

Y90 Treatment via Pressure-Enabled Drug Delivery in Patient with HCC & Dosimetry Analysis Using MIM SurePlan Y90

OVERVIEW

A patient diagnosed with hepatocellular carcinoma (HCC) had a segment 4/8 lesion treated with Y90 radioembolization (RE) delivered via Pressure-Enabled Drug Delivery™ (PEDD™). Post-treatment dosimetry analysis performed using MIM SurePlan Y90* confirmed that with only 10mCi of resin Y90 a target dose of an average 162 Gy was delivered to the tumor, with minimal off-target delivery. This case shows how the reflux protection and flow modulating properties of the TriNav Infusion System can help drive more therapy into the target.

PATIENT HISTORY

A 74-year-old male with HCC was referred for Y90 RE to treat a lesion in segment 4/8 coming off a replaced left hepatic artery originating from the left gastric artery. The patient had received Y90 RE 9 months prior to treat a different lesion, and at the 3-month follow-up visit a new lesion measuring 30x34mm in segment 4/8 was identified (**Figure 1**). At the time that the patient was referred for the second Y90 RE treatment, the patient's total bilirubin was elevated to 1.3.

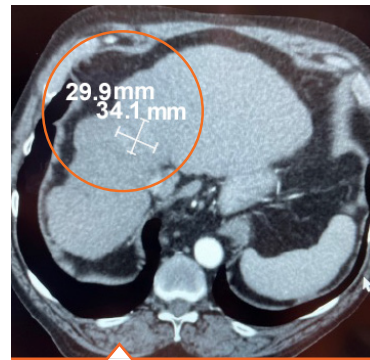


Figure 1: Pre-treatment CT shows a 30x34mm HCC lesion in Segment 4/8.

TREATMENT

The mapping procedure was performed with ^{99m}Tc-MAA delivered to the target segment 4/8 lesion via a standard endhole (EH) microcatheter. **Figure 2** from the mapping procedure shows significant reflux to segments 2 and 3. Two weeks following the mapping procedure, 10mCi of resin Y90 was delivered via a TriNav Infusion System placed at the same location as the mapping procedure. **Figure 3** shows how contrast injection via PEDD improved perfusion to the tumor without enhancement of segments 2 and 3, which demonstrates control of reflux and preferential delivery to the target tumor. **Figure 4** shows the post-Y90 PET-CT which demonstrates highly focal treatment of the tumor and very little uptake in the surrounding tissue.

At the 2-month follow-up, CT imaging showed complete necrosis of the tumor, and the patient's bilirubin had decreased to 0.9 (**Figure 5**).

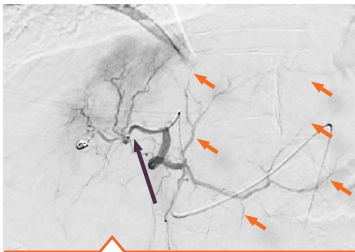


Figure 2: Angiography from mapping procedure showing contrast injection to segment 4 via EH microcatheter (purple arrow), with reflux to segments 2 and 3 (orange arrows).

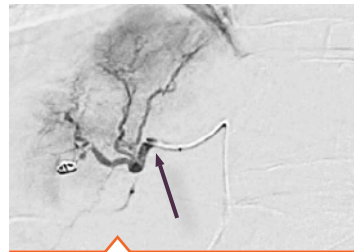


Figure 3: Angiography from treatment procedure showing contrast injection to segment 4 via TriNav (purple arrow). Hyper-perfusion of the tumor, excellent control of reflux, and no enhancement of segments 2 and 3 are demonstrated.

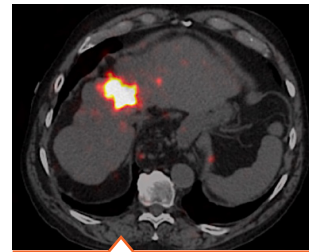


Figure 4: Post-Y90 PET-CT demonstrates the highly focal delivery to the tumor and minimal uptake to the surrounding hepatic parenchyma achieved with PEDD.

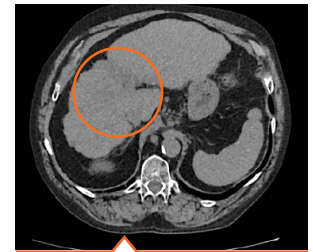


Figure 5: 3-month follow-up CT imaging showing complete necrosis of the treated tumor.

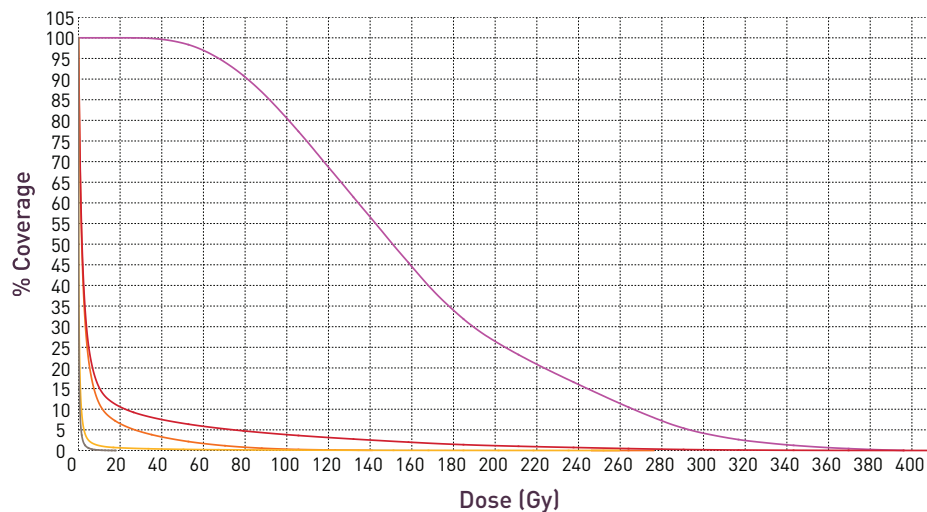
*MIM Software Inc.

Y90 Treatment via Pressure-Enabled Drug Delivery in Patient with HCC & Dosimetry Analysis Using MIM SurePlan Y90

DISCUSSION

Following the treatment procedure, the case was reviewed using MIM SurePlan Y90. The resulting Dose Volume Histogram (DVH) (Figure 6) confirmed that the target dose was delivered to the tumor. The pink line on the DVH shows the high dose delivered to the tumor, while the other curves (lungs and normal liver) approach the y-axis representing the acceptably low dose delivered to the non-target areas. Dosimetry calculations in MIM showed that with only 10mCi of resin Y90, 162.4 Gy was successfully delivered to the target tumor, while only 12.5 Gy was delivered to the normal liver tissue. This DVH illustrates that TriNav achieved successful on-target dose delivery by reflux protection to the off-target areas.

MIM-Generated DVHs



Dose ID	Dose Details					
D1	VSV Dose					
Contour	Line Style	Max Dose	Min Dose	Mean Dose	SD	
	D1	D1	D1	D1	D1	D1
Liver	—	412.81	0.01	12.54	37.68	
Lung_L	—	18.09	0.00	0.30	0.79	
Lung_R	—	271.88	0.00	0.93	6.24	
Normal Tissue	—	276.09	0.01	5.67	13.46	
Tumor 1	—	412.81	22.71	162.43	69.97	

Figure 6: Post-treatment dosimetry analysis carried out in MIM SurePlan MRT showed that 162.4 Gy was successfully delivered to the target tumor, while only 12.5 Gy was delivered to the normal liver tissue.

CONCLUSION

This case and the post-treatment dosimetry analysis performed demonstrate how PEDD may be used to improve tumor targeting and reduce off-target delivery in Y90 radioembolization procedures.

For additional data supporting enhanced liver tumor targeting in Y90 RE procedures, refer to www.trinavinfusion.com/pedd-data/.

This content is sponsored by TriSalus Life Sciences®. Results are not predictive of outcomes in other cases.

INDICATIONS FOR USE: The TriNav Infusion System is intended for use in angiographic procedures. It delivers radiopaque media and therapeutic agents to selected sites in the peripheral vascular system.

CONTRAINDICATIONS: TriNav is not intended for use in the vasculature of the central nervous system (including the neurovasculature) or central circulatory system (including the coronary vasculature).

Rx ONLY. For the safe and proper use of the TriNav device, refer to the Instructions for Use.