IMAGING OF UPPER UT TCC

IS THERE AN EVIDENCE BASED STRATEGY?

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UPPER TRACT TCC

- 0.7-4% of patients with primary bladder cancer develops UT-TCC.
- RISK FACTOR;
  - Bladder TCC (+risk factors for TCC)
  - Multicentricity,
  - Recurrent tumors
  - Carcinoma in situ (CIS)
  - Vesicoureteral reflux (VUR)
  - Bacillus Calmette Guerin (BCG) treatment

TMN Classification:

T – Primary tumour

TX Primary tumour cannot be assessed
T0 No evidence of primary tumour
Ta Non-invasive papillary carcinoma
Tis Carcinoma in situ
T1 Tumour invades subepithelial connective tissue
T2 Tumour invades muscularis
T3 (Renal pelvis) Tumour invades beyond muscularis intoperipelvic fat or renal parenchyma
(Ureter) Tumour invades beyond muscularis into periureteric fat
T4 Tumour invades adjacent organs or through the kidney into preinephric fat

N – Regional lymph nodes

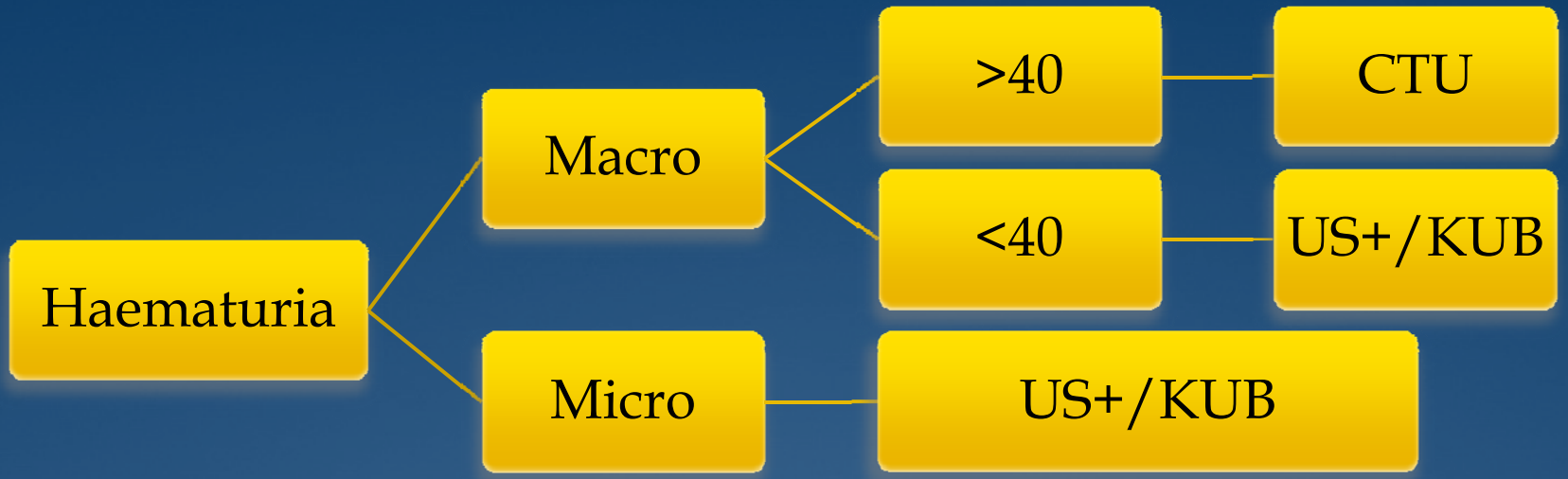
NX Regional lymph nodes cannot be assessed
N0 No regional lymph node metastasis
N1 Metastasis in a single lymph node 2 cm or less in the greatest dimension
N2 Metastasis in a single lymph node more than 2 cm but not morethan 5 cm in the greatest dimension or multiple lymph nodes, none more than 5 cm in greatest dimensionN3Metastasis in a lymph node more than 5 cm in greatest dimension

M – Distant metastasis

M0 No distant metastasis
M1 Distant metastasis

WHY IMAGE?

- DIAGNOSIS
  - Early detection
- STAGING



RCR guidelines MBUR 7
ESUR guidelines
BAUS guidelines

Guidelines for the diagnosis of urothelial cell carcinoma of the upper urinary tract

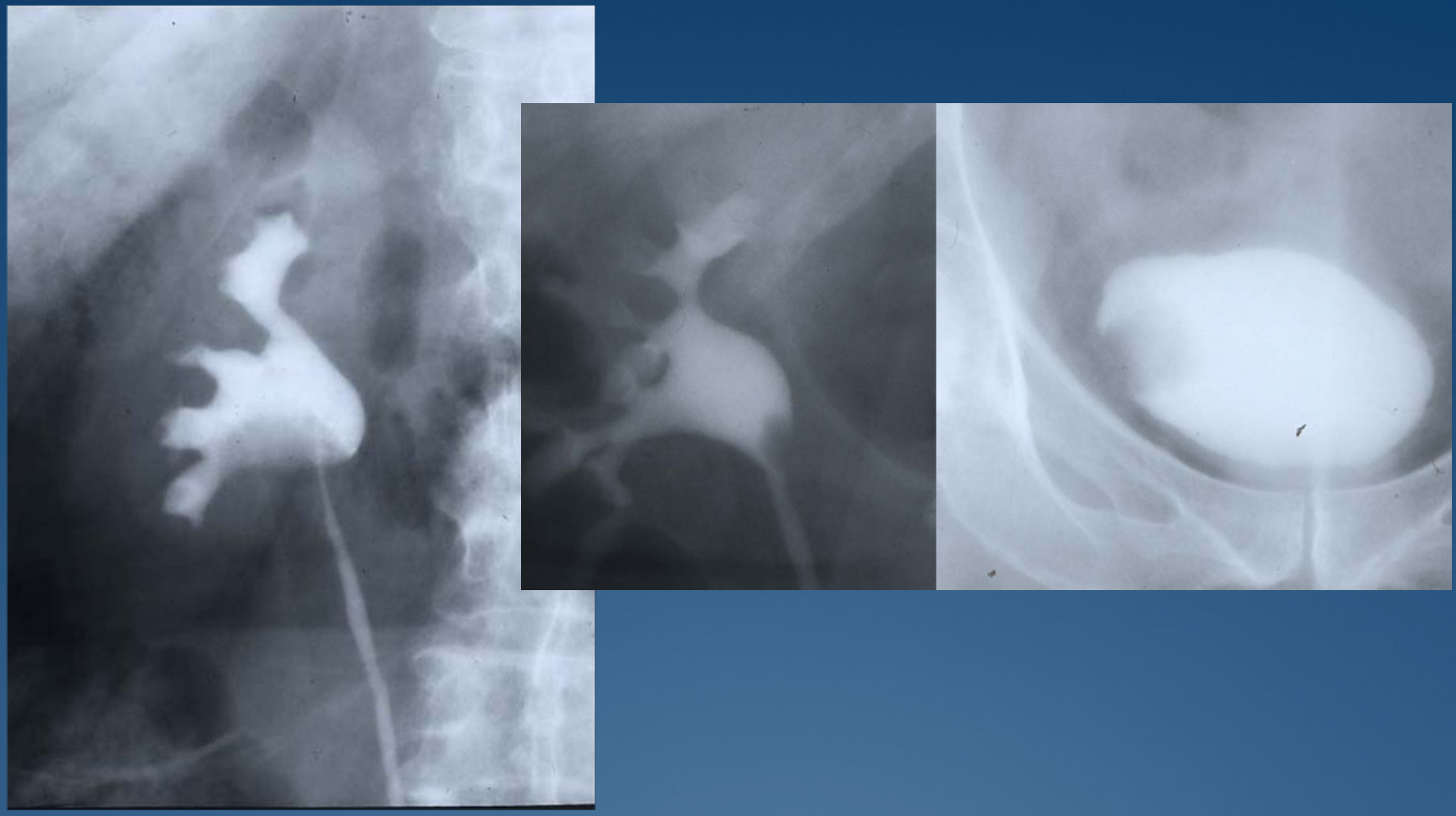
Recommendations for diagnosis of UUT-UCC	GR
Urinary cytology	A
Cystoscopy to rule out a concomitant bladder tumour	A
MDCTU	A

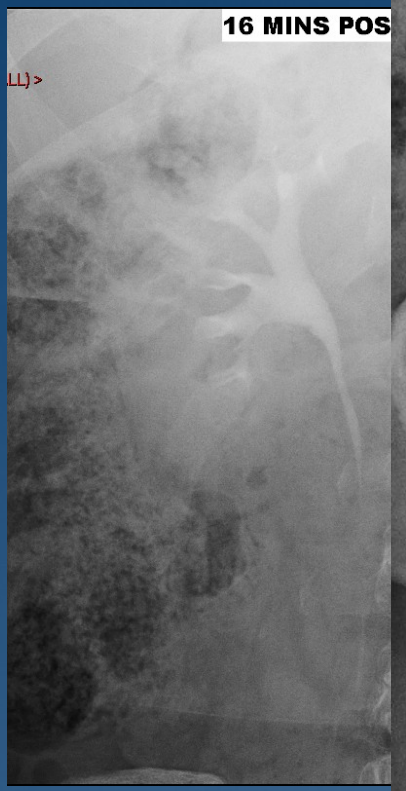
GR = grade of recommendation
MDCTU = multidetector computed tomographic urography
UUT-UCC = urothelial cell carcinoma of the upper urinary tract.

European Guidelines for the Diagnosis and Management of Upper Urinary Tract Urothelial Cell Carcinomas: 2011 Update

IMAGING MODALITIES

- IVU
- CT
  - STANDARD
  - CTU
- MRI
  - STANDARD
  - MRU
    - STATIC
    - CONTRAST ENHANCED
- OTHER




16 MINS POS

5MINS POST CONTRAST

IVU

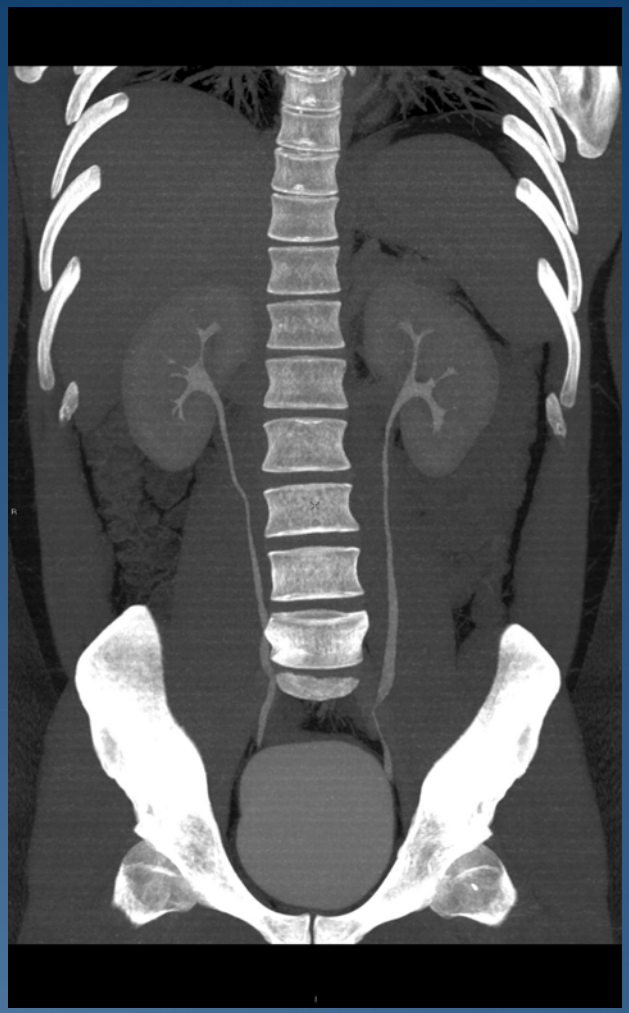
- Poor sensitivty for UPTTC: 50% (Albani et al. J Urol 2007)
- 15% of tumour >3cm are missed and all <3cm
  - Indirect detection of renal masses
- Only around 60% are of diagnostic
- No role in Haematuria (unless there is no access to CT!)

CTU

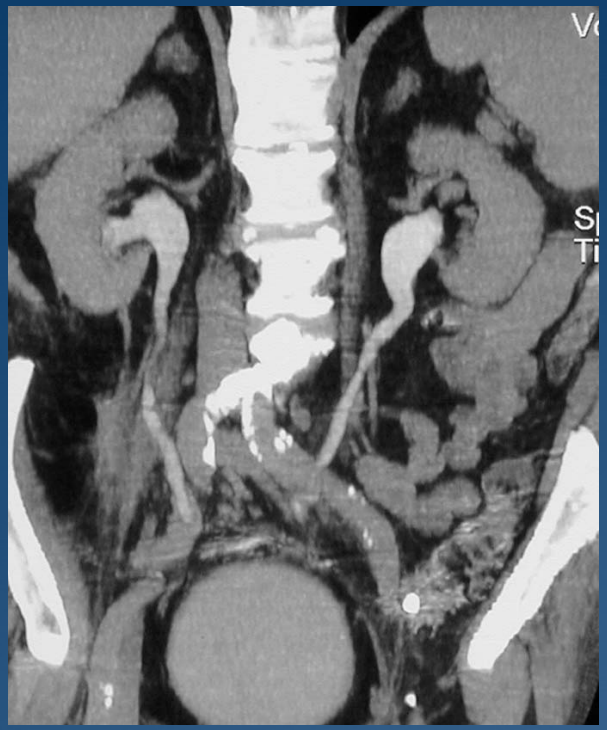
- CTU 16,900 articles
- CTU + TCC 1,160 articles
- Technique has evolved:
  - 4 phases
  - 3 phases
  - 2 phases
  - **Single phase**

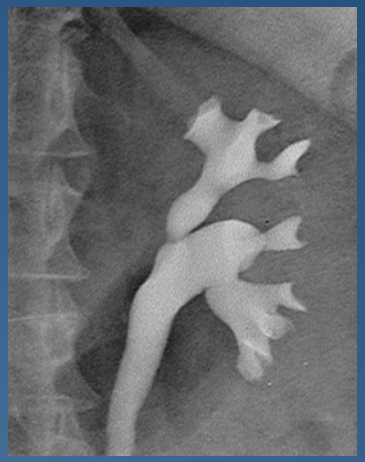
Optimise

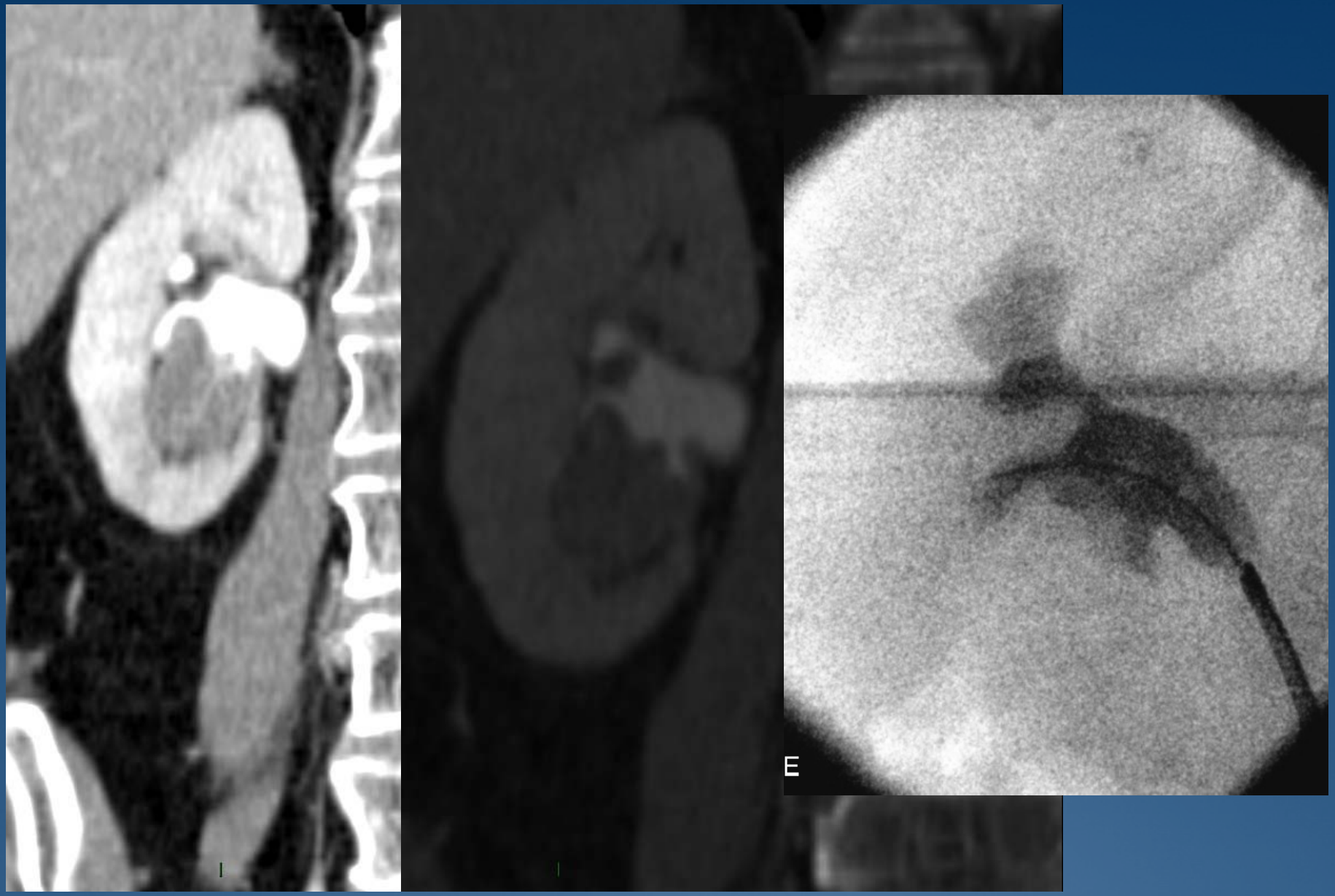
- Dose
  - One excretory phase with frusemide
    - Compression, prone scanning & saline unnecessary
  - Split-bolus
    - Combined nephrographic and excretory phase
  - Eliminate the control



CT Urography
Good visualisation of the urinary tract



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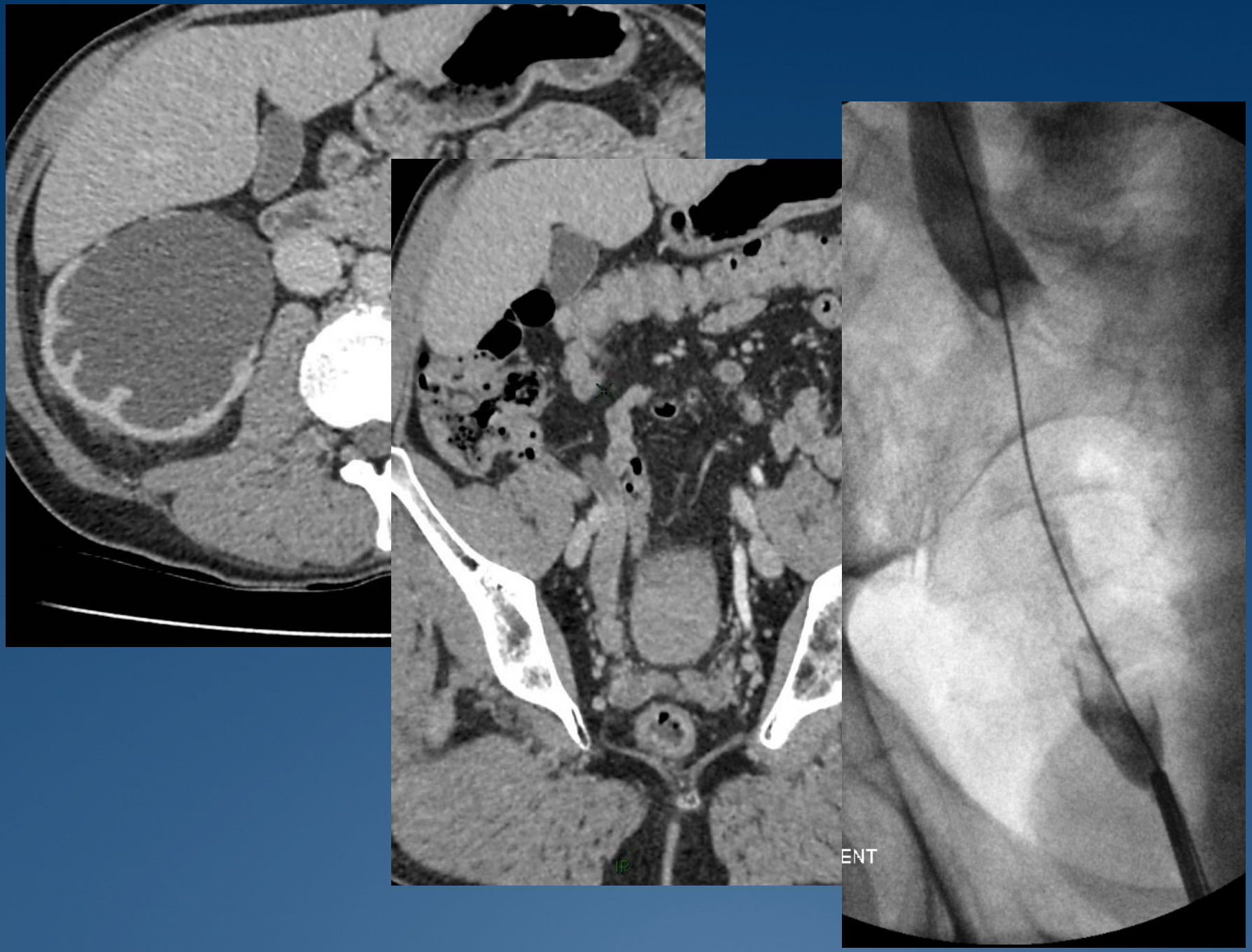
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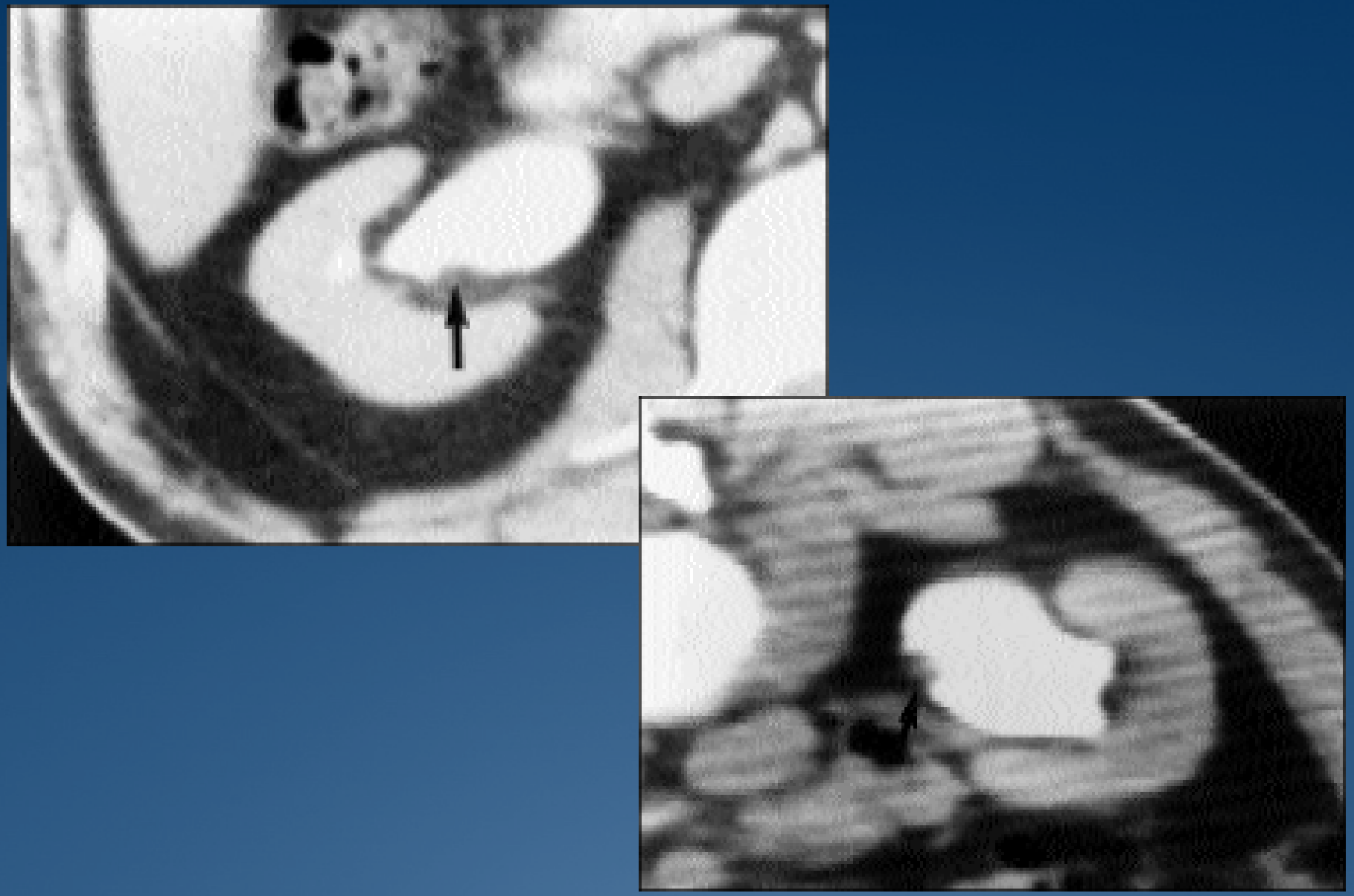


CT vs RP

* Retrograde pyelography gold standard
* 106 patients
* Both CT & RP
* Histology and 3-5 year follow-up
* RP: 97% sensitive, 93% specific
* CT: 97% sensitive, 93% specific
* Reserve RP for non-diagnostic CT or renal failure

Cowan et al. BJUI 2007

Additional benefit?

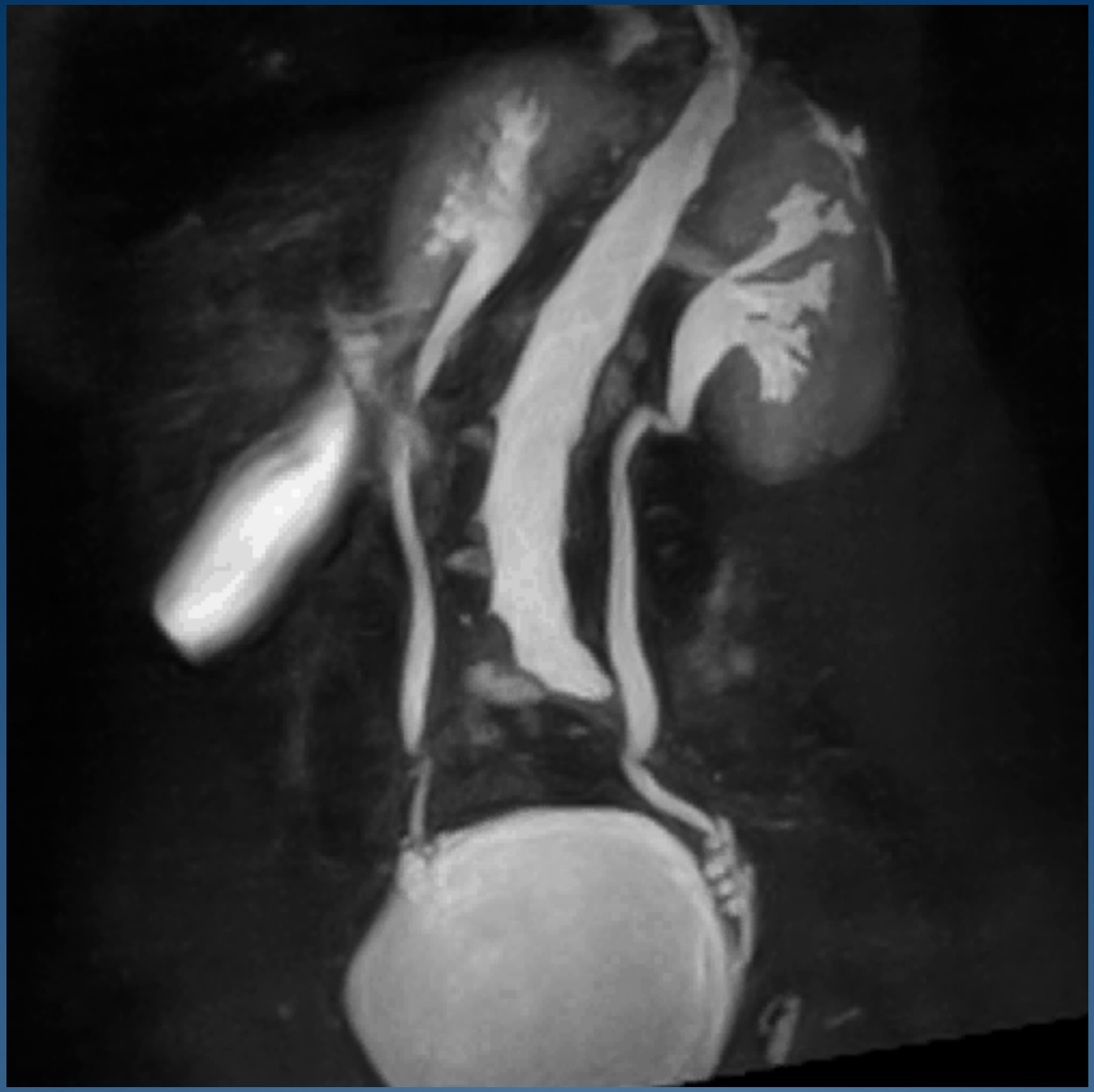
- 344 patients
- 259 (75%) had extra-urinary findings
- 62 (18%) potentially highly significant
- 3 cancers
  - 2 NHL
  - 1 lung (T1 N0 M0)
- Other
  - Appendicitis, diverticular abscess, AAA

Liu et al. AJR 2005

Other Imaging Techniques

MRU

- Complementary role
  - Problem solving
  - Local staging
  - Patients not suitable for CT



MRU

- The role of MR urography is still evolving
- Less sensitive than CTU (for TCC)
- Has limitations (older patients with pace makers,etc…)

CONCLUSIONS

- CT Urography should now become the first imaging choice in investigating frank heamaturia
- The technique should be optimised to improve detection rate without increasing radiation
- Imaging should be tailored to patient's condition
- *Should we routinely image all patients with haematuria?*
- *Should all patient with microscopic haematuria be excluded?*

References:

* **Imaging of Hematuria** Owen J. O'Connor et al, AJR:195, October 2010

* **CT Urography Working Group of the European Society of Urogenital Radiology (ESUR). CT urography: definition, indications and techniques: a guideline for clinical practice.** Van Der Molen AJ, Cowan NC, Mueller-Lisse UG, Nolte-Ernsting CC, Takahashi S, Cohan RH; *Eur Radiol 2008; 18:4–17*

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