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NHS
National Institute for Clinical Excellence

Percutaneous radiofrequency ablation of renal cancer

1 Guidance

1.1 Limited evidence suggests that percutaneous radiofrequency ablation (RFA) of renal cancer brings about reduction of tumour bulk and that the procedure is adequately safe. However, the evidence of its effect on symptom control and survival is not yet adequate to support the use of this procedure without special arrangements for consent and for audit or research.

1.2 Patient selection is important and the procedure should normally be limited to patients who are unsuitable for surgery. The procedure should only be offered after assessment by a specialist multidisciplinary team, which should include a urologist and an interventional radiologist.

1.3 Clinicians wishing to undertake percutaneous radiofrequency ablation of renal cancer should take the following actions.

- Ensure that patients offered it understand the uncertainty about the procedure's efficacy and provide them with clear written information. Use of the Institute's *Information for the Public* is recommended.
- Audit and review clinical outcomes of all patients having radiofrequency ablation of renal cancer.

1.4 Controlled research into the long-term clinical outcomes will be useful in reducing the current uncertainty. The Institute may review the procedure upon publication of further evidence.

2 The procedure

2.1 Indications

2.1.1 There are few symptoms in the early stages of renal cancer. Typically, symptoms develop as the disease progresses. The first symptom is often blood in the urine; pain and flank mass are the other classic symptoms.

2.1.2 The standard treatment for renal cancer is total or partial nephrectomy. However, with the improvement of medical imaging techniques, which have increased the detection rate of small incidental renal tumours, less invasive procedures have emerged. These include laparoscopic partial nephrectomy, cryoablation, ablation using high-intensity ultrasound, and radiofrequency ablation.

2.1.3 Percutaneous radiofrequency ablation may be considered in patients with small renal tumours (for example, less than 4 cm in diameter) in whom surgery may not be well tolerated, or in patients who refuse surgery.

2.2 Outline of the procedure

2.2.1 Computed tomography (CT) or ultrasound scanning is used for image guidance, and the tumour is destroyed by heating to temperatures exceeding 60°C. In RFA, temperature changes are induced using a high-frequency alternating current applied via an electrode or electrodes inserted percutaneously and placed within the tissue to generate ionic agitation.

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This guidance is written in the following context:
This guidance represents the view of the Institute which was arrived at after careful consideration of the available evidence. Health professionals are expected to take it fully into account when exercising their clinical judgement. This guidance does not, however, override the individual responsibility of health professionals to make appropriate decisions in the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

Interventional procedures guidance is for health professionals and people using the NHS in England, Wales and Scotland.

2.3 Efficacy

2.3.1 The evidence base for this procedure was small and based on case series studies. In a UK study of eight patients with 11 tumours, seven patients (88%) remained tumour-free at a mean follow-up of 17 months, as assessed by CT. Other studies reported successful ablation, as assessed by CT, in 79% (19/24) to 100% (5/5) of tumours at follow-up. Patient characteristics such as tumour location and size varied among the studies, as did duration of follow-up. It was also unclear at what time-point recurrence had been measured in some studies, and the lack of histological data made it difficult to interpret the long-term outcomes. For more details, refer to the Sources of evidence (see right).

2.3.2 There was some evidence to suggest that larger renal tumours (in general, greater than 3 cm in diameter) required more than one treatment session to achieve the same outcome as smaller tumours. For more details, refer to the Sources of evidence.

2.3.3 One Specialist Advisor commented that although the treatment can be repeated, the likelihood of failure increases as the size of the tumour increases. All of the Specialist Advisors considered that long-term efficacy was yet to be established because only a small number of patients have been treated using this procedure.

2.4 Safety

2.4.1 Haematomas were the most commonly reported complication in the studies, with occurrence ranging from 5% (1/21) to 28% (8/29). Other reported complications included ureteric stricture and abdominal pain. For more details, refer to the Sources of evidence (see right).

2.4.2 The Specialist Advisors listed the main potential adverse events as bleeding, infection and ureteric stricture. Seeding of the needle track with tumour cells, and injury to the adjacent bowel were also listed as potential risks.

2.5 Other comments

2.5.1 The lack of histological data and limitations of CT assessment may make it difficult to determine whether total ablation of tumours has been achieved. In addition, little is known about the natural history of small renal tumours and the survival of patients with small tumours.

2.5.2 The site and size of the tumour seem to be important and results are likely to be better when treating smaller peripheral tumours.

3 Further information

3.1 The Institute issued cancer service guidance called *Improving Outcomes in Urological Cancer* in September 2002 (www.nice.org.uk/page.aspx?o=36469).

Andrew Dillon
Chief Executive
September 2004

Information for the Public

The Institute has produced information describing its guidance on this procedure for patients, carers and those with a wider interest in healthcare. It explains the nature of the procedure and the decision made, and has been written with patient consent in mind. This information is available, in English and Welsh, from www.nice.org.uk/IPG091publicinfo

Sources of evidence

The evidence considered by the Interventional Procedures Advisory Committee is described in the following document.

Interventional procedure overview of percutaneous radiofrequency ablation of renal tumours, June 2003

Available from: www.nice.org.uk/ip215overview

Ordering information
Copies of this guidance can be obtained from the NHS Response Line by telephoning 0870 1555 455 and quoting reference number N0702. *Information for the Public* can be obtained by quoting reference number N0703 for the English version and N0704 for a version in English and Welsh.

The distribution list for this guidance is available on the NICE website at www.nice.org.uk/IPG091distributionlist

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