ID data

- Sex: male
- Age: 50 y/o

Chief complaint

- Epigastric pain noted for one month

Present illness

- 50 y/o, male
- Epigastric pain for one month, esp. postprandial
- No refer pain, no acid regurgitation, no nausea, no body weight loss
- 和平hospital: CT & abd echo→one mass at apical area of right kidney

Present illness

- NTUH:

  --MRI→ one suprarenal mass(8cm in size)

  --bone scan→ no abnormal finding

- Visit to Dr.江 for further evaluation
- Admission for angiography

Past history

- HTN: sometimes up to 150 mmHg for years
- HBV carrier
- DM: (-)

Personal history

- Smoking: (-)
- Drinking: (-)
- Betel nut chewing: (-)
- Allergy: (-)
- Family history

  --mother: HTN

Physical examination

- Consciousness: clear
- HEENT: grossly normal
- Chest: clear breathing sound
- Abdomen: soft, no palpable mass, no tenderness, no Murphy sign
- Extremities: freely movable, no pitting edema

Lab data

- CBC/DC: WNL
- SMA: WNL
- Cortisol: am: 22.0(5-25ug/dl) pm:14.4 (2.5-12.5ug/dl)
- Aldosterone: 168 pg/ml
- Plasma renin: 3 ng/ml

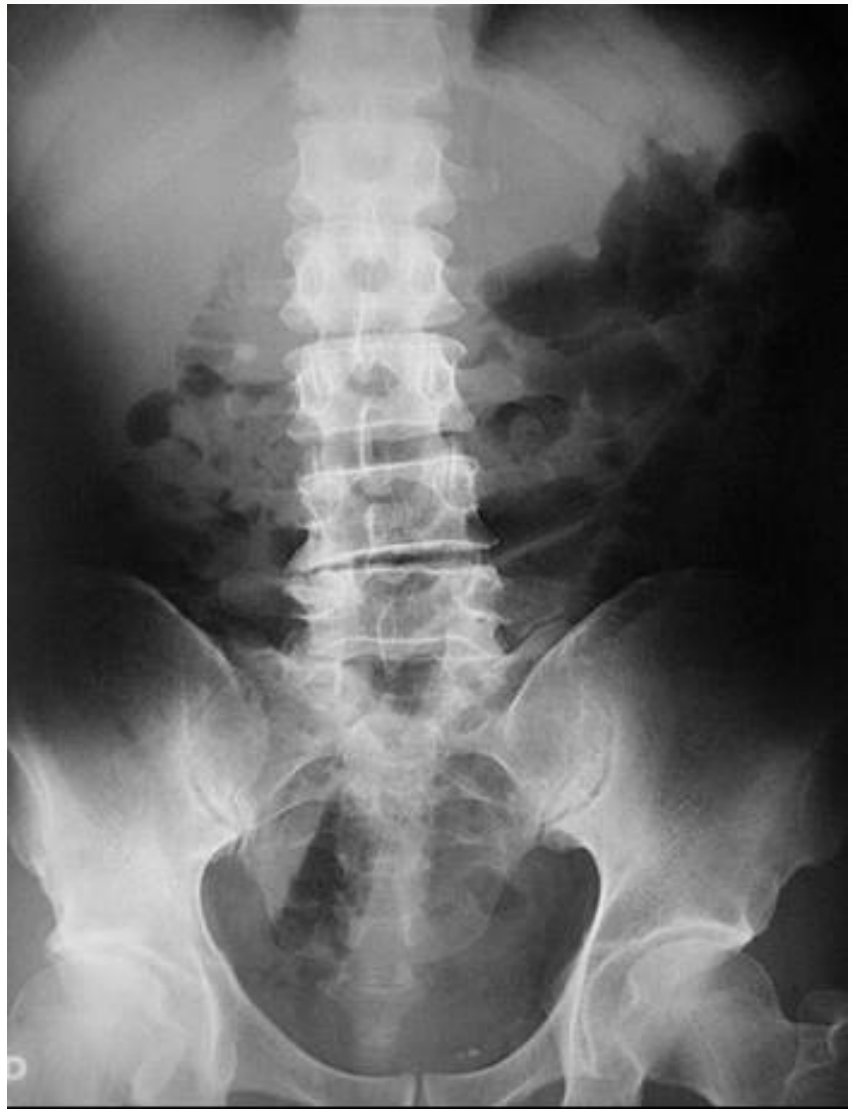
Lab data

- VMA: 3.1 mg/L (1.0-7.5 mg/ 24 hrs)
- Nor-epi, urine: 22.1ug/L (11.1-85.5ug/24hrs)
- Epinephrine, urine: <2.0 ug/L (<22.4)
- dopamine, urine: 178.8 ug/L (50-450)
- 17-ketosteroid: 9.4mg/L (6-22)
- 17-OHCS: 7.03 mg/L (3-12)

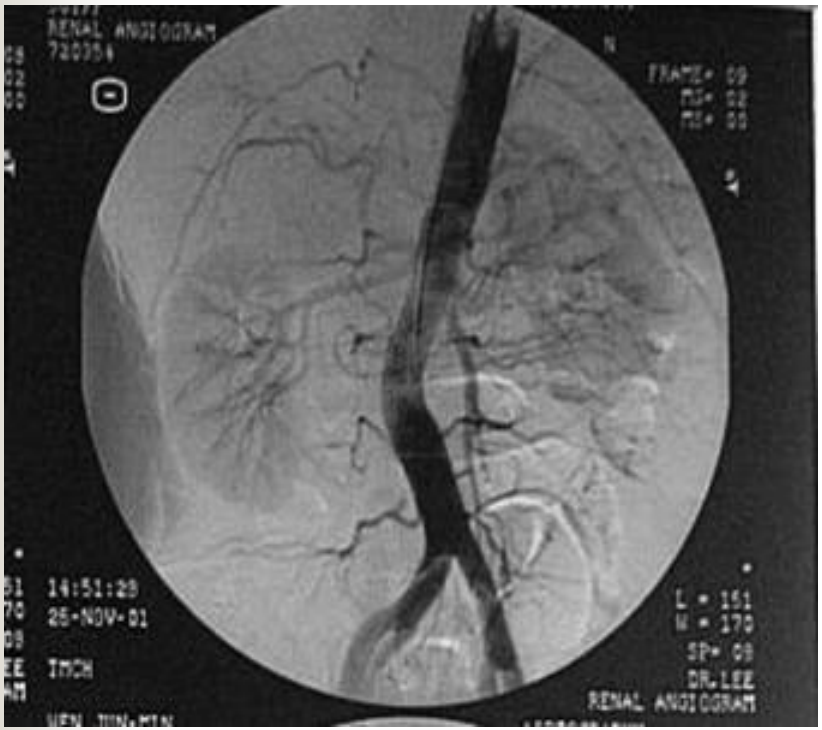
Image study

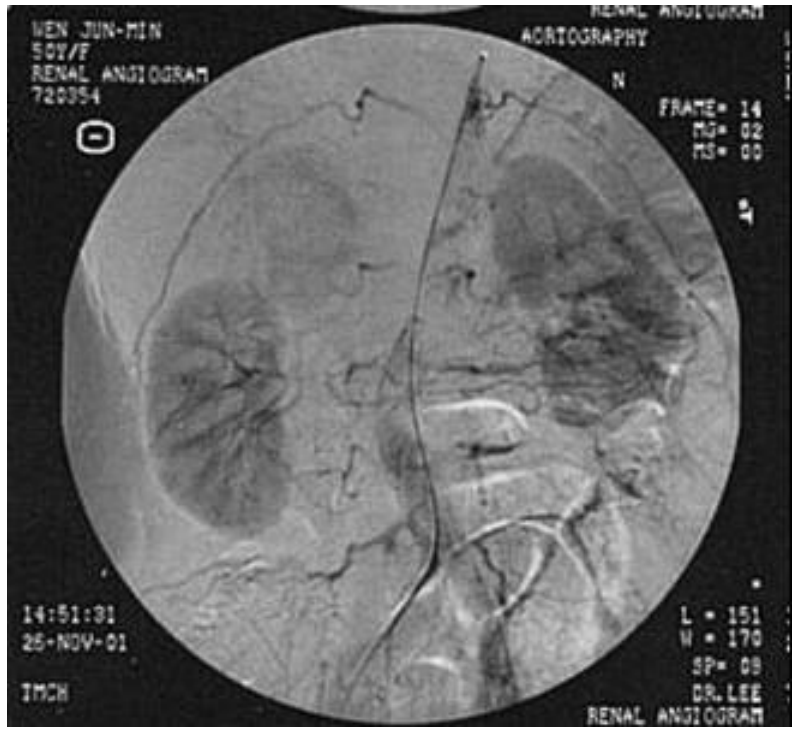
- 2001.11.26: KUB
- 2001.11.26: aortography, celiac; right renal and adrenal angiography; IVC venography
- 2001.11.27: IVP
- 2001.11.27: abd echo

- A radiopague density is located at right aspect of L2 level; a right upper ureteral stone can not be ruled out

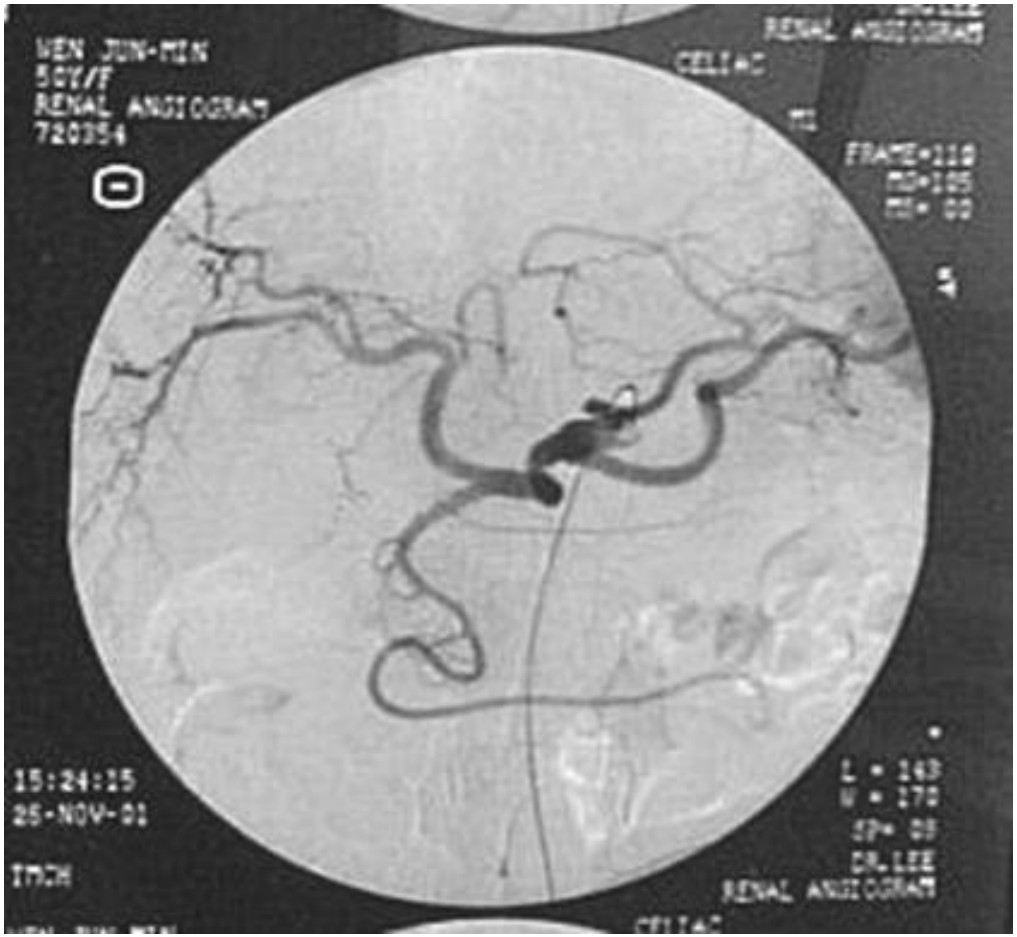


- 2001.11.26 angiography

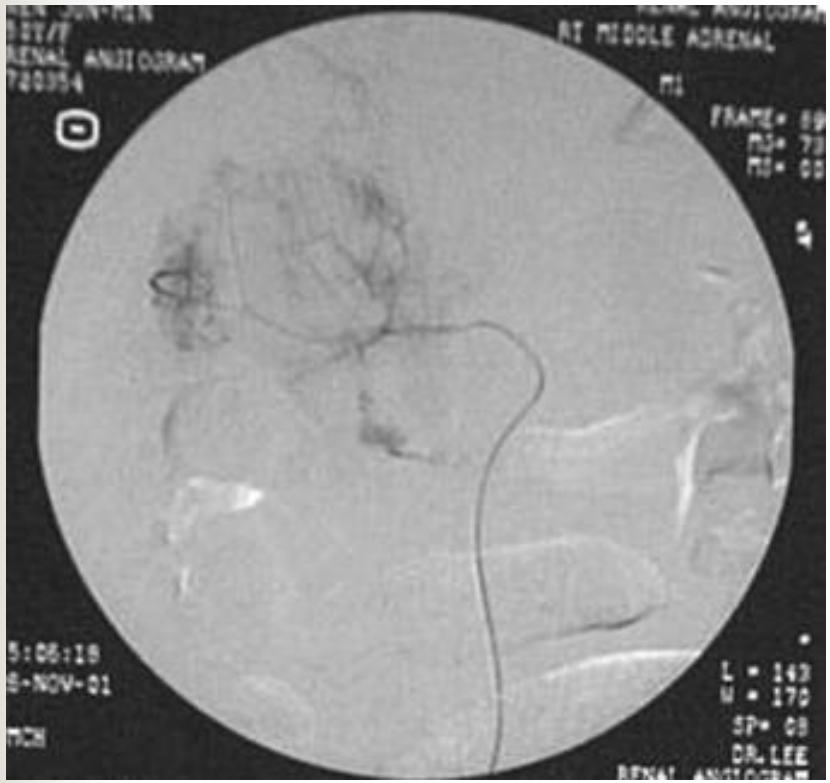


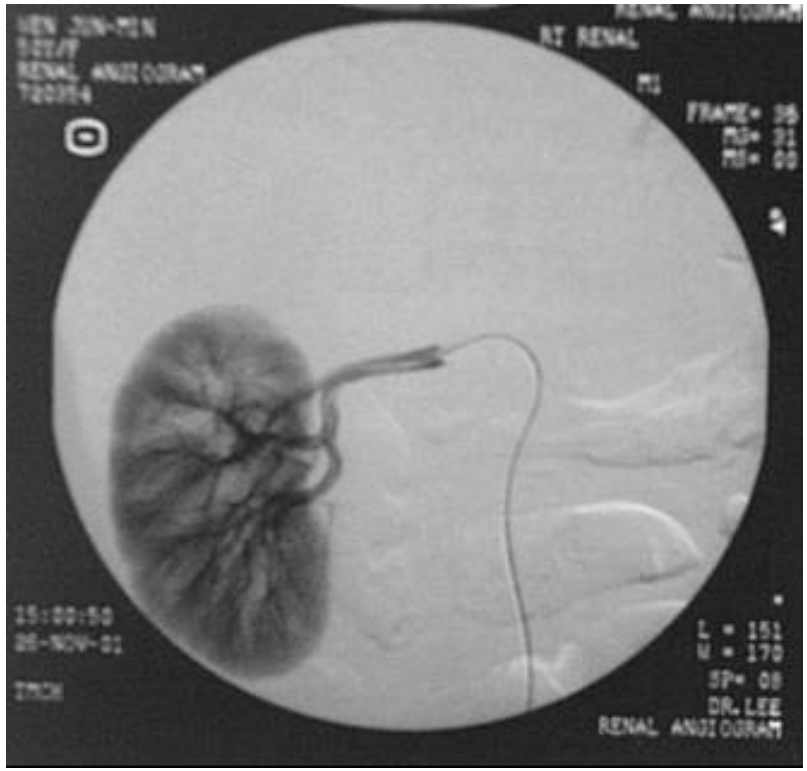


- 2001.11.26 celiac a.

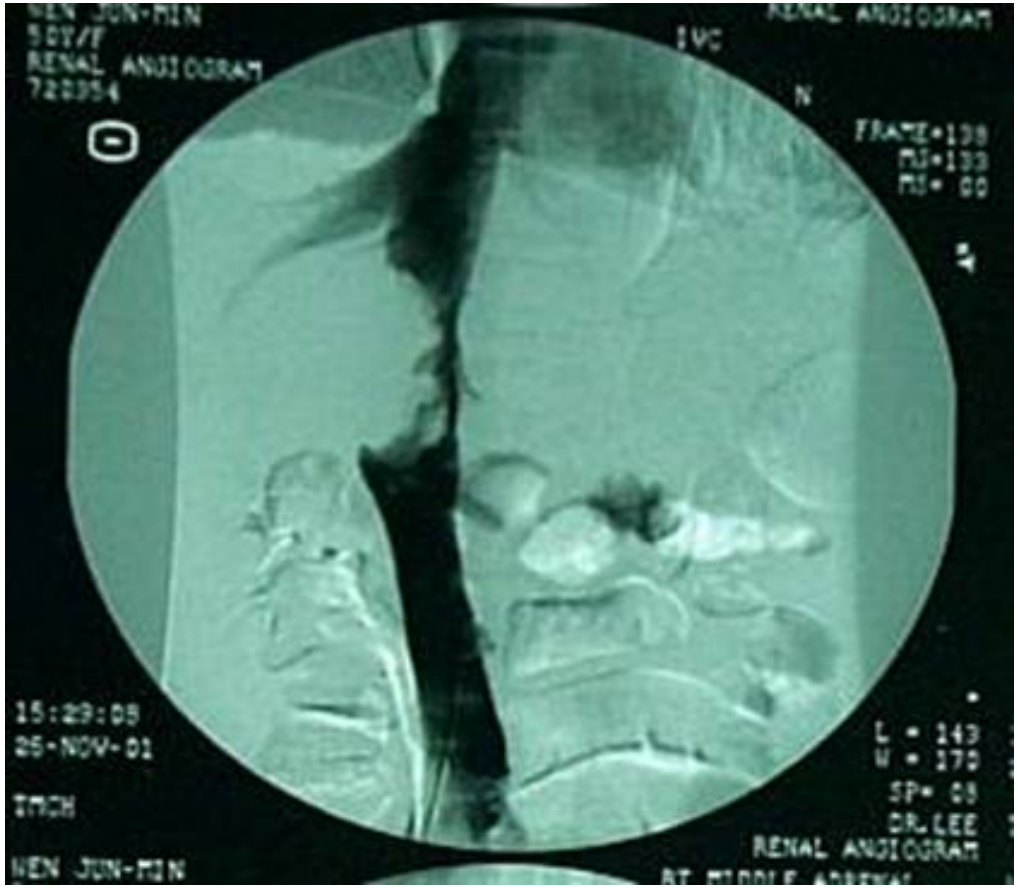


- 2001.11.26
  1. R’t adrenal tumor supplied from right middle adrenal a.
  2. No other tumor vessels from celiac or right renal a.

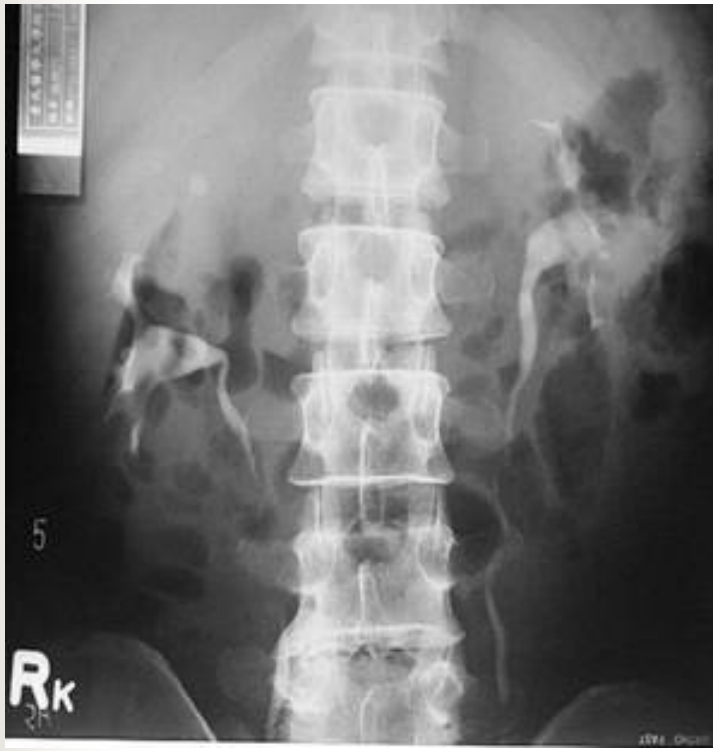


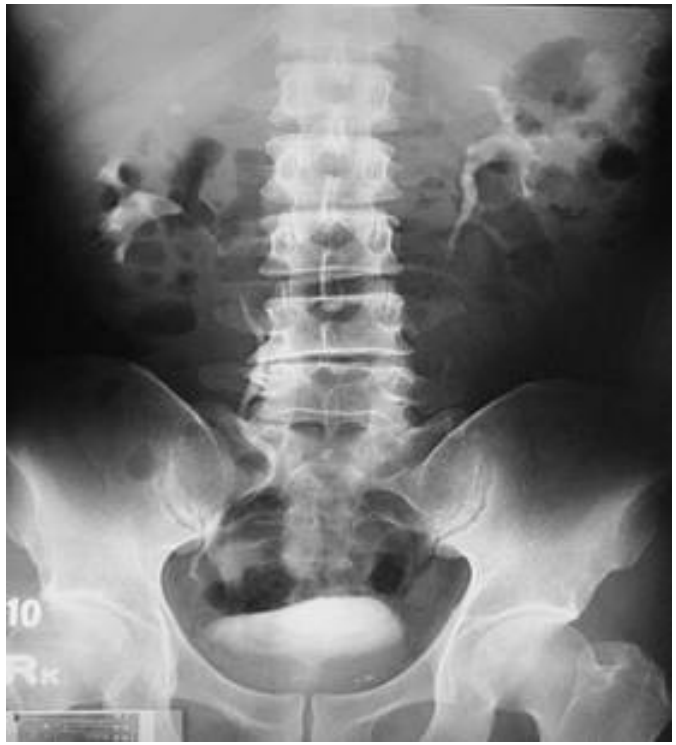


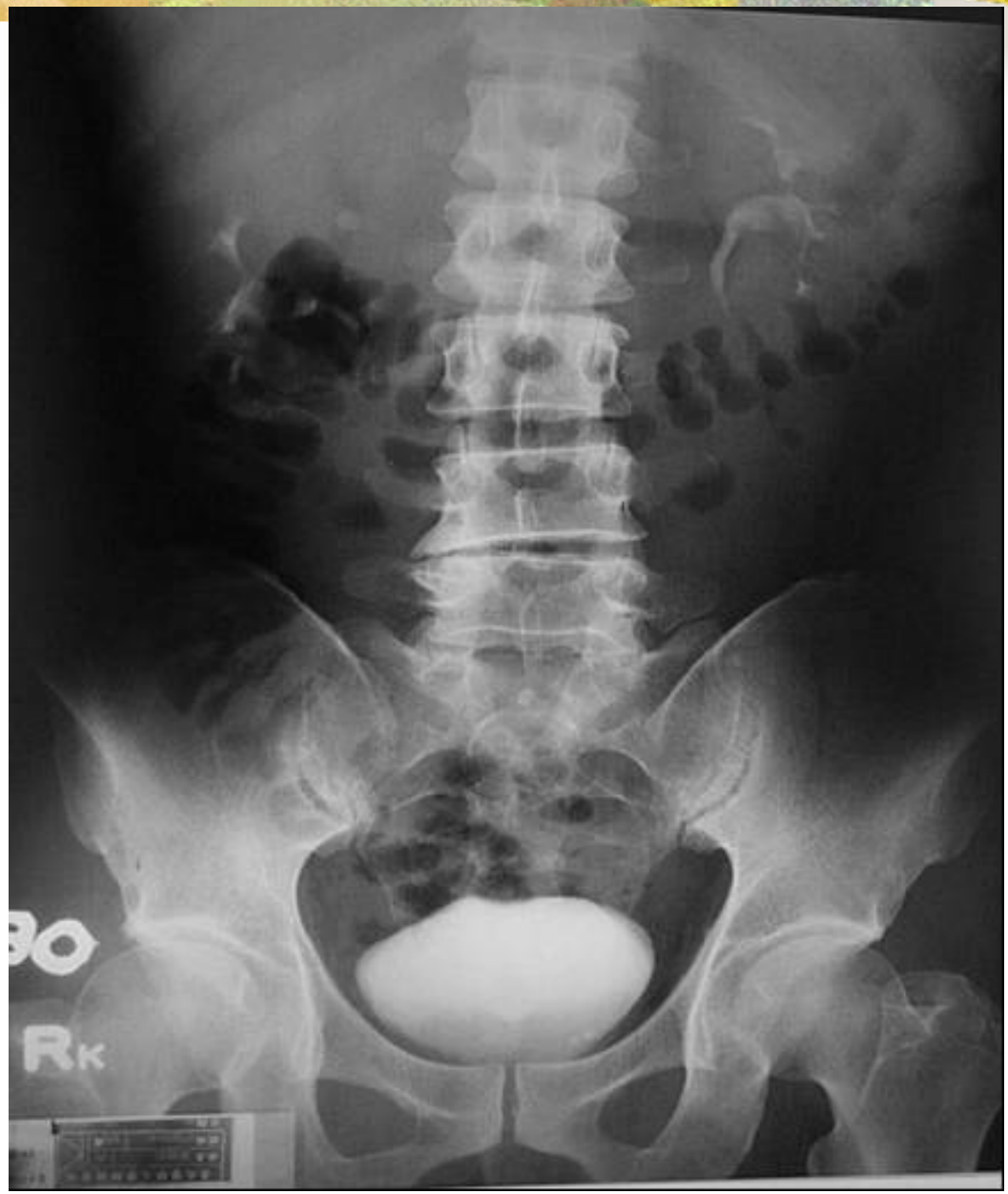
- 2001.11.26 IVC venography: markedly compressed, probably invaded



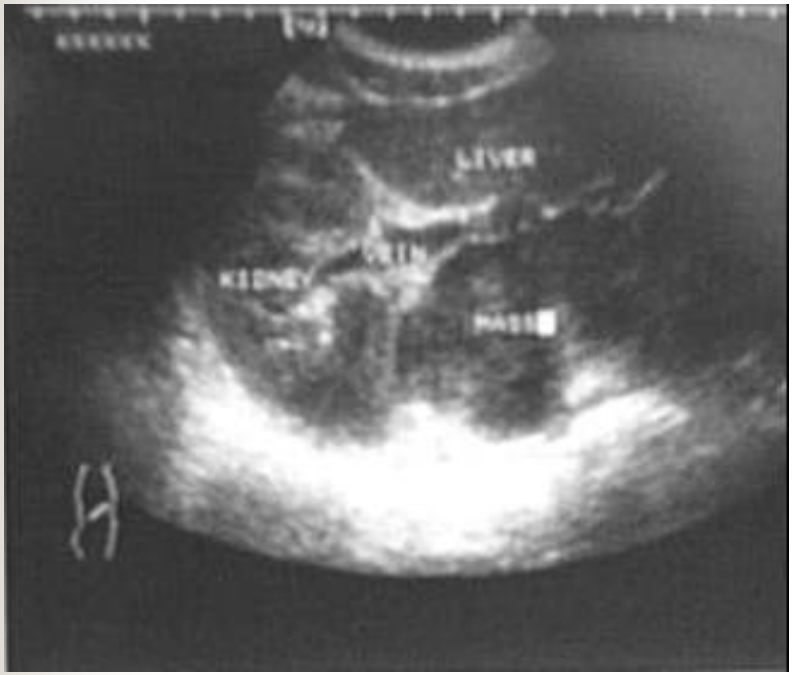
- 2001.11.27 IVP: normal contour of both side kidneys without evidence of obstructive uropathy or hydronephrosis

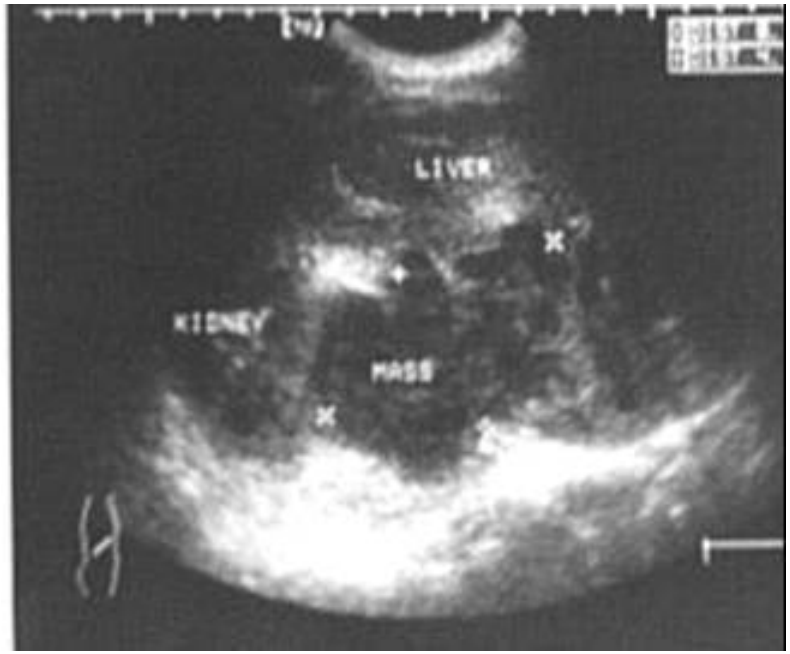





Rk

- 2001.11.27 abd echo:
  1. Gallbladder stone
  2. Intra-abdominal tumor, mixed echoic, clear margin, 8.1*4.8 cm in size





- 11.30 patient refuse op & discharge
- 2002.1.7 CT-guided biopsy
  --pathology: adrenocortical carcinoma
- NTUH: liver metastasis s/p chemotherapy
- Acute conscious change→NTUH→hepatic encephalopathy
- 2002.7.14 transfer to TMUH→EVL for EV bleeding → 2002.8.9 transfer to NTUH

Differential diagnosis for a adrenal mass

- Adrenocortical hyperfunction

  --endogenous Cushing's syndrome

  --primary hyperaldosteronism

  --adrenogenital syndrome

- Adrenal medullary tumors

  --pheochromocytoma

- Hypoadrenalism

- Adrenal disorders not resulting in altered hormonal activity

Endogenous Cushing's syndrome

- ACTH-dependent Cushing's syndrome

  --85%, pituitary cause

  --ectopic: 1. Overt type: small-cell lung ca 2. Occult type: bronchial carcinoid

- Adrenocortical adenomas

  --CT: homogenous (heterogenous, when hemorrhage or necrosis existed)

- Adrenal carcinomas

  --CT: heterogenous, with necrosis and calcification

  --may invade IVC, liver, lung, bone and lymph node

Primary hyperaldosteronism(Conn's syndrome)

- Adrenocortical adenomas(Conn's tumor)

  --**CT**: low density(<10 HU), high cytoplasmic lipid content; not enhance significantly after contrast medium

  --**MRI**:

  T1-weighted: hypo-to-isointense relative to the live

  T2-weighted: hyper-to-isointense relative to hepatic parenchyma

- Adrenogenital syndrome

  --androgen-producing tumors

  --congenital adrenocortical hyperplasia: childhood

Adrenal medullary tumor

- Pheochromocytoma

  --90% functional; only 50% of sympathetic and 1% of parasympathetic tumors produce excess catecholamine

  --unenhanced CT: similar density to surrounding soft-tissue structure

  --MRI: T1: hypointense; T2: hyperintense due to necrosis

  --US: well-defined, uniform reflectivity

Hypoadrenalism

- Enlarged gland most commonly due to tuberculosis

- Non-hyperfunctioning adrenal adenomas

  --non-neoplastic overgrowth of adrenocortical cells of the zona fasculata

  --obese diabetics and elderly women

- Primary adrenocortical carciomas

  --highly malignant

  --most > 6 cm at the time of diagnosis and on the left

- Adrenal metastases

  --from tumors of the lung, kidney, melanoma, breast, ovary and digested tract

  --CT: larger than adenoma, less well-defined, inhomogeneous; have a thick , irregular enhancing rim after contrast medium

  --MRI: T1: hypointense, relative to the liver; T2: hyperintense

- Primary adrenal lymphoma

  --poor prognosis

  --**CT**: solid homogeneous, soft-tissue density, calcification is unusual

- Adrenal cysts

  --uncommon, unilateral, women> men

  --**CT:** well-defined, thin-walled fluid-filled structure; no enhancement after contrast medium

  -- **-MRI**: T1: hypointense; T2: hyperintense

- Adrenal myelolipoma

  --benign, fat and bone marrow tissue

  --asymptomatic and nonfunctioning

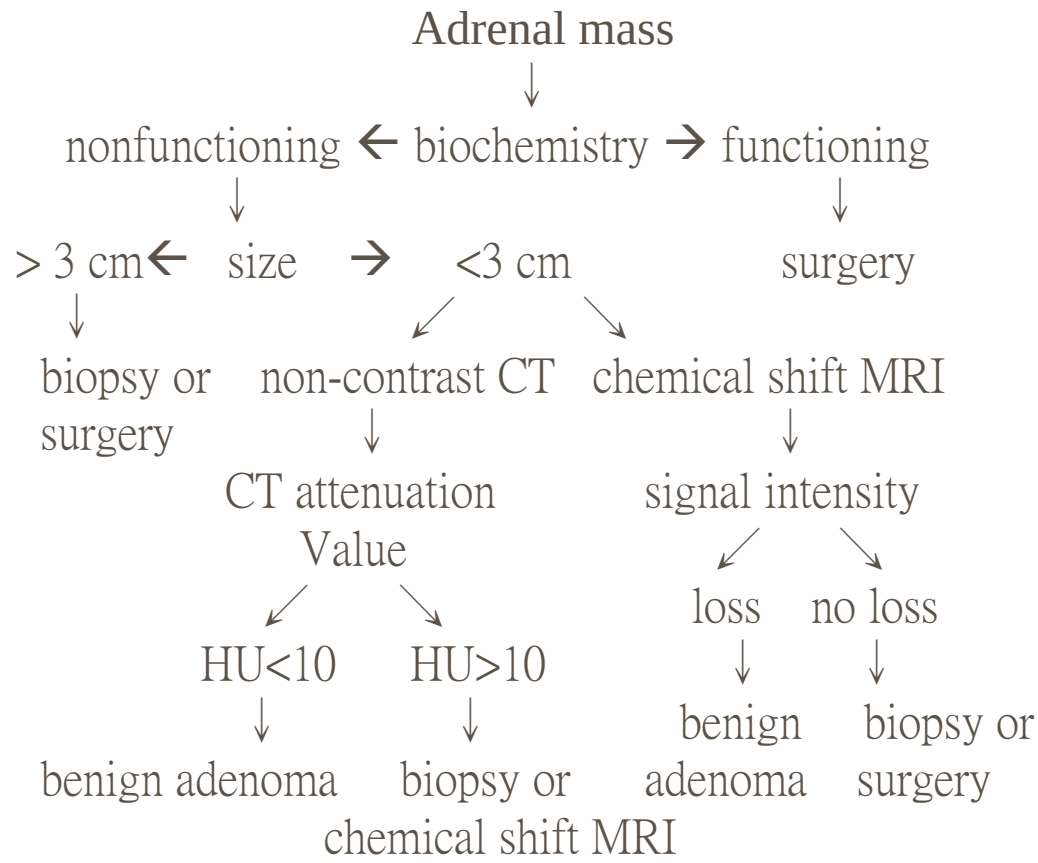
  --the diagnosis is based on the demonstration of fat within an adrenal mass

- Infection

  --adrenal abscess: thick-walled cystic lesion

  --adrenal hemorrhage

  --granulomatous infection(tuberculosis, histoplasmosis, or blatomycosis)


Adrenal mass
nonfunctioning
biochemistry
functioning
> 3 cm
size
<3 cm
surgery
biopsy or surgery
non-contrast CT
chemical shift MRI
CT attenuation Value
signal intensity
HU<10
HU>10
loss
no loss
benign adenoma
biopsy or chemical shift MRI
benign adenoma
biopsy or surgery

Pathological diagnosis

- **Adrenocortical carcinoma**

Discussion: Adrenocortical carcinoma

- Rare and highly malignant
- 90% produce steroid but only 50% cause symptom
- Functioning carcinoma most commonly result in Cushing's syndrome
- Virilization or hyperaldosteronism may also occur

Discussion: Adrenocortical carcinoma

- Usually large (> 6 cm) at the time of diagnosis
- more common on the left; 10% bilateral
- CT: heterogeneous, with areas of necrosis and calcification; about 15% < 6 cm in diameter and resemble adenomas
- may invade IVC, liver, lung, bone and lymph node