

Radiofrequency ablation for Liver tumours

Information for patients

Introduction

- Hepatocellular carcinoma (HCC) and metastases (especially from colorectal carcinoma) are the most common malignant tumours to affect the liver.
- Radiofrequency ablation (RFA) is a minimally invasive technique useful to these groups of patients. It is shown to be a potentially curative treatment for small (<3cm) and medium-sized (3-5cm) HCC, and increases the 5-year survival rate of colorectal liver metastasis from 0-1% up to 55%.
- In this technique, a small needle is attached to a device that delivers radiofrequency (RF) energy. The needle is inserted into the tumour, the RF energy heats and destroys cancerous tissue.
- The procedure will be performed by a team of experts from different specialties, which include radiologists with special training in interventional radiology, surgeons, anaesthetists and other medical experts.
- It will be performed in the Department of Radiology or in the operating theatre under ultrasound (US) or computed tomography (CT) guidance.

Procedure

- In the planning stage, the patient will be assessed for the feasibility of radiofrequency ablation. This will include assessment of the general medical condition and other coexisting diseases, the surgical and anaesthetic risk of the procedure and whether the tumour is suitable for radiofrequency ablation. Usually US, CT scan or magnetic resonance imaging (MRI) will be performed to assess the tumour. With these studies, the size and location (whether the lesion is in close proximity to the gallbladder, colon or big vessels) of the lesion are determined. These data help in the planning of treatment. Pathological confirmation (examination of a small piece of the lesion obtained by biopsy) of the tumour may be obtained before the procedure.
- The procedure can be performed percutaneously (insertion of needle through skin), laparoscopically (insertion of needle through tunnels made in the abdomen) and via open surgical technique. RFA can be performed under heavy sedation or general anaesthesia.
- Before the procedure, an electrode pad will be attached to the thighs of the patient. This is necessary for the application of RF energy during the procedure. Antibiotics may be given to prevent infection. An intravenous line will be set for administration of fluids and drugs.
- The upper portion of the patient's abdomen will be exposed and cleaned with antiseptic. Local anaesthetics will be injected. US or CT examination of the liver will be performed to locate the tumour and guide the insertion of needle. After proper placement of the needle, RF energy will be delivered to the tumour.
- The average duration of the procedure is 2 to 4 hours
- Additional procedures like temporary hepatic vein occlusion, portal vein occlusion or prior transarterial chemoembolization may be performed to augment the effect of RFA.
- Glucose solution may be infused into the peritoneal cavity for displacement of adjacent bowel or diaphragm from the tumor. This may prevent thermal injury to these organs.

- After the procedure, the patient will be transferred back to the ward for recovery and monitoring of vital signs (blood pressure and pulses).
- The patient may have nausea, pain and fever after the procedure. This is usually short lasting and subsides with medication. If the recovery is good, the patient will be discharged from the hospital. (If the patient tolerates the procedure well, he/she may be discharged in 1 to 2 days.)
- The patient will have regular follow up in the outpatient clinic. CT or MRI will be performed to monitor the response of the tumour to treatment.
- Depending on the size and status of the tumour, repeated RF sessions may be needed.

Potential complications

- Post-ablation syndrome (common): malaise, low grade fever after RFA – last for 2 to 7 days.
- Bleeding:
 - into peritoneum (<2%).
 - under the liver capsule or inside the liver (<1%).
 - Into biliary tract (rare).
 - Into chest (rare).
- Small asymptomatic right pleural effusion will develop in the majority of patients. Moderate to large pleural effusion may be seen in patients after treatment of large lesions (1.8%).
- Collection of air in the pleural cavity (<1%).
- Liver abscess (<1%): especially in patient with previous endoscopic biliary procedure, biliary surgery or when the immune system is poor.
- Tumour growth along the needle tract (<4%).
- Thermal injury to adjacent structures may occur. With careful assessment, this should be rare. These include:
 - Gallbladder: Cholecystitis
 - Bowel wall: Bowel perforation
 - Bile ducts: Biliary obstruction; collection of bile inside liver (biloma). The frequency and consequence depends on site of bile duct injury
 - Diaphragm: Shoulder pain, rarely diaphragm rupture
 - Kidney: Hematuria, deteriorated kidney function
 - Adrenal: Sudden rise in blood pressure
 - Stomach: Perforation (in patient with previous abdominal surgery)
- Hepatic decompensation (inadequate liver function) may occur in patients with minimal hepatic reserve due to underlying disease.
- Liver infarct (rare).
- Blood clot inside portal vein (rare): more frequent in cirrhosis liver and with other additional manoeuvre for temporary portal vein occlusion.
- Injury to heart and pericardium (rare): causing heart rate disturbance and blood collection in pericardial space.
- Burn at the site of the electrode pad (rare).
- Sepsis (rare).
- Procedure related death (rare).

Disclaimer

This leaflet has been prepared by the Hong Kong Society of Interventional Radiology. This leaflet is intended as general information only. Nothing in this leaflet should be construed as the giving of advice or the making of a recommendation and it should not be relied on as the basis for any decision or action. It is not definitive and the Hong Kong Society of Interventional Radiology Limited does not accept any legal liability arising from its use. We aim to make the information as up-to-date and accurate as possible, but please be warned that it is always subject to change as medical science is ever-changing with new research and technology emerging. Please therefore always check specific advice on the procedure or any concern you may have with your doctor.

Prepared in 2010. Version 2.0.