Poster #51

THE INTRODUCTION OF ADVANCED BIOMATERIALS FOR USE IN UROLOGIC PROCEDURES

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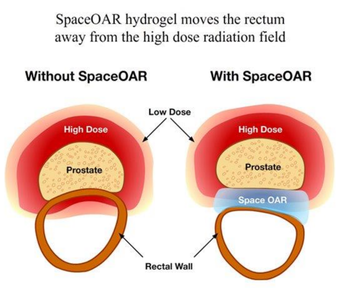
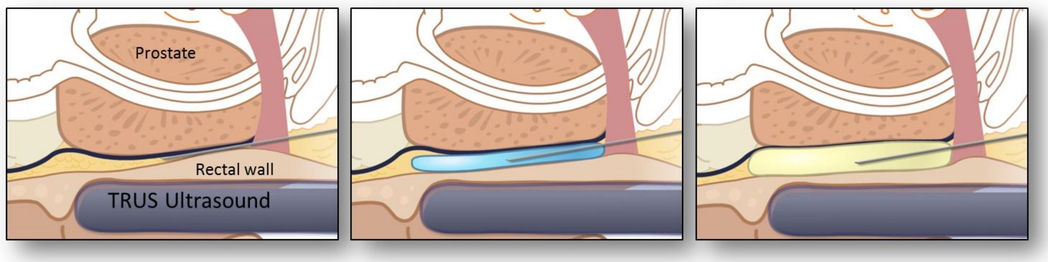
Introduction: The utilization of absorbable polyethylene glycol (PEG) hydrogels has become commonplace in neurosurgery (DuraSeal® Dural Sealant, DuraSeal® Spine Sealant, Covidien) and in Interventional Cardiology (MynxGrip®, AccessClosure). The development of two new hydrogels (SpaceOAR® Spacer, TraceIT® Tissue Marker, Augmenix) with Urologic applications may impact the treatment patterns of certain common urologic conditions including *prostate cancer* and *bladder cancer.*

Methods:

Prostate Cancer

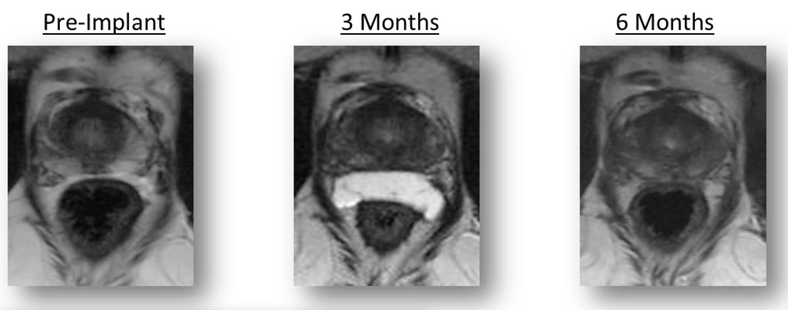
The main limitation of prostate irradiation in PCa patients is concern about injury to the Organ At Risk (OAR), the rectum.

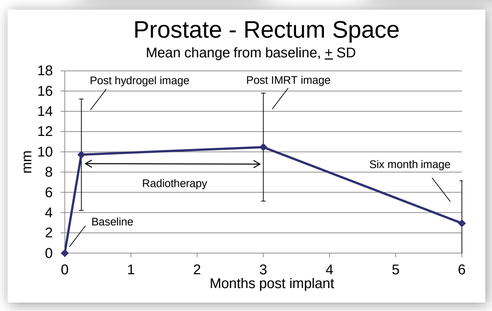




- Under transrectal ultrasound guidance SpaceOAR liquid is injected via a transperineal 18G needle into the perirectal fat posterior to Denonvilliers' fascia
- Injected as liquid
- Solidifies within 10 seconds
- Maintains space 3 months
- Absorbs in 6 months

Results:

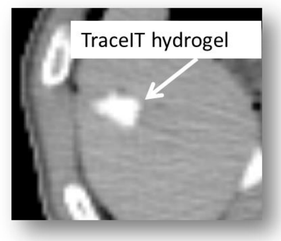




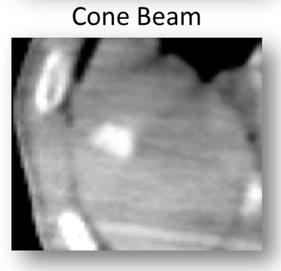
SpaceOAR hydrogel maintained space out through 3 months and absorbs in approximately 6 months

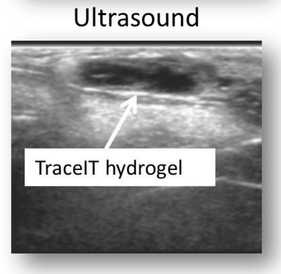
From Uhl M et al. Radiother Oncol. 2013 Feb;106(2):215-9

Bladder Cancer



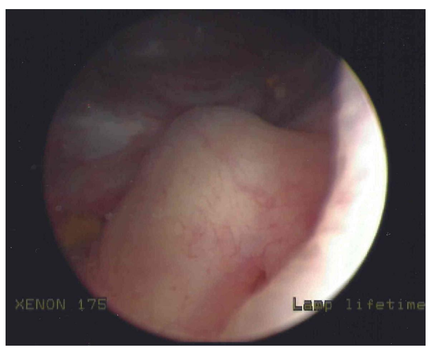
Modality	Visibility
CT	Yes
CBCT	Yes
Mammography	Yes
kV, planer x-ray, fluoroscopy	Poor
MRI (T2, flair)	Yes
Ultrasound	Yes





- Radiotherapy for bladder tumors is hampered by difficulty in localizing the area of tumor within the bladder.
- Ability to target tumors accurately could increase effectiveness of radiation delivery
- Limit irradiation of normal bladder

- TraceIT is a particulated iodinated PEG hydrogel designed for cystoscopic injection into bladder wall and other visceral sites
- Marks the tumor bed to facilitate tumor localization during radiotherapy



- A series of three patients were implanted to evaluate marker visibility, ability to delineate in RT plans, and resistance to migration

Conclusion:

- In-situ forming hydrogels for use as perirectal spacers appear to be well tolerated and can allow significantly reduced radiation dose to the rectum
  - May allow dose escalation and hypofractionation
- In-situ hydrogel can be used as a bladder marker that is easy to deploy, and resists migration.
  - May allow for improved radiation targeting