A Case of Metastatic RCC

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Radiology 4001

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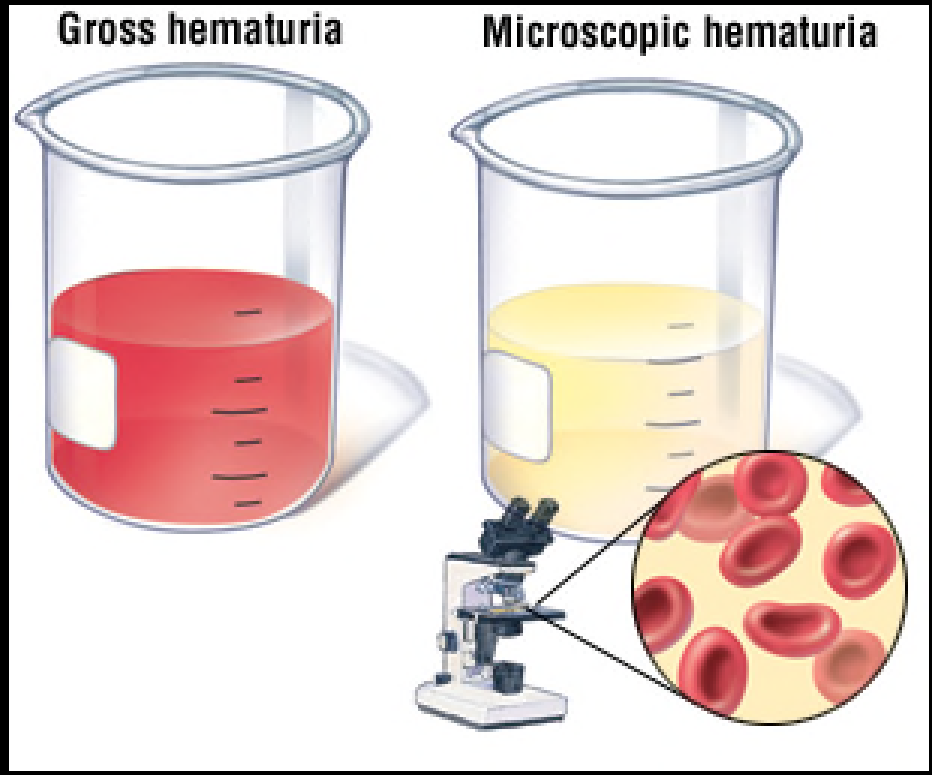
Clinical History

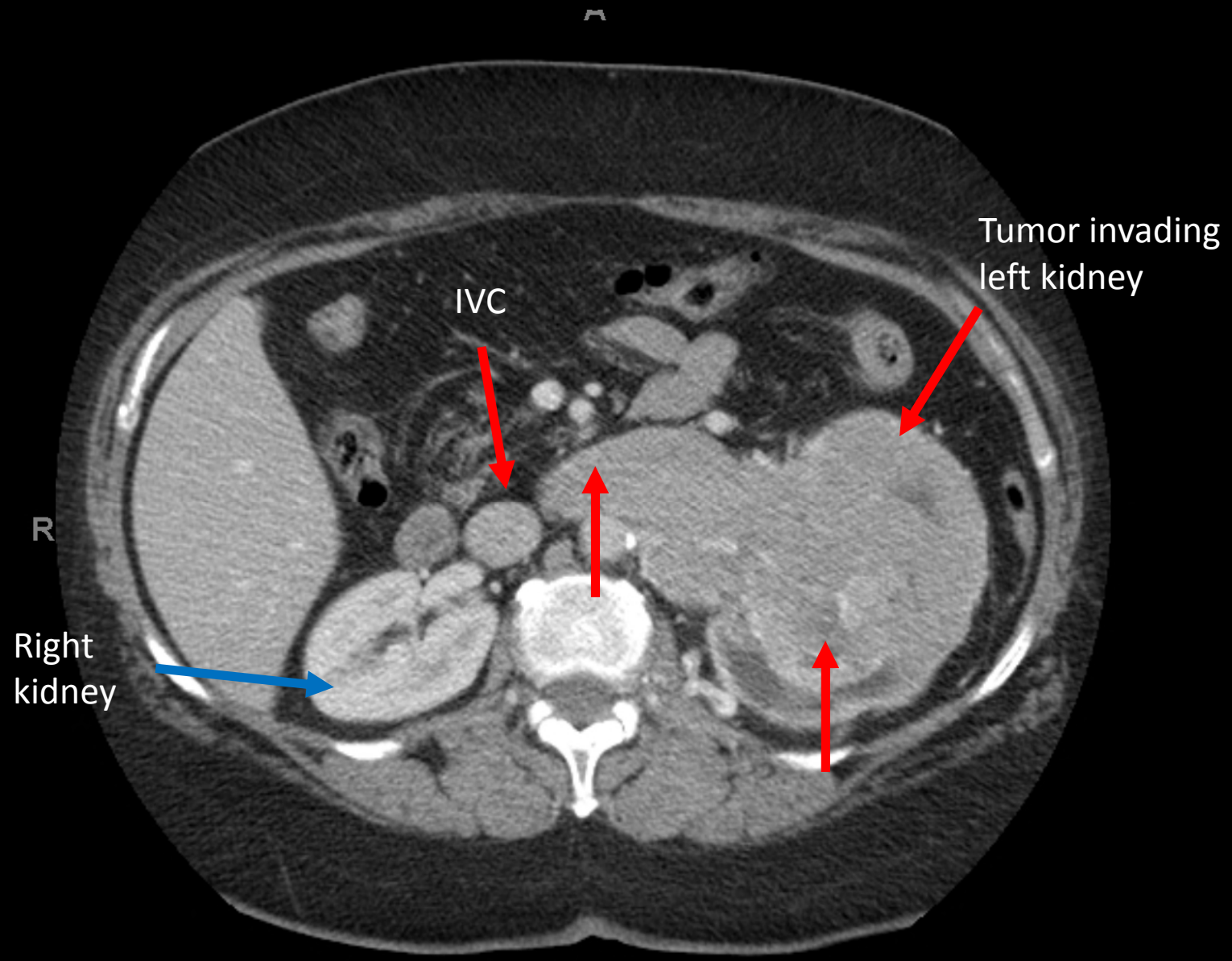
- 58 F presented to clinic with gross hematuria in May 2013
- PMHx: HTN, DM (HbA1c 6.6)
- 1 ppd 20 years smoking
- No family history of cancer
- Vitals WNL
- P/E WNL



Initial Imaging

Axial, contrast enhanced CT at level of kidneys

Soft tissue window

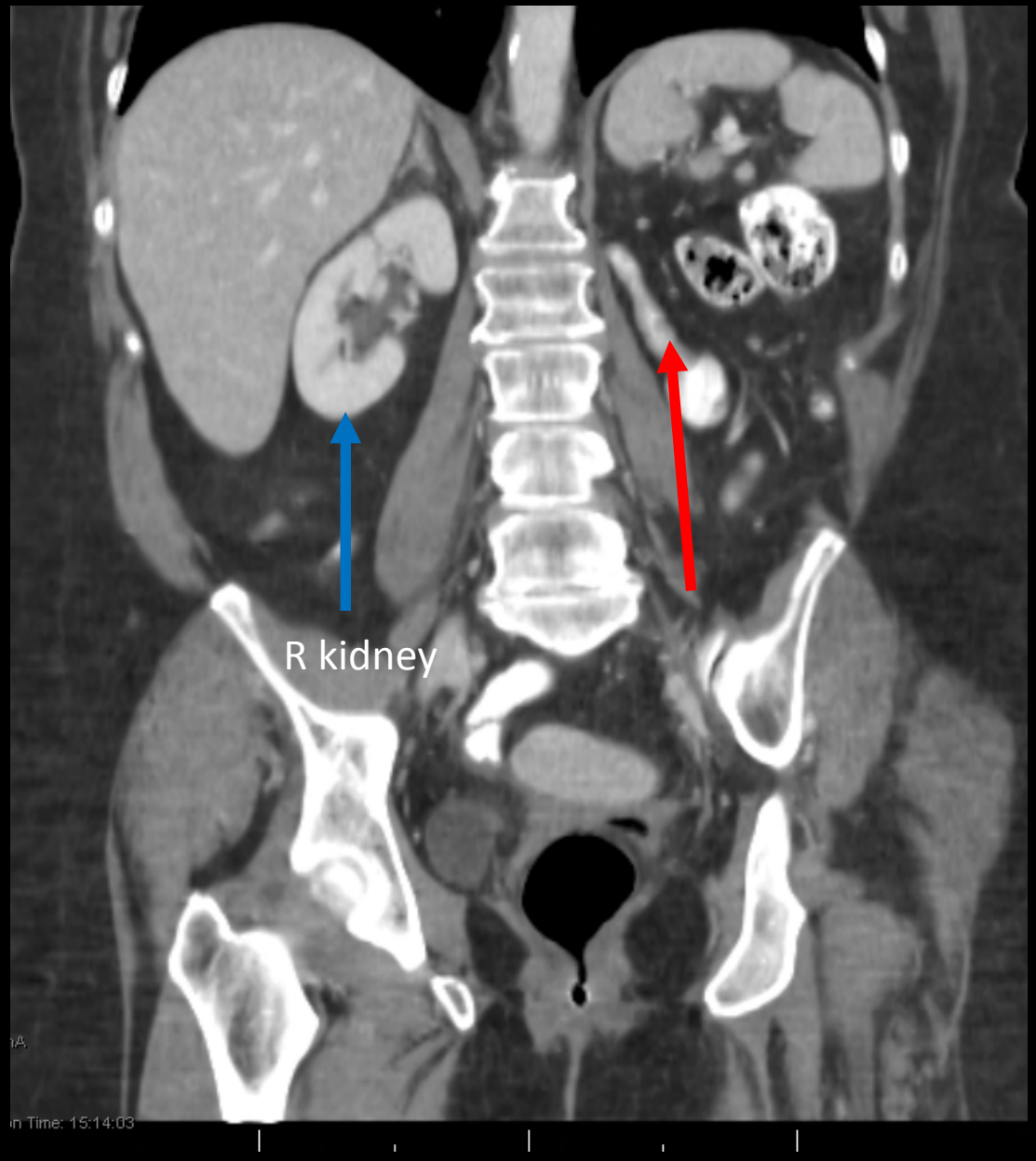


L nephrectomy 2 weeks later

Coronal, contrast enhanced CT at level of kidneys

Soft tissue window

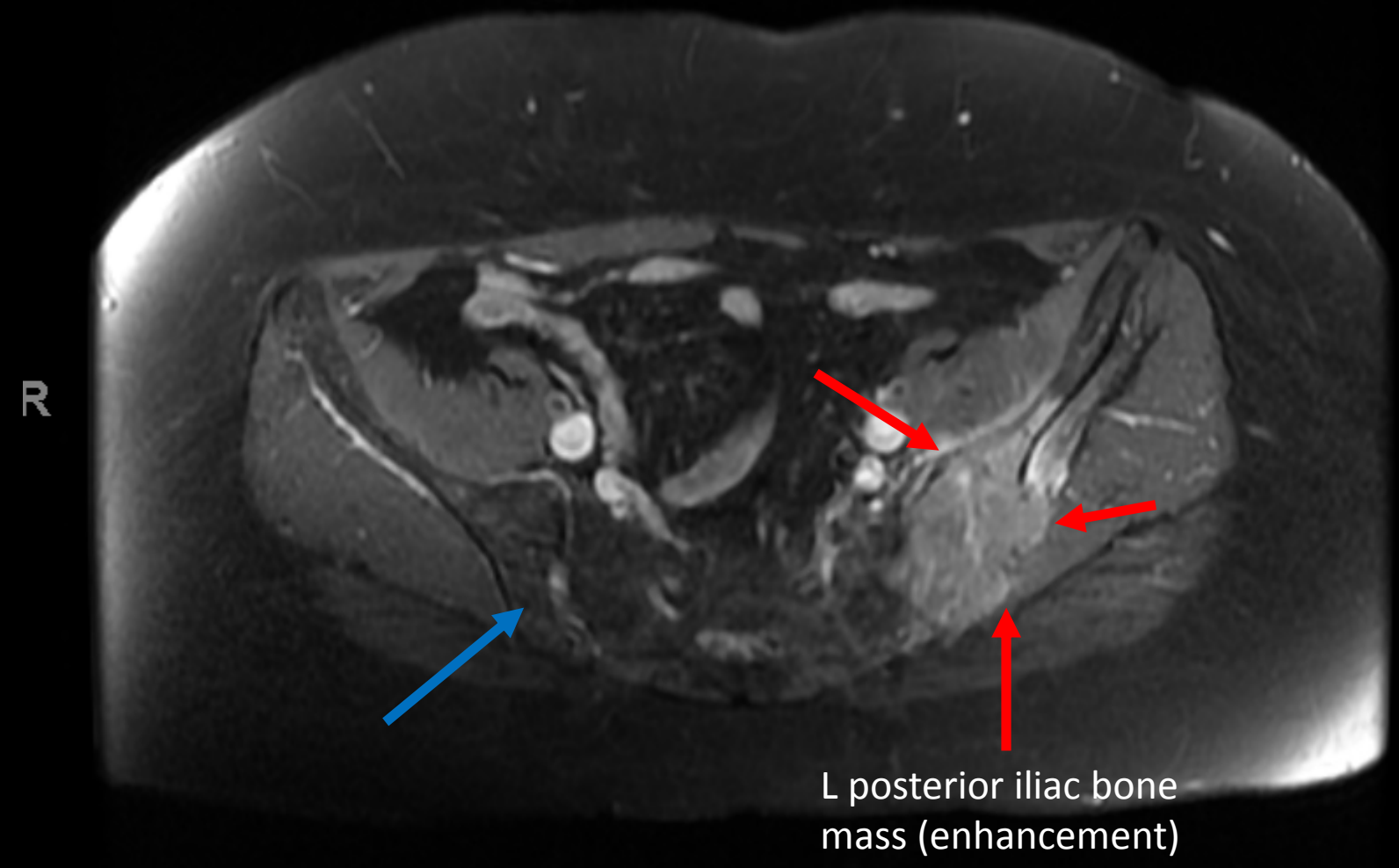
Final path: T3a clear cell RCC



3 years later- L hip pain

Axial, T1
Postcontrast, fat sat

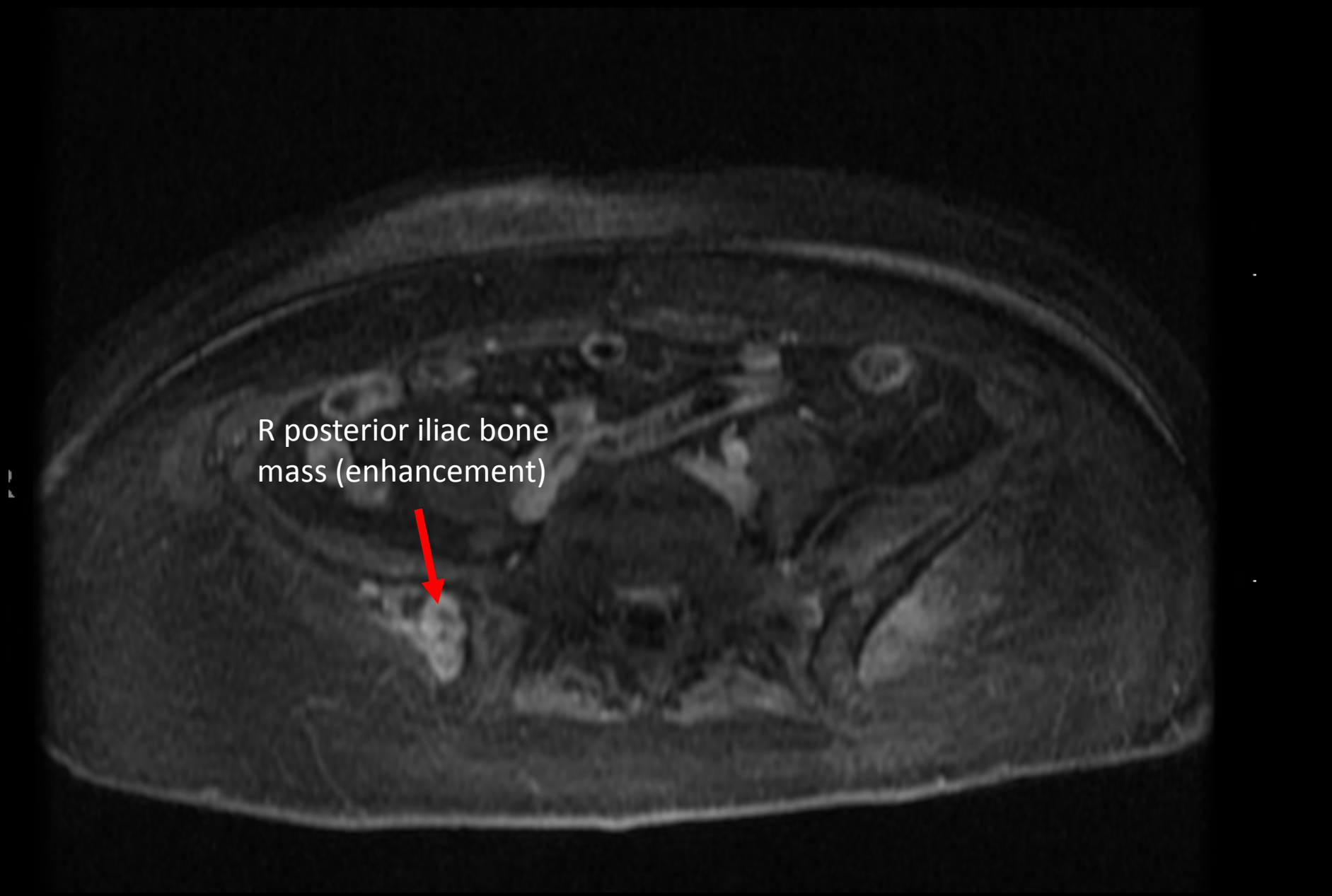
Patient then underwent EBRT and IR embolized feeding artery for pain control



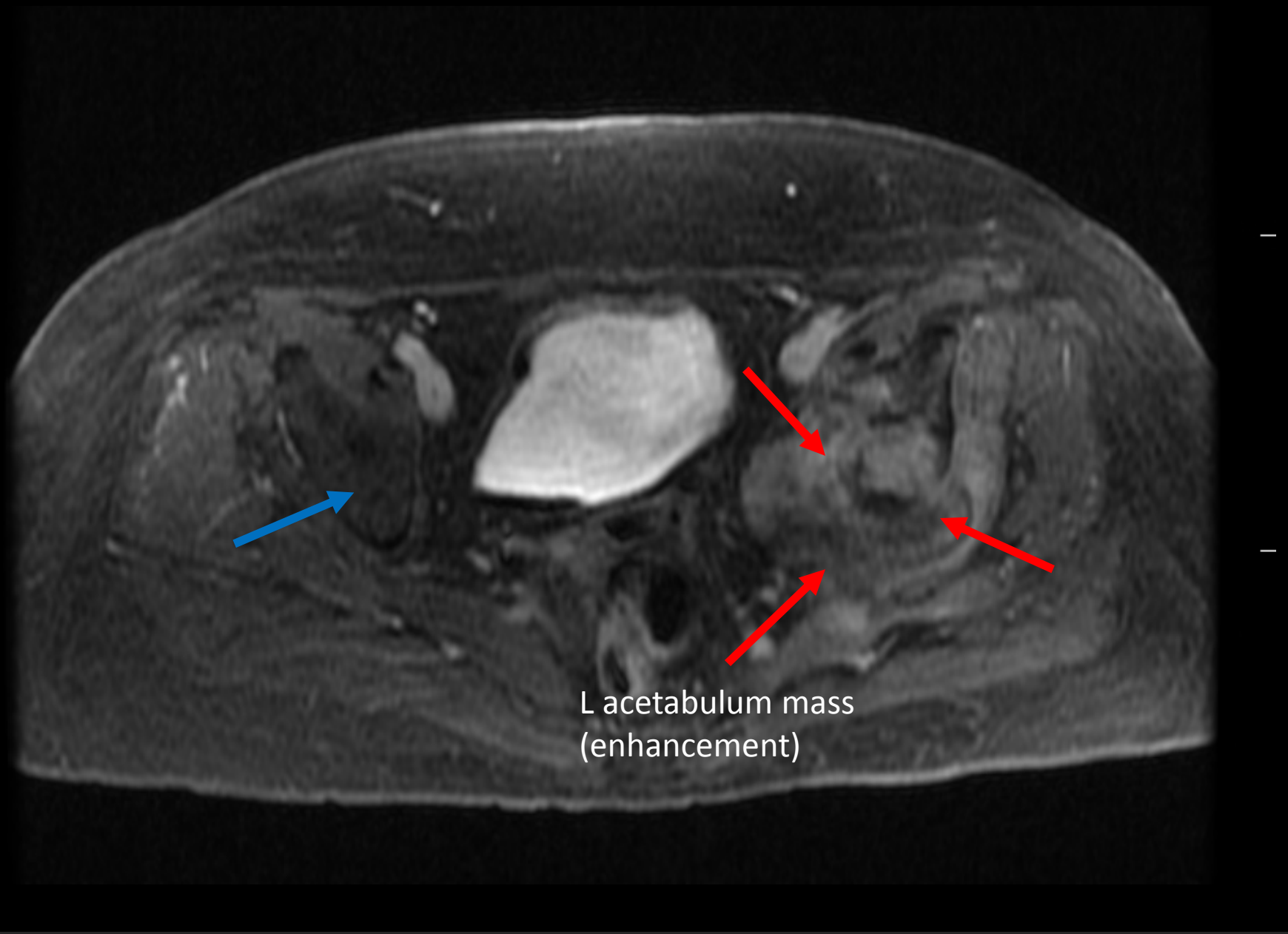
3 years later- September 2019

Axial, T1
Postcontrast, fat sat

September 2019



September 2019

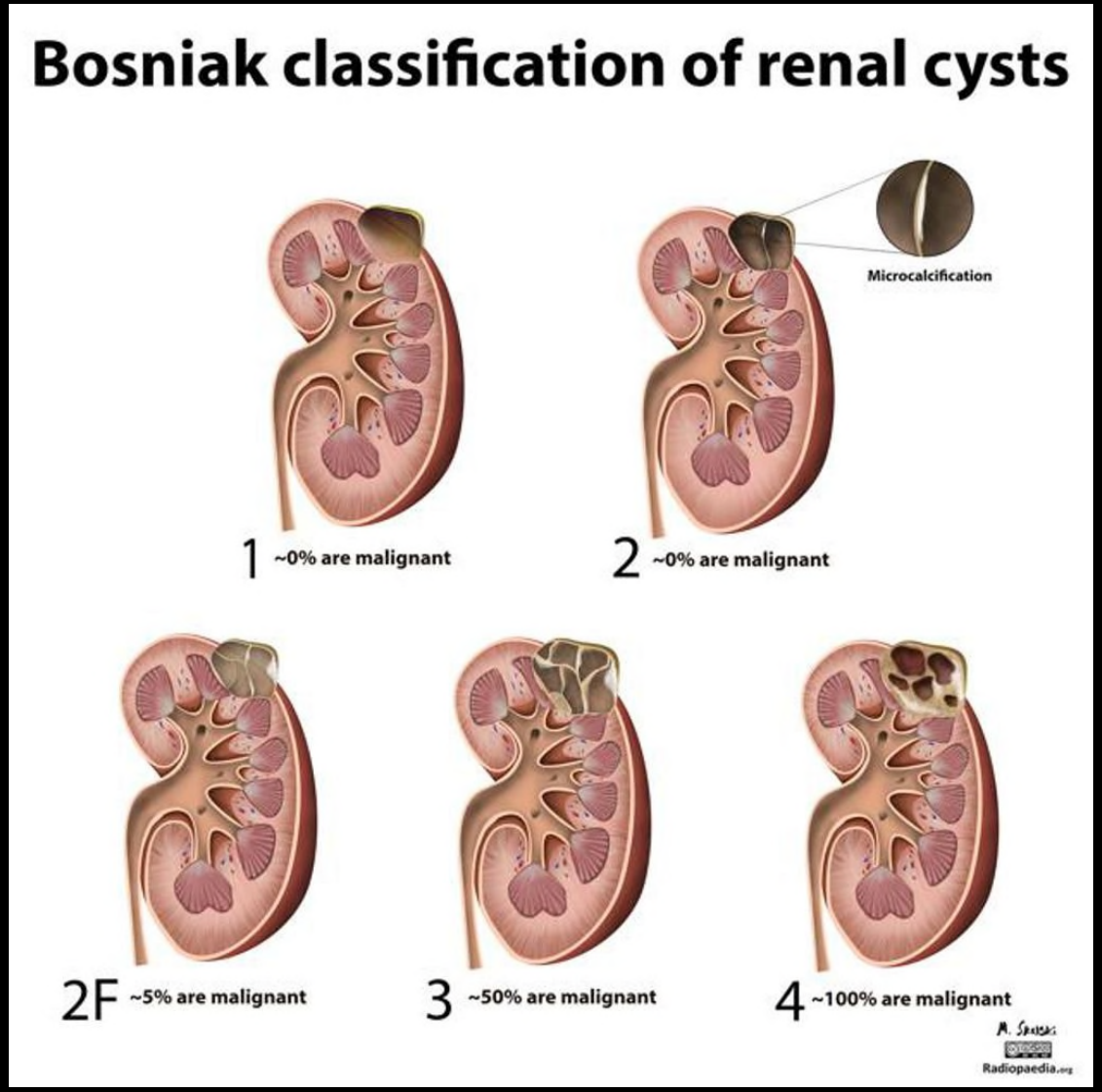


Summary of Patient Course

- **2013**: Initial- L renal mass involving renal vein (T3a)
- Treated with L nephrectomy and sunitinib
- **2016**: Mets to L iliac > started on immunotherapy, EBRT, IR embolization
- **2019**: Mets to R iliac and L acetabulum expanding
- Awaiting finalization of treatment

Discussion

- Many renal tumors are found incidentally
- Symptoms of RCC can include flank pain, hematuria, weight loss, fever, sweats
- The classic triad is now rare
  - Flank mass, hematuria, pain
- Masses can be cystic or solid

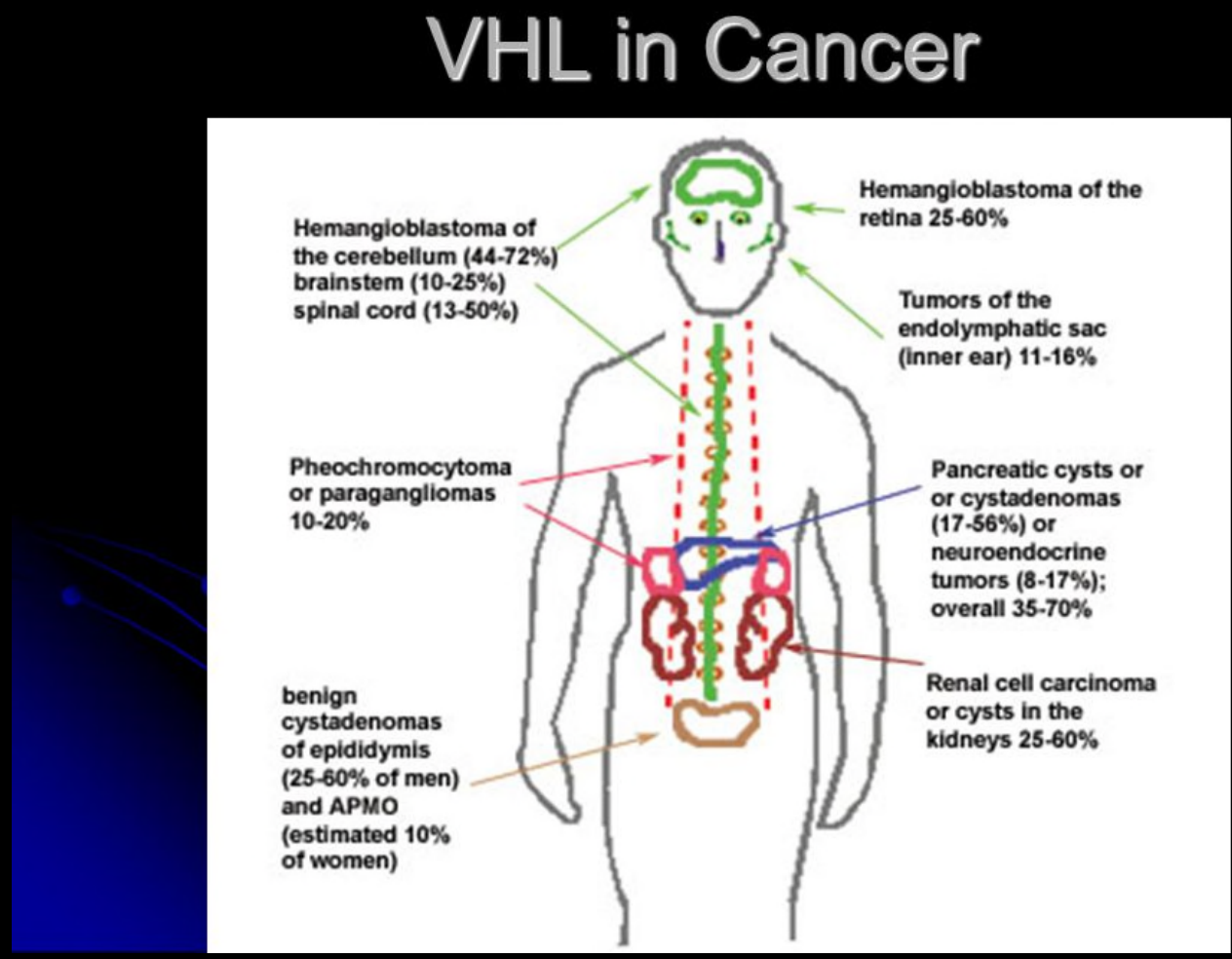


Comparison of RCC Types

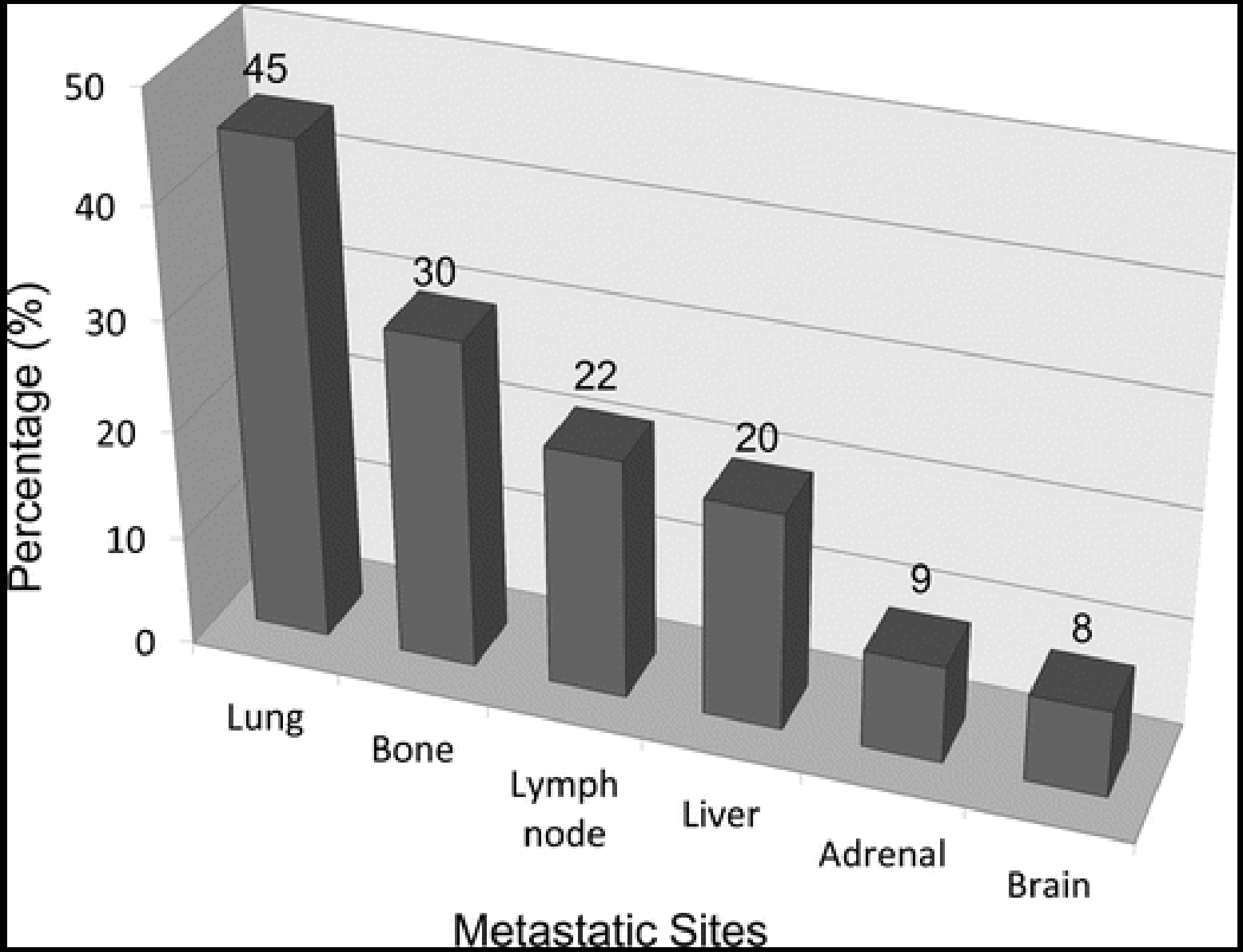
Feature	Clear Cell	Papillary	Chromophobe	Collecting duct
Prevalence	65%	10-15%	5-10%	<1%
Common cytogenetics	Loss of 3p	Polysomy 7 and 17, loss of Y	Multiple chromosomal deletions	?
Cell origin	Proximal tubule	Proximal tubule	Collecting duct	Collecting duct
Disease association	VHL, BHD, TS	Chronic renal failure	BHD	Sickle cell

Clear Cell RCC

- Most common primary renal malignancy in adults
- Clear cytoplasm and low N/C ratio
- Arises from proximal tubule
- Associated with loss of 3p
- MC type of RCC in **VHL**



Metastatic sites in RCC



https://pubs.rsna.org/doi/full/10.1148/rg.336125110

Final Diagnosis:

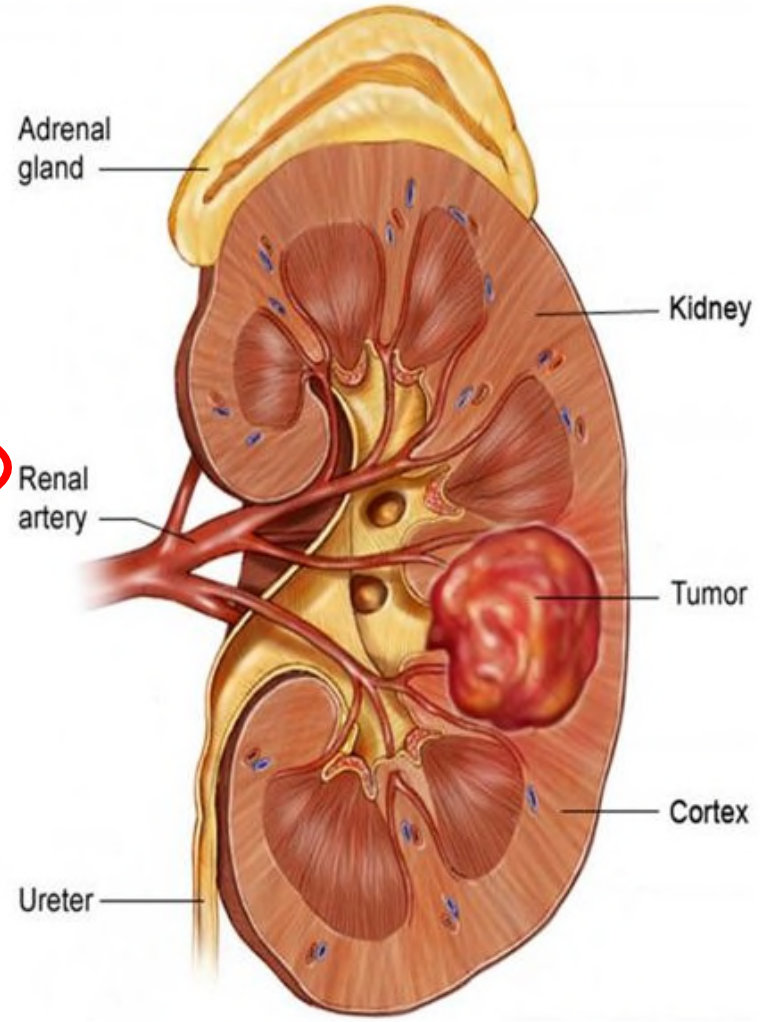
T3a clear cell

With multiple bony metastatic recurrences

5 year overall survival: 43-72%

Kidney Cancer Staging

T1a	≤4 cm
T1b	4.1–7 cm
T2a	7.1–10 cm
T2b	>10 cm
T3a	Invades perinephric or sinus fat and/or the renal vein
T3b	Invades the IVC below the diaphragm
T3c	Invades the IVC above the diaphragm
T4	Invades beyond Gerota's fascia
N1	Involves regional lymph nodes
M1	Distant spread



National Comprehensive Cancer Network®

NCCN Guidelines Version 4.2018
Kidney Cancer

NCCN Guidelines Index
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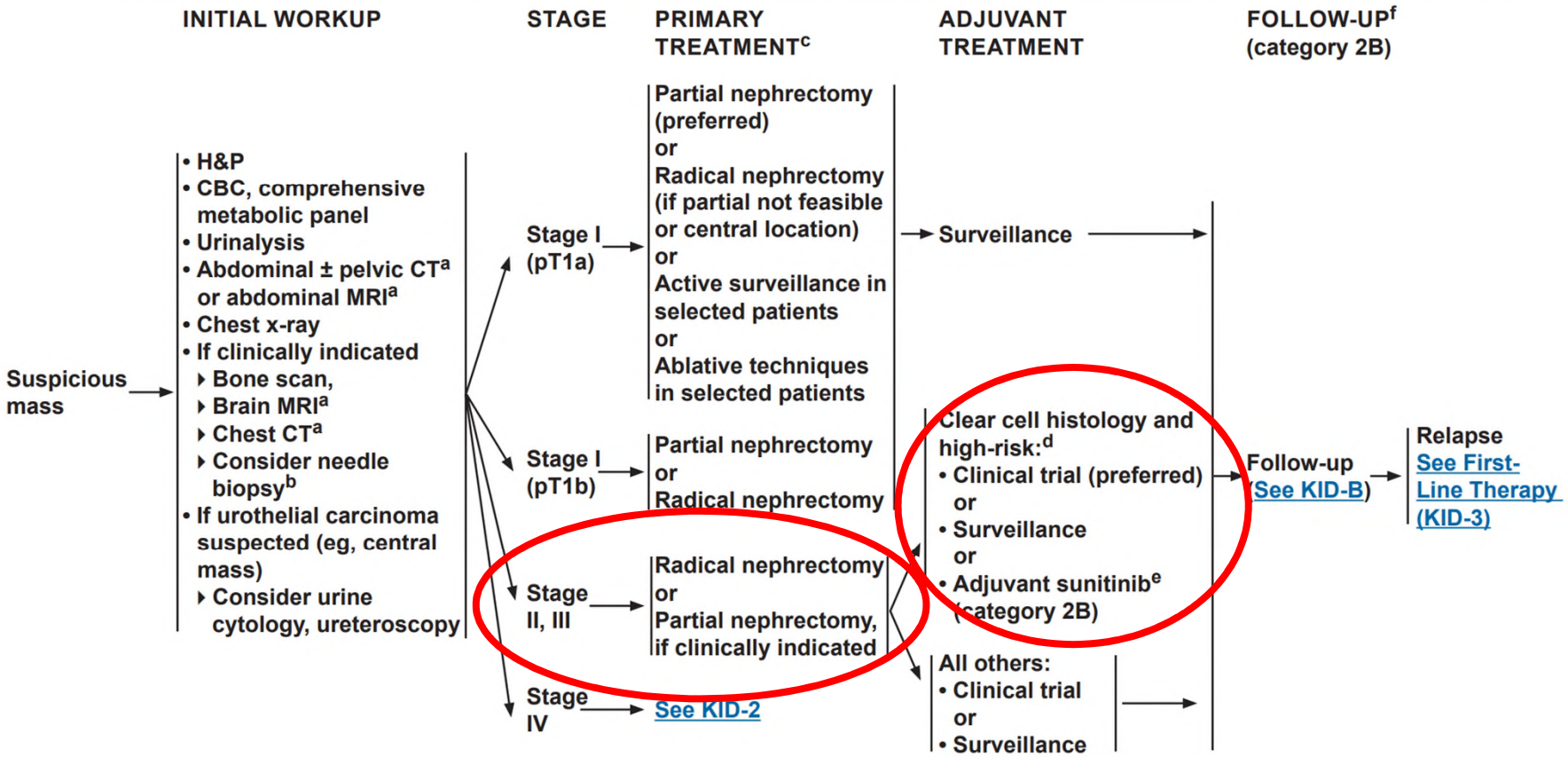
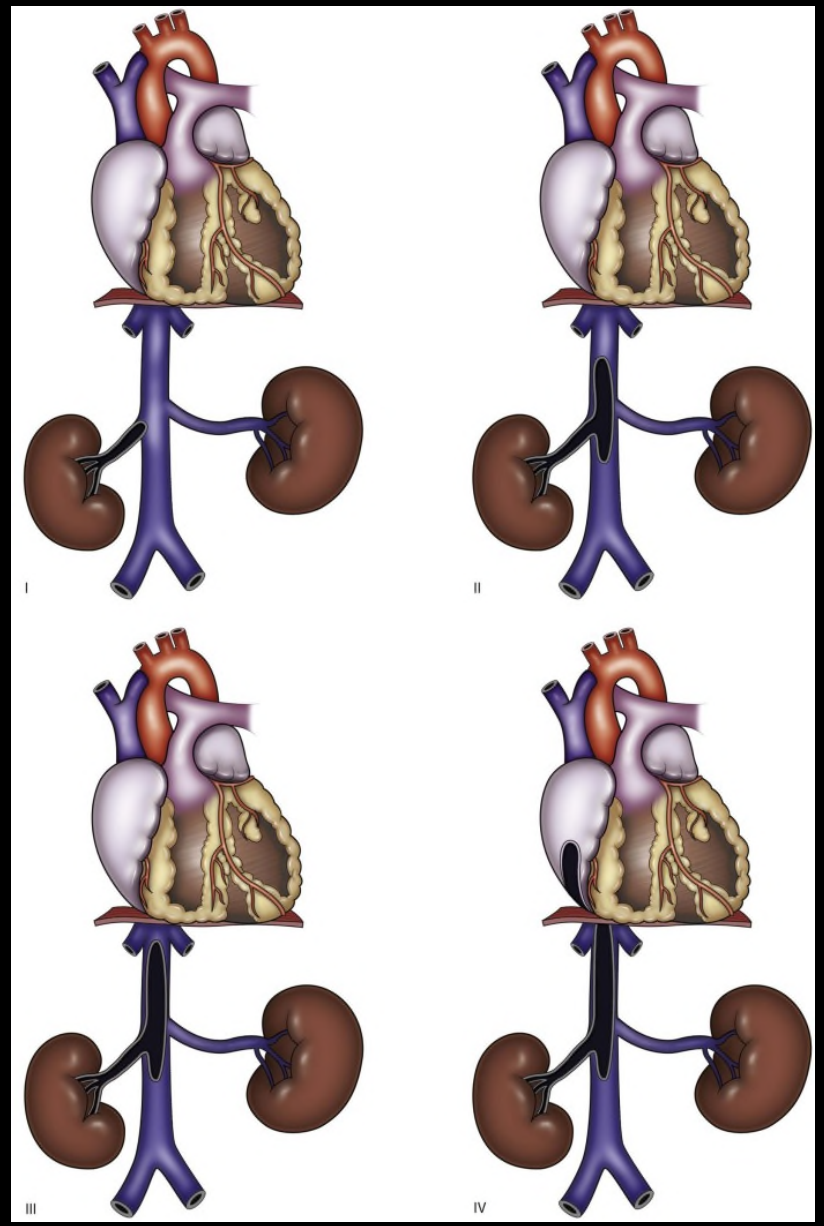


[a]Imaging with contrast when clinically indicated.
[b]Biopsy of small lesions may be considered to obtain or confirm a diagnosis of malignancy and guide surveillance, cryosurgery, and radiofrequency ablation strategies.
[c]See Principles of Surgery (KID-A).
[d]High-risk defined as: tumor stage 3 or higher, regional lymph-node metastasis, or both.
[e]Dosing of adjuvant sunitinib: 50 mg per day - 4 weeks on, 2 weeks off for 1 year.



THROMBUS LEVEL	INCIDENCE RATE IN RCC	PROPORTION OF THROMBI	CRANIAL EXTENT OF THROMBUS	MANAGEMENT OF TUMOR THROMBUS
0	12%	65%	Confined to renal vein	Radical nephrectomy
I	2%	10%	Within 2 cm of renal vein ostium	IVC milking, partial IVC occlusion, ostial cavotomy
II	3%	15%	Below hepatic veins	Complete IVC mobilization/control, infrahepatic cavotomy
III	1%	5%	Between hepatic veins and diaphragm	Complete occlusion: suprahepatic IVC clamping, infrahepatic cavotomy
				Partial occlusion: veno-venous bypass, infrahepatic cavotomy
IV	1%	5%	Above diaphragm	Deep hypothermic arrest, infrahepatic cavotomy, right atriotomy

Treatment

- Vary incredibly
- Stage III- begin with radical nephrectomy and possibly LN dissection
- Can add sunitinib for one year following nephrectomy
- For relapsed disease
  - Clinical trials are preferred
  - For high risk patients (like this one)
    - High dose IL-2
    - Immune checkpoint inhibitors- **ipilimumab + nivolumab**
- EBRT for bone mets- pain control

ACR Appropriateness Criteria

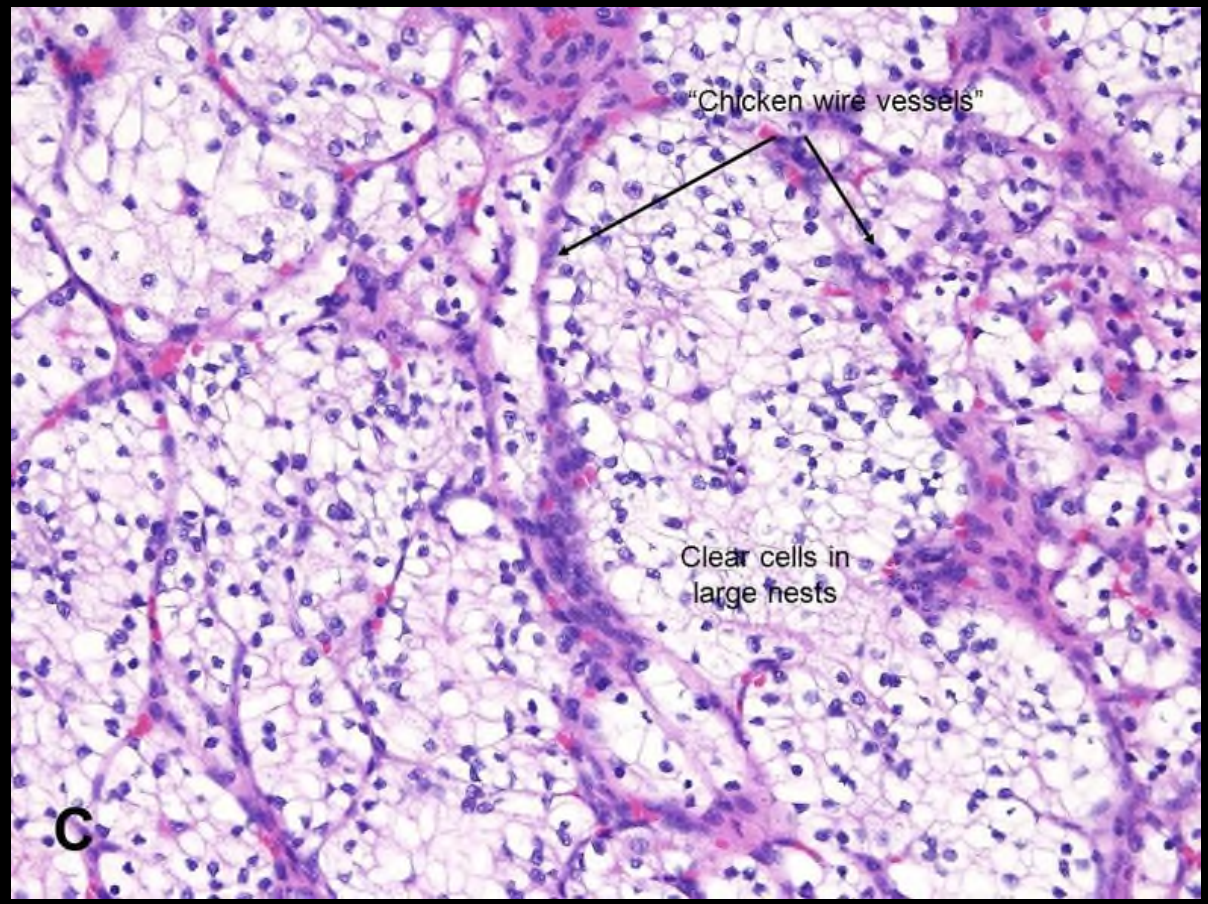
Radiologic Procedure	Rating	Comments	RRL*
CT abdomen without and with IV contrast	9	This procedure is complementary to x-ray chest.	☢☢☢☢
X-ray chest	8	This procedure is complementary to CT.	☢
MRI abdomen without and with IV contrast	8	This procedure is an alternative to CT.	O

- Billing (based on NCCN follow-up protocol)
  - CT A/P before and after contrast: $6454 x 9= $58086
  - CXR 2 view: $460x9 - $4140
  - MRI pelvis- $4109x2- $8218
- **Total cost for imaging (in uninsured): $70,444**

https://www.mdanderson.org/patients-family/becoming-our-patient/planning-for-care/insurance-billing-financial-support/health-care-disclosures.html

Take Home Points

- Renal Cell Carcinoma most commonly metastasizes to lung but can also go to brain, adrenal and bone
- Treatment varies and often guided by clinical trials
- Invasion of renal vein makes surgical and medical management more complex



References

- Wieder's Urology Guide- Renal Tumors
- Campbell Walsh Urology- Open Surgeries for Kidney
- NCCN Kidney Cancer Guidelines
- Radiopedia
- UpToDate –Renal Cell Carcinoma


Questions?