

## **Microwave 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. Microwave tumor ablation 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. When compared with radiofrequency ablation, which is a more commonly used technique, microwave tumor ablation has the advantage of better tumor ablation in tumor close to sizable intra-hepatic vessels, and is capable to produce a larger ablation zone in a shorter time interval. It also shows comparable survival and complication rates in preliminary clinical studies.

In this technique, a small needle is attached to a device that delivers microwave energy. The needle is inserted into the tumour, the microwave 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 microwave tumor 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 microwave tumor 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 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. It can be performed under heavy sedation or general anaesthesia.

Before the procedure, antibiotics may be given to prevent infection. An intravenous line will be set for administration of fluids and drugs.

During the procedure, 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, microwave energy will be delivered to the tumour. The average duration of the procedure is 2 to 4 hours. Additional procedures like prior transarterial chemoembolization may be performed to augment the treatment effect. Fluid 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 sessions may be needed.

#### **Potential complications**

Post-ablation syndrome (common): malaise, low grade fever – 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 (rare).

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 (rare).

Thermal injury to adjacent structures may occur. With careful assessment, this should be rare. These include:

Gallbladder: Cholecystitis and perforation

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.

Injury to heart and pericardium (rare): causing heart rate disturbance and blood collection in pericardial space.

Sepsis (rare).

Procedure related death (rare).

### **Disclaimer**

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