

Cryoablation for renal cancer

Information for patients

Introduction

- Renal cell carcinoma (RCC) is the most common malignant tumour in the kidney.
- Percutaneous cryoablation is a minimally invasive technique useful to these groups of patients. It is shown to be a potentially curative treatment for small (<4cm) RCC without removing the whole kidney.
- In this intervention procedure, a small needle is attached to a cryo-delivery system which employs the Joule Thompson effect by use of Argon gas and Helium gas. The needle is inserted into the tumour, producing the freeze/ thaw cycles which kill the tumour tissue.
- The procedure will be performed by a team of experts from different specialties, including interventional radiologists, urologists, and anaesthetists.
- The procedure will be performed in the Department of Radiology or in the operating theatre under ultrasound (US) or computed tomography (CT) guidance.

Procedure

- At planning stage, patient will be assessed for the feasibility of the procedure. This includes assessment of the general medical condition and any coexisting illness, the surgical and anaesthetic risks of the procedure and suitability of the tumour for the ablation. Usually US, CT scan or magnetic resonance imaging (MRI) will be performed to assess the tumour. With these studies, the size and location (central or peripheral, any close proximity to the colon) of the lesion are determined. This information helps the planning of treatment. Biopsy of the tumour for confirmation may be obtained before the procedure.
- The procedure can be performed percutaneously (insertion of needle through a small cut on the skin), laparoscopically (insertion of needle through keyhole surgery) or by open surgical technique. The procedure can be performed under sedation or general anaesthesia.
- The patient has to abstain from any medication that increases bleeding risk according to instruction.
- The patient is kept fast before the procedure.
- For percutaneous approach, the skin will be disinfected with antiseptics. Local anaesthetics will then be administered. Under the guidance by US or CT, the needle is inserted into the target tumour. After proper placement of the needle, freeze/thaw cycles will be applied to the tumour.
- The average duration of the procedure is 2 to 4 hours
- Additional procedure such as embolization of the tumour may be performed before the cryoablation in selected patients to reduce the risk of bleeding.
- In selected patients, a ureteric catheter may be placed before the cryoablation to reduce cryo-injury to the ureter, or allow healing of ureter in case of injury.
- Fluid or gas may be infused into the peritoneal cavity for displacement of adjacent bowel loops from the tumor. This can avoid thermal injury to the bowel, in particular the colon.
- After the procedure, the patient will be transferred back to the ward for recovery and monitoring of vital signs (e.g. 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 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 treatment response.
- Depending on the size and status of the tumour, repeated ablation sessions may be needed.

Potential complications

- Pain at the treatment area – usually temporary and mild. You may need to take painkillers for a few days for pain control
- Haematuria (10-20%) – mostly self-limiting, urine gradually clears within 12 hours
- Bleeding around the kidney, in the retroperitoneal region or in chest wall - usually minor and asymptomatic, need for transfusion in less than 2% patients.
- Nerve injury – mostly self-limiting, rarely prolonged and requiring months for recovery (2%). This may occur when cryoablation is extended into adjacent psoas muscle or body wall, resulting in pain or numbness in the flank, abdominal wall, groin, genital regions or thigh. May result in flank muscle laxity.
- Thermal injury to adjacent organs. With careful assessment and procedure, this should be rare. These include:
 - Bowel wall: Bowel perforation, delayed fistula formation to the urinary tract (<1%)
 - Adrenal: Sudden rise in blood pressure (rare)
 - Pancreas: Pancreatitis (rare)
 - Urinary tract: urine collection near the kidney (1%), ureteric stricture (1%)
- Pneumothorax – air collection in pleural cavity (1%), usually minor
- Thermal injury to skin (rare)
- Infection (rare)
- Stroke (very rare)
- Myocardial infarction (very rare)
- Tumour growth along the needle tract (very rare)
- Procedure related death (very rare)
- For sedation and pain relief during the procedure, intravenous drugs like Fentanyl and Midazolam may be given. The potential side effects are nausea, vomiting, respiratory suppression, bradycardia (slow heart beat). Severe side effects may lead to heart attack, stroke or even death (very 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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