Austin Radiological Association

Nuclear Medicine Procedure

MAA Mapping
(Tc-99m-Macroaggregated Albumin)

Overview

- Endovascular mapping and conjoint 99mTc-macroaggregated albumin (99mTc-MAA) hepatic perfusion imaging provide essential information before liver radio-embolization with 90Y-loaded microspheres in patients with primary and secondary hepatic malignancies. This integrated procedure is to determine whether there is a risk for excessive shunting of 90Y-microspheres to the lungs.

Indications

- Pretreatment of Y-90 TheraSpheres

Examination Time

- 1 hour 30 min

Patient Preparation

- None.

Equipment & Energy Windows

- Gamma camera: Large field of view, preferably a dual head camera.
- Collimator: Low energy, high resolution, parallel hole.
- Energy window: 20% window centered at 140 keV.

Radiopharmaceutical, Dose, & Technique of Administration

- Radiopharmaceutical: Tc-99m-macroaggregated albumin.
- Dose:
  5 mCi (185 MBq) Check with performing radiologist – may be 2 syringes one with 2 mCi and one with 3 mCi both in 5cc syringe, or 5 mCi in one 3cc syringe.
- Technique of administration: Endovascular administration to be done in IR suite.

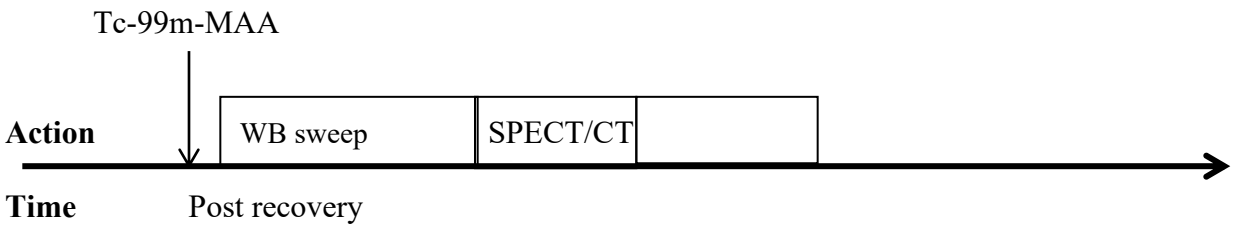
Patient Position & Imaging Field

- Patient position: Supine
- Imaging field: Entire lungs and liver.

Acquisition Protocol

- Imaging may begin immediately.
- Acquire a sweep from chest to pelvis and complete processing portion that follows.
  Parameters: 256 X1024 matrix and scan speed of 8cm/min
- Acquire SPECT/CT images
  Parameters: 18 sec per stop, 64 stops, matrix of 128 X 128

Protocol Summary Diagram



Data Processing

- Use the WB processing workflow to calculate the percentage of shunting.

Optional Maneuvers

- None

Method for timely correction of Data Analysis and reporting errors and notification of referring parties

- Data Analysis and reporting errors are reported to the interpreting physician and appropriate clinic manager for timely correction and notification of the referring physician via report addendum or STAT call if error is significant.

Principle Radiation Emission Data - Tc-99m

- Physical half-life = 6.01 hours.

Radiation	Mean % per disintegration	Mean energy (keV)
Gamma-2	89.07	140.5

Dosimetry - Tc-99m-Macroaggregated Albumin

Organ	rads/6 mCi	mGy/222 MBq
Lungs	1.32	13.2
Bladder wall		
2 hour void	0.18	1.8
4.8 hour void	0.33	3.3
Liver	0.11	1.1
Spleen	0.10	1.0
Total body	0.09	0.9
Kidneys	0.066	0.66
Ovaries		
2 hour void	0.045	0.45
4.8 hour void	0.051	0.51
Testes		
2 hour void	0.036	0.36
4.8 hour void	0.039	0.39

% Liver-Lung Shunt Worksheet

SEGMENT	ANTERIOR (counts)	POSTERIOR (counts)	Total
Right Lung			
Left Lung			
Liver			

$$\%\ \text{Liver-Lung Shunt} = \frac{\text{Total Right Lung Cts + Total Left Lung Cts}}{(\text{Total Right Lung Cts + Total Left Lung Cts}) + (\text{Total Liver Cts})}$$

$$= \frac{\qquad\qquad\qquad\qquad}{(\qquad\qquad) + (\qquad\qquad)}$$

$$= \frac{\qquad\qquad\qquad\qquad}{\qquad\qquad\qquad\qquad} \times 100 = \_\_\_\_\_\%$$