

Renal Tumors in Transplantation

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Clinical-Pathological Correlation
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Overview

- Case reports
- Neoplasia in transplantation
- Renal allograft tumors
- Native kidney RCC
- Role of screening

Case #1

- 52 y.o. male
- Cadaveric trsplt Sept 1997
- etiology of renal failure: unknown
- PMHx: superficial TCC

Case #1

- Feb '03: abdo bloating & wt loss
- U/S – echogenic foci in spleen
- CT – hypodense lesions in allograft

Allograft Ultrasound



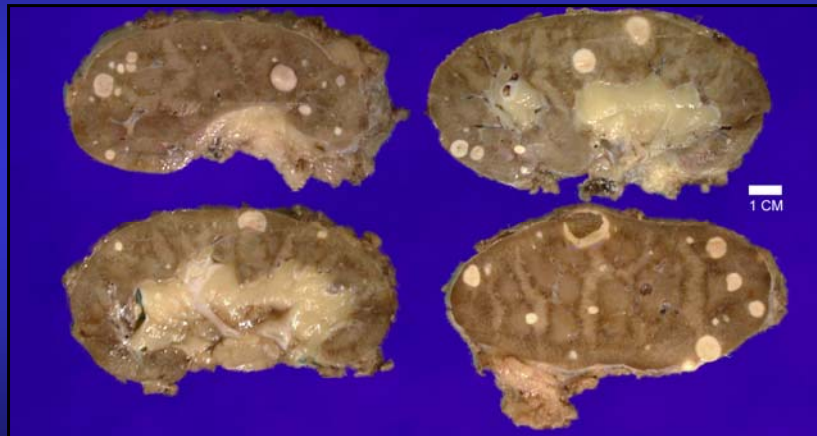
CT scan



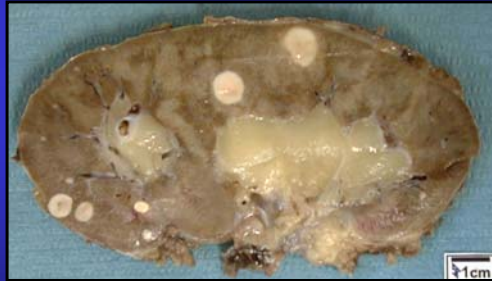
Case #1: Pathology

- FNA Bx +ve for papillary RCC
- Transplant Nephroureterectomy June 2003
- Pathology: grd I papillary RCC, 51 foci 2-17mm in size
 - All tumor w/in renal capsule
 - No RA or RV invasion

Multifocal Papillary RCC



Multifocal Papillary RCC



Histopathology

Donor info: Case #1

- 14 y.o. male
- Arachnoid cyst hemorrhage
- Liver recipient OK to date
- Contralateral renal recipient: graft functioning

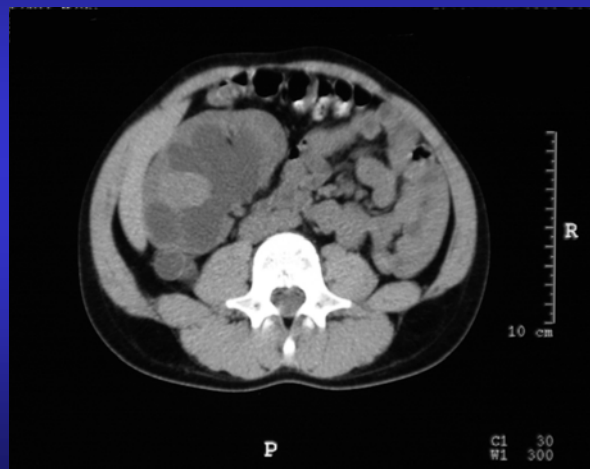
Case #2

- 10 y.o. male
- PUV w/ solitary right kidney
- cadaveric trsplt 1997
- PMHx: UTI's, growth delay

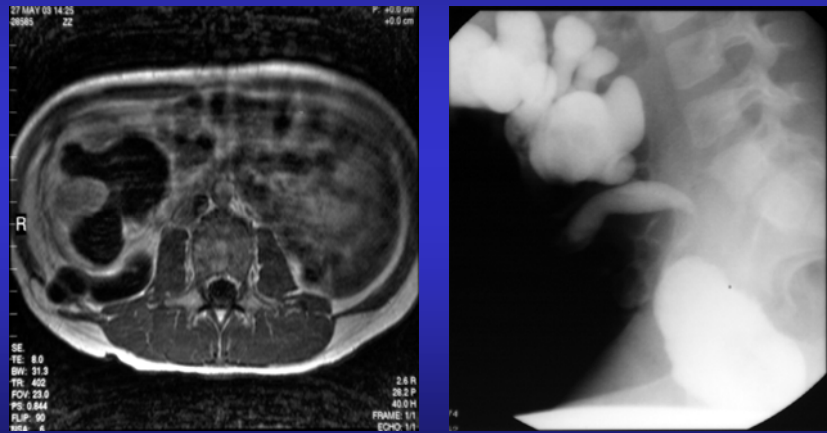
Case #2

- 2002 1cm mass in allograft
- 2003 mass incr to 3cm
- Chronic rejection of allograft,
Creat ~400

CT w/ contrast renal allograft



Non-functioning native kidney



Case #2: Pathology

- 3 x 1.5 x 1cm mass
- proliferation of smooth muscle around blood vessels
- Dx: medullary leiomyoma

Histopathology

Donor info: Case #2

- 59 y.o. female
- SAH
- NIDDM, uterine fibroid
- Liver recipient-deceased
- Contralat renal – graft failed

Post-Transplant Neoplasms

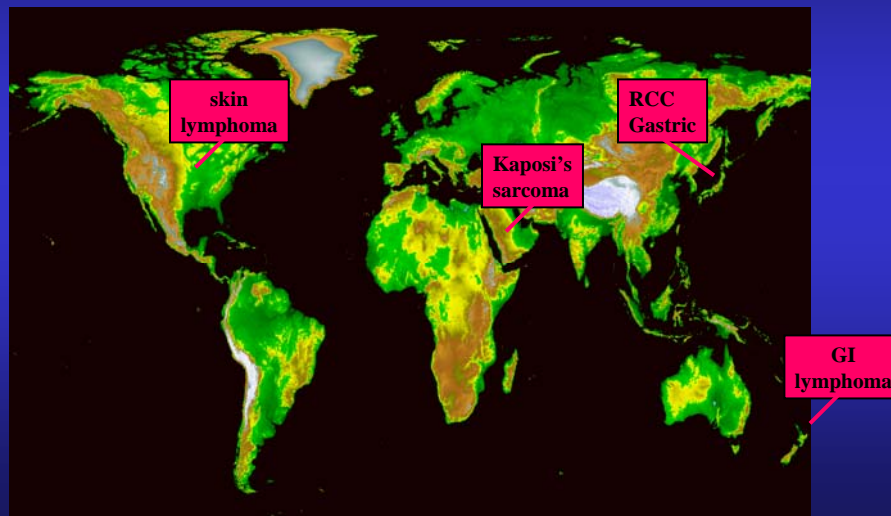
Post-transplant neoplasms: epidemiology

- 3-4 X incr risk of malignancy
- 15-20% after 10 yrs
- Skin, lymphoproliferative, KS, renal, anogenital & cervical

Cincinnati Transplant Tumor Registry – I.Penn

- 1998 review: 11483 tumors in 10787 patients
- 4305 = cancers skin & lips (29 X incr)
- 1931 = post transplant lymphoproliferative disorder (PTLD) (28-49 X incr)
- 465 = Kaposi's sarcoma (400-500X incr)
- 409 = renal carcinoma (25-75 X incr)
- 353 = cervical carcinoma (14-16X incr)
- 279 = anogenital carcinoma (100 X incr)

Geographic Differences



Transplant Neoplasms : Prognosis

- PTLD: mortality 35%
- KS: mortality – 57%
- Skin cancer –60% multifocal
- RCC – 41% mortality (n= 256
CTTR '95)

Renal Allograft Tumors

Primary Allograft Tumors

- 43 cases reported
- Potentially lethal
- Clear cell/papillary
- Leiomyoma not reported

Multifocal Papillary: Case #1

- 3 cases reported
- Multifocality →? Genetic defect
- Hereditary papillary RCC
- *Met* proto-oncogene

Leiomyoma: Case #2

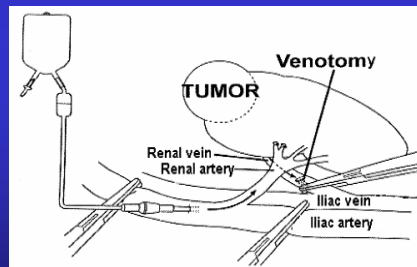
- Autopsy rate 5.2%
- Origin: capsular, vessel, pelvis
- F>M
- Rarely clinically significant
- ?role of GH Rx

Allograft Tumors: Treatment

- Observation
- Nephron-sparing surgery
- Radical nephrectomy

Allograft tumors: nephron sparing

- 6 cases of partial nephrectomy
- Maximum 9cm tumor
- F/U 3-48 mo's w/out recurr
- Cryoablation –1 case
- RFA – 1 case



Schostak *et al* 2002

Tumor in Cadaveric kidney

??? What to do

Tumor Transfer

- 15 cases – excision & trsplt
- → No recurrence of tumors
- Incomplete excision → recurr
w/ mets & death (2 cases)

Tumor Transfer

- 10,997 Tx 1990-97, Germany
- 30 cases of RCC in allograft – 0.273%
- Mean tumor size 2.2cm, donor avg 50yr
- → Screening for cadaveric donors >45yr
 - Pre-explant U/S
 - Immediate preparation of allograft

Wundelich H *et al* Urol Int 67(1) 2001

Native kidney RCC in Transplantation

RCC prevalence

- Non-trspl = 0.04%¹
- Dialysis Px = 1.5-3%²
- Transplant Px = 0.5-3%³

1. Tosaka *et al* JU 1990, Terasawa *et al* JU 1994, 2. Miller *et al* AJN'94 3. Heinz-Peer *et al* Radiology '95

RCC: Risk Factors

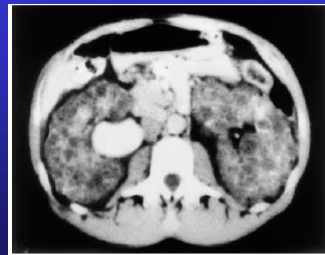
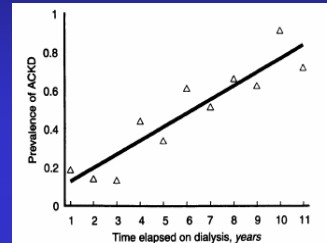
- Smoking
- ? Immunosuppression
- Acquired renal cystic disease

Acquired Renal Cystic Disease

- Bilateral cysts-ESRD
- No genetic cause
- Due to uremia
- Diagnosis
 - Radiologic: 3- 5 cysts per kidney
 - Pathologic: cysts involving >25% of kidney

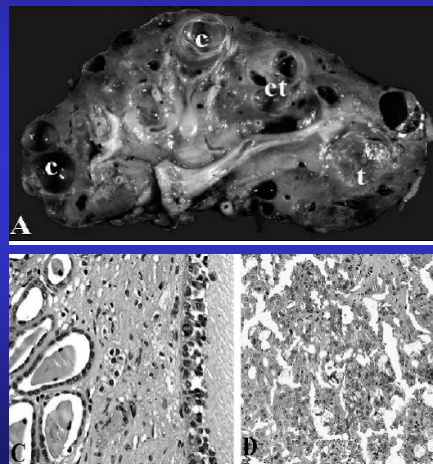
Acquired Renal Cystic Disease

- Incidence incr w/ time on dialysis
- M>F
- 2-7% ARCD → RCC
- Pathophysiology



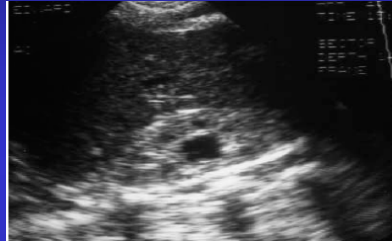
ARCD and RCC: Pathology

- Cysts w/ mural nodules
- Cysts lined w/ atypical epithelial cells
- Papillary type & clear cell
- Usu lower grade



ARCD and RCC: Imaging

- U/S: cheap, no contrast, ?screening
- CT: optimal modality w/ non-ionic contrast
- MRI: gadolinium used to detect neovascular.



?? Role of Screening for
RCC in Trspltx Px

Screening

- aSx Px prior to trsplt
- early intervention
- Reduce morbidity & mortality

RCC: high incidence in ESRD

- MGH – ipsilateral Nx @ Tx
- n= 260
- 4.2% RCC (n=11)
- 6 clear cell, 5 papillary, 1 chromophobe
- Risk factors: male, GN, ARCD

Denton et al Kid Intntl 2002 61(61)2201-2209

Tx RCC : clinical impact

	Dialysis Patients	Transplant Patients
Tumor size	2.8cm	6.75cm
Metastasis	8%	53%
Mortality	0	29%

Pope *et al* 1994 J. Urology, n=20 (Vanderbilt)
Non-screened pop'n

RCC Screening : Pre-transplant

- U/S: n=206
- 22 →CT
- 8 w/ RCC→rad Nx
- RCC = 3.8%
- No false +ve CT
- Avg T size = 2cm
- All organ confined

Gulnikar AC *et al Transplantation* 1998 (Mississippi)

RCC Screening : Transplant Px

- Doublet *et al J.Urol* 1997 (Paris)
- N=129 → U/S, 55→CT
- 9 Px → lap radNx →4/9 RCC
- Prevalence = 3.9%
- all tumors T1 & low grd
- 5 unnecessary surgeries

RCC Screening : Transplant Px

- Heinz-Peer *et al Radiology* 1995 (Vienna)
 - n=385
 - 6 Nx→ 5 RCC's
- Cogny-Van *Trsplt Proc.* 1995 (Fr.)
 - n=220
 - 7 Nx → 3 RCC's

Screening : Drawbacks

- Harm associated w/ test
- Costly to society
- F+ve → anxiety, unnecessary Rx
- F-ve → Px ignore Sx

Malignancy in Renal Trsplt: Clinical Impact

- Causes of DWGF:
 1. CVS – 36%
 2. Infection – 17%
 3. Malignancy – 9%
- 5% malignancy = RCC
- Estimate RCC → 0.45% of DWGF

Akinlolu et al Kid Int 2000

AST Clinical Practice Guidelines

Table 33. Uroepithelial malignancies and renal carcinomas

Incidence	Renal carcinomas occur in 0.5 to 3.9% of renal transplant recipients. The risk of renal carcinomas among renal transplant recipients is 10 to 100 times higher than that in the general population.
Consequences	Renal carcinomas represent approximately 3.6% of all tumors observed in transplant recipients. Renal carcinomas are aggressive in renal transplant recipients. Widespread metastasis to the lymph nodes, liver, and lungs and invasion of the renal veins and inferior vena cava can occur. Approximately 40% of transplant patients with renal cell carcinoma die as a result of their malignancies. Patients with uroepithelial tumors usually present with metastatic disease and have a median survival time of only 17 mo.
Rationale	Early clinical manifestations are usually absent for renal carcinomas. The course is aggressive in renal transplant recipients, with local spread and metastases. Good survival rates are possible with early diagnosis and treatment.
Recommendations	Urinalyses and radiographic screening for uroepithelial malignancies and renal carcinoma are <u>not</u> recommended (C). Urine cytologic studies are not recommended for screening for uroepithelial malignancies, except possibly for patients with histories of analgesic abuse (D).

J Am Soc Nephrol 11: S1-S86, 2000

Renal tumors in transplantation: Summary

- Allograft tumors – role for nephron sparing
- RCC incidence increased in Trspl
- Role of Screening controversial

