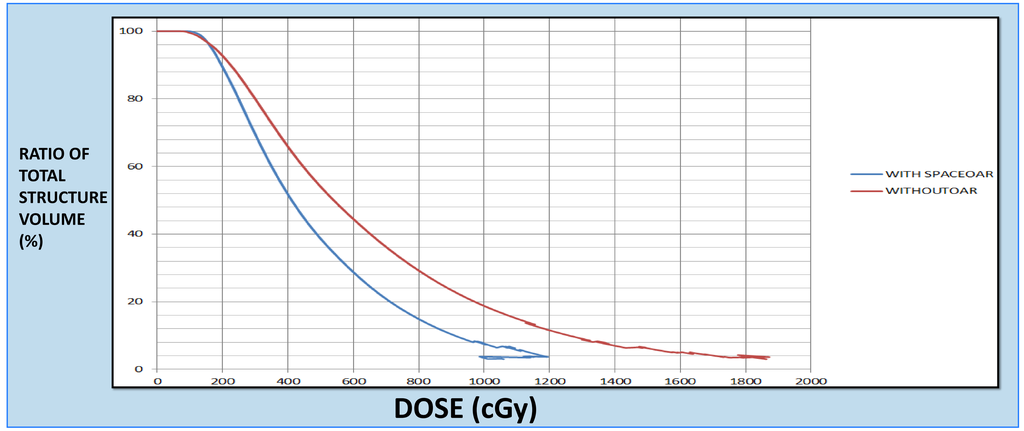
RESULTS



Example of an axial view isodose comparison of a HDR prostate plan with spaceOAR® hydrogel (left) and without (right). Red 40.5Gy (150%), Yellow 27Gy(100%),Green 13.5Gy(50%), Blue 9.45Gy(35%).



Example of a sagittal view isodose comparison of a HDR prostate plan with spaceOAR® hydrogel (left) and without (right). Red 40.5Gy (150%), Yellow 27Gy(100%), Green 13.5Gy(50%), Blue 9.45Gy(35%).



Cumulative dose-volume histogram (DVH) comparison of the rectal dose for 38 patients used in the study (76 cases) with spaceOAR® hydrogel (blue) vs with patients without the spaceOAR® hydrogel (red).

		With SpaceOAR®	Without SpaceOAR®	p-value
Rectum	Max Dose (Gy)	9	13.7	<.05
	Mean Dose (Gy)	2.5	3.4	<.05
	V75 (cc)	0.2	0.7	<.05

CONCLUSION

SpaceOAR® hydrogel is an effective method to create space between the prostate and rectum and reduce radiation dose to the rectum for the patients receiving HDR brachytherapy treatment for prostate cancer.

REFERENCES & ACKNOWLEDGEMENT

- Wu, Susan Y. et al. “Improved rectal dosimetry with the use of SpaceOAR during high-dose-rate brachytherapy” Brachytherapy, Volume 17, Issue 2, 259-264.
- https://www.spaceoar.com/what-is-spaceoar-hydrogel/how-does-spaceoar-hydrogel-work/
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