RADIOEMBOLIZATION WITH YTTIUM-90 MIRCOSPHERES FOR INOPERABLE LIVER CANCER

Information for patients

Introduction

- Intra-arterial irradiation by Yttrium-90 has been developed in the treatment of inoperable liver tumors to eradicate tumor cells by radiation.
- This procedure is performed by a radiologist with special training in interventional radiology. It will be performed in the Department of Radiology under imaging guidance.
- This procedure involves selective cannulation of the artery supplying the liver tumors and the subsequent delivery of radioactive Yttrium-90.
- Yttrium-90 particles emit high-energy electrons, which kill the tumor cells in the vicinity.

Procedure

- Computed tomography (CT) and catheter angiography will be used to assess the feasibility of the treatment. The tumor and liver volume will be assessed in CT.
- In catheter angiogram, the arteries in the liver and the adjacent organs will be studied, which serves as a roadmap in subsequent treatment. A radioactive test agent, Technetium-99m-macroaggregated albumin (Tc-MAA), will be injected to the tumor-supplying artery to assess the fraction of particles flowing to the lungs. Excessive shunting to lung is considered a contraindication of treatment with Y-90.
- The relative uptake of the Tc-MAA by the tumor to that by the surrounding normal liver tissue will be estimated.
- Prophylactic coil embolization of the gastro-duodenal artery or other communicating arteries will be considered on a tailor-made basis by the interventional radiologist. This will prevent or reduce the chance of radioactive particles flowing to the gastrointestinal tract during Y-90 treatment.
- If the treatment is considered feasible, the radiation dose delivered to the liver and tumor will be calculated and the appropriate dose of radioactive particles is ordered. The treatment procedure will usually be performed within 3 weeks after the initial Tc-MAA study.
- Patient will be admitted to the hospital before the procedure. Bleeding tendency and liver function will be checked and corrected if needed.
- The procedure usually lasts for 1 – 2 hours. The interventional radiologist starts with puncturing the femoral artery at the groin region. A small catheter will be used to catheterize the supplying arteries to the liver tumor for delivery of a suitable dose of Yttrium-90 particles.
- After injection of particles, the catheters will be removed. Bleeding at the groin will be stopped by manual compression. A special vascular closure device may be used for similar purpose.
- After the procedure, your vital signs (blood pressure, pulse) will be monitored.

- As Hong Kong is a densely populated city, the patient will be kept isolated in the hospital for 1 to 2 days before discharged for radiation protection purpose. Patient is advised to avoid visiting by children and pregnant women in the next week.
- You will be followed up in the clinics. The liver function and alpha fetoprotein level will be monitored. CT or MR will be used to monitor the effect of treatment.

Potential Complications

- **Related to radiation**
  - Post-radioembolization syndrome (20 – 50%)
  - Fatigue, nausea, vomiting, loss of appetite, fever, abdominal discomfort, and loss of vitality and body weight
  - Hospitalization is usually not required
  - Radiation pneumonitis (less than 1%)
  - Gastrointestinal complications (gastric or duodenal ulcers, less than 5%).
  - Pancreatitis (uncommon), this can be serious or even fatal
  - Peri-umbilical pain & radiation dermatitis(uncommon)

- **Local**
  - Hepatic dysfunction (0 – 4%)
  - Biliary sequelae (less than 10%)
  - Includes biliary necrosis, stricture and abscess
  - Abscess may require drainage and antibiotics
  - Radiation cholecystitis requiring surgical intervention (less than 1%)
  - Portal hypertension (clinically relevant manifestations such as reduced platelet counts or variceal bleeding are rarely seen)

- **General**
  - Hair loss, persistent nausea and vomiting (uncommon)
  - Allergy to Yttrium-90 particles (rare)
  - Bleeding, infection (uncommon)
  - Vascular injury
  - Thrombosis / injury of access arteries (uncommon)
  - Vascular and heart damage by catheters or guidewires (very rare).
  - Reduction in white cell count (common, no report of opportunistic infection documented in literature)
  - Acute chills lasting minutes during procedure (rare)
  - Gustatory abnormalities including transient metallic taste (rare)
  - Procedure related death is rare.
  - The overall adverse reactions related to iodine-base non-ionic contrast medium is below 0.7%. The mortality due to reaction to non-ionic contrast medium is below 1 in 250 000.

Disclaimer

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