Surgical Management of Renal Cancer

David Thomas
Renal cancer

- 8,228 new cases RCC 2007
- 3% all cancer in UK
- 3,848 deaths from RCC in 2008
- 40% of these will die from RCC
- Third most common urological malignancy
Figure 1.1: The 20 most commonly diagnosed cancers (excluding non-melanoma skin cancer), UK, 2007

- Breast
- Lung
- Colorectal
- Prostate
- N-H-L
- Malignant melanoma
- Bladder
- Kidney
- Oesophagus
- Stomach
- Pancreas
- Uterus
- Leukaemias
- Ovary
- Oral
- Brain with CNS
- Multiple myeloma
- Liver
- Cervix
- Mesothelioma
- Other

Number of new cases

Male
Female
Renal cancer

- At presentation 20% metastatic disease
- At presentation 25% locally advanced
- One third of patients with localised disease will develop metastases
- 50% of all patients with RCC will require complex treatment decisions
### Classification of renal tumours

<table>
<thead>
<tr>
<th>Type</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional</td>
<td>60 - 85 %</td>
</tr>
<tr>
<td>Chromophilic</td>
<td>7 - 14 %</td>
</tr>
<tr>
<td>Chromphobic</td>
<td>4 - 10 %</td>
</tr>
<tr>
<td>Collecting duct</td>
<td>1 - 2%</td>
</tr>
<tr>
<td>Oncocytic</td>
<td>2 - 5 %</td>
</tr>
</tbody>
</table>
Oncocytoma
## Renal cell carcinoma - Survival

<table>
<thead>
<tr>
<th>TNM</th>
<th>5 yr dis-free survival</th>
<th>5 year survival</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1 ab</td>
<td>93%</td>
<td>98%</td>
</tr>
<tr>
<td>Stage 2</td>
<td>75%</td>
<td>75%</td>
</tr>
<tr>
<td>Stage 3a</td>
<td>60%</td>
<td></td>
</tr>
<tr>
<td>Stage 3b</td>
<td>61%</td>
<td>50%</td>
</tr>
<tr>
<td>Stage 3c</td>
<td></td>
<td>35%</td>
</tr>
<tr>
<td>Stage 4</td>
<td></td>
<td>20%</td>
</tr>
</tbody>
</table>
Leibovichich Score

- Low
- Intermediate
- High

- Tumour size
- Grade
- Nodes
- Necrosis
Surgery for Renal Cancer

- Surgery is the only definitive curative treatment for renal cancer
Surgery for Renal Cancer

- Small renal mass
- Partial nephrectomy
- Lap Radical nephrectomy
- Open Radical nephrectomy
- Caval Thrombus
- Cytoreductive nephrectomy
Incidental Finding

- Increasing imaging
- Ultrasound
- CT
- MR
Small renal mass
82y recurrent PE 2.5 cm mass
Conservative management

- elderly patient
- Size lesion < 3cm
- Biopsy? Tend to be low grade
- 25% benign
- Rate of growth ? <3mm / year
- Surveillance ultrasound
- Minimally invasive options
Meta-analysis of 234 solid renal masses (<4cm)

Conservative management

Follow up 34 months

No metastases seen

Mean lesion size 2.6cm (1.73 - 4.08)

Mean growth rate of 0.28cm yearly

Elderly patient lesion < 3 cm - reasonable to observe
Partial Nephrectomy

- Polar segmental resection
- Wedge resection
- Major transverse resection
- Bench resection and auto transplant
- Laparoscopic
Absolute

- Solitary kidney
- Renal Impairment
Relative

- Normal contralateral kidney
- T1a tumours < 4cm
- T1b tumours 4-7 cm
- At least 20% RCC cases suitable nephron sparing option
Von Hippel Lindau Disease

Cut off 3cm    Duffey 2004
Loin Approach

- X1 / X11 rib
- Morbid
- Bleed
- Leak
- 5-10% complication
Partial Nephrectomy

- A. Novick       Cleveland clinic
- J Urol 2000
- 107 patients 10 year follow up
- Tumours < 4cm

- Survival and recurrence identical to total nephrectomy
- EORTC similar findings
Lap Partial nephrectomy
Partial Nephrectomy
# Warm Ischaemia

<table>
<thead>
<tr>
<th>Clamp time</th>
<th>% loss function</th>
<th>recovery</th>
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<tbody>
<tr>
<td>20 min</td>
<td>40 - 50</td>
<td>Complete, mins</td>
</tr>
<tr>
<td>30 min</td>
<td>50 - 60</td>
<td>Complete, days</td>
</tr>
<tr>
<td>60 min</td>
<td>60 - 70</td>
<td>incomplete</td>
</tr>
</tbody>
</table>
## Lap v Open partial nephrectomy

<table>
<thead>
<tr>
<th></th>
<th>Lap  Gill</th>
<th>Open  Novick</th>
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</thead>
<tbody>
<tr>
<td>200 patients</td>
<td></td>
<td></td>
</tr>
<tr>
<td>size</td>
<td>2.8 cm</td>
<td>3.3 cm</td>
</tr>
<tr>
<td>WIT</td>
<td>27.8 min</td>
<td>17.5 min</td>
</tr>
<tr>
<td>EBL</td>
<td>125ml</td>
<td>250ml</td>
</tr>
<tr>
<td>Op comp</td>
<td>5 %</td>
<td>0 %</td>
</tr>
<tr>
<td>Post op comp</td>
<td>11 %</td>
<td>2 %</td>
</tr>
<tr>
<td>Pos margin</td>
<td>3 %</td>
<td>1 %</td>
</tr>
<tr>
<td>LOS</td>
<td>2 d</td>
<td>5 d</td>
</tr>
</tbody>
</table>
Open partial nephrectomy

- Solitary kidney
- Large tumour
- Central tumour
- Multiple tumours
- Requirement for cooling
- Ischaemia > 30 min
Minimally Invasive Treatment

- Radio Frequency Ablation
- Cryotherapy
- Less morbidity, easier than lap partial
- ? Effective  ? Long term follow up
Radiofrequency ablation
Laparoscopic cryotherapy probe

Cyst

Tumor Ice ball

Kidney
Minimally Invasive Treatments

- Small < 3cm
- Non central lesion
- Laparoscopic cryotherapy
- CT guidance RFA

- Selection, follow up, counselling
Total Radical Nephrectomy

- Larger tumours
- Multiple tumours
- Not suitable for partial
- Caval thrombus
- Nodal disease
Laparoscopic radical nephrectomy
Lap Nephrectomy
Lap Nephrectomy
Lap nephrectomy
Lap Nephrectomy
Endocatch
Lap radical nephrectomy

- Safe
- Oncologically sound
- Conversion 2-5%
- Recovery faster
- Less transfusion
- Reproducible data
Advanced renal tumours
Open radical nephrectomy

- Large renal tumours T2 / T3 a,b,c
- Operator experience dependent
- Vein invasion
- Extensive Intestinal adhesions
- Caval thrombus
- Lymph node dissection
Open Nephrectomy
Caval Thrombus
Level of thrombus

- I infrahepatic
- II intrahepatic
- III suprahepatic
- IV atrium
Liver Surgeon
Cardiac Surgeon
Deep Hypothermic Circulatory Arrest

- Mobilise kidney
- Heparinise
- Bypass
- Cool 18°C
- Caval thrombectomy
- Patch
- Warm
- 5% mortality
- 5% cva
RCC Caval Thrombus

Kaplan Meier Survival Analysis

31.3% 5-year survival

N=50
What about the nodes?

- EORTC 30881
- 772 randomised patients
- Nephrectomy v nephrectomy + lymphadenectomy
- No survival advantage
- Staging procedure only
Adrenalectomy?

- Survival in T1-2 same +/- adrenalectomy
- Only if involvement with tumour
- Important in managing bilateral disease
- Upper pole tumours, adequate margin
Surgery in Metastatic disease

- Cytoreductive
- Multiple metastases
- Isolated metastasis
- Local resection
- Lung, bone, thyroid
Cytoreductive nephrectomy

- EORTC 30947 1998
- 83 patients
- SWOG 8949 1997
- 241 patients

- Immunotherapy alone 7.8 m
- Nephrectomy + immunotherapy 13.6 m

- Survival advantage 10 months
Cytoreductive nephrectomy

- Performance status
- Cerebral metastasis
- Multiple Bone metastasis
- Pulmonary mets > 20 / effusion

- MDT discussion
- Laparoscopic potentially most beneficial
Metastatic disease
Metastatic Disease
TKI and cytoreductive nephrectomy

- Evidence for cytoreductive nephrectomy and TKI in metastatic RCC?
- Survival benefit TKI v interferon (Motzer)
- Nephrectomy independently associated with improved survival in patients receiving TKI (Warren 2009)
- Surgery or TKI which treatment first?
Unanswered questions

- SORCE
- CARMINA Met RCC
- nephrectomy and sunitinib v sunitinib alone
- EORTC
- Sunitinib pre v post surgery - neoadjuvant
Surgery in Renal Cancer

- Potential for Over treatment
- Potential for Under treatment
- Spare the nephrons
- Cytoreductive nephrectomy
Uro-Oncology MDT

- Urologists
- Interventional radiologist
- Oncologists
- Specialist Nurse
- Uropathologist
- Tailor treatment to the patient