

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

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.

You should understand the benefits and risks of this treatment before you sign the consent form.

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. About 20% however 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 when 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. Others 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 either very high or low temperatures are used to destroy tumour cells. Radiofrequency ablation treats tumours by heating them and cryoablation treats tumours by freezing them. The energy to heat or freeze the tissue is delivered through thin needles (also called electrodes or probes). These needles are inserted through the skin into the tumour under image guidance using a CT scanner and sometimes an ultrasound machine. The doctor performing the treatment will decide on which technique is best to use in your situation and this choice will be explained to you.

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 degrees) at the needle tip.

Cryoablation

Cryoablation (also called cryotherapy) is a 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 degrees.

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. There are a number of benefits related to thermal ablation which are listed in Table 1. Despite all these benefits, this procedure is not suitable for everyone. The position and size of some tumours may make them unsuitable for percutaneous ablation.

Table 1

<u>Benefits of percutaneous thermal ablation</u>
<ul style="list-style-type: none">– 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 receiving 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

Who will be doing the percutaneous thermal tumour ablation?

An Interventional Radiologist performs the procedure. These specialists work 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 starved for the procedure (sometimes 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 in to 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 actually 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 allows 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 in to the skin and the needles are inserted through tiny incisions. Sometimes, several needles are used depending 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 heated or frozen depending on the technique being used. 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).

Are there any risks or complications?

There are risks related to any procedure. Overall complication rates are quoted between 8-13% with the vast majority being minor and self limiting such as pain, bruising and blood in the urine. Serious complications which require treatment are rare (2% or less) and include bleeding requiring a blood transfusion, injury to the urine collecting system requiring a stent, injury to bowel requiring surgery and thermal damage to other nearby organs (including the skin which could require skin grafting). Other potential risks include nerve damage (which can result in numbness or pain which is normally temporary) and pneumothorax (air leak in the lung).

We may also be unsuccessful at treating the whole tumour at one session and tumour recurrence can also occur (just as with partial nephrectomy).

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. NICE guidance has also been published for cryotherapy. The longer term benefits for cryotherapy are less certain in the medical literature than radiofrequency ablation (partly because it is a newer technology) and therefore it is recommended only after these uncertainties have been clearly explained to the patient. Please ask the doctor treating you why they are recommending this treatment.

Data collection

This leaflet is part of our commitment to providing the best possible care we can to you. The National Institute for Clinical Excellence (NICE) has also recommended that all centres that provide percutaneous thermal ablation treatment collect information to ensure our practice is safe and monitor how well the treatment works. This information will be confidential and will be anonymised if submitted to an electronic database. If you prefer not to participate in this data collection it will not affect your treatment in any way. A doctor looking after you can fully explain why we collect this information and what details are recorded.

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

MidCity Place

71 High Holborn

London WC1V 6NA

Phone: 0845 003 7780

Email: nice@nice.org.uk

- British Society of Interventional Radiology (BSIR)

www.bsir.org.uk

BSIR Administrator

4 Verne Drive

Amphill

Bedford MK45 2PS

Phone: 01525 403026

E-mail: office@bsir.org

For further information about the Trust, visit our website www.royalberkshire.nhs.uk

Royal Berkshire NHS Foundation Trust

London Road

Reading RG1 5AN

0118 322 5111 (switchboard)

Dr. Farhan Ahmad, Consultant Interventional Radiologist, November 2010

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