

Treating your kidney tumour by percutaneous thermal tumour ablation using radiofrequency ablation (RFA)

Introduction

This leaflet tells you about the procedure known as “percutaneous thermal tumour ablation”, explains what is involved, the benefits and possible risks. It is not meant to replace informed discussion between you and your doctor but can act as a starting point for such a discussion. Further sources of information are suggested at the end of the leaflet. Your consultant will be happy to give you time to ask all the questions you need to. If you have any other queries please call the Radiology Department on 0118 322 7961.

Kidney tumours

There are many different types of kidney tumours. The most common type is called a renal cell carcinoma (RCC) and you will normally be offered percutaneous thermal tumour ablation treatment if this type is suspected. Most renal cell cancers are slow growing. However, about 20% are more aggressive, grow faster and will also spread to other areas of the body. As yet we cannot reliably predict how a tumour will behave and therefore treatment is offered when appropriate.

How are kidney tumours normally treated?

The treatment of choice for renal tumours is surgical excision (removal). This may be performed by conventional open or keyhole (laparoscopic) surgery where either the whole kidney is removed (total nephrectomy) or a portion of the kidney containing the tumour is excised (partial nephrectomy). These procedures are not suitable for all patients. Some patients may not be fit for surgery and others may have poor kidney function which surgery can worsen. Preserving kidney function is very important. Other patients may not wish to undergo a surgical procedure.

What is percutaneous thermal tumour ablation?

“Percutaneous” means through the skin and ablation means destruction (of tissue).

“Percutaneous thermal tumour ablation” is therefore a technique where very high (or in some cases very low) temperatures are used to destroy tumour cells. The energy to heat the tissue is delivered through thin needles (also called electrodes). These needles are inserted through the skin into the tumour under image guidance using a CT scanner and sometimes an ultrasound machine.

Radiofrequency ablation

Radiofrequency ablation (RFA) is a thermal ablative technique that destroys tumour by heating the tissue. An electric current is passed through the needle which results in high temperatures (between 60 and 100°C) at the needle tip.

Cryoablation

Cryoablation (also called cryotherapy) is an alternative thermal ablative technique that destroys tumour by freezing the tissue. The tumour is rapidly frozen and destroyed at temperatures as low as –20 to –40°C.

Both radiofrequency ablation and cryoablation techniques are effective. We currently use Radiofrequency ablation treatment at this Trust.

Why am I being offered percutaneous thermal ablation?

Percutaneous thermal ablation should be considered in patients who are unsuitable or high risk for surgery or have complicating factors. Patients with chronic kidney failure, a solitary kidney, multiple kidney tumours, those with previous kidney surgery or those who have refused surgery are all potential candidates. Your consultant will be considering this procedure for you only after a detailed assessment. This will include a CT scan, discussion of your case at a multi-disciplinary meeting where consultants from several specialties meet and, of course, discussion with you. Your consultant will also explain the alternatives including surgery or simply monitoring the tumour.

There are benefits and risks related to any treatment option and these will be explained in detail when you are consented for the procedure. This procedure is not suitable for everyone. The position and size of some tumours may make them unsuitable for percutaneous ablation.

Benefits of percutaneous thermal ablation

- Least invasive procedure which avoids open surgery.
- Short procedural time compared to surgery.
- Low rate of post-operative complications.
- Minimal blood loss, low likelihood of needing a blood transfusion.
- Less post-procedural pain compared to surgery.
- Shorter recovery period and hospital stay compared to surgery.
- Better preservation of kidney function compared to surgery.

Risks of percutaneous thermal ablation

- Pain, bruising and blood in the urine.

Serious complications – 2% or less

- Bleeding requiring a blood transfusion.
- Injury to the urinary system requiring a stent.
- Injury to the bowel requiring surgery.
- Thermal damage to nearby organs (including the skin, which could require skin grafting).
- Nerve damage (resulting in numbness or pain, normally temporary).
- Pneumothorax (air leak in the lung)
- Lack of success at treating the whole tumour in one session leading to a tumour recurrence.

Who will be doing the percutaneous thermal tumour ablation?

An interventional radiologist performs the procedure, and works closely with the urology doctors both in ensuring your suitability and in assessing the results of treatment.

Where will the procedure take place?

The procedure is performed in the X-ray Department in the CT scanner.

How do I prepare for percutaneous thermal ablation?

You will be given an appointment to attend a pre-procedural consultation and pre-assessment clinic. All preparation details will be discussed with you and you will be able to ask questions of your own. We will also carry out some blood tests.

What happens on the day of the percutaneous thermal ablation?

Most patients are admitted the night before and kept 'nil by mouth' from midnight or given an early breakfast, depending on the time of the procedure. The nurse will make sure you are in a hospital gown, check your blood pressure and confirm your details. A cannula (plastic tube) will be inserted into your arm for the administration of fluids and drugs. Very occasionally, before the procedure, a tube is also passed into the bladder and up into the kidney being treated. Saline (a salt solution) is flushed through this during the procedure to protect the kidney from injury. You will be told of this during your consultation if this is planned. You will be seen by your consultant and the anaesthetist before the procedure. Your consent for the procedure will be confirmed and you will have an opportunity to ask any questions.

What happens during the percutaneous thermal ablation procedure?

Most procedures are performed under general anaesthesia (you will be asleep). Thermal ablation can also be performed under sedation with local anaesthetic (you are awake but drowsy and numb). Once asleep in the CT room we will apply pads to your thighs which

allow the electric current to flow away (for radiofrequency ablation only). We will then position you on the scanner, normally lying on your front. Your back and sides are cleaned with antiseptic and most of your body covered with sterile drapes. The CT scanner is then used to take pictures and decide on where the needles should be positioned. Local anaesthetic is then injected into the skin and the needles are inserted through tiny incisions. The number of needles used depends on the size of the tumour. We normally also take a biopsy (tissue sample) of the tumour at this time. Once all the needles are correctly positioned the tumour is then treated. The duration of treatment depends on the size of the tumour. Once completed, all needles are removed and a plaster placed over the small incisions.

Will it hurt?

Insertion of a cannula (plastic tube or drip) into the veins before the procedure should be no more painful than an injection. Since the procedure is normally performed under general anaesthetic you will not be aware of anything. If you have the procedure under sedation and local anaesthetic you will be constantly monitored to ensure you are comfortable. After the procedure any soreness from the treatment in your back and sides can be treated with injections or tablets on the ward.

How long will it take?

Every patient's situation is different and it is not always easy to predict how complex or straightforward the procedure will be. A typical case takes around 2 hours. Others will take longer.

What happens afterwards?

The general anaesthetic will be reversed in the CT room and you will be transferred to a recovery area. Most patients can then be transferred to a urology ward for further observation. Rarely, patients are transferred to the Intensive Care Unit if more intensive monitoring is required. You will be assessed after the procedure and encouraged to mobilise the next day. Patients are normally discharged the next day. A CT scan is performed 3 months after the procedure to assess the treatment and decide on whether further treatment is necessary.

Please remember that after percutaneous thermal ablation you will be required to have long-term CT scan follow up (possibly up to 4 times in the first year and at least yearly thereafter).

How successful is percutaneous thermal ablation?

There are no studies which directly compare percutaneous thermal ablation to surgery in the treatment of renal tumours as yet. Evidence from many published studies looking at radiofrequency ablation or cryoablation have however shown comparable results to surgery in terms of successful tumour ablation when treating small tumours (less than 3-4cm). The follow up period in many of the larger studies is still however limited and we must therefore

be cautious about the longer term results (beyond 5 years) and the possibility of tumour recurrence. This is why we carefully monitor patients with CT scans.

The strength of evidence now means that radiofrequency ablation is now recommended by the National Institute for Clinical Excellence (NICE) in the treatment of small renal tumours not suitable for surgery.

And finally

Some of your questions should have been answered by this leaflet but remember this is only a starting point for discussion about your treatment with the doctors looking after you.

Make sure that you are satisfied that you have received enough information about the procedure before you sign the consent form.

Further information

- National Institute for Health and Clinical Excellence (NICE) www.nice.org.uk
IPG353 Percutaneous radiofrequency ablation of renal cancer: Understanding NICE guidance
IPG207 Cryotherapy for renal cancers: Understanding NICE guidance
- British Society of Interventional Radiology www.bsir.org/patients/kidney-tumour-ablation/
- For further information about the Trust, visit our website www.royalberkshire.nhs.uk

This document can be made available in other languages and formats upon request.

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