# General Data

- Gender: Male
- Age: 83 y/o

# General History

- C.O: RUQ dull pain for 10+ days.
- Present HX:
  - A case of R't renal stone without any intervention for 50+ years.
  - General malaise, poor appetite and weight loss were noted for 3 months.
  - RUQ dull pain esp when flexion for 10+ days.
  - Abdominal sono showed a huge renal mass of R't kidney.

# General History-II

- Abdominal CT (2003/07/09)showed:
  - Bilateral renal stones.
  - R't hydronephrosis.
  - R't renal mass (heterogeneous with active necrotic inflammatory process)
- Admitted on 2003/07/11.

# Lab Data

| 取樣日期 | 920708 | 920711 | 920715 | 920722 |
|---|---|---|---|---|
| 取樣時間 | 0946 | 1736 | 0406 | 0843 |
| **WBC [5.2-12.4 x10.e3/uL]** | 14.35 | 11.00 | 20.34 | 4.88 |
| **RBC [4.2-6.1 x10.e6/uL]** | 3.80 | 3.33 | 3.59 | 3.41 |
| **HGB [12-18 g/dL]** | 11.2 | 9.7 | 10.7 | 9.9 |
| **HCT [37-52 %]** | 31.7 | 27.0 | 32.8 | 28.6 |
| **MCV [80-99 fL]** | 83.5 | 81.0 | 91.4 | 84.0 |
| **PLT [130-400 x10.e3/uL]** | 520 | 382 | 297 | 400 |
| **%NEUT [40-74 %]** | | 86.8 | 95.5 | 73.7 |
| **%LYM [19-48 %]** | | 5.7 | 1.6 | 15.2 |
| **%MONO [3.4-9.0 %]** | | 4.6 | 2.6 | 3.5 |

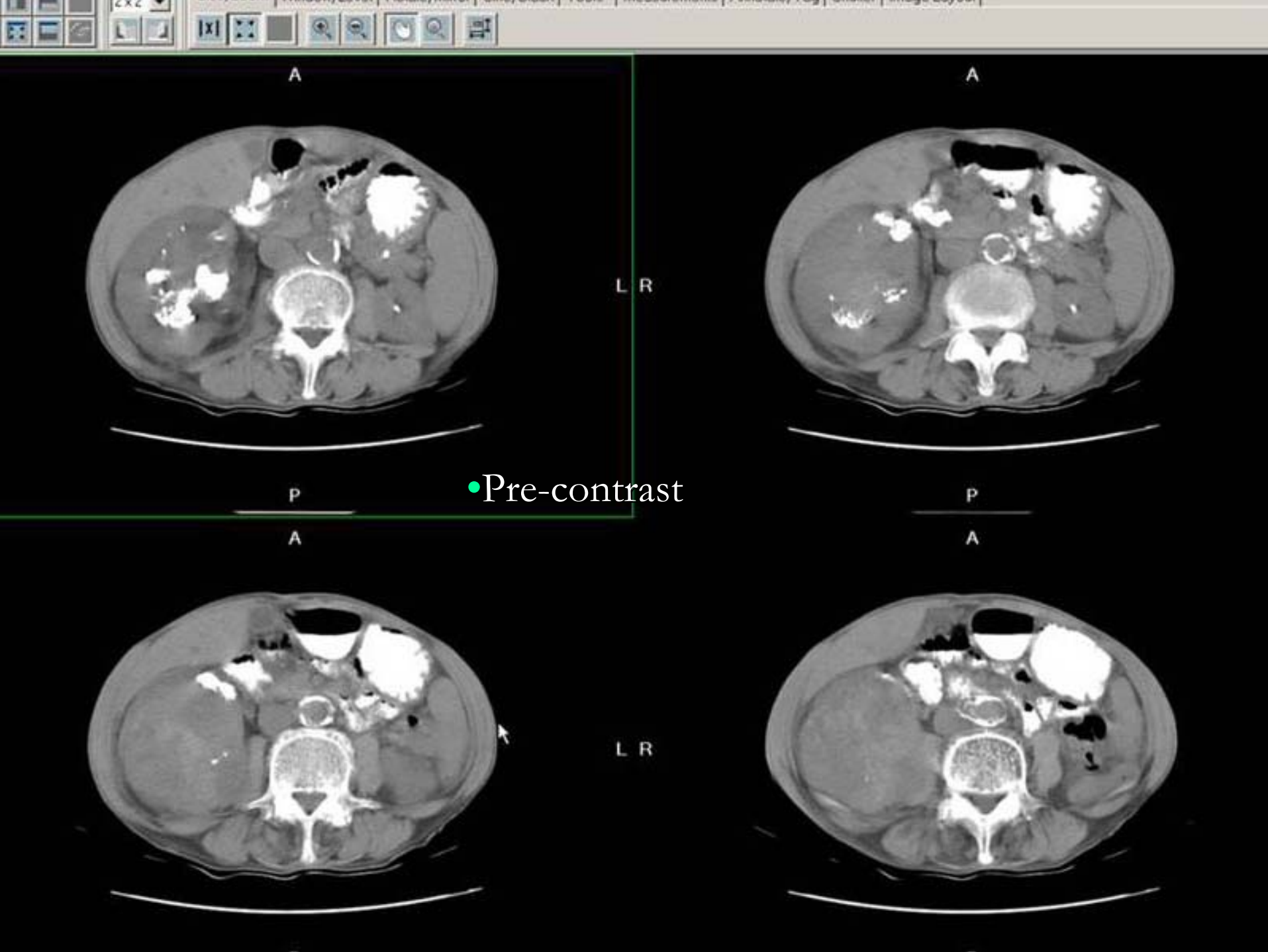
# Lab Data-II

| 取様日期 | 920708 | 920711 | 920715 | 920722 |
|---|---|---|---|---|
| 取様時間 | 1736 | 1736 | 0407 | 0850 |
| **Glucose(血)2[80-140 mg/dl]** | 108 | 127 | | |
| **BUN(血) [7-18 mg/dl]** | 13 | 14 | 19 | 18 |
| **Creatinine(血)[0.5-1.3 mg/dl]** | 1.3 | 1.1 | 1.6 | 1.9 |
| **Albumin(血)[3.5-5.3 g/dl]** | | 2.9 | | 2.5 |
| **Na(血)[135-158 meq/L]** | | 136.0 | 135.0 | 139.0 |
| **K(血)[3.5-5.3 meq/L]** | | 2.90 | 4.00 | 3.60 |
| **Ca (血)[8.4-10.2 mg/dl]** | | 8.8 | 8.1 | 8.5 |
| **Cl(血)[98-108 meq/L]** | | 103.0 | 108.0 | 112.0 |

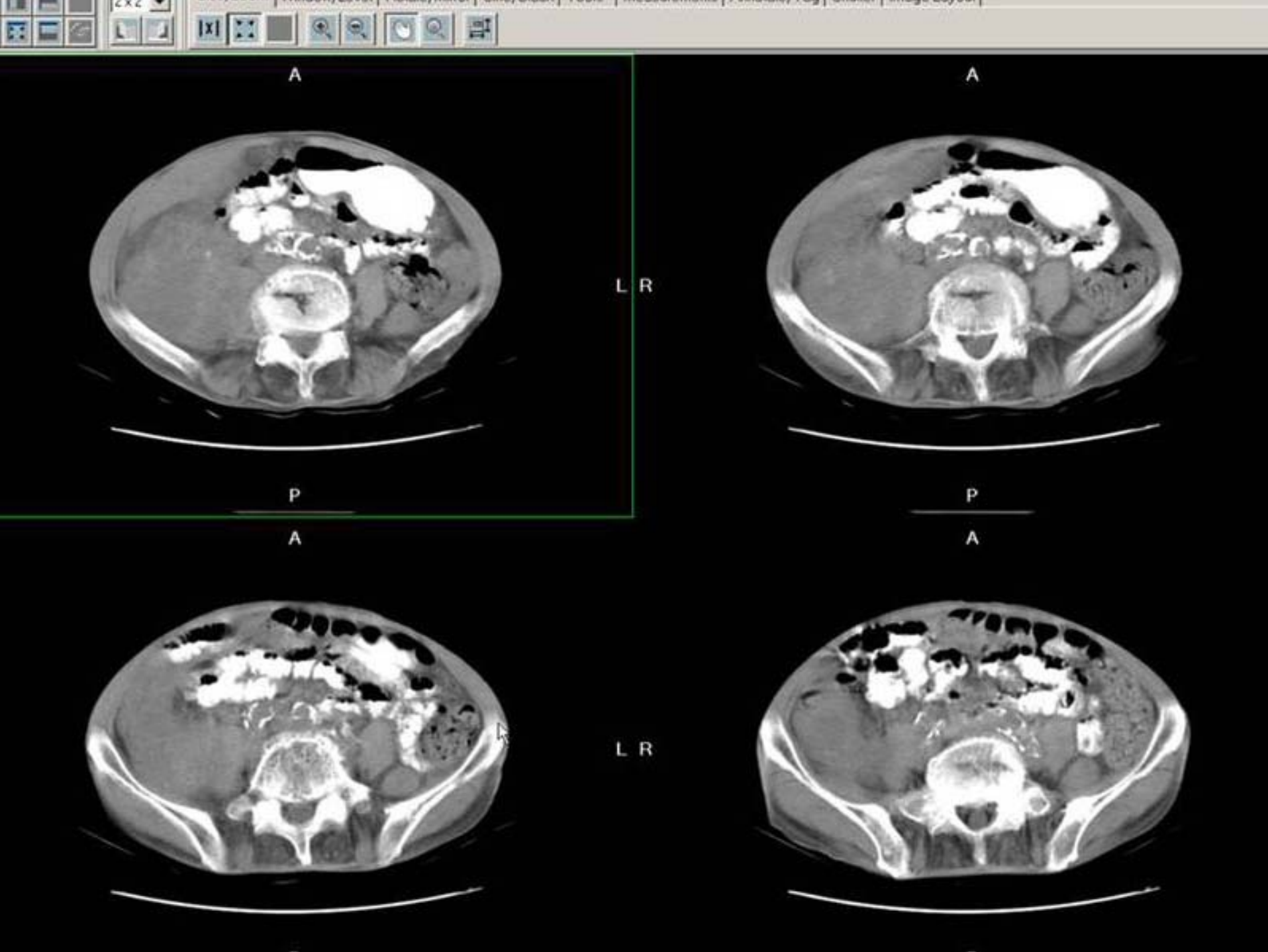
# Imaging Findings

# 20030709: Upper Abdomen CT

- remarkable heterogenous enhanced mass lesion of lower pole of Rt kidney,,measuring about 8.47x9.8cm in largest dimension.
  - renal fascia is poor demarcated.
  - Reactive infilatration of Rt side psoas muscle and Rt side gluteal muscle could not be rule out.
  - severe hydronephrotic change with calyceal stones.




- Pre-contrast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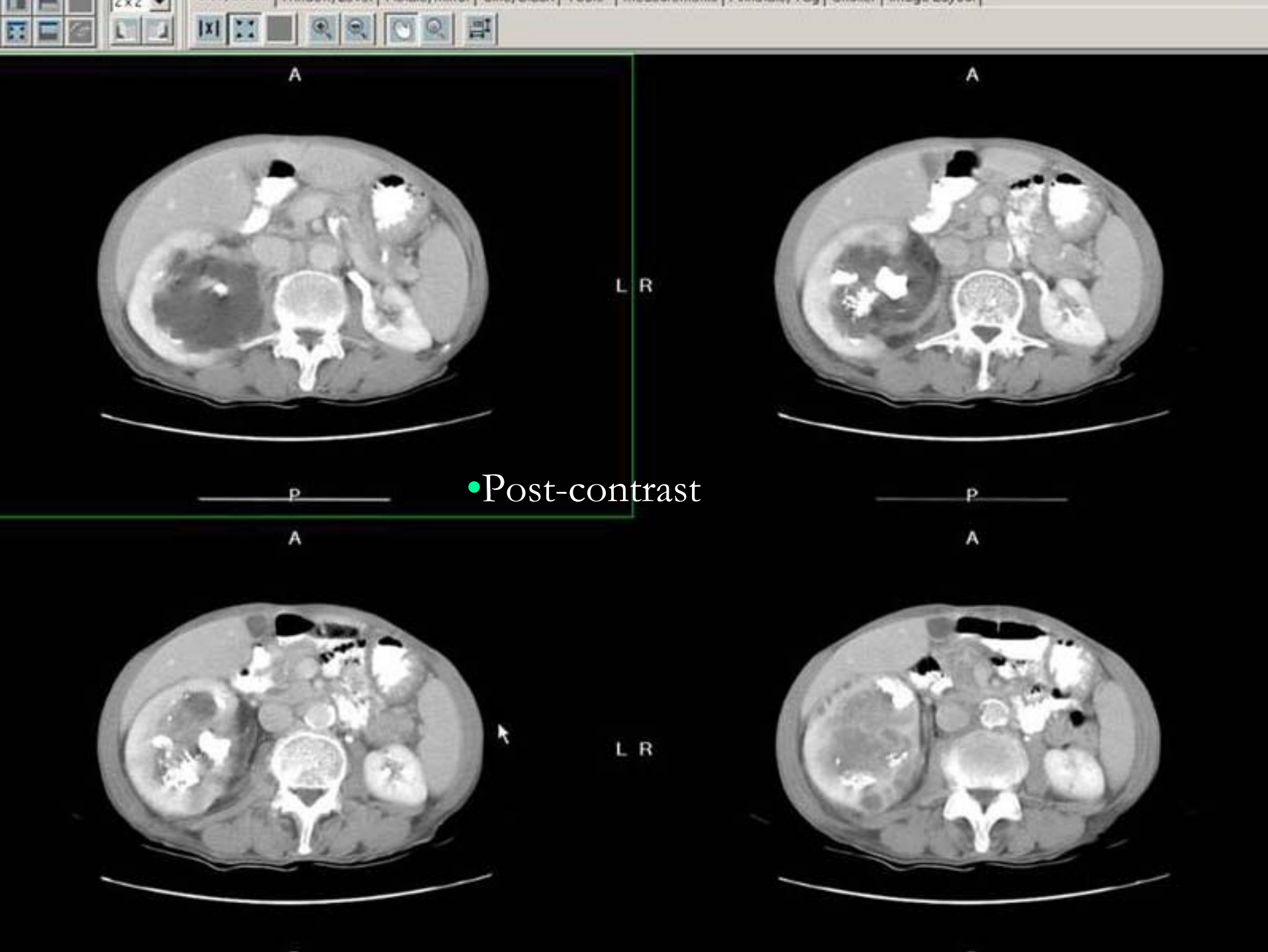
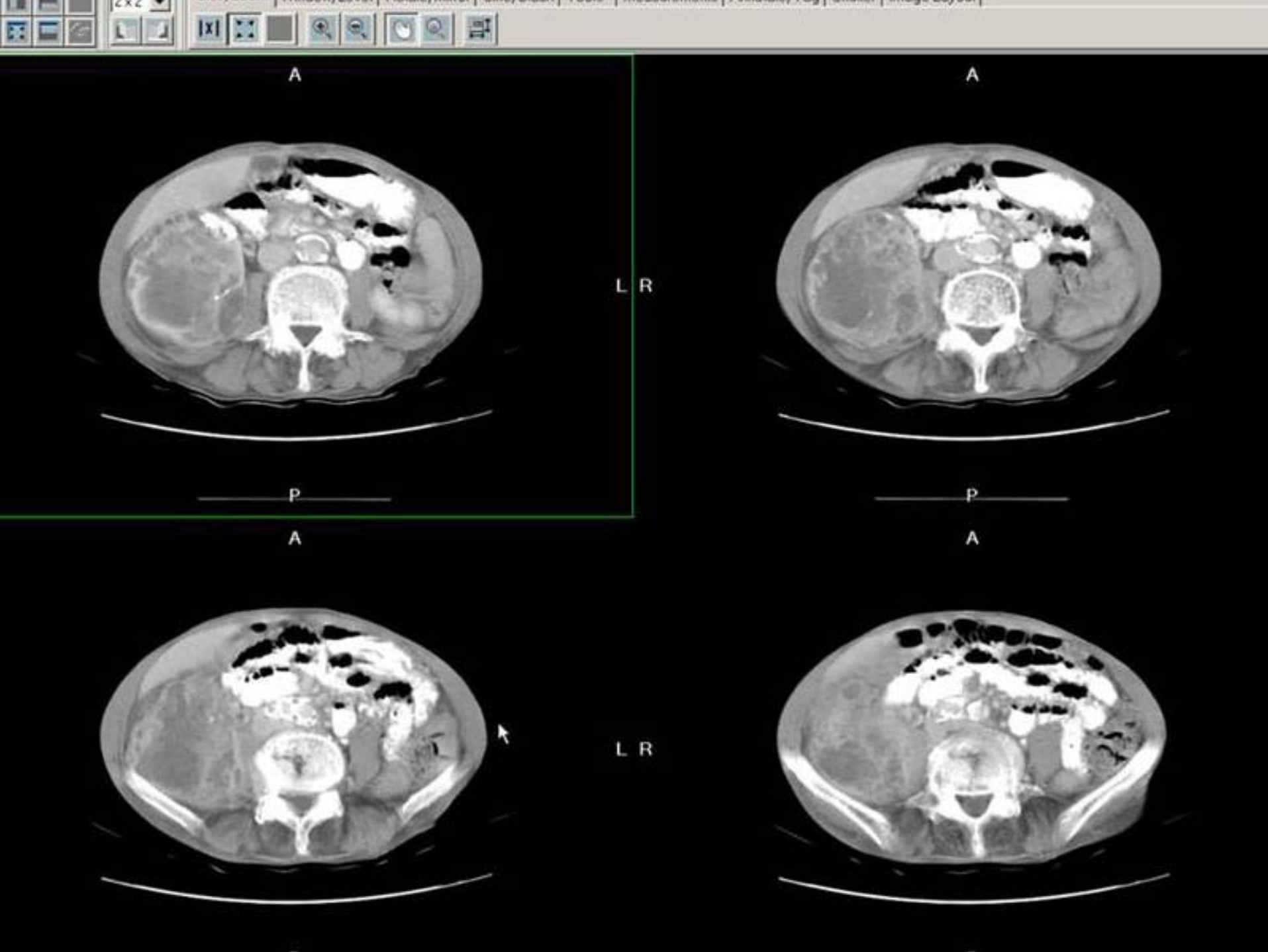



- Post-contrast


A
L R
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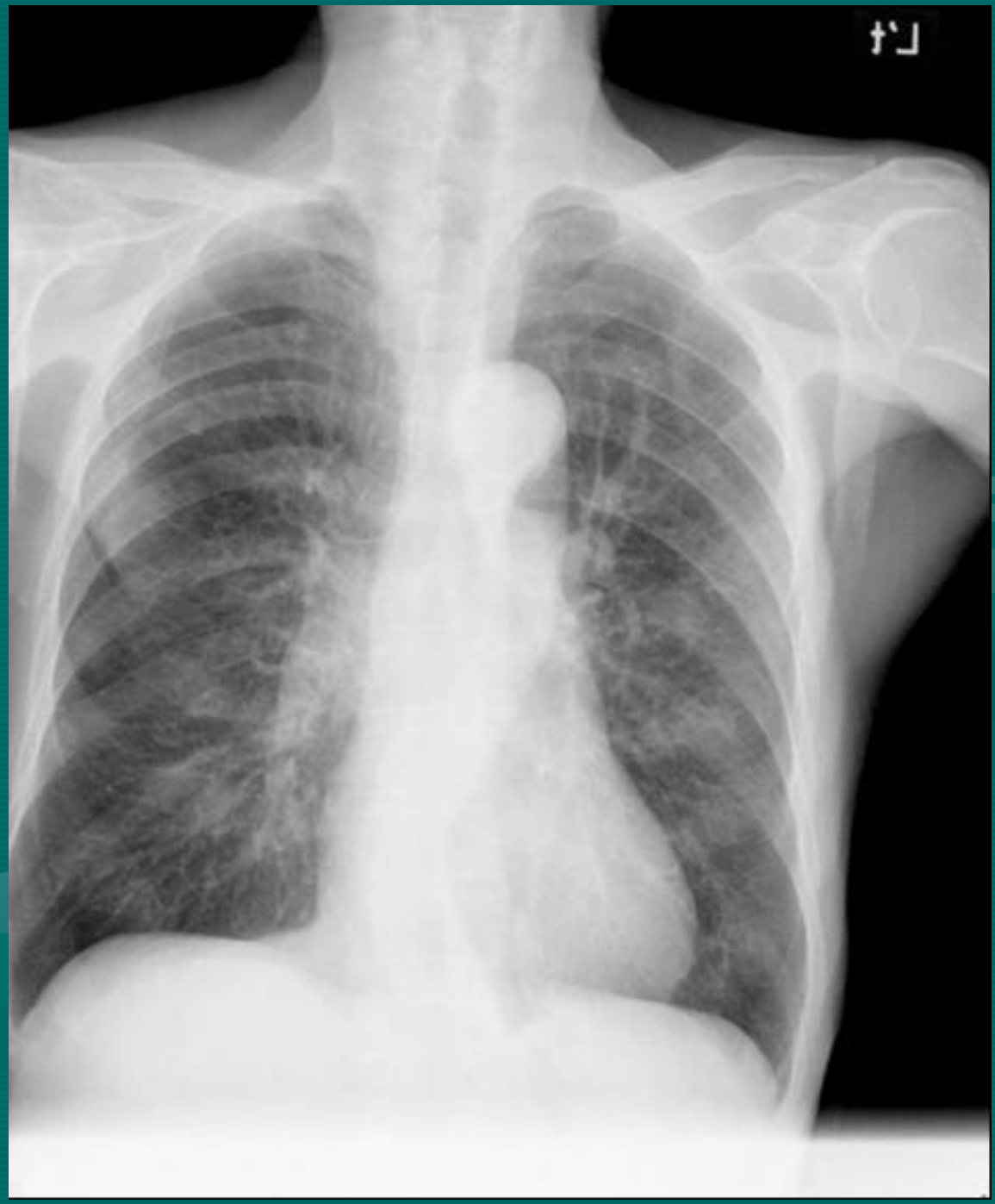
P
A
L R
A

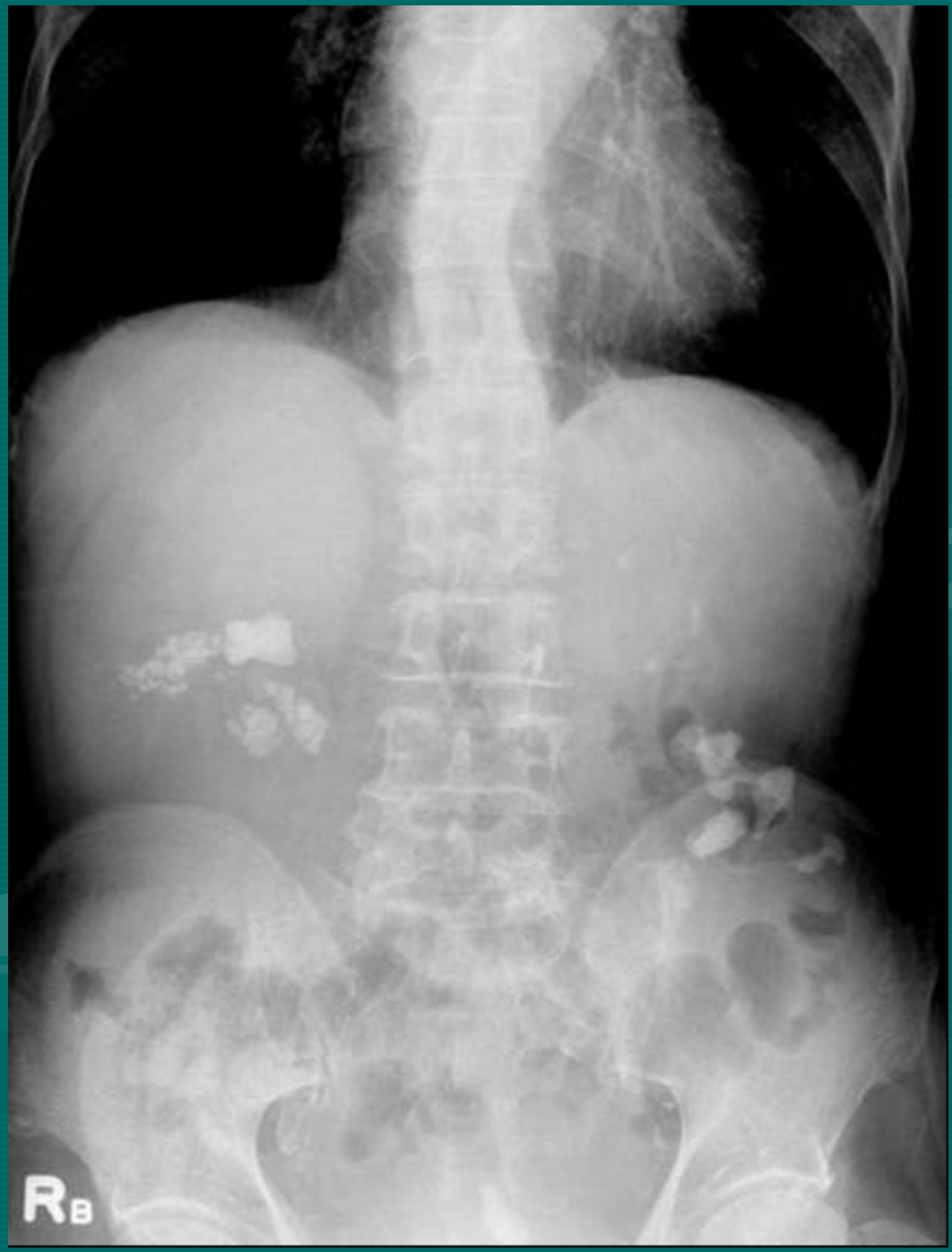
# 20030710: CXR

- No cardiomegaly.
- Some fibrotic, radiopaque lesions at rt upper lung fields, with pleura and pul. hilum R/O old TB.
- Increased peribronchial infiltrates at rt lower lung fields.
- Tortuous aorta.



# 20030710: KUB

- Several radiopaque nodules at RUQ of abdomen R/O multiple gall-bladder stones. are considered.
- Several radiopaque densities at bil. renal shadows. R/O multiple bil. renal stones.
- The bil. renal shadows are not well demonstrated in this film.


RB

# Differential Diagnosis

- RCC
- Transitional Cell Carcinoma (TCC)
- Oncocytoma (benign neoplasm)
- Pyelonephritis

# Transitional Cell Carcinoma (TCC)

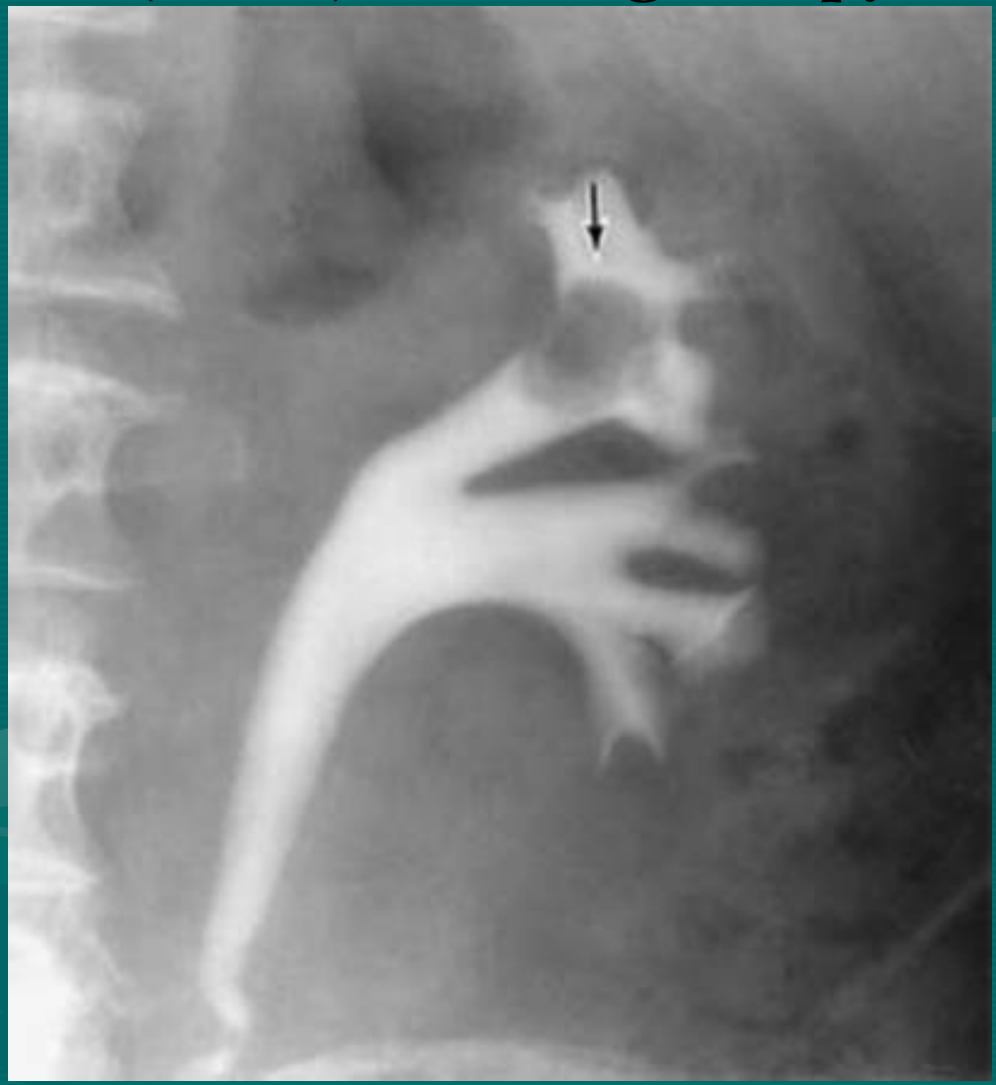
- 50 times more common than renal pelvic tumors.
- 90% of all bladder cancers.
- appear as papillary, exophytic lesions.
- WHO: 3 grades
- Progression rate:
  - grade 1:10-20%
  - grade 2:19-37%
  - grade 3:33-67%
- 10-year survival rate:
  - Low grade: 98%
  - High grade: 35%

# Staging of ureteral and renal pelvic carcinoma

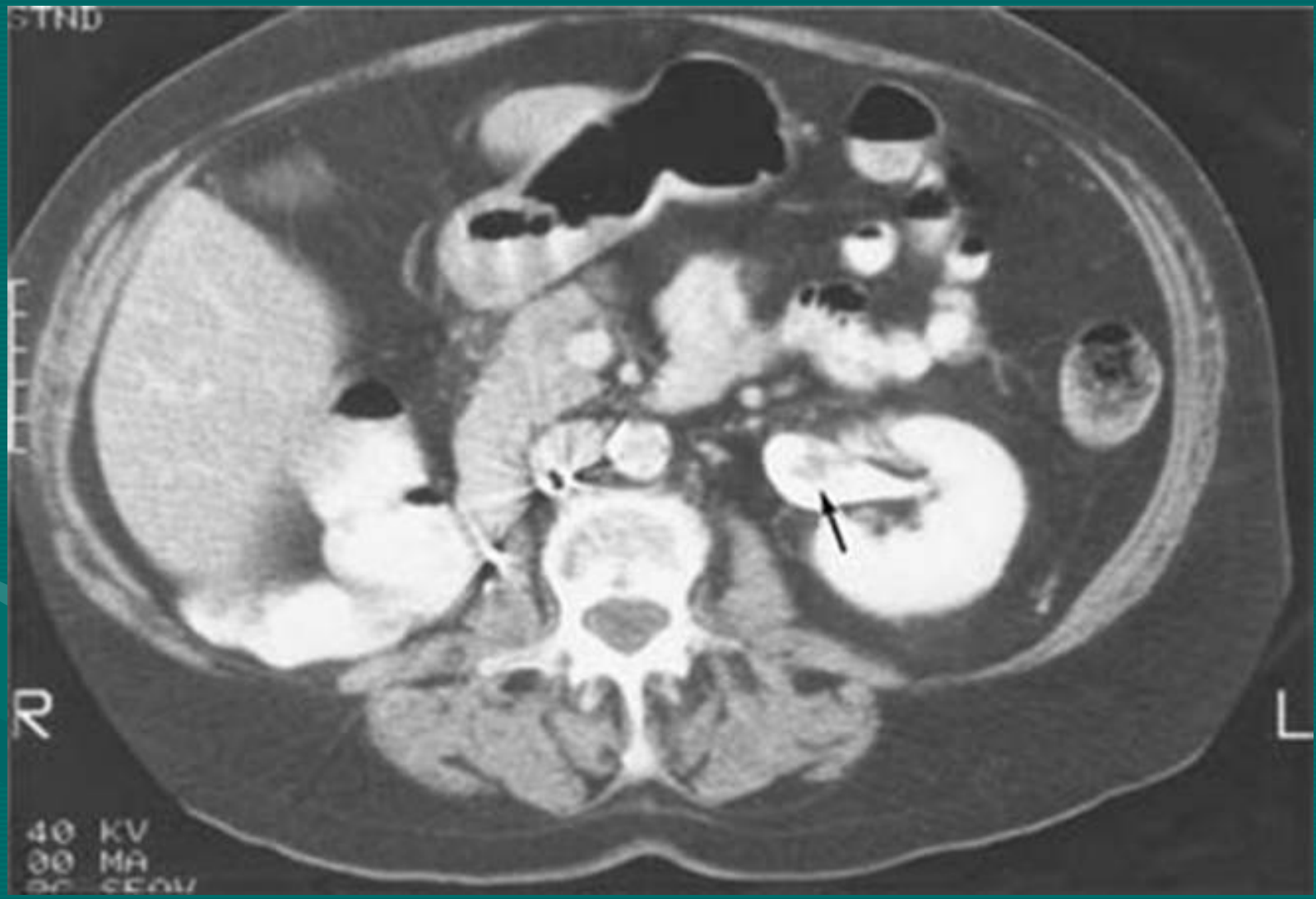
| | System | |
|---|---|---|
| | Batata[1] | TNM[2] |
| Confined to mucosa | O | Ta, Tis |
| Invasion of lamina propria | A | T1 |
| Invasion of muscularis | B | T2 |
| Extension through muscularis into fat or renal parenchyma | C | T3 |
| Spread to adjacent organs | D | T4 |
| Lymph node metastases | D | N+ |
| Metastases | D | M+ |

[1] Drawn from Batata et al, 1975.
[2] Drawn from American Joint Committee on Cancer, 1988.

# Filling defect representing a transitional cell carcinoma (arrow) on retrograde pyelography



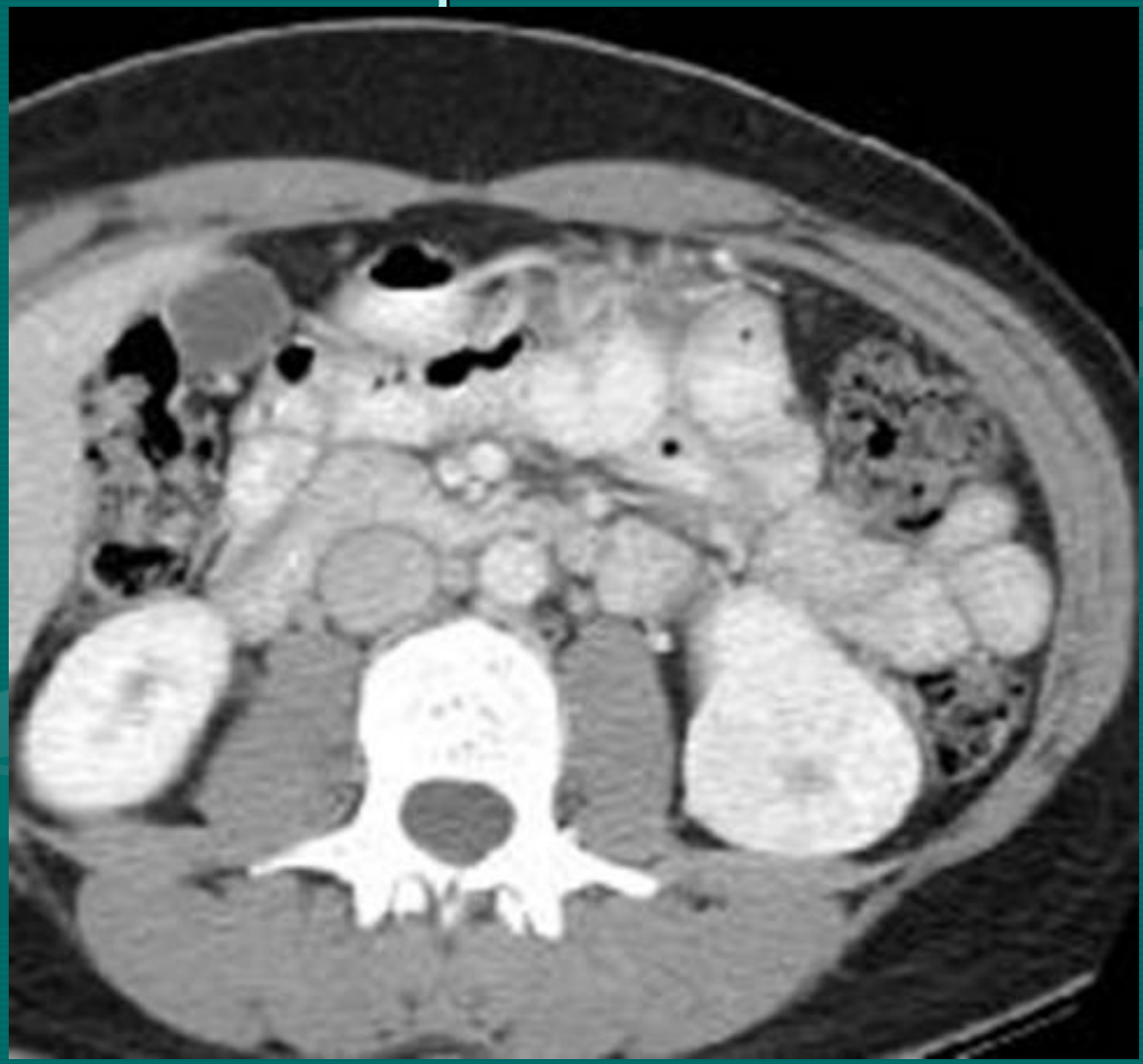
# Computed tomography scan showing the presence of a renal pelvic tumor (arrow )



# Oncocytoma

- most common benign solid renal tumor.
- originate from the intercalated cells of the collecting duct .
- on gross : tumors appear spherical, large (about 7 cm), with a pseudocapsule.
- on cut sections: homogeneous with a mahogany color in contrast to yellow RCCs.
- on CT scans or MRIs: presence of a central scar.
- on angiograms: spoke-wheel pattern of vessels. (not entirely specific)

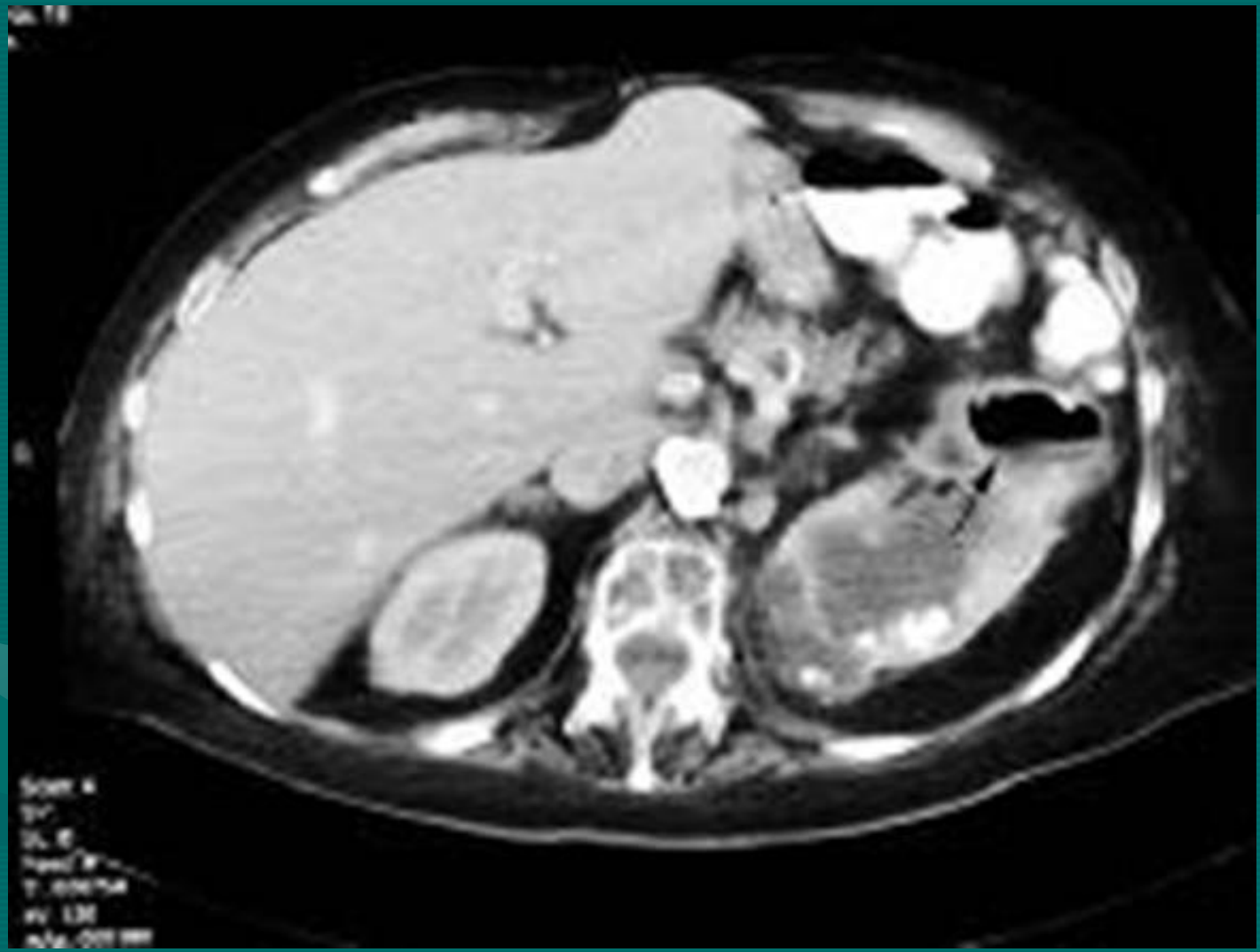
# Oncocytoma, kidney. Contrast-enhanced CT scan of the abdomen obtained during the nephrographic phase



# Pyelonephritis

- results from bacterial invasion of the renal parenchyma.
- most often: ascending infection from the lower urinary tract.
- Urinalysis
- Contrast-enhanced helical/spiral CT scan (CECT) is the diagnostic imaging study of choice in adults.

# Emphysematous pyelonephritis. CT scan image showing gas in the left kidney



# Operation

- 2003/07/14: R't hand-assisted-laparoscopic (HAL) nephrectomy.
  - A huge R't kidney with severe adhesion to liver, colon, duodenum was dissected.
  - A tumor mass with necrosis was noted at low pole of R't kidney after removal of the kidney.

# Pathologic Report

- 2003/07/21:
  - Renal squamous cell carcinoma, keratinizing
  - tumor was invasion to the renal parenchyma
  - closed to the outer surgical margin (less than 0.3 cm.)

*Adjuvant R/T was suggested after the op, but was refused.

*local recurrence of RCC was noted on 2004/01/26.

# Discussion

# Renal Cell Carcinoma (RCC)

- the most common primary renal malignant neoplasm in the adult.
- 85% of renal tumors and 2% of all adult malignancies.
- men : women = 2:1
- Peak age: 50-70 years.
- Approximately 30,800 new cases were expected in the United States in 2001, with approximately 12,100 deaths.
- One fourth to one third of patients have metastatic disease at the time of presentation.
- Risk factors : age, male sex, smoking, cadmium and asbestos exposure, excessive weight, chronic dialysis use, and several genetic syndromes (familial RCC, von Hippel-Lindau syndrome, and tuberous sclerosis).

# Pathophysiology

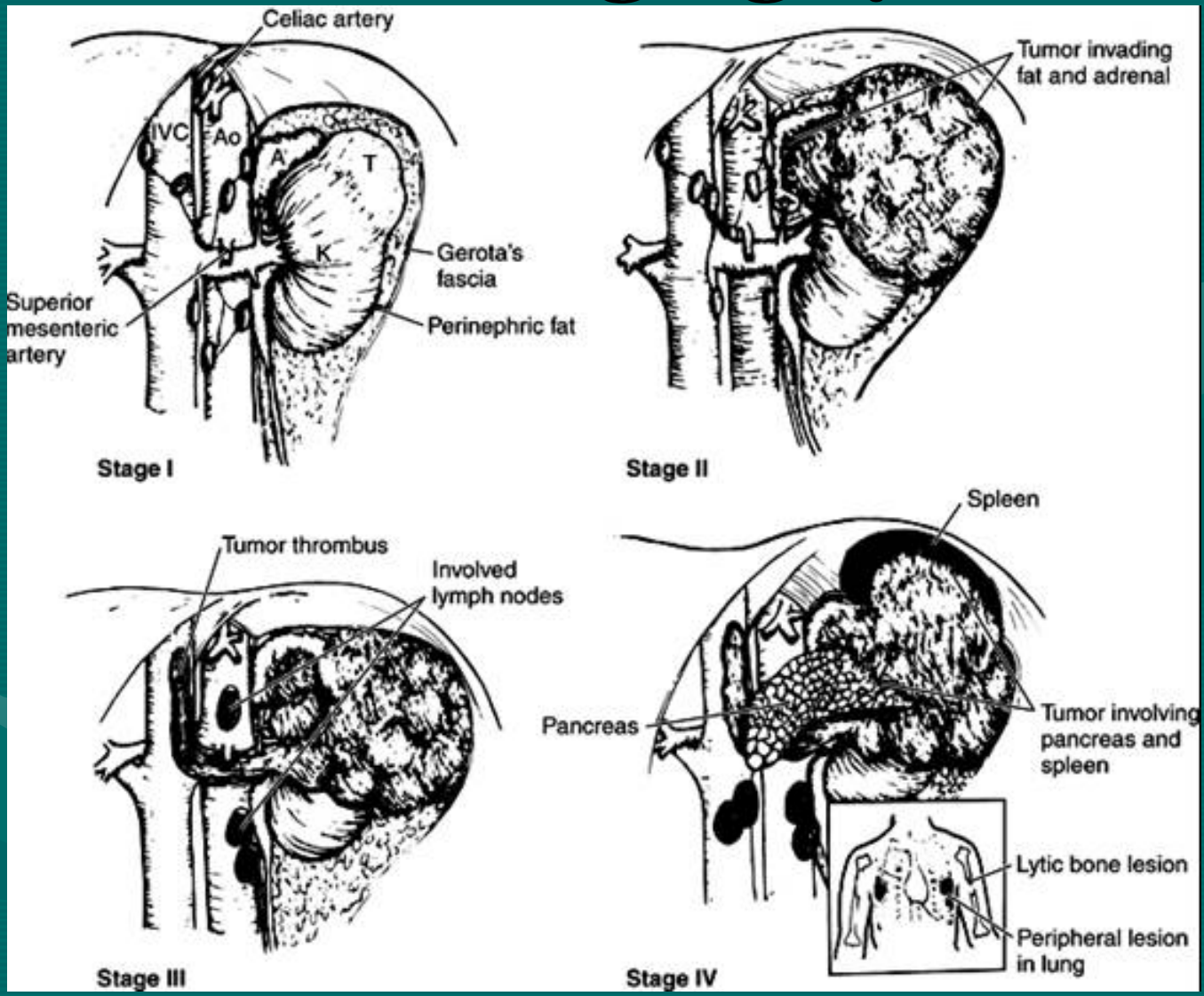
- arise from the tubular epithelium (usually based in the renal cortex).
- Pathologic subtypes:
  - clear cell, papillary, granular cell, chromophobe cell, sarcomatoid, and collecting duct subtypes.
  - These tumors vary from being nearly completely cystic to being completely solid.
- Bilateral RCCs are common in von Hippel-Lindau syndrome, tuberous sclerosis, and chronic dialysis; (occur in only approximately 2% of sporadic cases of RCC)

# Staging

- Robson classification:

1. Stage 1 RCCs are confined to the kidney.
2. Stage 2 RCCs extend to the adrenal gland or perinephric tissues but not beyond the Gerota fascia.
3. Stage 3a tumors extend into the renal vein or vena cava.
4. Stage 3b tumors involve the regional nodes.
5. Stage 3c tumors involve both regional nodes and the renal vein or vena cava.
6. Stage 4a tumors extend beyond the Gerota fascia.
7. Stage 4b tumors have distant metastases.

# Robson staging system



# Mortality/Morbidity

- The prognosis of patients with RCC depends on its stage at diagnosis.
  - The prognosis is worst for patients with metastatic disease at presentation
  - best for patients with small masses confined to the kidney.
  - larger lesions tend to be higher grade and also metastasize more frequently.
  - Poorly marginated or necrotic lesions also tend to be of higher grade.
- Unresectable RCCs have a 5-year survival rate of less than 2%.

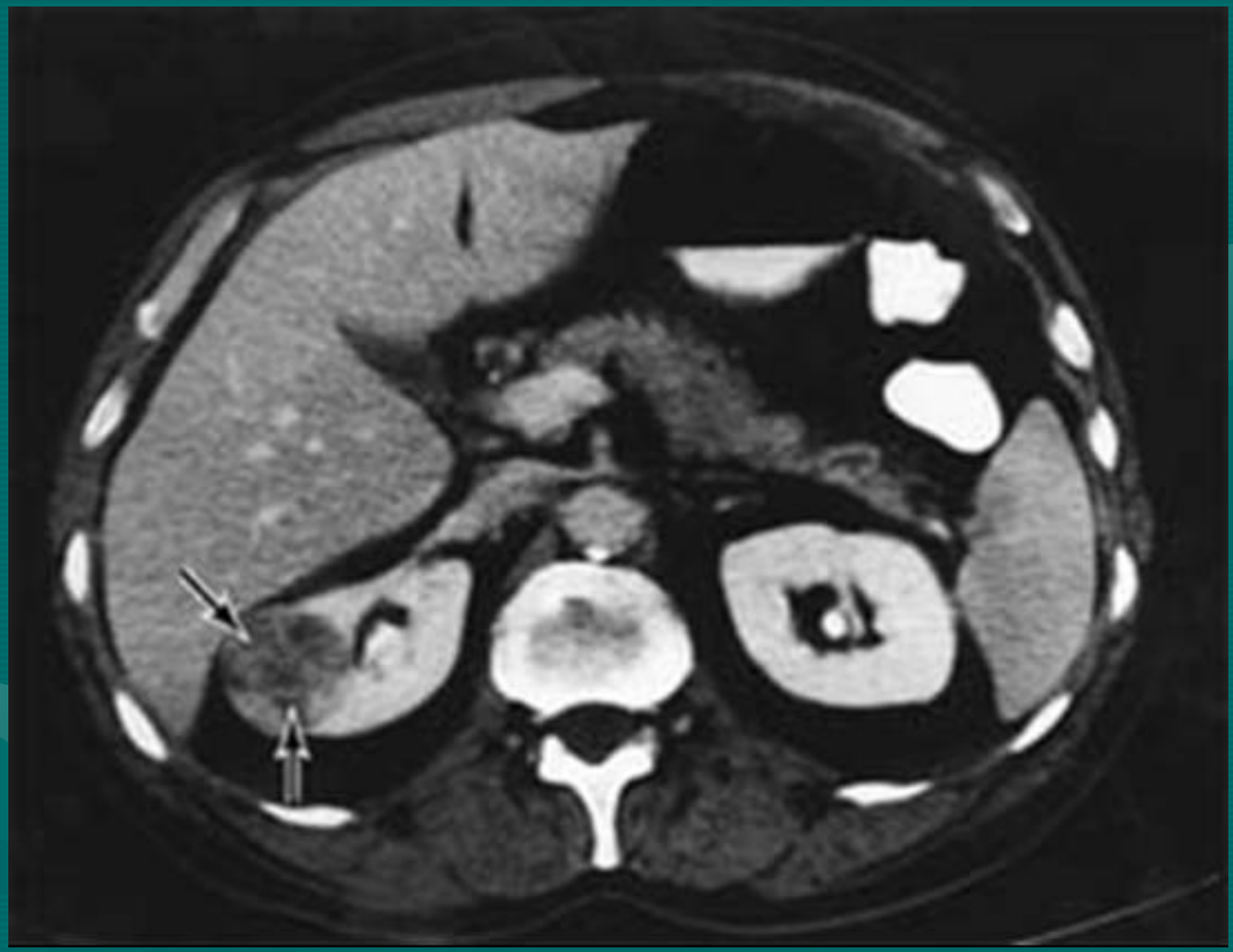
# Preferred Imaging Examination

- The preferred method of imaging is dedicated renal CT.
- In most cases, this single examination can be used to detect and stage RCC and to provide information for surgical planning without additional imaging.
- In the few patients in whom the CT findings are equivocal, US or MRI can be useful.

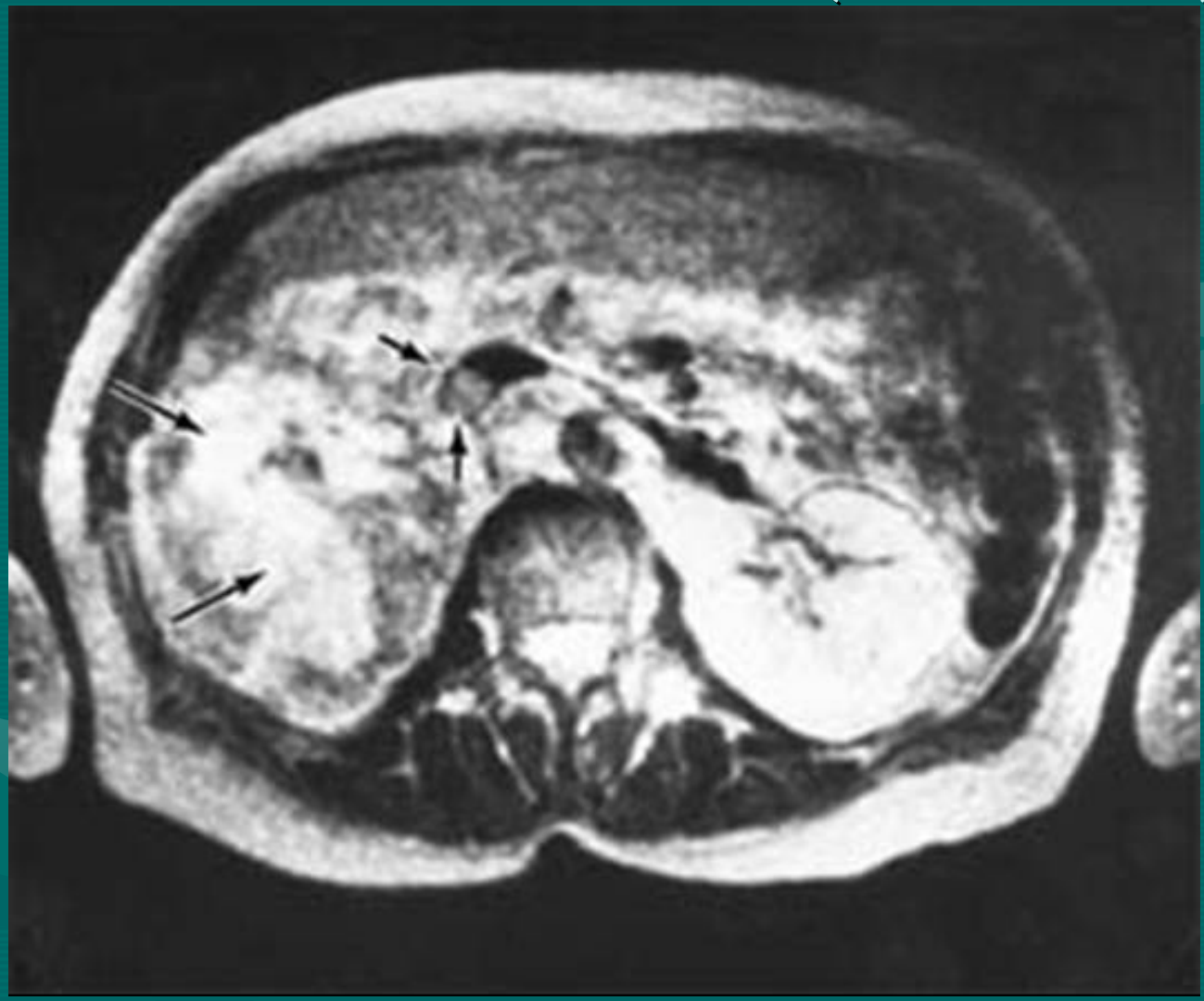
(If contrast material cannot be intravenously administered, CT is a poor choice and MRI should be performed instead. )

- Angiography is rarely used in the workup of suggested RCC, but it can provide information about the origin of the tumor in troublesome cases.

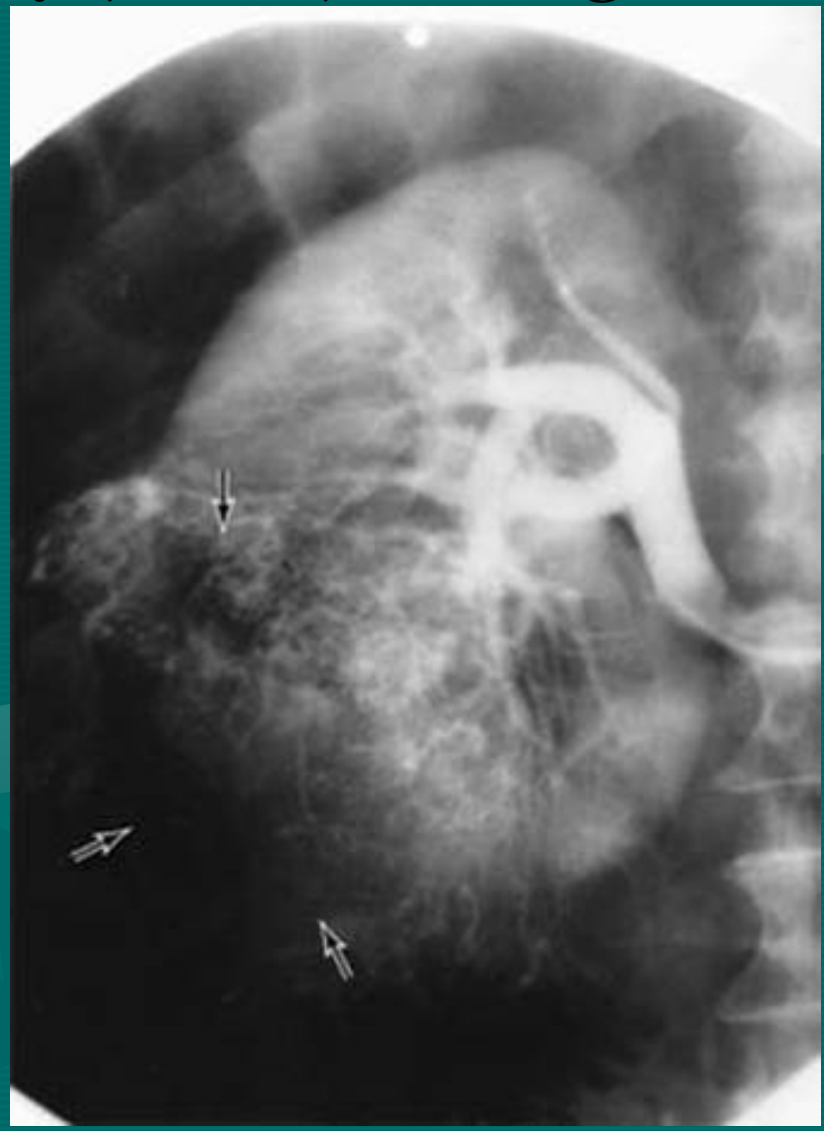
# CT (contrast enhancement) of a RCC



# Transaxial MRI (T2) of a RCC (long arrows) with vena caval tumor thrombus (short arrows)



# Right renal angiogram showing typical neovascularity (arrows) in a large lower pole RCC



# Treatment

- **Medical Care:**
  - More than 50% of RCC are cured in early stages, but outcome for stage IV disease is poor.
  - Selected patients with metastatic disease respond to immunotherapy, but many patients can be offered only palliative therapy for advanced disease.

(The treatment options for renal cell cancer are surgery, radiation therapy, chemotherapy, hormonal therapy, immunotherapy, or combinations of these)

# Treatment-II

- **Surgical Care:**
  - Surgical resection remains the only known effective treatment for localized renal cell carcinoma, and it also is used for palliation in metastatic disease.
  - Radical nephrectomy, involves complete removal of the Gerota fascia and its contents, including a resection of kidney, perirenal fat, and ipsilateral adrenal gland, with or without ipsilateral lymph node dissection.

# FOLLOW-UP

- For stage I and II RCC:
  - complete history, physical examination, chest x-ray, liver function tests, BUN and creatinine, and calcium are recommended every 6 months for 2 years, then annually for 5 years.
  - Abdominal CT scan is recommended once at 4-6 months and then as indicated.
- For stage III RCC:
  - physical examination, chest x-ray, liver function tests, BUN and creatinine, and calcium are recommended every 4 months for 2 years, every 6 months for 3 years, and then annually for 5 years.
  - Abdominal CT scan should be performed at 4-6 months, then annually or as indicated.

# References


1. Emedicine.com
2. Smith's General Urology, 14th edition.
3. Radiology Illustrated Uroradiology, 1st edition.