Radiofrequency ablation (RFA) is being used as a local treatment method for lung, liver and renal tumours. RFA provision started in Ipswich 18 months ago. Here we present our first audit of lung ablations.

The Royal College of Radiologists have recently published guidance on the provision of RFA in the United Kingdom. The standards used in this audit are drawn largely from this document (Ref 1) and from other published data.

### Standards

<table>
<thead>
<tr>
<th>Staff</th>
<th>Standard</th>
<th>Met?</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinical and support</strong></td>
<td>Necessary to base with patients and clinicians, adequate day case or overnight assessment</td>
<td>Partially met.</td>
<td>Most of the clerical support is done by the lead radiologist</td>
</tr>
<tr>
<td><strong>Nursing</strong></td>
<td>Assistance during the procedure, aftercare and discharge…</td>
<td>Met.</td>
<td>Two interventional radiology nurses attend each ablation. One attends to the patient, the other to the RF generator</td>
</tr>
<tr>
<td><strong>Radiographic</strong></td>
<td>…need to be familiar with RFA and cross sectional intervention…</td>
<td>Met.</td>
<td>One of a team of three senior CT radiographers run each case</td>
</tr>
<tr>
<td><strong>Radiology</strong></td>
<td>…at least two per centre… adequate training…</td>
<td>Met.</td>
<td>Two consultants, 10 and 19 years experience. Where possible both attend each RF case. One underwent a three month formal Fellowship training in RFA.</td>
</tr>
</tbody>
</table>

### Logistic

<table>
<thead>
<tr>
<th>Standard</th>
<th>Met?</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outpatients</td>
<td>Patients need to be seen in OP prior to procedure</td>
<td>Met.</td>
</tr>
<tr>
<td>Anaesthetist pre assessment</td>
<td>Patients requiring GA will need reassessment…</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Day case beds</td>
<td>Adequate day case or overnight beds are necessary</td>
<td>Met.</td>
</tr>
</tbody>
</table>

### Patient audit

**Standards (Ref 2)**

1) Technical success in >90%
- Satisfactory needle placement
- Satisfactory ablation cycle according to manufacturers protocol

2) Complications

- Local relapse rate <30% (Ref 3)

### Method

- Departmental database of RFA patients
- Post procedural imaging reviewed
- Clinical notes reviewed
- Follow-up where available

### Results

- Audit period: April 2009-August 2010
- A total of 59 lesions treated (all sites)
- 33 lung lesions in 17 patients
- Follow up between 18 and 1 month

### Complications

- Minor: 20%
  - Small pneumothorax not needing chest drain
  - Mild chest pain
  - Mild haemoptysis
  - Mild pyrexia

- Major: <5%
  - Large pneumothorax needing chest drain
  - Lung abscess
  - Severe chest pain
  - Severe haemoptysis

- 33 lung lesions in 17 patients

### Technical success

- Number (%): 33 (100)
- Standard met: Yes
- All lesions were accessible

### Complications

- Minor: 6 (18)
- Standard met: Yes
- Patient experienced severe intercostal root pain after conventional treatment. Three week treatments for stabbing.
- Patient with metastases close to vessels. One went on to surgery. 1 by systemic treatment. A recurrence in a subclavian vein is treated. 1 patient required treatment for pneumothorax.

- Major: 1 (3)
- Standard met: Yes
- Patient with primary non small cell lung cancer too frail for conventional treatment. Three week treatments for stabbing.
- Patient with metastases close to vessels. One went on to surgery. 1 by systemic treatment. A recurrence in a subclavian vein is treated. 1 patient required treatment for pneumothorax.

### Relapse

- Local: 4 (12)
- Standard met: Yes
- 1 liver metastases at 2 months after treatment. (a) shows a subpleural appearance with central necrosis. (b) shows a subpleural appearance with central necrosis. (b) shows a scar. 2 patients with metastases close to vessels. One went on to surgery. 1 by systemic treatment. A recurrence in a subclavian vein is treated. 1 patient required treatment for pneumothorax.

### Metastatic

- Local: 3 (9)
- Standard met: Yes
- 1 metastatic nodal relapse in primary lung non-small cell cancer. 1 liver metastases at 6 months after treatment. (c) shows a subpleural appearance with central necrosis. (d) shows a scar. 2 patients with metastases close to vessels. One went on to surgery. 1 by systemic treatment. A recurrence in a subclavian vein is treated. 1 patient required treatment for pneumothorax.

### Analysis

86 year old female patient with biopsy proven peripheral primary squamous cell bronchogenic tumour. Treated with three cycles of RFA. (a) shows satisfactory post ablation appearances with central necrosis. (b) shows severe intercostal root pain after conventional treatment. (c) shows a scar. (d) shows a scar. 2 patients with metastases close to vessels. One went on to surgery. 1 by systemic treatment. A recurrence in a subclavian vein is treated. 1 patient required treatment for pneumothorax.

72 year old man. Four pulmonary metastases from a colorectal primary. Three treated successfully. Fourth lesion ablated with left lower lobe pulmonary artery. Satisfactory needle position (a) but local relapse after 1yr (b) (arrow).

83 year old female with small sub pleural metastasis from a colorectal cancer. (a) shows severe intercostal root pain for 3 weeks after the procedure. This is almost certainly due to thermal damage to the intercostal nerve. (b) shows appearances 1 month after treatment.

### Conclusion

- Standards met:
  - Lack of clerical support which may become more of an issue as case load grows
  - Disease progression predictable
  - More frequent in tumours adjacent to vessels
  - More frequent in larger tumours
  - More frequent in non CTIC resections

- Re-audit annually

References: