



Surgical Management of Renal Cancer



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NHS Foundation Trust

Surgery for Kidney Cancer

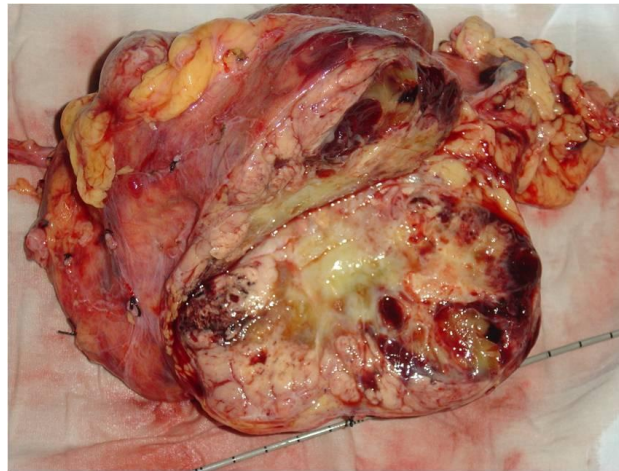
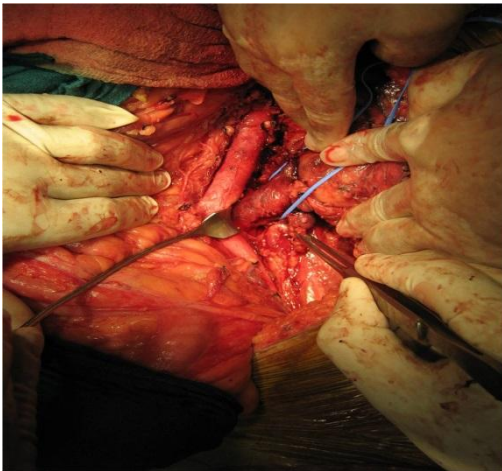
Roles of Surgery

1. Curative intervention – localised disease
2. Symptomatic control – advanced disease
3. Augmentation of efficacy of systemic therapy – advanced disease



Surgery for Kidney Cancer

Radical Nephrectomy is only potentially curative treatment for renal cell carcinoma!!!



Robson
J Urol
1963;89:37-42

? Has much changed in 50 years



Surgery for Kidney Cancer

Spectrum of Disease

1. Small renal masses
2. 'Clinically significant' tumours with no evidence of metastases
3. Metastatic RCC
 1. Asymptomatic tumour
 2. Symptomatic tumour



Surgery for Kidney Cancer

1. Small renal masses

Detected as incidental findings

Natural history often slow progression + low risk of metastatic disease if < 3-4cm



Surgery for Kidney Cancer

2. 'Clinically significant' tumours

In absence of spread Robsons conclusion remains true

Surgical excision – usually nephrectomy remains treatment of choice

Laparoscopic approach – case selection

Open surgery



Surgery for Kidney Cancer

3. Metastatic RCC

Symptomatic tumour

Surgery – often most effective palliation

Asymptomatic tumour

? Rationale for surgery in the context of extra-renal disease

? Role in conjunction with systemic therapies



Surgery for Kidney Cancer

1960's - Dialysis

1970's - Partial nephrectomy

1980's – IL2/interferon

1990's – Laparoscopic nephrectomy

2000's -

Cytoreductive nephrectomy

Elective partial nephrectomy

Ablative therapies

Targeted therapies



Surgery for Kidney Cancer

Level 1 Evidence – limited to 3 trials

2 trials showing nephrectomy + IFN improved survival to IFN alone

* generally interpreted as nephrectomy improves survival



Surgery for Kidney Cancer

1 trial - nephrectomy vs partial for T1 tumours with normal contralateral kidney.

Higher complications with PN

No increased risk of cardiovascular or renal failure related outcomes with RN

* Generally ignored



Surgery for Kidney Cancer

Epidemiological data

1. Increased incidence of (diagnosed) RCC
2. Profound stage shift to T1 disease
3. No improvement in overall mortality – no change in numbers presenting with metastatic disease



Surgery for Kidney Cancer

Observational data – tumours <3-4cm

1. Low incidence of metastatic disease
2. Slow growth in many patients (<1cm/year)
3. Minimal risk of metastatic disease with surveillance and intervention with demonstrated growth



Surgery for Kidney Cancer

T1 disease – increased options

1. Partial nephrectomy
2. Ablative therapies
3. Surveillance in selected patients



Surgery for Kidney Cancer

Partial nephrectomy

Open – morbidity

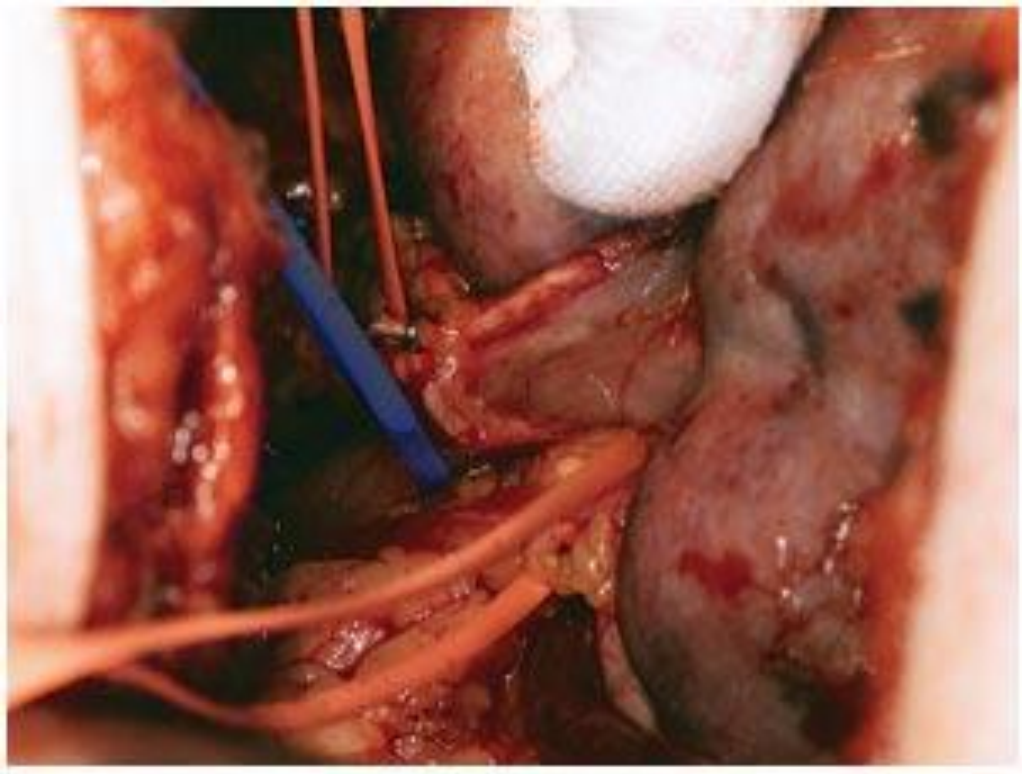
Laparoscopic – feasible but difficult

Robotic – available at selected institutions*

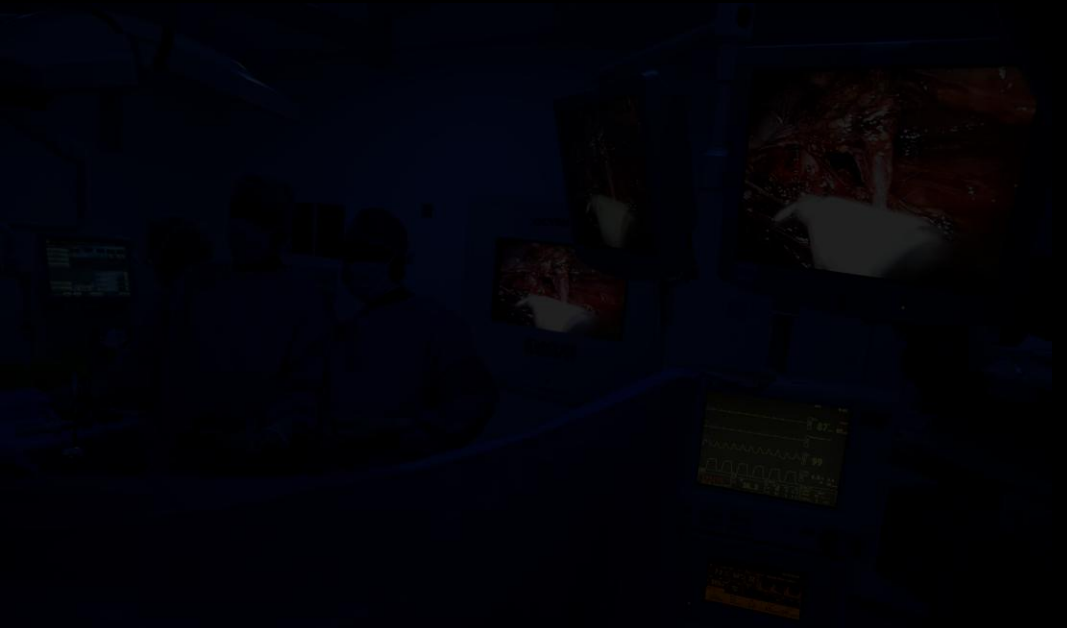
* Urological focus – driven by urologists,
institutions, industry



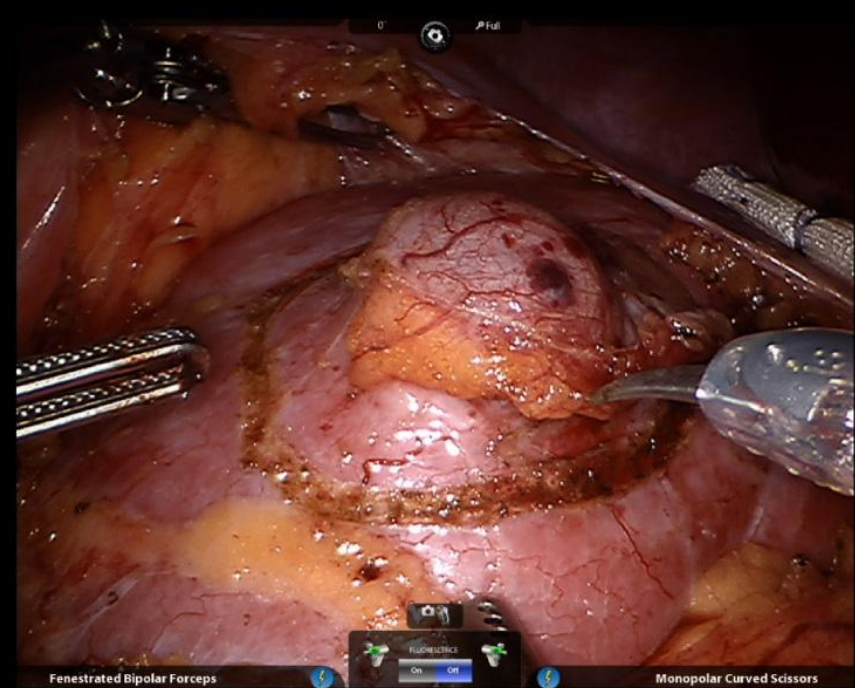
Surgery for Kidney Cancer



Surgery for Kidney Cancer

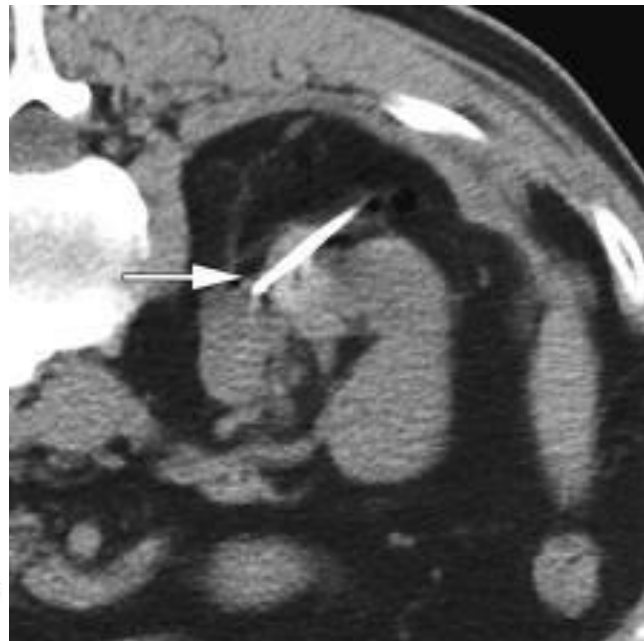
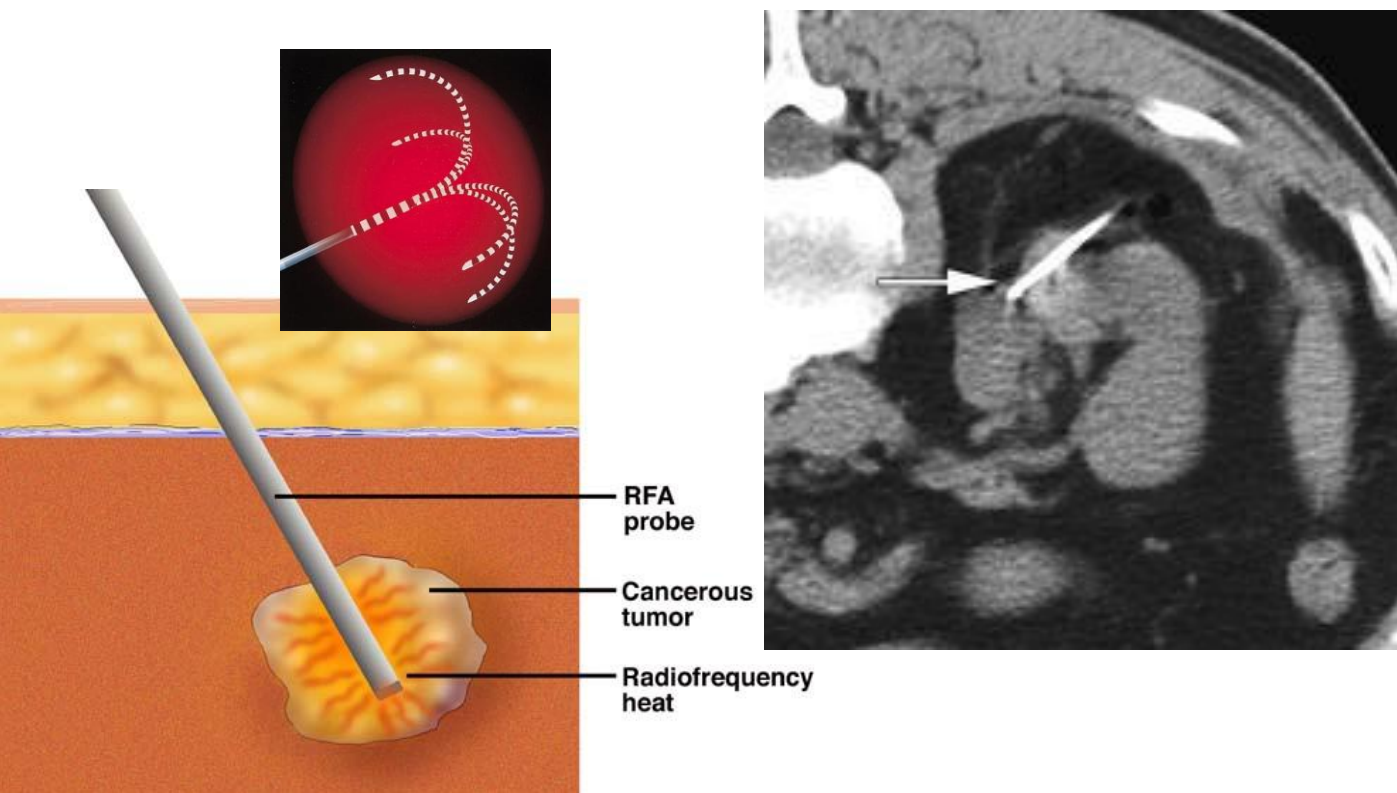


Surgery for Kidney Cancer



Surgery for Kidney Cancer

Ablative therapies – Percutaneous (??Lap)
Cryotherapy/Radiofrequency ablation



Surgery for Kidney Cancer

Ablative therapies –
cryotherapy/radiofrequency ablation

10% local failure (ie persistent tumour)

Nephrectomy usual outcome if subsequent surgery

Size/anatomical limitations

* Good option for selected patients with small
lesion/failed surveillance



Surgery for Kidney Cancer

T2 Tumours

Nephron sparing approaches potentially compromise surgical outcomes

Laparoscopic/Open Nephrectomy OR
Open Partial (imperative indication)



Surgery for Kidney Cancer

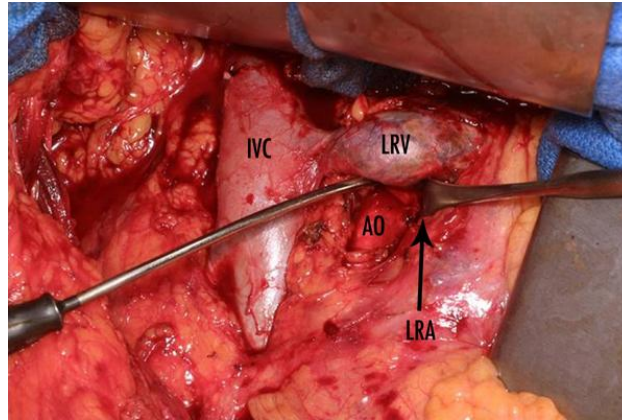
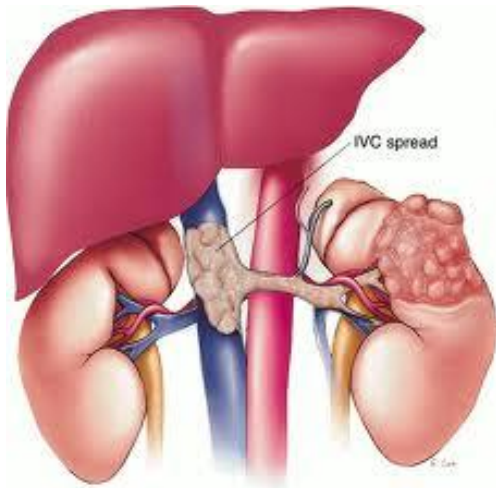
T3 Tumours

1. Intravascular tumour
2. Nodal disease



Surgery for Kidney Cancer

Tumour Thrombus



Surgical excision often feasible

May require cardiopulmonary bypass

Prognosis related to N/M status



Surgery for Kidney Cancer

Lymphadenectomy - EORTC - 30881

772 patients with T1-3 NoMo

- RN vs RN + LND
- No difference in CSS

BUT

- High prevalence of low risk disease
- Only 3% have LN+
- Few patients(17%) – progressed/died

Underpowered – difficult to draw conclusions

Blom et al
Eur Urol 2009



Surgery for Kidney Cancer

Lymphadenectomy – N0M0

EORTC/SEER – no benefit with clinical non-involved nodes

Institutions – benefit in ‘high’ risk cases

Mayo Clinic

- High T stage – T3, T4, High Fuhrman grade 3, 4
- Large size (>10cm), Histological tumour necrosis
- * Advocate intra-operative frozen section



Surgery for Kidney Cancer

Lymphadenectomy – N+M0

Institutional series reports of patients undergoing extensive LND with

- Improved CSS
- Long term survival

But

- Non- randomised
- Median improvement @ 5 months



Surgery for Kidney Cancer

MD Anderson - 40 patients

- Extended dissection
- Only included COMPLETE resections

- Median CSS 20.3 months

Canfield et al

J Urol 2006



Surgery for Kidney Cancer

Lymph Node Disease - Autopsy series

(death from other causes)

- 554 patients with RCC
- 80(14%) had LN+ disease

BUT only 5 had exclusively para-aortic or paracaval

Johnsen & Hellsten

J Urol 1997



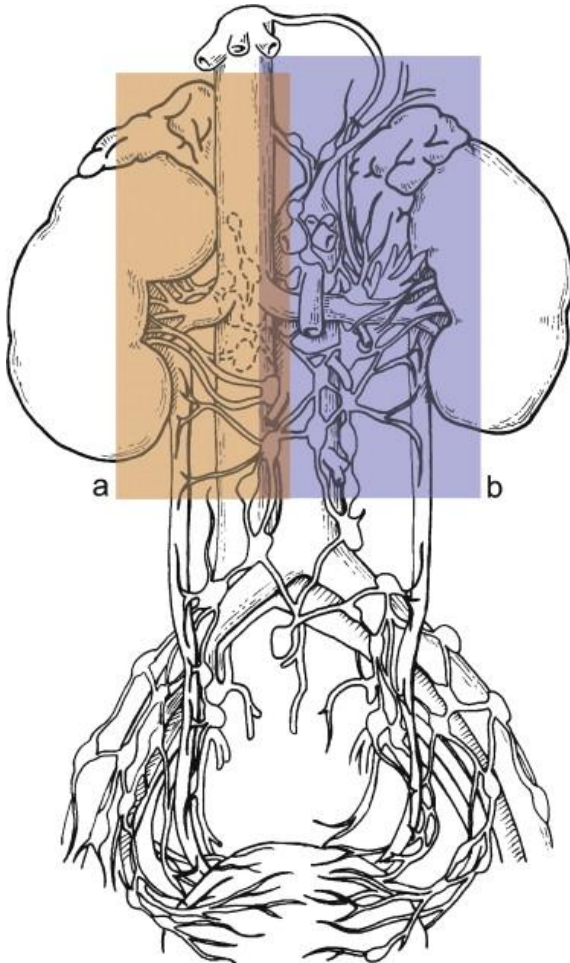
Surgery for Kidney Cancer

Left

- Crus to aortic bifurcation

Right

- Paracaval +
interaortocaval



Parker, AE
American J Anat 1935

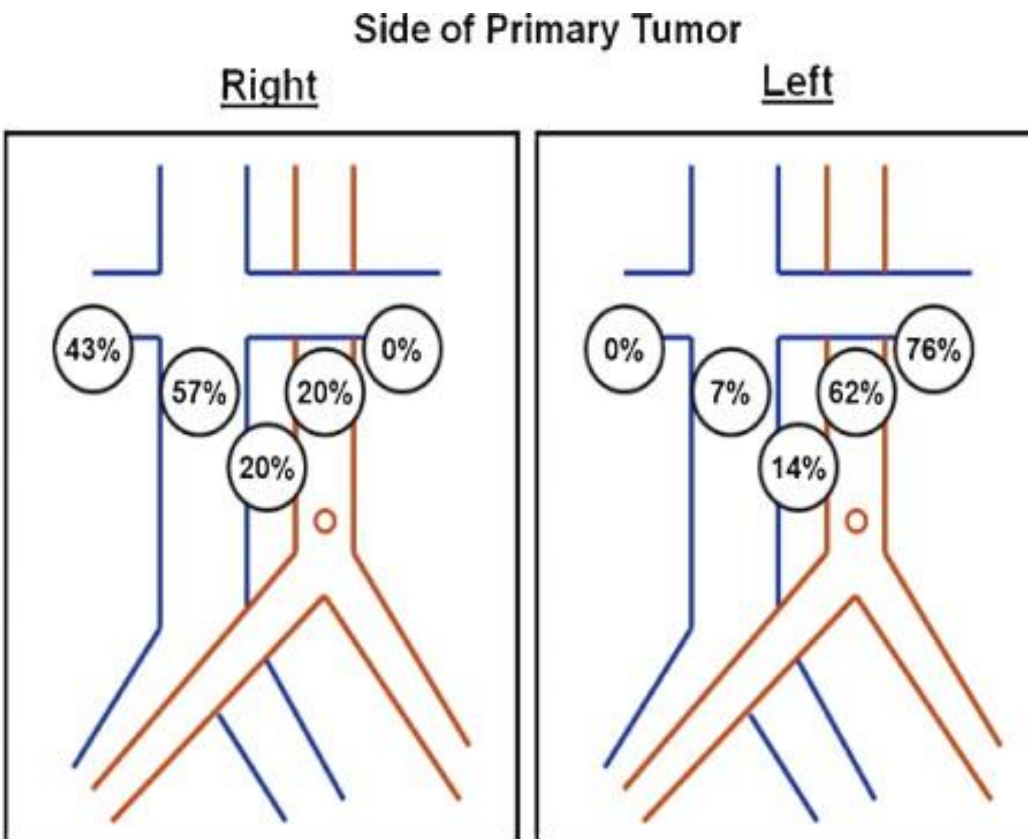


Surgery for Kidney Cancer

No uniformly accepted guidelines on extent or anatomic boundaries when performed as an adjunct to radical nephrectomy

Staging accuracy correlates with extent of dissection/number of nodes

Crispen et al
Eur Urol 2011



Surgery for Kidney Cancer

Lymphadenectomy – N+M0

5 year CSS

- 18% - extracapsular nodal disease
- 35% - without extracapsular nodal disease

Dimashkeh et al

J Urol 2006



Surgery for Kidney Cancer

Lymphadenectomy –

Appears of no benefit in T1-2 disease if cN0

Poor evidence base outside these parameters

Possibly consider in high risk(>10cm, necrosis) if
cN0/N1



Surgery for Kidney Cancer

Cytoreductive Nephrectomy(CRN)

	N	Survival(med) N + IFN	Survival(med) IFN alone
EORTC 30947	85	17	7
SWOG 8949	241	11.1	8.1
Combined	326	13.6	7.8

2 trials showing nephrectomy + IFN improved survival to IFN alone

* Generally (mis)interpreted as nephrectomy improves survival



TABLE 2. SURVIVAL IN SUBGROUPS DEFINED ACCORDING TO STRATIFICATION FACTORS.

CATEGORY	MEDIAN SURVIVAL		1-YR SURVIVAL		P VALUE*
	INTERFERON ALONE	NEPHREC-TOMY PLUS INTERFERON	INTERFERON ALONE	NEPHREC-TOMY PLUS INTERFERON	
	mo		%		
Not stratified	8.1	11.1	36.8	49.7	0.012
Stratification factor					
Measurable disease					0.010
Yes	7.8	10.3	34.7	46.6	
No	11.2	16.4	43.1	63.6	
Performance status†					0.080
0	11.7	17.4	49.2	63.6	
1	4.8	6.9	28.2	32.5	
Type of metastases					0.008
Lung only	10.3	14.3	41.5	58.5	
Other	6.3	10.2	34.6	45.1	

*P values for the comparison of median survival between groups were derived with the log-rank test.

†Performance was scored as 0 or 1, with 1 indicating decreased activity.



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NNT - 8 patients undergo surgery for ONE additional patient to survive at 12 months

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NNT - 23 patients undergo surgery for ONE additional patient to survive at 12 months

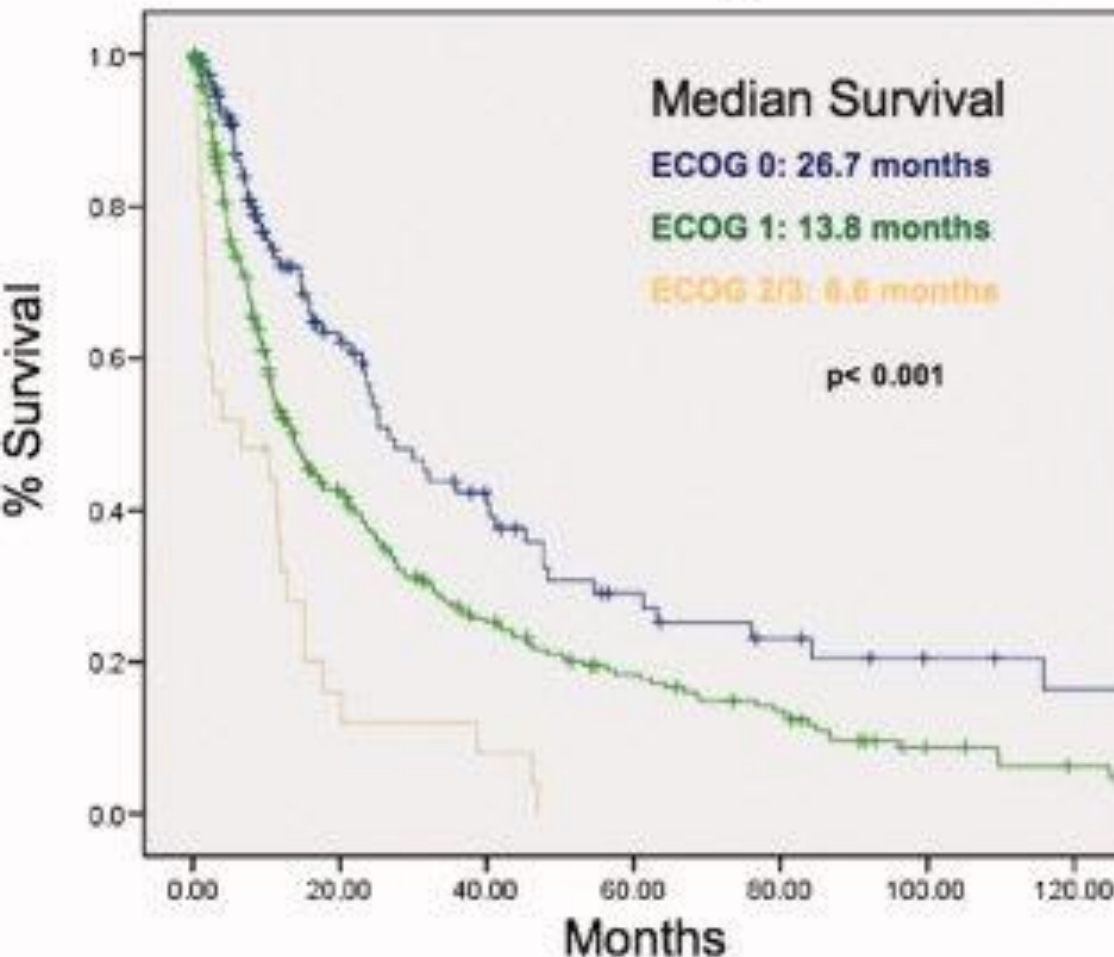
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Surgery for Kidney Cancer

ECOG and Disease Specific Survival



Cytoreductive Nephrectomy

UCLA – 1989-2006

418 patients

ECOG PS

0 – n=117, 26.7 months

1 – n=274, 13.8 months

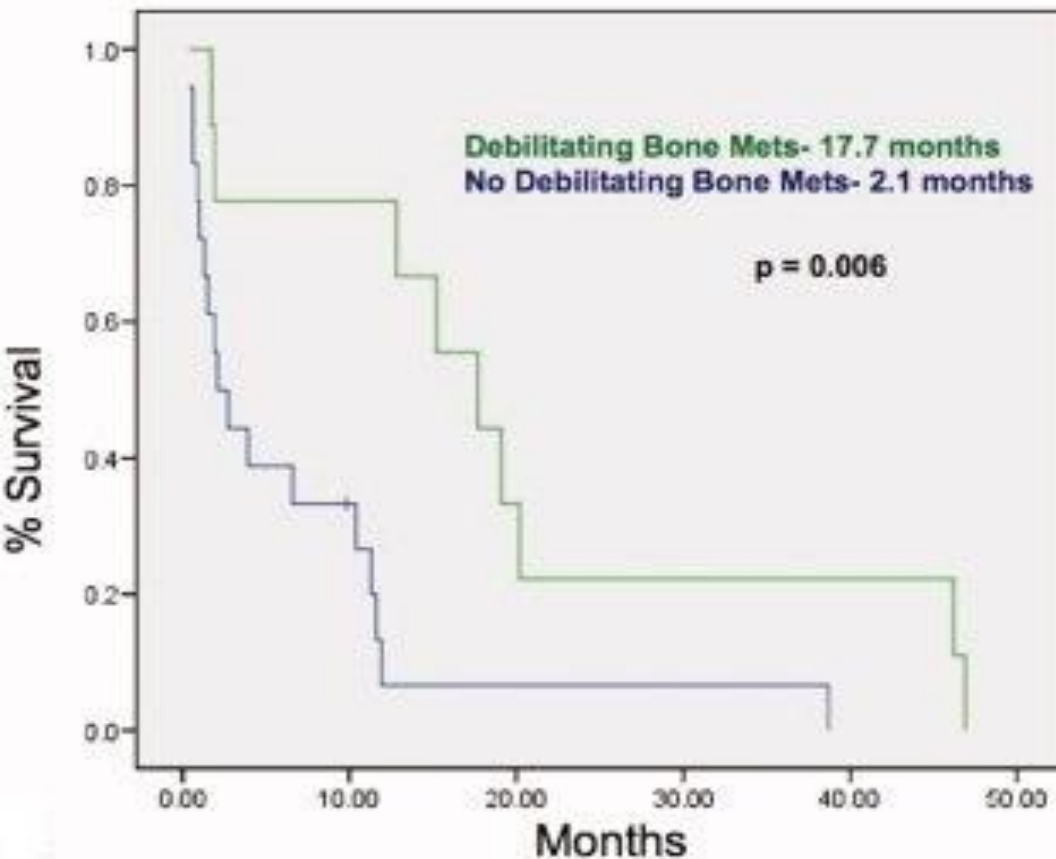
2/3 – 27, 6.8 months

Shuch et al
Cancer 2008



Surgery for Kidney Cancer

Disease Specific Survival for ECOG 2/3



Cytoreductive Nephrectomy

Outcome better if ECOG 2/3 status related to painful bone metastases rather than visceral disease

17.7 vs 2.1 months

*Shuch et al
Cancer 2008*



Surgery for Kidney Cancer

Metastatic disease

Patient scenarios

1. Symptomatic primary



2. Asymptomatic primary



Surgery for Kidney Cancer

Asymptomatic Primary

ECOG PS > 1 - not of benefit/potentially harmful

ECOG 0 – no evidence at present time

CARMENA (Sutent vs CRN + Sutent)

Other trials



Surgery for Kidney Cancer

Asymptomatic Primary

Low Volume Disease

No definite evidence

Possibly an initial intervention particularly if there is consideration for deferring systemic therapy

High Volume Disease

May not be advantage

Could delay systemic therapy

Consider if response to systemic treatment and good PS



Surgery for Kidney Cancer

Lymphadenectomy with
CRN?

Suggestion of improved
survival

Limited to institutional series

Selection bias ++

UCLA – CRN + IL2

129 patients – N+M+

5 month survival advantage with
LND

NCI – CRN + IL2

82 pN –ve; 72 pN +ve

Median survival 14.7 vs 8.5 months

Survival – no difference between pN+ with
LND and complete resection and pNo

Vasselli et al

J Urol 2001



Surgery for Kidney Cancer

57% of patients treated with cytoreductive nephrectomy + LND were pN₀

Lack of lymphadenopathy predicts survival of patients with metastatic disease

Vasselli et al
J Urol 2001

UCLA

Survival of N+M₀ equivalent to N₀M+

N+M+ survival << both N+M₀ and N₀M+

Pantuck et al
J Urol 2003

3 years cancer specific survival with cytoreductive nephrectomy + LND

pN₀ - 34.7%
pN+ - 14.4%

Lughezzani et al
Cancer 2009



Surgery for Kidney Cancer

Summary

Surgery remains the most reliable curative intervention for RCC

Most RCC requiring intervention are small localised tumours

Nephron sparing approaches including surveillance, ablative non-surgical interventions and minimally invasive surgical techniques increasingly utilised.



Surgical Issues in RCC

Summary

Role of CRN including timing and indications yet to be determined for metastatic disease

Lymphadenectomy role also requires clarification

Lymph node status may be a significant confounder for which stratification is required in future surgical and systemic therapy trials.



Surgical Issues in RCC



Surgical Issues in RCC



Surgical Issues in RCC

