UW Health
University of Wisconsin Hospital and Clinics

Division of Nuclear Medicine Procedure / Protocol

HEPATIC ARTERIAL PERFUSION SCINTIGRAPHY **CPT CODE: 78202**
UPDATED: MARCH 2018

Indications: Patients with hepatic artery catheters for treatment of hepatic metastases.

Patient Prep: None.

Scheduling: Nuclear Medicine physician experienced in injecting the hepatic arterial perfusion device should provide a suitable time for him/her to inject the patient. Allow 90 minutes of imaging time.

NOTE: Prior to starting the procedure, it is helpful to have the pager number of the oncology nurse who frequently accesses these pumps, in case they are needed to help with needle placement.

Radiopharmaceutical & Dose: Tc-99m macroaggregated Albumin (MAA) 4 mCi +/- 20% (3.2-4.8 mCi). MAA must be recently prepared at 98% or greater purity. Volume of MAA should be 1 ml. Do not adjust for weight.

Imaging Device: Large field of view gamma camera with LEHR collimator.

Imaging Procedure: The injection is made into the direct port of the implanted infusion pump. A "Special Arrow Drug delivery system bolus needles" by Arrow Internation is required with the latest devices. The injection will be made by the Nuclear Medicine physicians using the following procedure:

1. Use Chloraprep swabs and sterile technique.
2. Eye protection should be used.
3. Use Special Bolus needle.
4. Prime the needle and tubing with normal saline and clamp.
5. Patient may require the use of lidocaine or EMLA cream, but generally this is not necessary.
6. Insert needle and flush with a small amount of saline.
7. Inject the MAA using four-way stopcock, followed by 10 ml of normal saline slowly over 30 sec, so the needle is not dislodged from the correct position.
8. Flush with 5 ml of 100 unit/ml of heparin.
9. Remove needle.

Two 5 min static images should initially be obtained. "Chest" image should place the liver at the bottom of the field of view to assess for arteriovenous shunting (lung visualization). "Abdomen" image should place the liver at the top of the field of view to assess for extrahepatic perfusion (e.g. stomach or bowel).

Initial static images should be checked. SPECT/CT images may be obtained at the discretion of the reading physician.

Display:

1) Screen capture both static images in a 4x4 display. Label views with appropriate orientation and anatomical location. Screencap in B&W display as "Liver Statics Screencap".

2) Calculate % Lung Shunt. Open "Chest" image in Presirsphere Xeleris processing program. Draw lung ROI on image. Draw Lung & Liver ROI on image. % lung uptake will be automatically calculated and displayed. Screencap as "% Lung Uptake Screencap".

3) If SPECT/CT images were obtained, process via the Volumetrix Xeleris processing program. Save MIP and Screencap Fused Transaxial, Fused Coronal and Fused Sagittal images. File save & exit. Convert CT to Hounsfield units.

% Shunt Formula:

$$\frac{\text{Ant. Lungs + Post. lungs}}{\text{Ant. (lung + liver) + Post. (lung + liver)}}$$

Interpretation:

The hepatic arterial perfusion (HAP) scan should demonstrate only the liver. The liver metastases should have hyper-perfused rims and more perfusion overall than normal liver. Photogenic defects may also be present. If extrahepatic sites (typically stomach) are visualized, this indicates catheter misplacement. The HAP allows concentrated chemotherapy to be delivered without the expected normal systemic effects. The chemotherapy can cause bowel complications. The lung visualization indicates A-V shunting, and therefore systemic distribution of chemotherapy (a quarter of all treated patients).

Ideal % Lung shunt is >10%.

PACS:

Send all raw images and screencaps to PACS. If SPECT/CT was performed, send Attenuation Corrected Tomo and Corrected CT data.

Comments:

Note: The **Special Bolus Needle** is stocked in Nuclear Pharmacy.

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