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Oncologic and nephrological outcomes of nephron-sparing surgery for unilateral renal tumors: a 12-year mean follow-up study of 12 children.

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Cozzi DA

Nephron-sparing surgery for renal tumors in children: current indications.

Imperative

Solitary kidney / Bilateral renal tumor

Reasonable

Unilateral renal tumor in patients at increased risk for renal failure or predisposed to bilateral renal tumors

Nephron-sparing surgery for renal tumors in children: current indications.

Elective

A nephron-sparing approach to unilateral renal tumor and normal contralateral kidney is considered investigational at the present time.

Background

eGFR < 90ml/min/1.73m² is associated with a 20-30% increase in the risk both of major vascular events and of death from any cause.

Meta Analysis of eGFR, Death and Vascular Disease.
Mafham M et al. Plos One 2011

Background (*cont'd*)

Glomerular filtration rate and prevalence of chronic kidney disease in Wilms' tumour survivors.

Stefanowicz J et al. Pediatr Nephrol 2011

Chronic kidney disease in children with unilateral renal tumor.

Cozzi DA et al. J Urol 2012

Purpose

To evaluate our institutional experience with NSS for unilateral renal tumor in children with or without predisposition to bilateral kidney tumors.

Single Institution Experience

Unilateral primary renal tumors (44 children)

(Jan 1992 - Dec 2011)

	Nephrectomy	NSS
No. of patients	31	13
Stages	All	I (11) & II (2)
No. pts lost to follow-up	1	1
Event-free survival	80%	100%
Mean follow-up (mos)	148 (2-201)	147 (1-214)

Nephron-Sparing Surgery for Unilateral Primary Renal Tumor

Patient characteristics

Characteristic	Patients (n=13)
Age at surgery (yrs)	3.9 ± 3.2
Male / Female ratio	4 / 9
Pre-operative chemotherapy	10
Tumor size at surgery (cm)	6.1 ± 3.6
Stages I & II	11 & 2
Age at last follow-up (yrs)	15.2 ± 6.6

Data presented as mean ± SD or n.

Nephron-Sparing Surgery for Unilateral Primary Renal Tumor (n=13)

Indication	Number
Purely elective	8
Hyperplastic nephroblastomatosis	2
WAGR syndrome	1
Familial vesico-ureteric reflux	1
IgA nephropathy	1

Postoperative tumor histology (n=13)

Tumour histology	Number
Mixed type Nephroblastoma	8
Blastemal type Nephroblastoma	2*
Epithelial type Nephroblastoma	1
Cystic Nephroma	1
Oncocytoma	1

* Up-front nephrectomy in 1 case.

Postoperative sequelae (n=4)

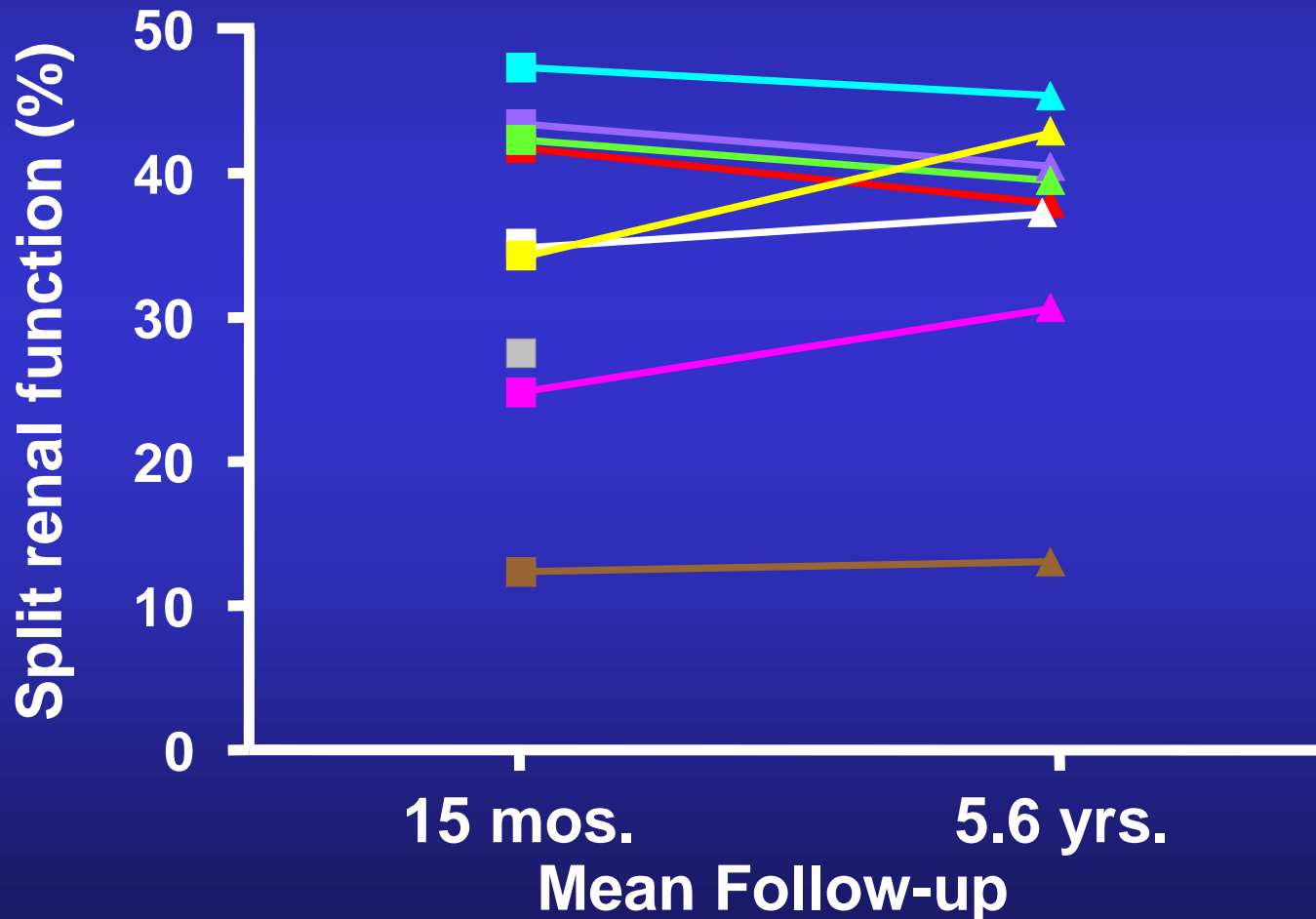
Event	Number
Gross haematuria	1
Adhesive small bowel obstruction	1
Metachronous contralateral tumor	1
Completion nephrectomy	1

Nephrological outcomes at 12-year mean follow-up

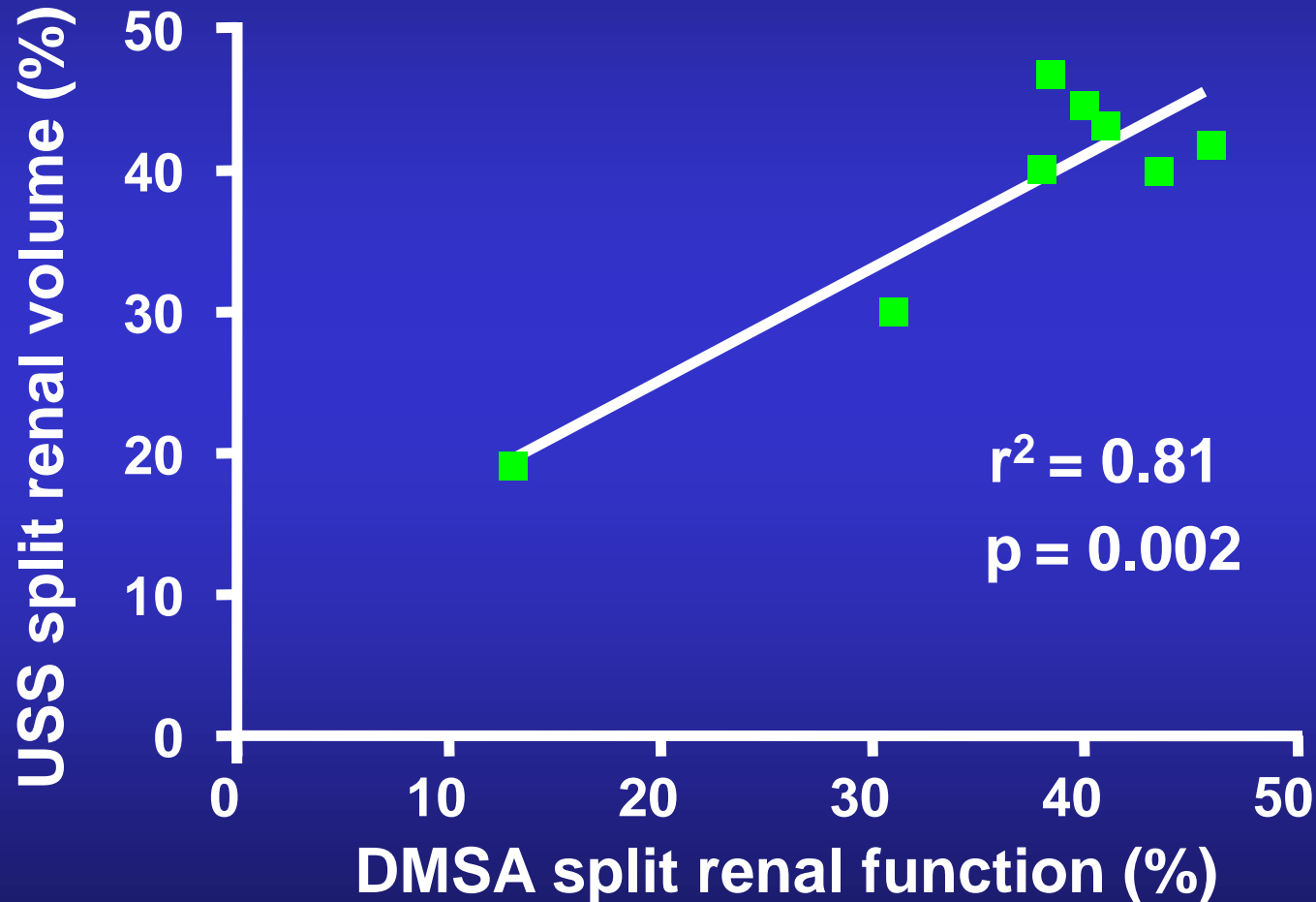
CKD Stage	eGFR (ml/min/1.73m²)	Patients (n=12)
Stage 1	> 90	11
Stage 2	60 - 89	1*
Stage 3	30 - 59	-
Stage 4	15 - 29	-
Stage 5	< 15	-

* This patient underwent bilateral NSS for a metachronous Wilms' tumor

DMSA uptake of kidney remnant after nephron-sparing surgery



Ultrasonography volume measurement vs. DMSA renal function of kidney remnant



Conclusion

Nephron-sparing surgery for primary unilateral renal tumor is associated with excellent long-term oncologic outcomes.

Oncologic outcomes of partial vs radical nephrectomy for unilateral Wilms tumor

	Nephrectomy	NSS
No. of patients	121	82
Total recurrences	20 (16%)	9 (11%)
Systemic-only	14 (12%)	3 (4%)
Local-only	4 (3%)	3 (4%)
Combined	2 (2%)	3 (4%)

Oncologic outcomes of partial vs radical nephrectomy for unilateral Wilms tumor

	Nephrectomy	NSS
No. of patients	121	82
Overall survival	95%	95%
Median RFS	83%	89%
Local RFS	95%	93%
Median follow-up (mos)	69	48

Conclusion *(cont'd)*

Nephron-sparing surgery is feasible in about 30% of children with primary unilateral renal tumor.

Pathological review of Wilms tumor nephrectomy and implications for NSS

Eligibility criteria

Unifocal mass outside the renal hilum

Sparing a third or more of the kidney

Favorable histology

No renal sinus or segmental vascular invasion

No metastatic lymph nodes or gross regional disease

Distinct interface between tumor and kidney remnant

Conclusion *(cont'd)*

Nephron-sparing surgery for primary unilateral renal tumor may provide an opportunity to prevent minor renal dysfunctions secondary to radical nephrectomy.