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Surgery of the Wilms' tumor with thrombosis



*In 1893 Blunt Sutton described the tumor thrombus
of kidney's embryonic adenomyosarcoma
(nephroblastoma)*

Frequency of occurrence – 3 - 6%

Right atrial infiltration – < 1%

(Godzinski J.,1999; Lambert A.W., 2001; Ritchey M.L., 1988; Szavay P.,2004)

Peculiarities of the Wilms' tumor trombus

- High risk of pulmonary embolism
- High response to chemotherapy

(Lambert A.W., 2001; Shamberger R.C., 2001)

Our experience:

(chemotherapy SIOP 2001/04)

Complete response – 57.9%

Partial response – 21.1%

Effect of chemotherapy to thrombus



What factors determine the survival?

Histological type

Stage of disease

Preoperative chemotherapy

(Ritchey M.L. 1993, 2001; Lall A. 2006)

The level infiltration of IVC doesn't influence on survival if radical operation was performed

Our experience from 1980 to 2011

48/1714 (2.8%)

Have been treated or observed

24 patients were operated on

Males – 15; females - 9

Age: 1.92y – 15y (median 5.17y)

19 – *had chemotherapy before surgery*

5 – *had primary surgery*

pStage

pStage	n
II	2 (8.3%)
III	15 (66.7%)
IV	6 (25%)
V	1 (4.1%)
Total	24

Total 24

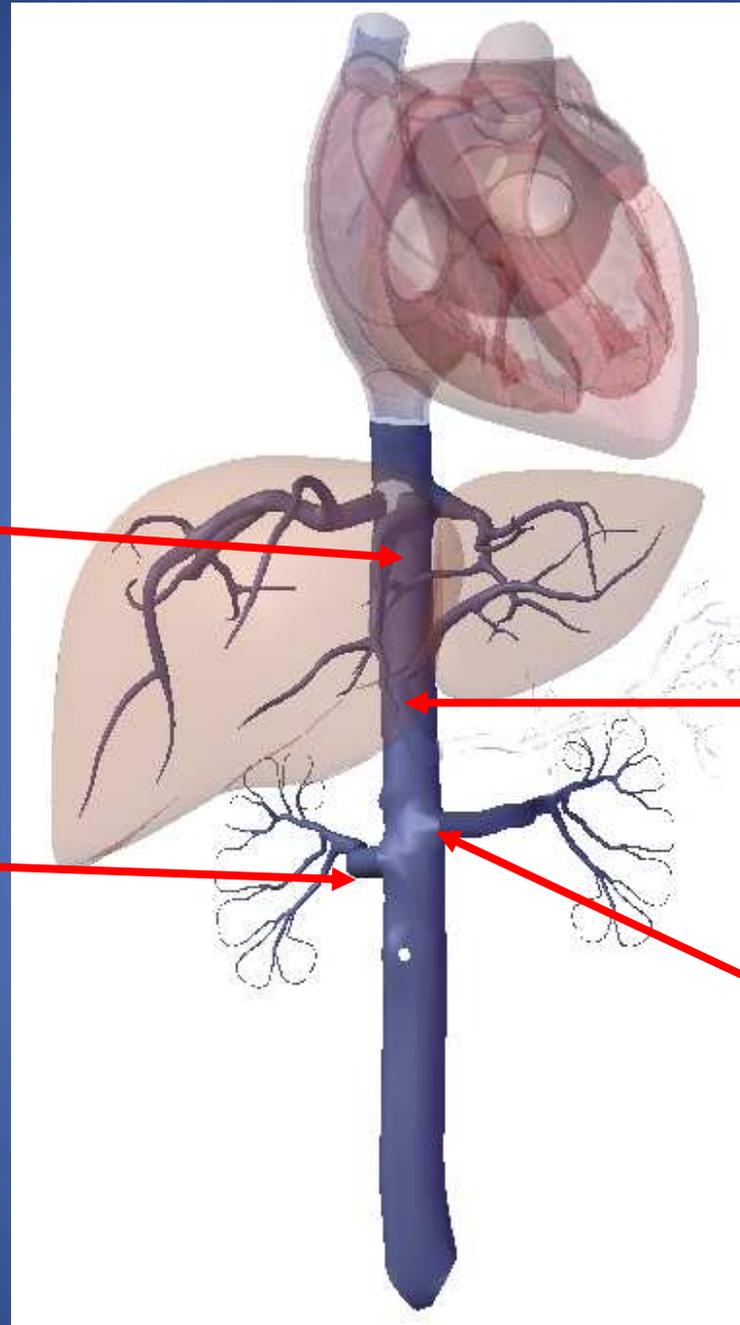
Retrohepatic
segment of IVC

5

Infrahepatic
segment of IVC
8

Right renal vein
6

Left renal vein
5



Blood loss

100 – 3500 ml

Complications
of surgery stage

47.8%

Hypotension:

- bleeding

(5,3 – 108.7 ml/kg;
med 26,5 ml/kg)

- reduction of
cardiac return

**High blood loss
is bad surgery
planning!!!**

Grade (Nakayama D.K., 1986)	n
<u>Low</u> (< 15 ml/kg)	9 (37.5%)
<u>Moderate</u> (15-29 ml/kg)	10 (41.7%)
<u>High</u> (> 30 ml/kg)	5 (20.8%)

Results

Time of operations – 90 – 390 min

Morbidity – 6/24 (25%): ileus, infectious, blood clot

Mortality – 1/24

urgent primarily nephrectomy with thrombectomy and
resection infrahepatic segment of IVC

cause of death – acute heart failure on 1st day after surgery

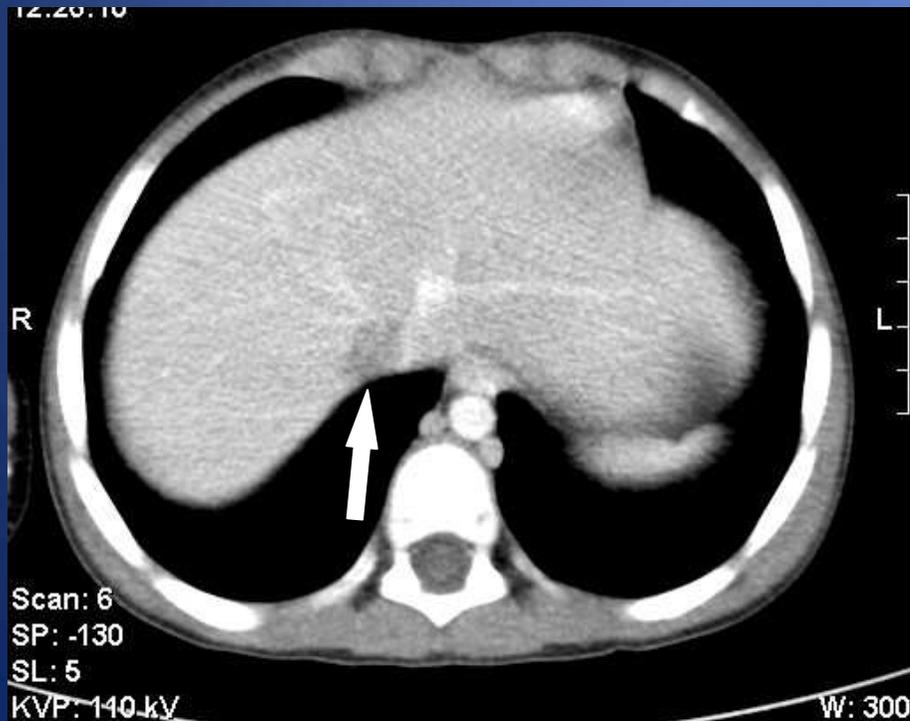
Radicalism of operations (R₀-75%)

Level of thrombus spreading	n	
	R ₀	R _{1/2}
Renal veins	8	3
Infrahepatic segment of IVC	7	1
Retrohepatic segment of IVC	3	2
Total	18	6

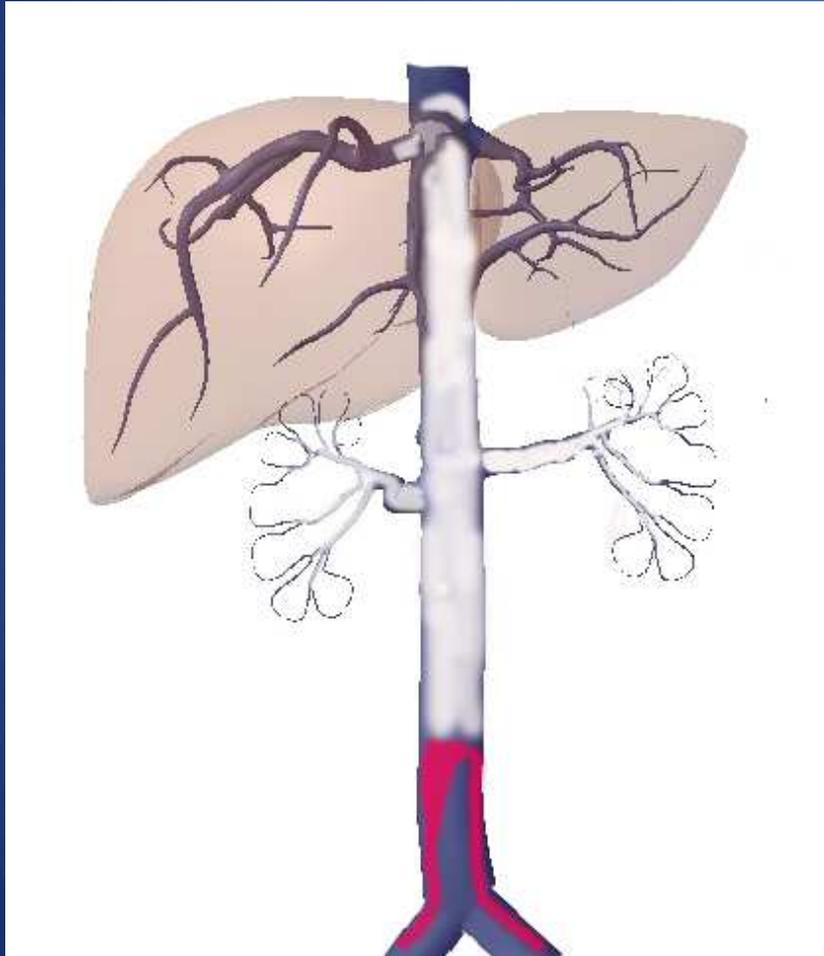
Case # 1:

4 y.o. male.

Diagnosis: Wilms' tumor at the left pT₃N₀M₀, tumor's thrombus IVC (retrohepatic segment), 4 courses of neoadjuvant chemotherapy.

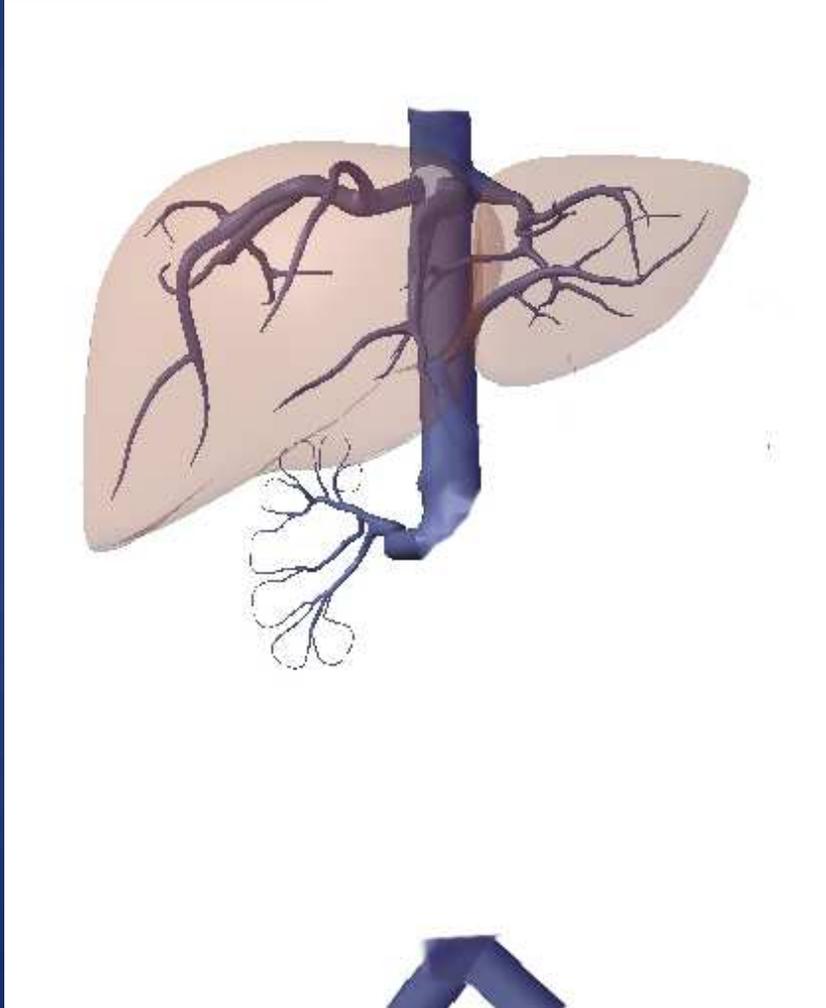


Vascular extension

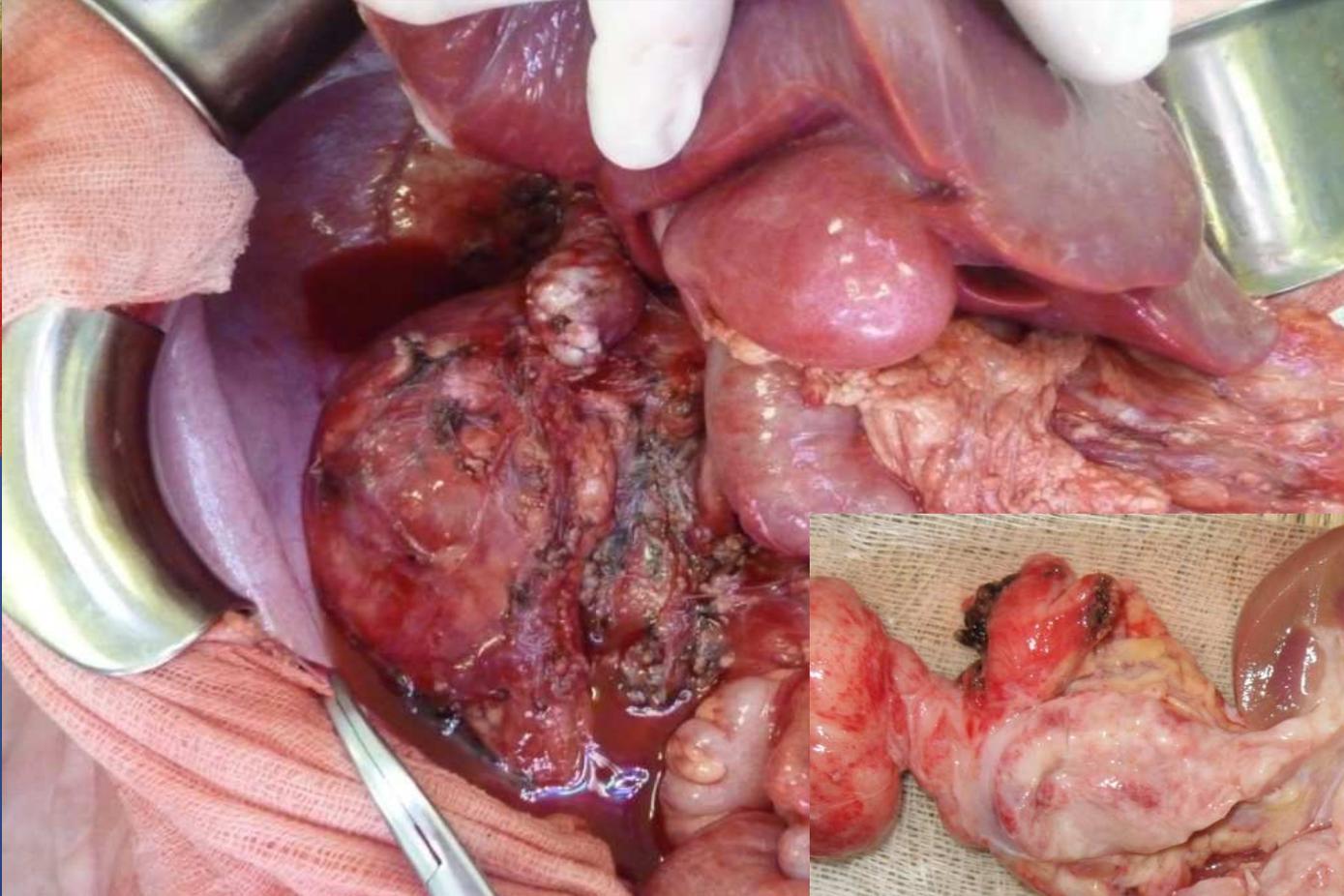


Adhesion and occlusion tumor's thrombus IVC involved retrohepatic segment with spreading to contralateral renal vein, right hepatic vein and infrarenal segment of IVC.

Operation



Left nephradrenalectomy,
thrombectomy with
resection of infrarenal
segment of IVC,
reconstruction of right
renal and right hepatic
veins



The time of operation – 390 min

Blood loss – 2000,0 ml

Using Cell-Saver with high degree of clearing
«on line» has been returned 600,0 ml of autoblood

In postoperative period: blood clot was in
retrohepatic segment of IVC with partial
recanalisation
by the 12th day

Discharge - on the 13 day

Remission – 19 months

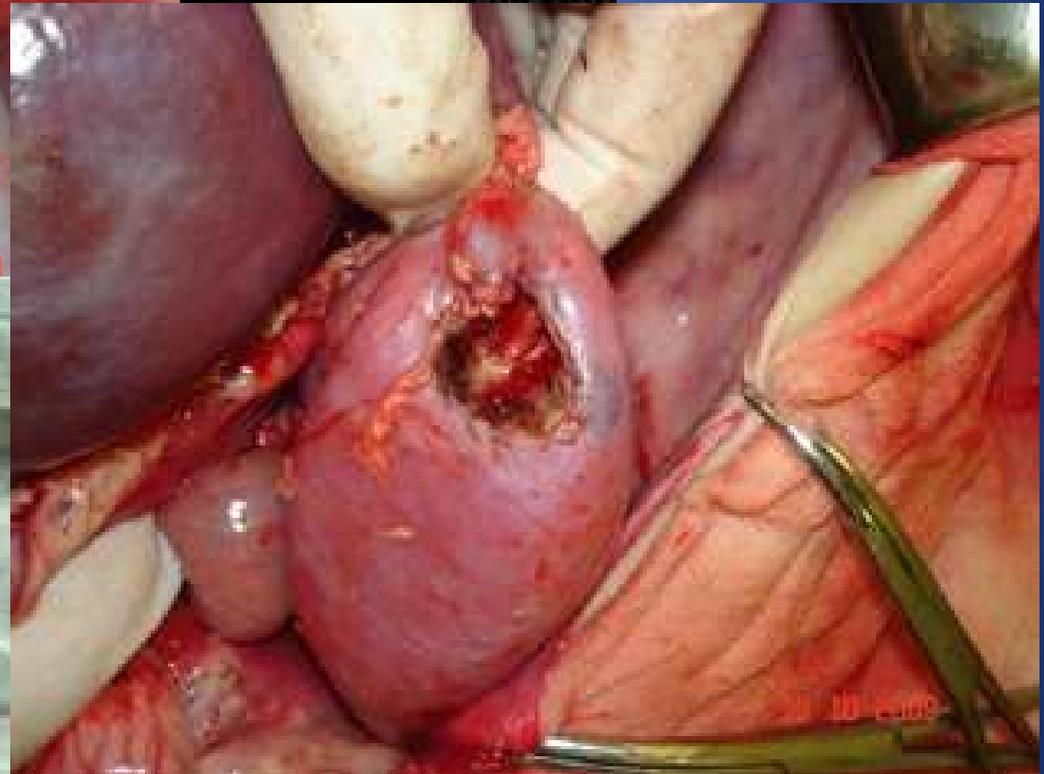
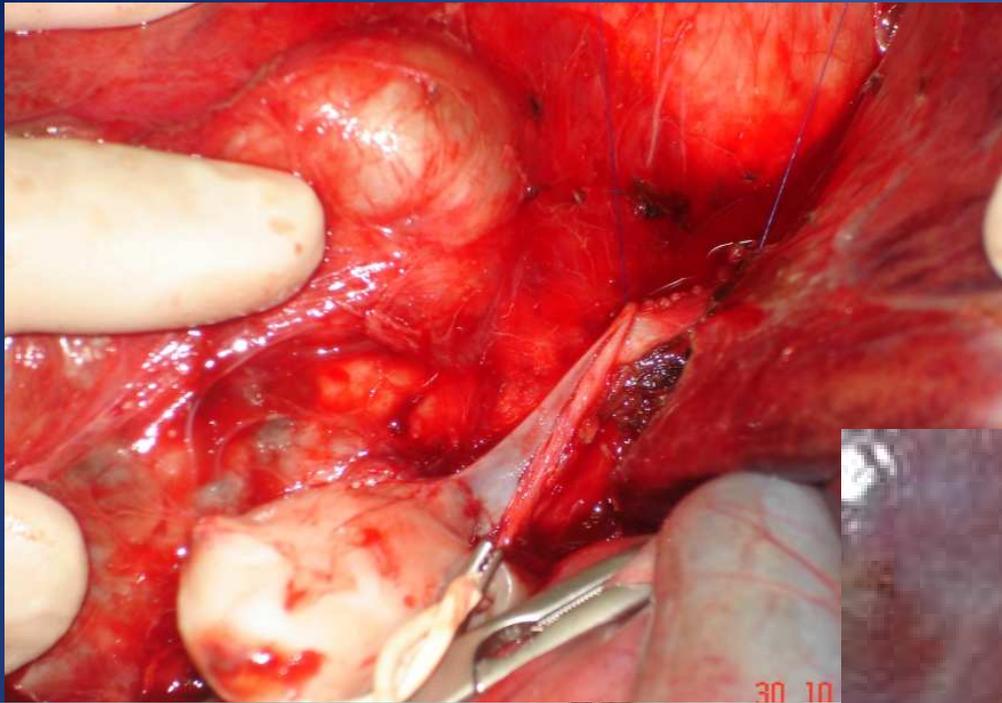
Case # 2:

The boy 2 years

Diagnosis: Bilateral nephroblastoma;
thrombus in IVC (retrohepatic
segment); 4 courses of neoadjuvant
chemotherapy

Operation:

right nephradrenalectomy,
thrombectomy of IVC, resection of
the left kidney and para-aortal
dissection



Operation time – 270 min

Blood loss – 100 ml

No complications

Discharge – on the 12th day

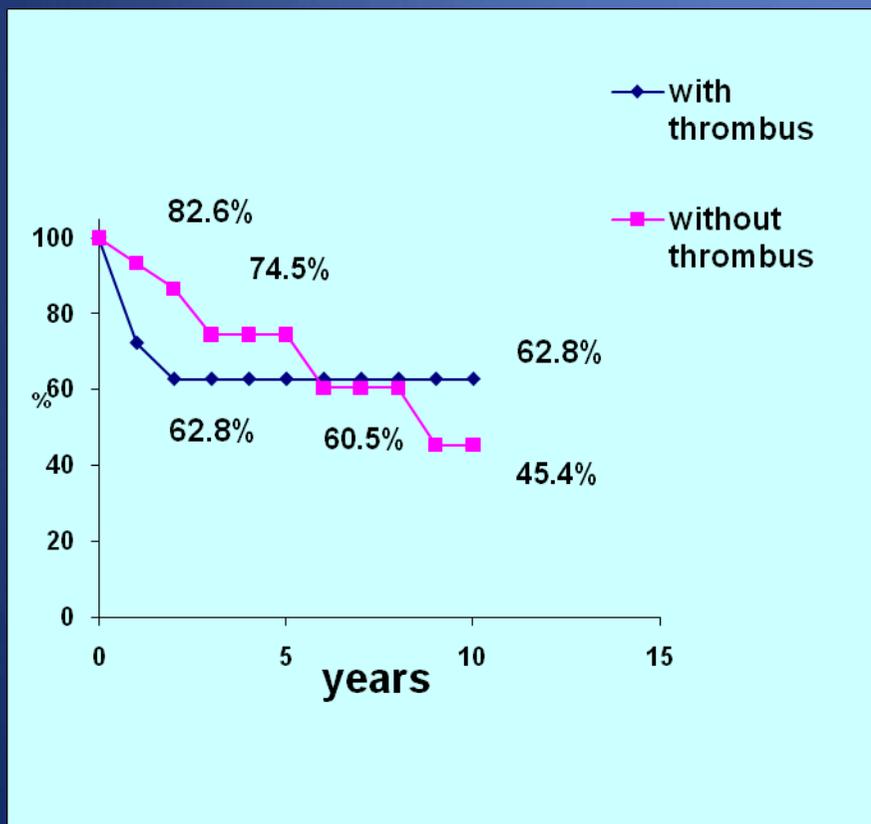
Remission – 24 months

Survival

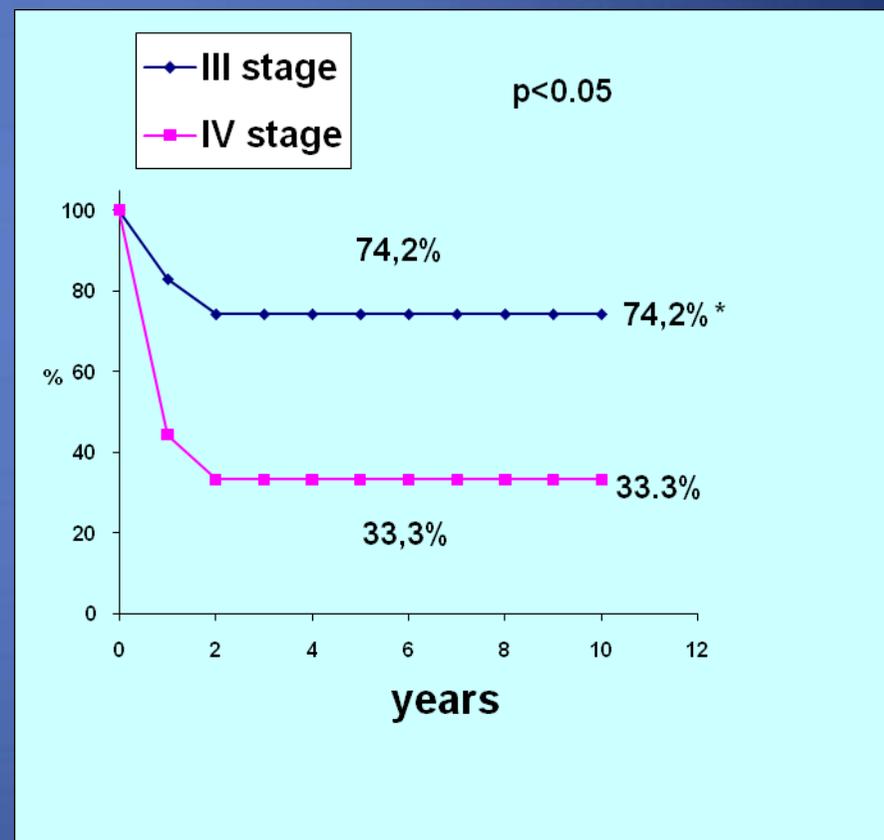
Criteria	Survival	Comments
Overall Survival (2y and 5y) with thrombus	62.8%	9 died during 2 y (8 – progression)
III and IV stages	74.2% and 33.3%	P<0.05
Overall survival without thrombus for III and IV st	74.5%	P<0.05
Histology: nonclassif. rhabdoid typical	80% 66.7% 58.8%	~t 1.95
Radicalism: Ro R1/2	64% 57.1%	P>0.05
Adjuvant Chem.: with without	65.5% 33.3%	t 1.95
Adjuvant RT: with and without	66.7% and 0%	

Survival (20 alive from 33)

Overall survival in cohorts with and without thrombus

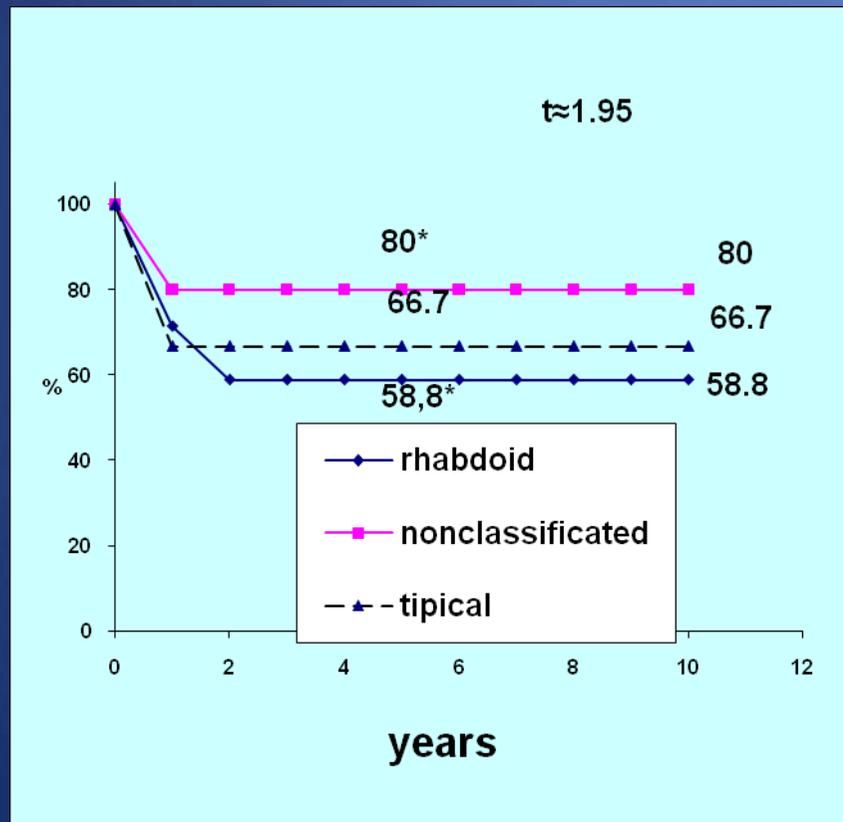


Overall survival in patients with thrombus in III and IV stages

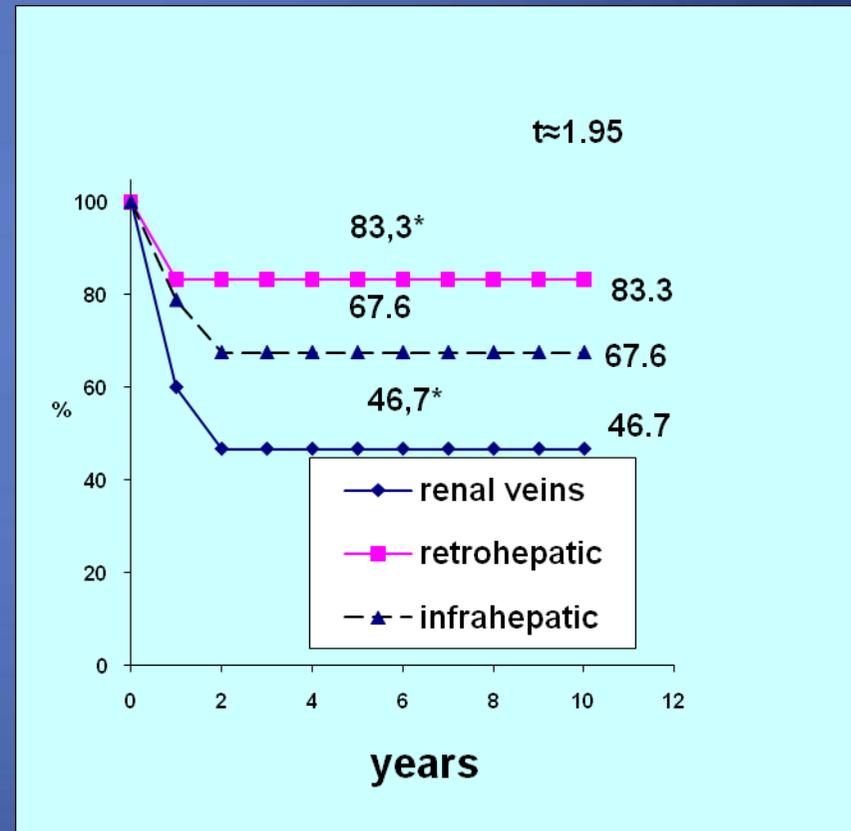


Survival

Overall survival depends on histology



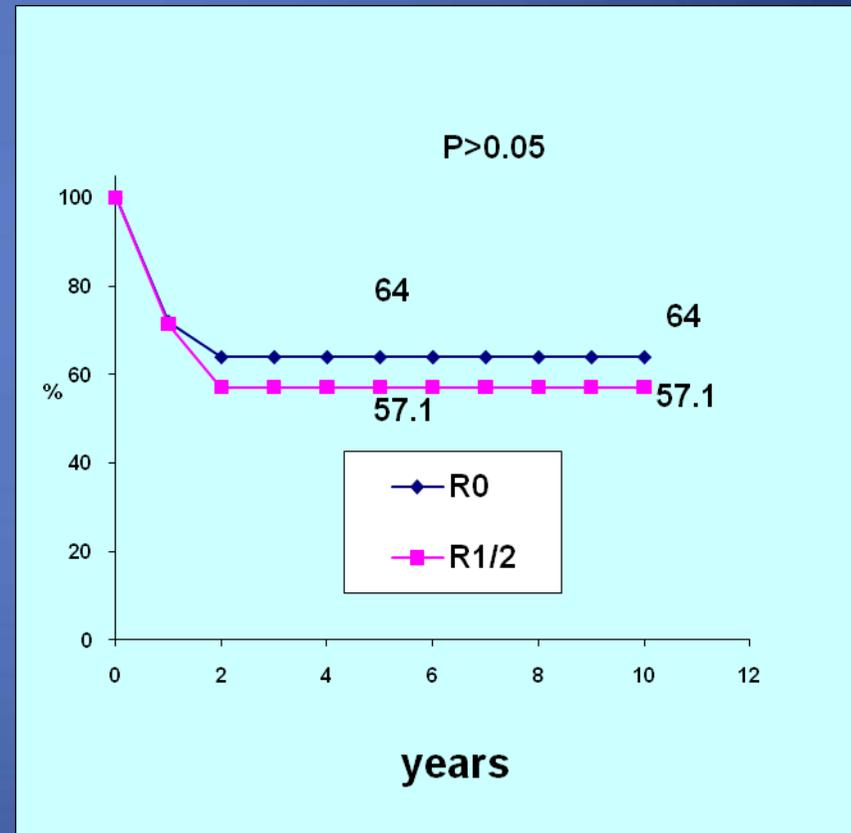
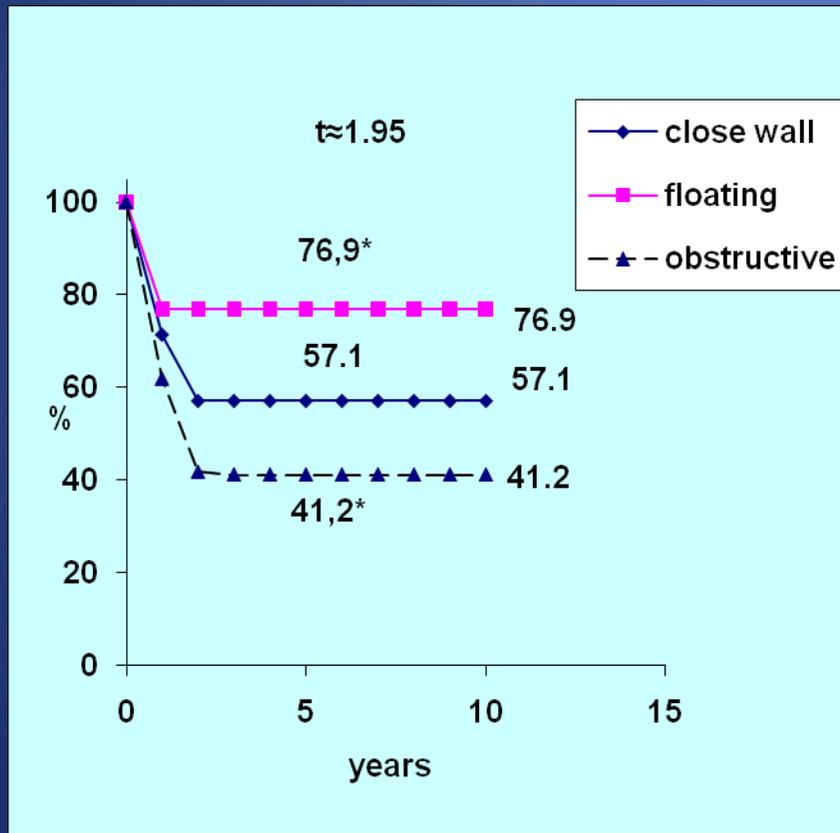
Overall survival depends on spreading in IVC



Survival

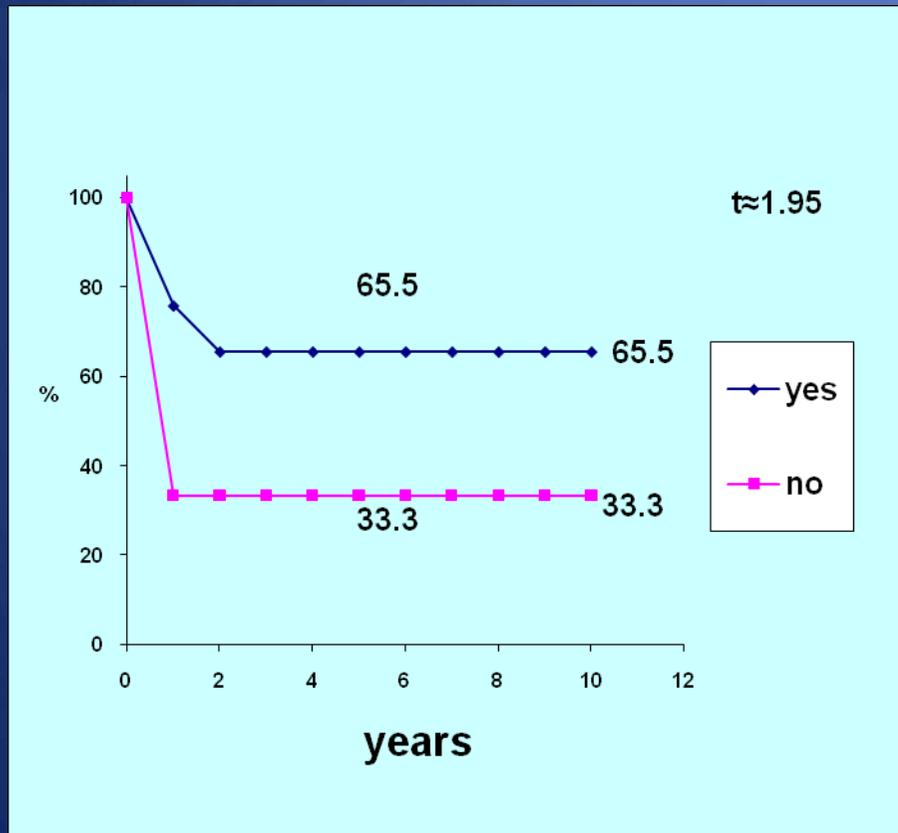
Overall survival depends on features of thrombus

Overall survival depends on radicalism of surgery



Survival

Overall survival depends on use chemotherapy



Overall survival depends on use radiation therapy



Conclusion:

- 1. Survival better in III stage than in IV
- 2. Tendency to increase survival : after neo- and adjuvant chem.; with floating thrombus, with nonclassif. histology thrombus
- 3. Not correlation between survival and thrombus spreading in IVC
- 4. Radiation therapy increase survival

Treatment strategy

The same as for III-IV stages of Wilms' tumor without thrombus in IVC

(SIOP 2001/04)

- Chemotherapy
- Surgery
- Chemotherapy + RT

What's Important ?!

- Preoperative chemotherapy!!!
- To know extension of thrombus before operation
- To know features of thrombus: floating or adhesive
- During each emergency nephrectomy should be careful to perform an examination of IVC and renal veins (prevent embolic complications)

