



# Retroperitoneal Soft Tissue Sarcoma: Advances and Challenges in Surgical Techniques

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# Sarcomas – difficult to treat because

- Paucity of randomised studies
- Anatomical location and route of spread make for difficult surgery

# Rare disease

- ASR\*  
STS Male – 5.12 / 100,000 Female – 4.58 / 100,000  
Colorectal Male – 53 / 100,000 Female – 47 / 100,000  
i.e. 1% of adult and 15% of paediatric malignancies
- Diverse histological subtypes
- Heterogeneous biological behaviour

# Differential Diagnosis

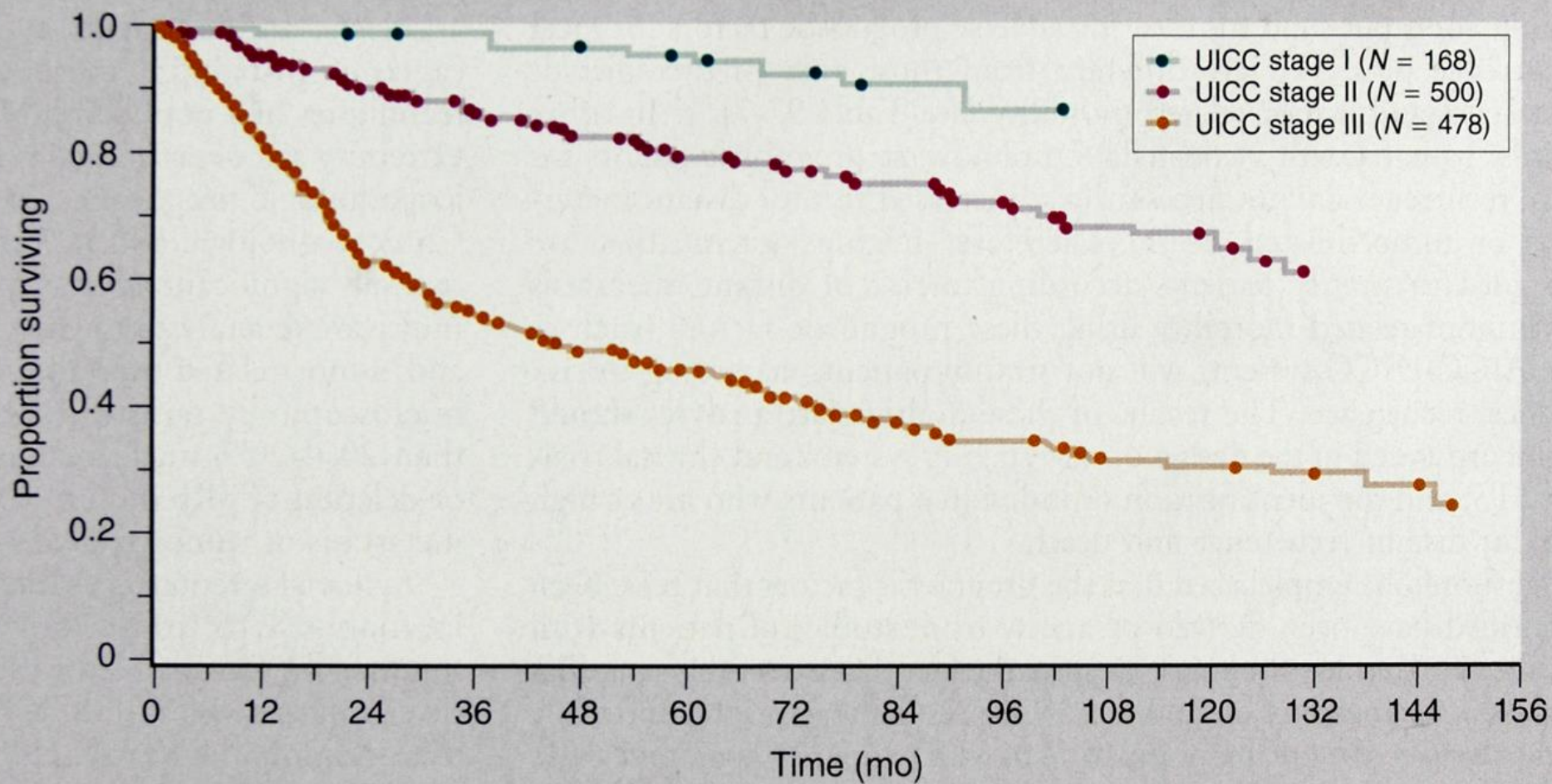
- Angiomyolipoma
- Pheochromocytoma
- Lymphoma

**Table 97-6 AJCC/UICC Staging System for Soft-Tissue Sarcoma**

T1		≤5 cm		
T1a		Superficial to muscular fascia		
T1b		Deep to muscular fascia		
T2		>5 cm		
T2a		Superficial to muscular fascia		
T2b		Deep to muscular fascia		
N1		Regional nodal involvement		
G1		Well-differentiated		
G2		Moderately differentiated		
G3		Poorly differentiated		
G4		Undifferentiated		
Stage IA	G1, 2	T1a, b	N0	M0
Stage IB	G2, 2	T2a, b	N0	M0
Stage IIA	G3, 4	T1a, b	N0	M0
Stage IIB	G3, 4	T2a	N0	M0
Stage III	G3, 4	T2b	N0	M0
Stage IV	Any G	Any T	N1	M0
	Any G	Any T	Any N	M1

Modified from Greene FL et al (eds.): UICC TNM Classification of Malignant Tumors, 6th ed. [LOC.], Springer Verlag, 2002.







**Table 97-7 Multivariate Analysis of Prognostic Factors in Patients with Extremity Soft-Tissue Sarcoma**

<b>Endpoint</b>	<b>Adverse Prognostic Factor</b>	<b>Relative Risk</b>
Local recurrence	Age > 50 years	1.6
	Local recurrence at presentation	2.0
	Microscopically positive margin	1.8
	Fibrosarcoma	2.5
	Malignant peripheral nerve tumor	1.8
Distant recurrence	Size 5.0–10.0 cm	1.9
	Size > 10.0 cm	1.5
	High-grade	4.3
	Deep location	2.5
	Local recurrence	1.5
	Leiomyosarcoma	1.7
	Other nonliposarcoma histology	1.6
Disease-specific survival	Size > 10.0 cm	2.1
	Deep location	2.8
	Local recurrence at presentation	1.5
	Leiomyosarcoma	1.9
	Malignant peripheral nerve tumor	1.9
	Microscopically positive margin	1.7
	Lower-extremity site	1.6

Adverse prognostic factors identified are independent by Cox regression analysis.  
Modified from Pisters PWT, Leung DHY, Woodruff JM, et al: Analysis of prognostic factors in 1041 patients with localized soft tissue sarcomas of the extremities. J Clin Oncol 1996;14:1679.

# Challenges in Management of Retroperitoneal Sarcoma

- **Difficulty of preoperative biopsy**
  - tissue diagnosis before treatment

- 60 year old male from Indonesian
- Percutaneous biopsy – low grade sarcoma or paraganglioma
- Treated definitively with chemotherapy!
- Came to NCC for second opinion







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- Biopsy and frozen section at NCC -  
?Lymphoma
- Final histology -  
paraganglioma



- Re-laparotomy and resection of tumour
- Final histology – hemangiopericytoma
- Presented at Joint Tumour Board – no role for adjuvant chemo or radiation therapy



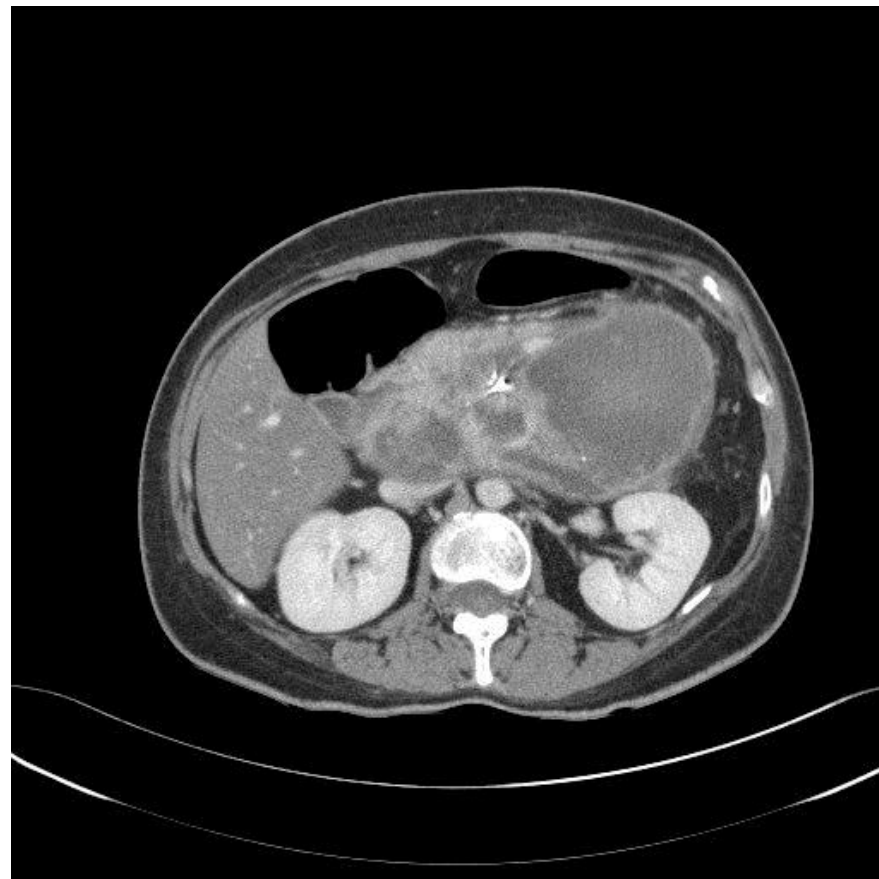
# Challenges in Management of Retroperitoneal Sarcoma

- Difficulty of preoperative biopsy
- **Anatomical proximity and compression**
  - 40y Chinese female
  - Initially presented with vague abdominal pain
  - CT Abdomen and Pelvis performed showed a large 17 x 9 x 10cm retroperitoneal mass centered around the duodenal C loop with the pancreatic head, inseparable from it, compressing the inferior vena cava with the superior mesenteric artery draping over the mass.

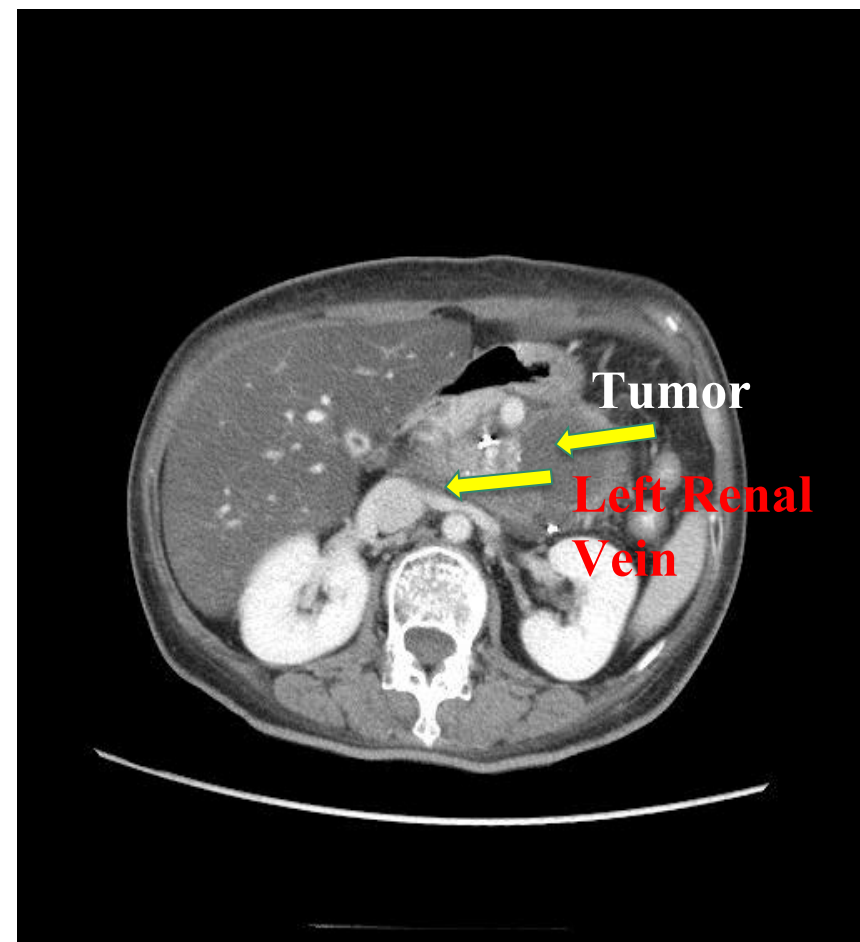
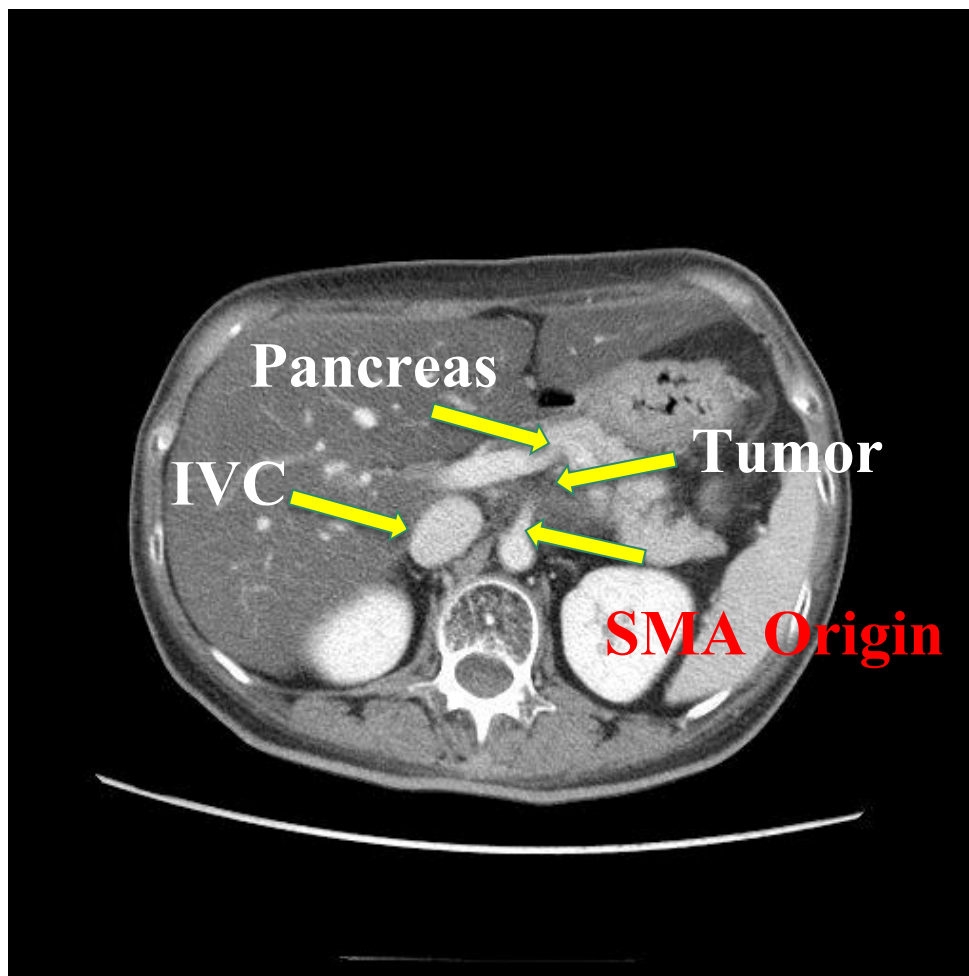


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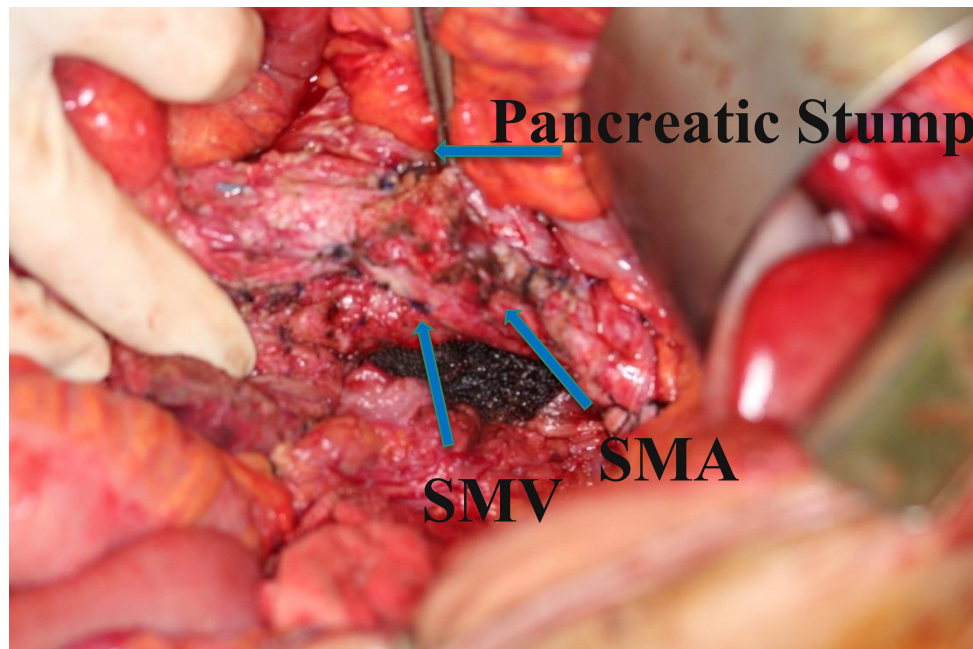
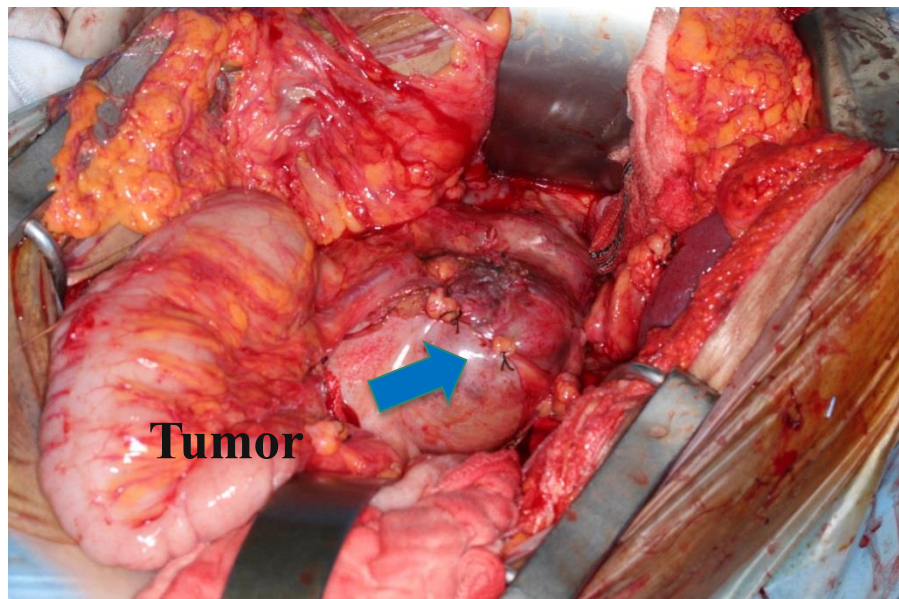


- She underwent 6 cycles of chemotherapy, last cycle given on 5/9/12
- Had radiation preoperative to downsize the tumour further





Underwent elective resection of retroperitoneal tumour and subtotal pancreatectomy



- Histology –Synovial sarcoma
- 12 month follow-up – disease free

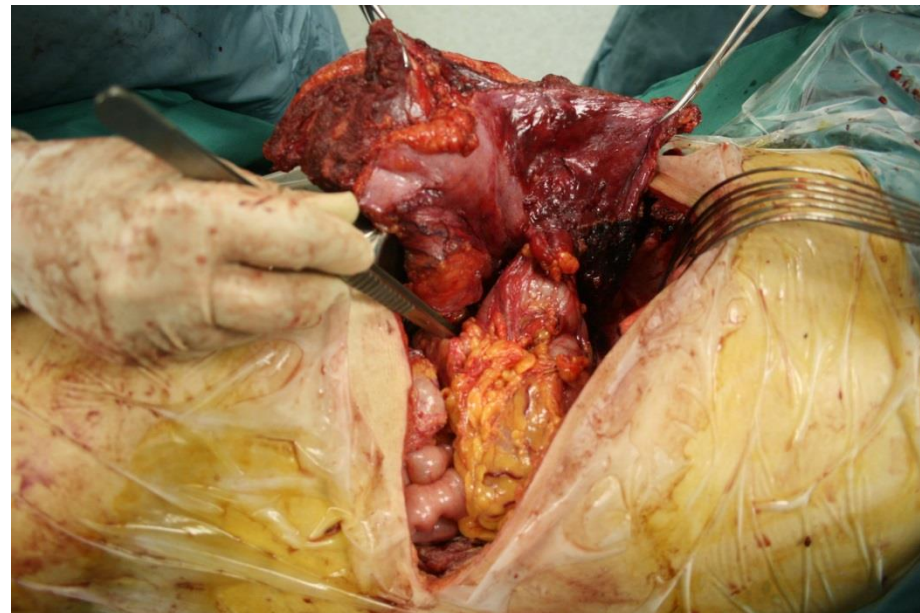
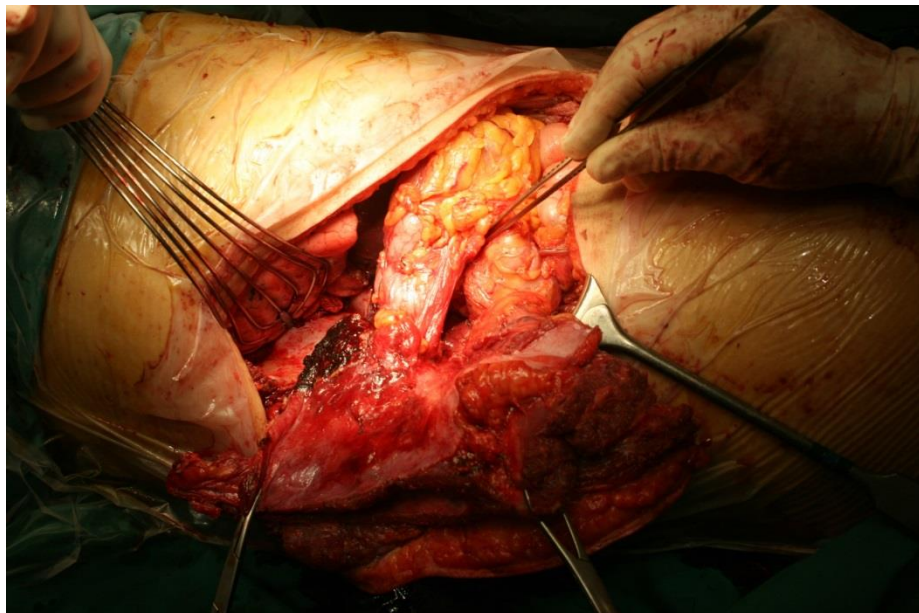
- Difficulty of preoperative biopsy
- Anatomical proximity and compression
- **Late presentation/Recurrence**





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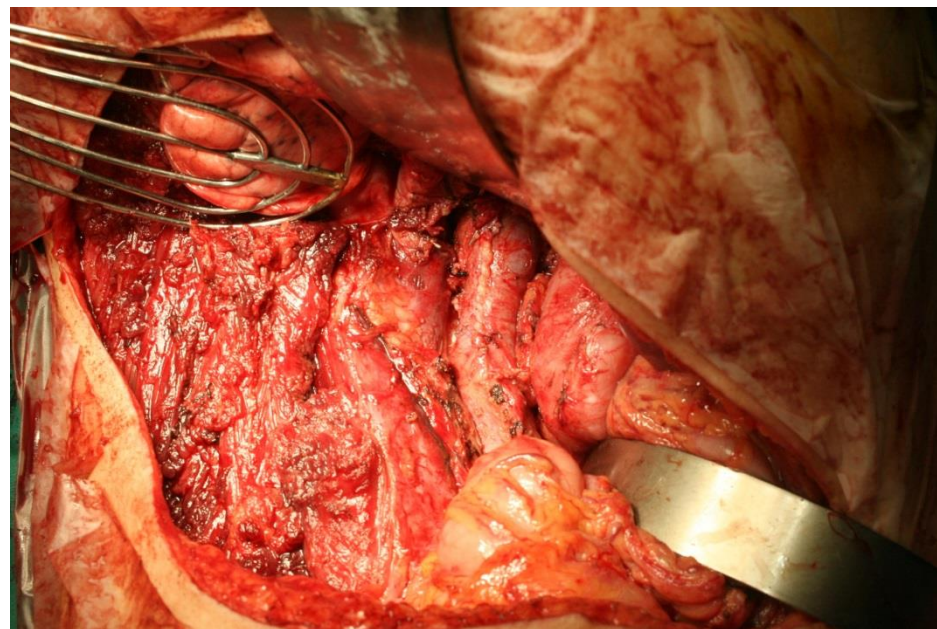
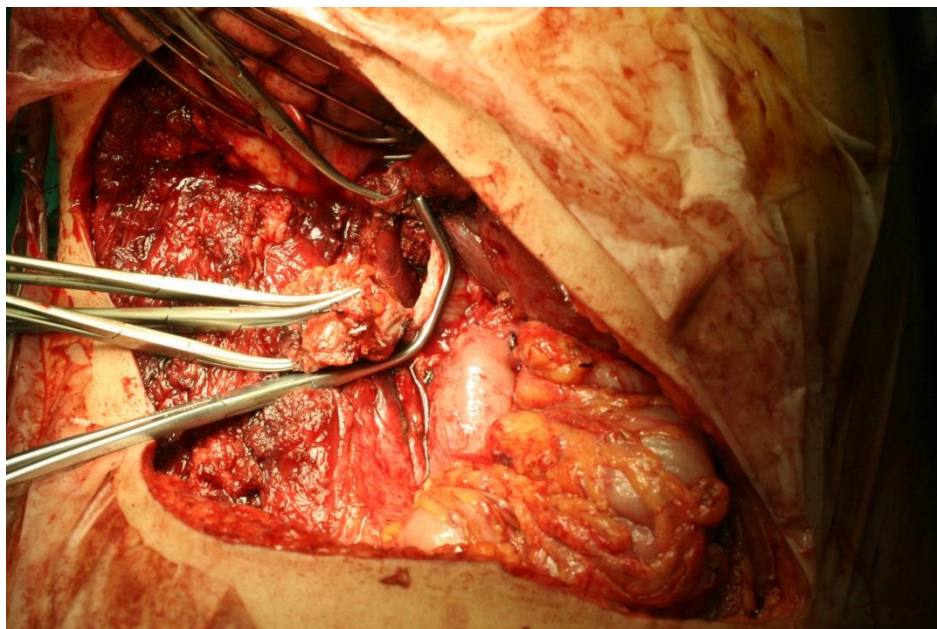






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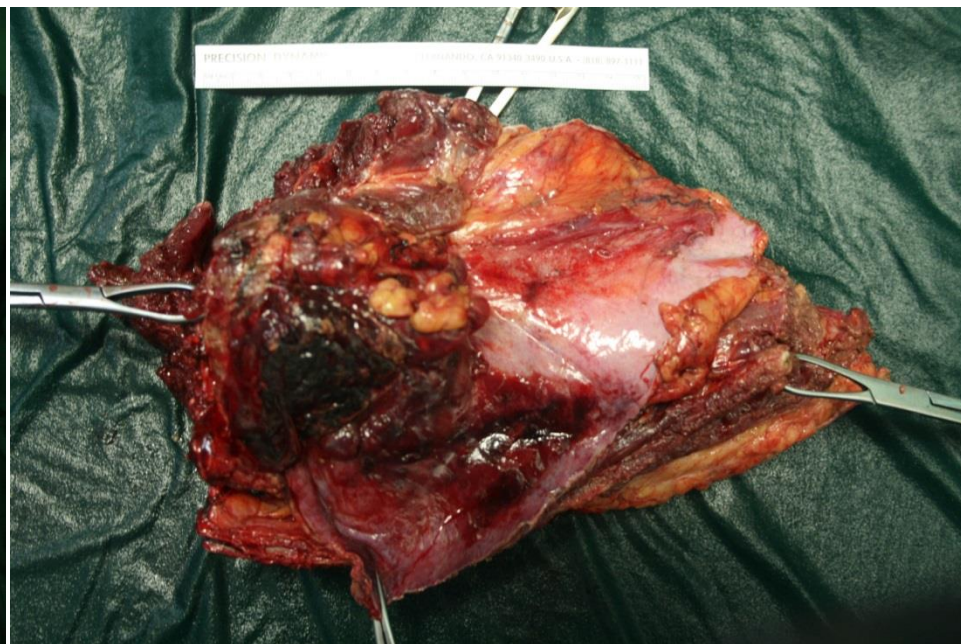
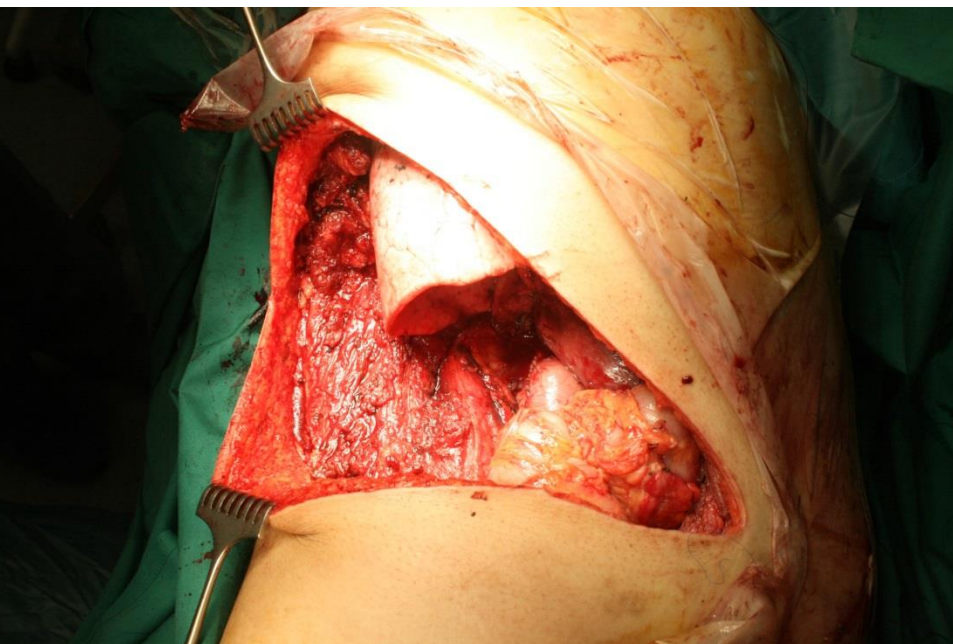
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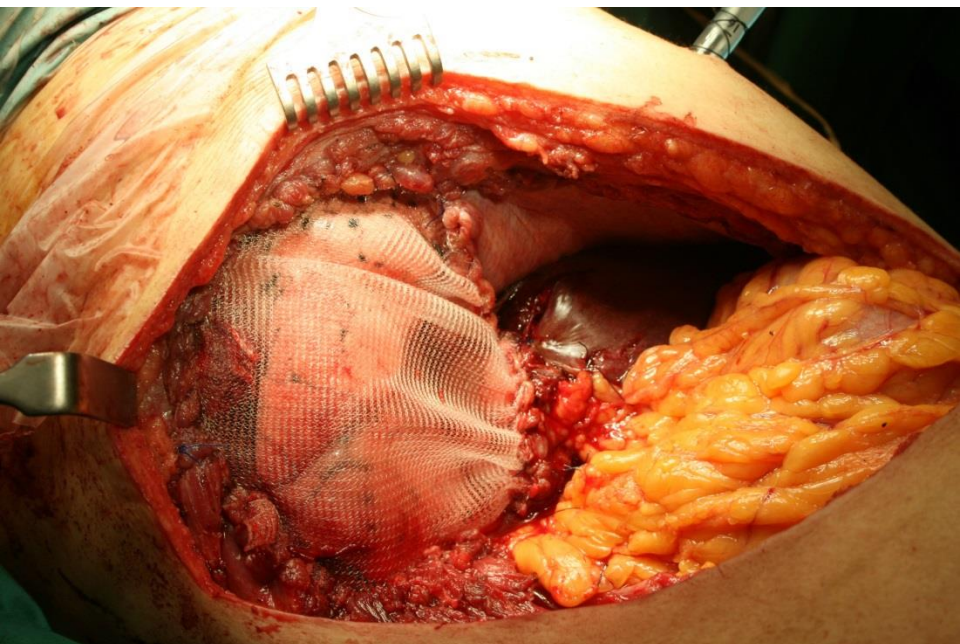






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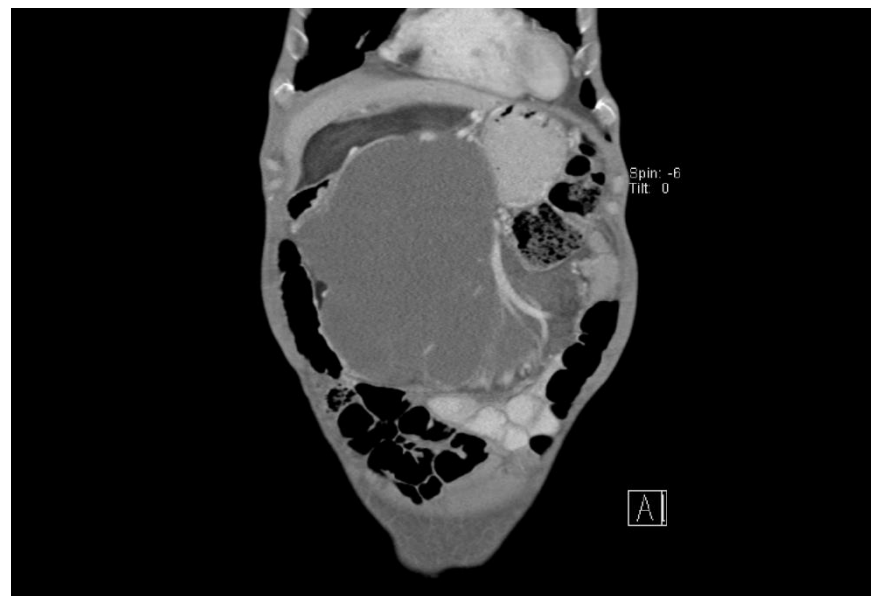


- Difficulty of preoperative biopsy
- Anatomical proximity and compression
- Late presentation
- **Clear surgical margins**
  - 70 / Chinese / Male
  - Multiple laporotomies for recurrent liposarcomas in the last 5 years
  - Recent laporotomy 4 months ago.
  - Deemed inoperable because of tumour being adjacent-invasion of major vessels.



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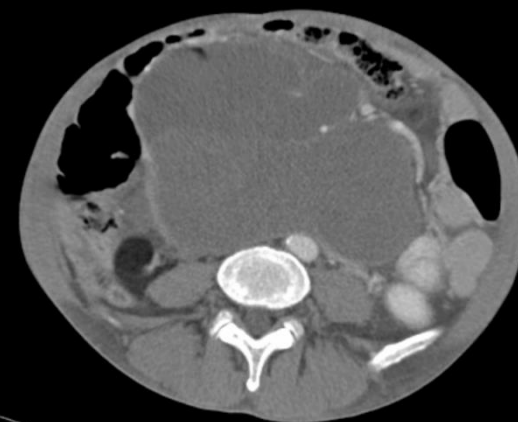
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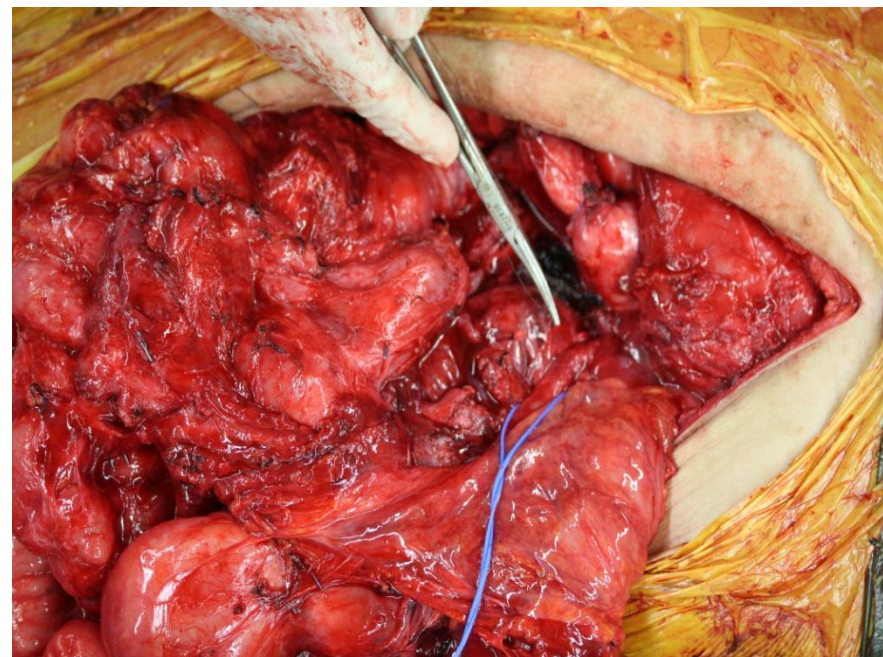
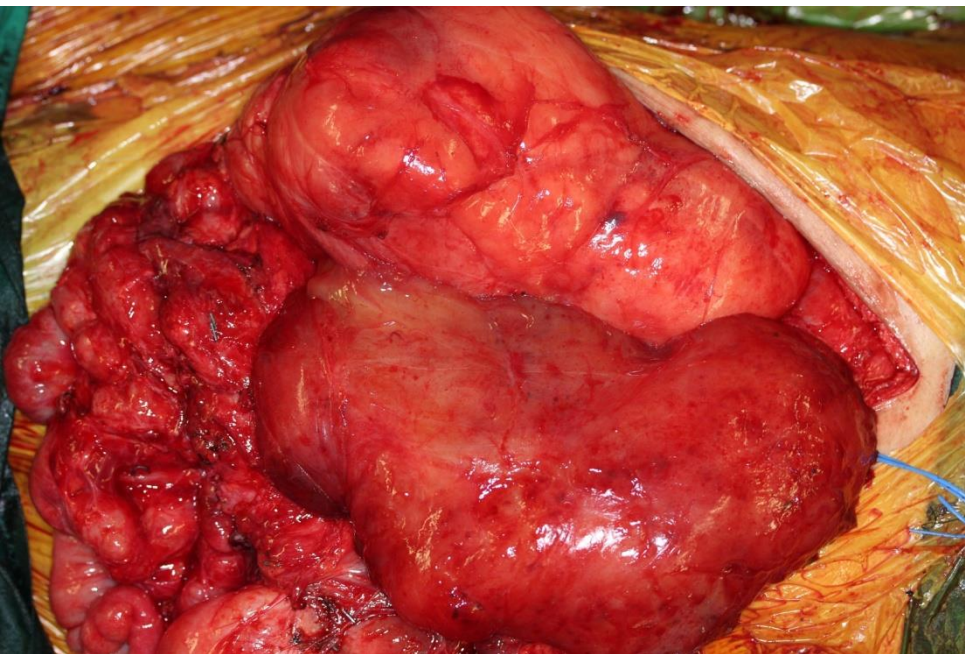






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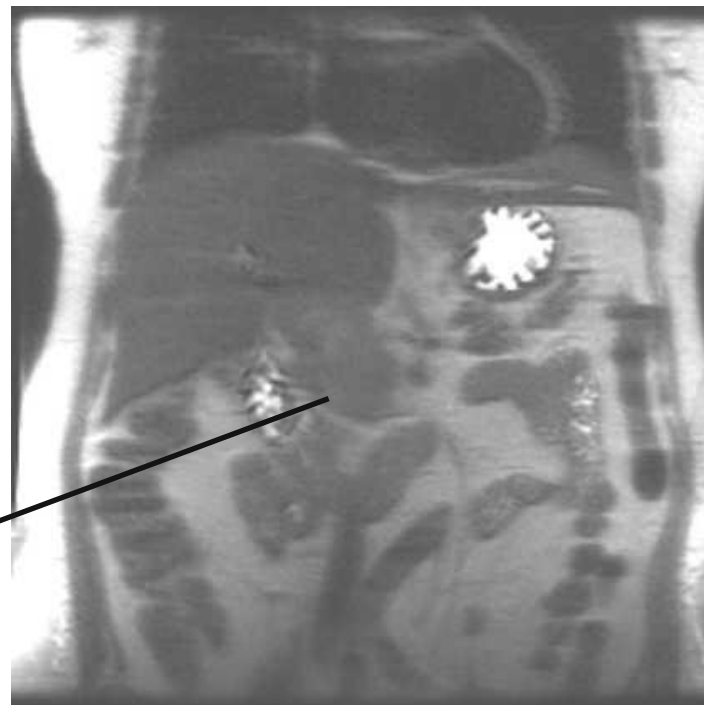
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- Difficulty of preoperative biopsy
- Anatomical proximity and compression
- Late presentation
- Clear surgical margins
- **Major vascular involvement**

- 70 year old female from Vietnam with right hypochondrial pain



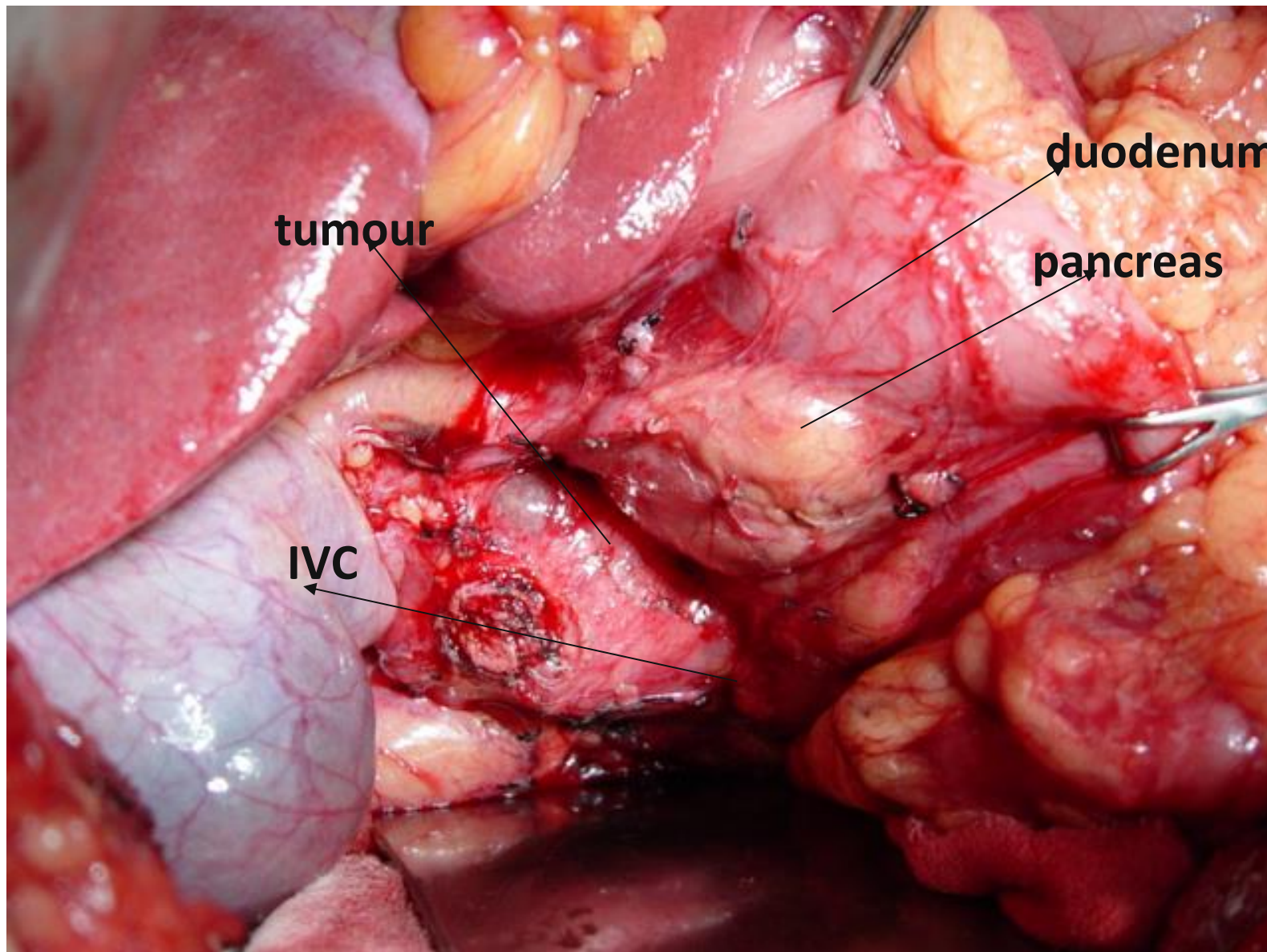
Mass in the region of head of pancreas involving the IVC





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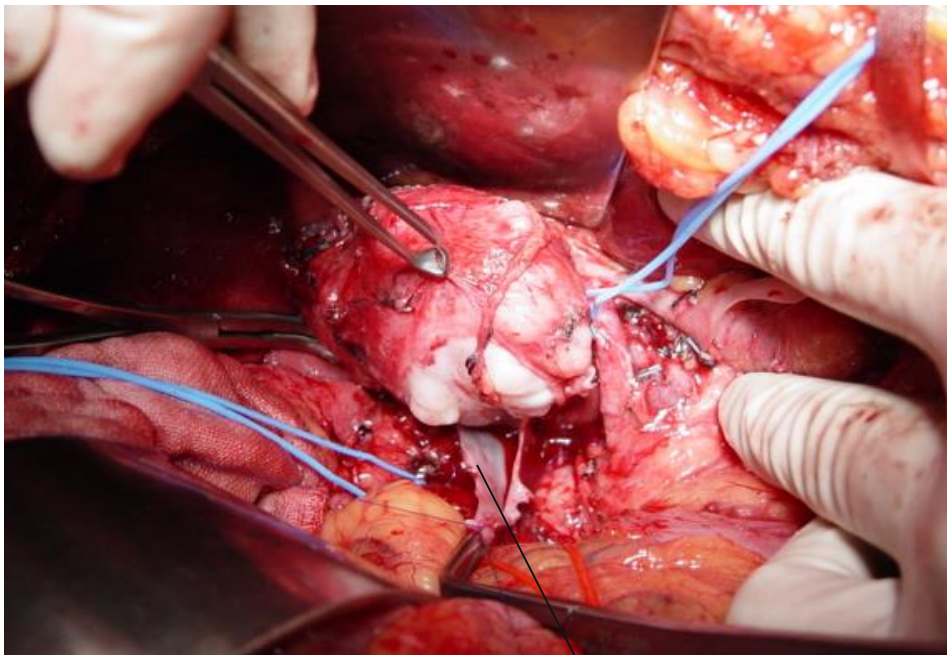


tumour

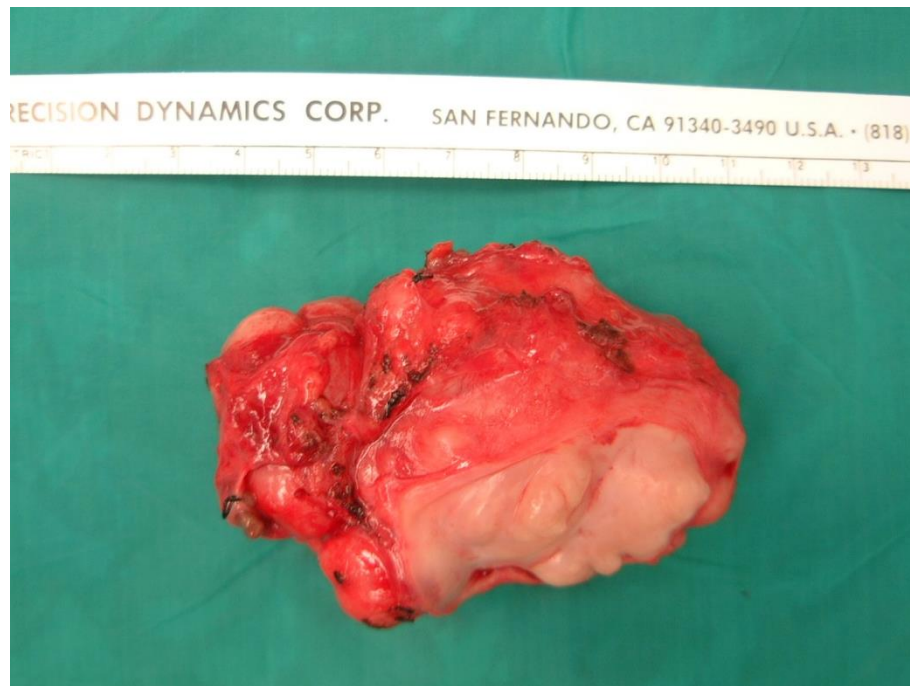
duodenum

pancreas

IVC



IVC  
Lumen



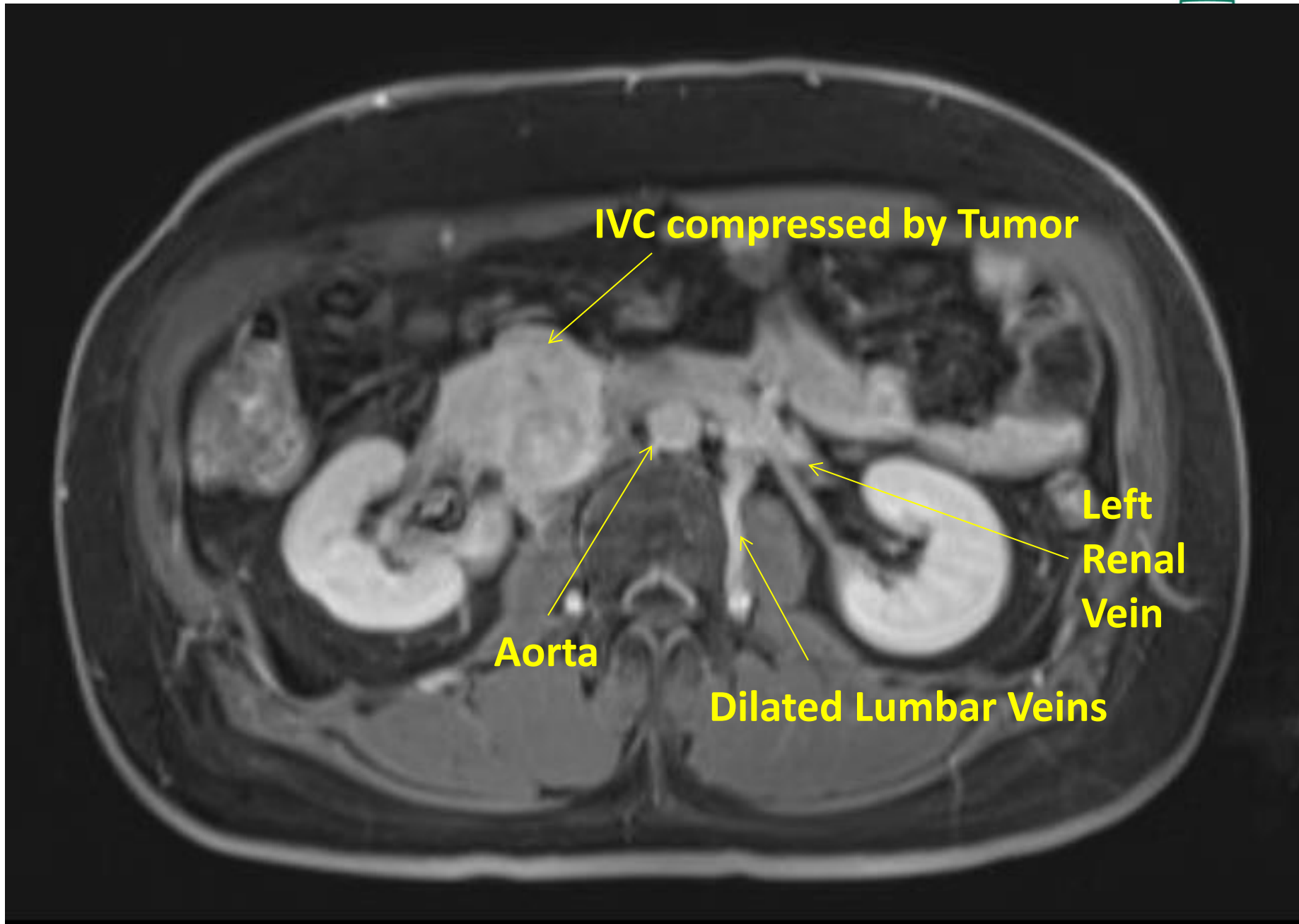
Caval leiomyosarcoma



# Surgery for retroperitoneal sarcoma requiring major vascular resection and reconstruction

Teo MC, Cheow PK, KC Soo  
Asian Journal of Surgery 2005

- Difficulty of preoperative biopsy
- Anatomical proximity and compression
- Late presentation
- Clear surgical margins
- Major vascular involvement
- **Treatment in multidisciplinary centre vs surgeons / medical oncologists who have occasional encounters with STS**
  - 35/Chinese/Male
  - Retroperitoneal mass seen in the region of the second and third part of the duodenum encasing the right renal artery and compressing the IVC
  - Treated for 1 year with chemotherapy
  - Consulted Peter MacCallum Cancer Centre who referred patient to NCCS



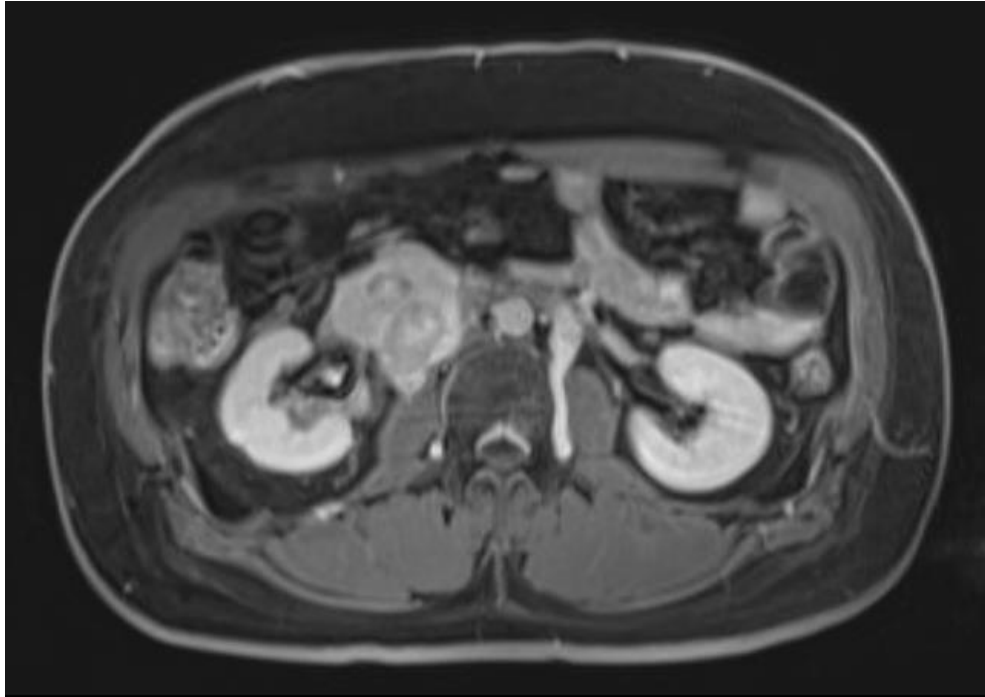
**IVC compressed by Tumor**

**Left  
Renal  
Vein**

**Aorta**

**Dilated Lumbar Veins**

# Surgical Considerations



- Preservation of left kidney by transecting left renal vein medial to lumbar vessel
- Ureteric stents to measure right and left renal function
- Right nephrectomy and IVC resection
- Consideration for right renal auto-transplantation



Local recurrence rate was 2.45x higher in patients who were not referred, 1.3x higher in the patients who were referred after surgery than in patients who were referred to a multidisciplinary tumour centre before any manipulation of the tumour.

*Soft tissue sarcomas should be treated at a tumour centre : a comparison of quality of surgery in 375 patients  
Acta Orthop Scand 1994, 65 : 47*

# RPS Analysis of French Sarcoma Research Group

- 1988 – 2008
- 12 centres, 586 patients
- Multivariate analysis
- Local recurrence – gender, organ involvement, piecemeal resection, specialisation of surgeon, perioperative radiotherapy
- Abdominal sarcomatosis – piecemeal resection, specialisation of surgeon
- Distal metastasis – histology, organ involvement
- Overall survival – age, gender, grade, adjuvant organ involvement, piecemeal resection

# NCCS-SGH

## 1990 - 2014

Patient demographics	Number of patients
Gender	N=85
Male	40
Female	45
Median age	55 (range: 27-79)
Median size of tumour	16.5cm
Grade of tumour	
High	55
Low	30

Histology	Number of patients (n=85)
Fibrosarcoma	1
Liposarcoma	61
MFH	5
Leiomyosarcoma	12
Synovial	1
Others	5

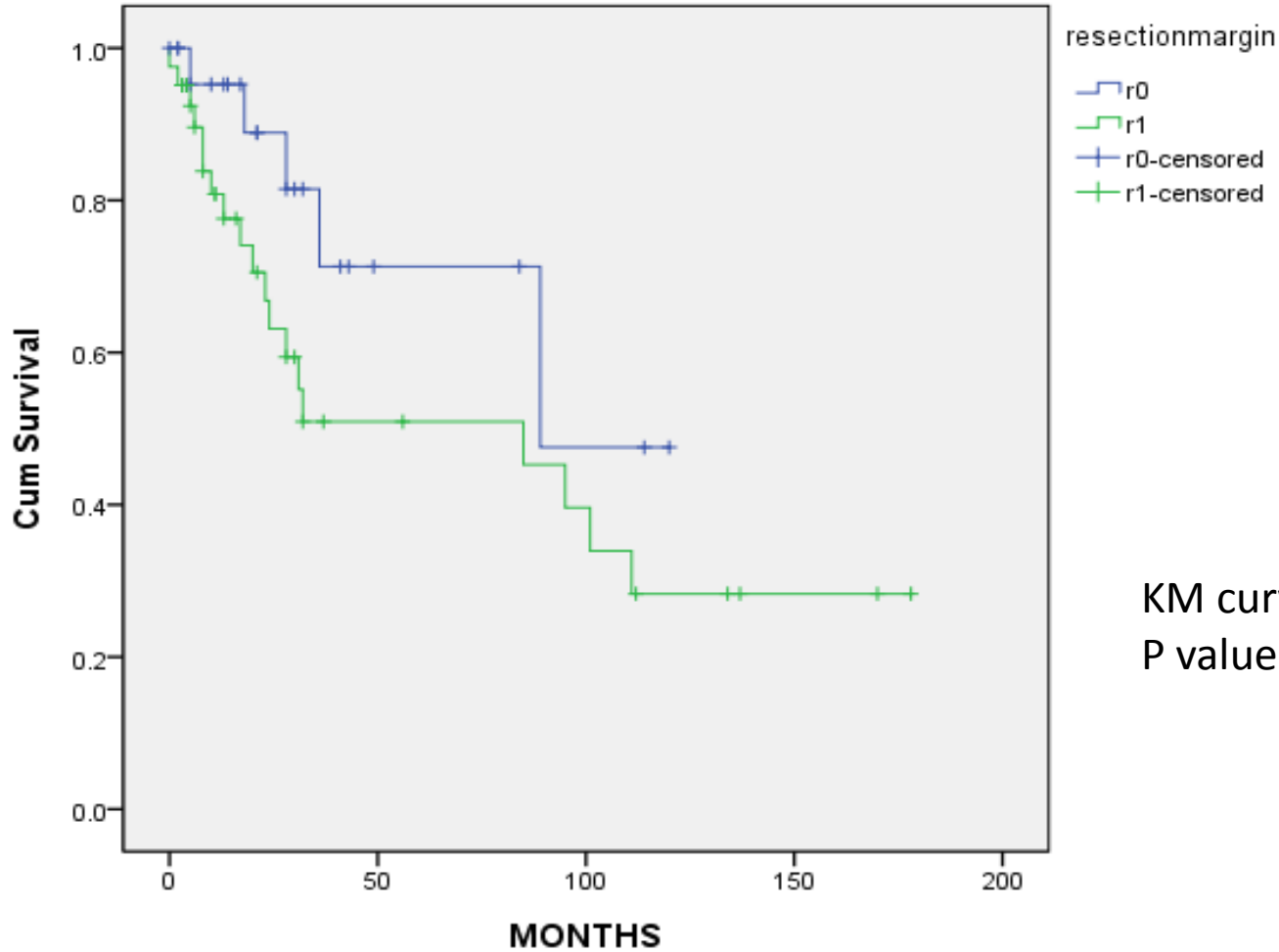
Margins – negative 35, positive 37



DFS	<b>Median: 21 months (range: 0-146)</b>
OS	Median: 45 months (range: 1-233)
Median follow up time	46 months



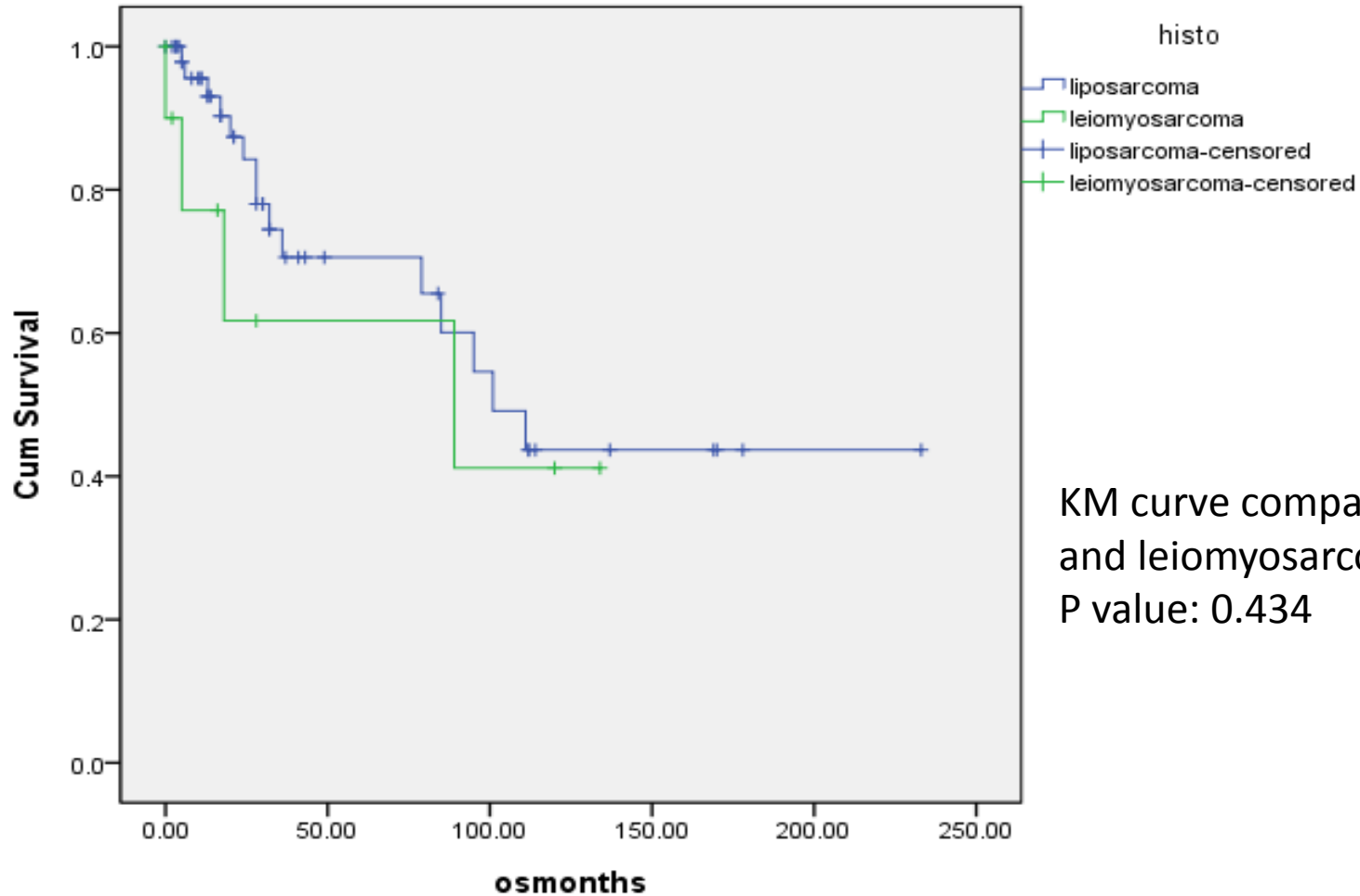
### Survival Functions



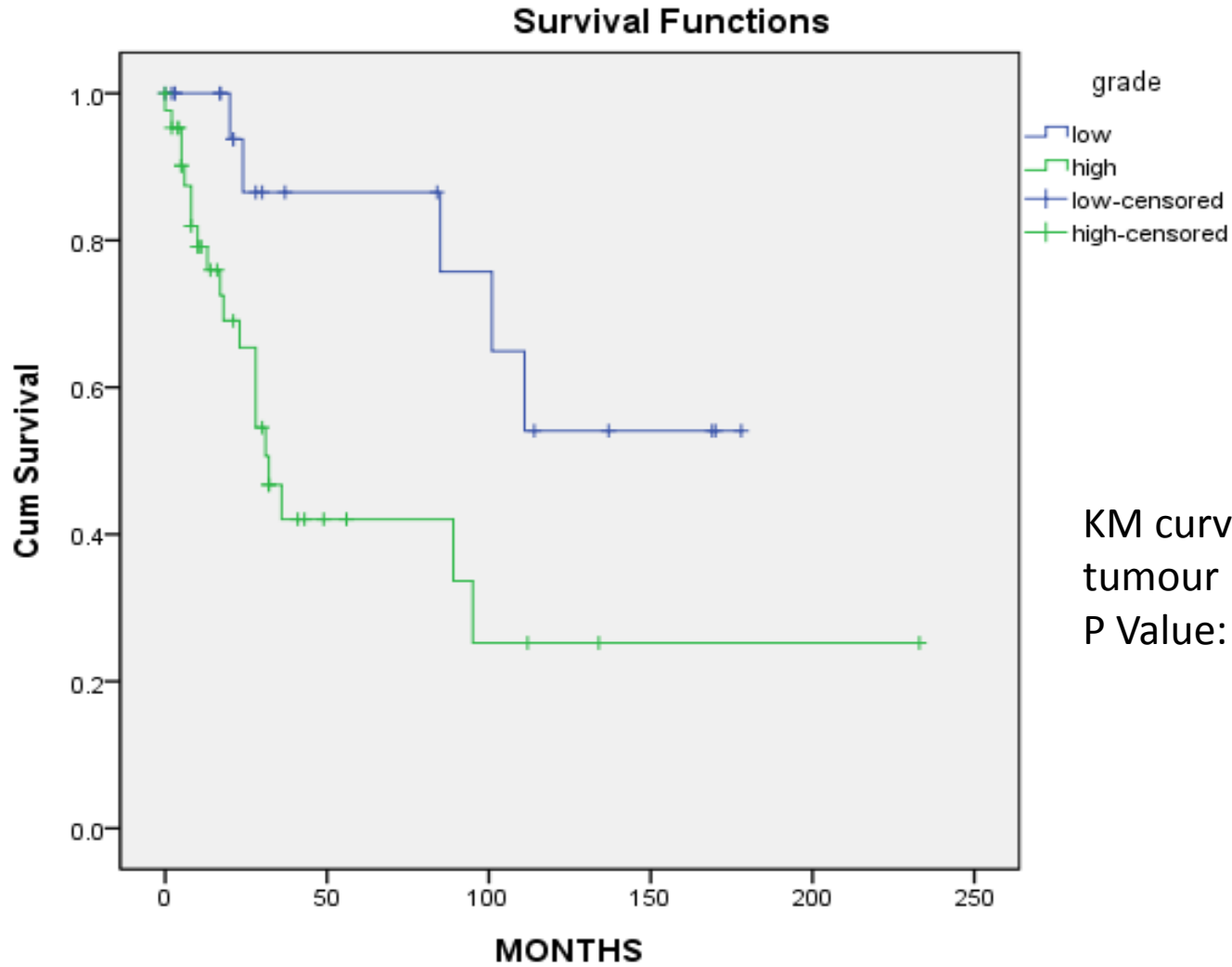
KM curve for resection margin  
P value: 0.111



### Survival Functions



KM curve comparing liposarcoma and leiomyosarcoma  
P value: 0.434



KM curve comparing grade of  
tumour  
P Value: 0.011

# **Retroperitoneal Liposarcomas: the experience of a tertiary Asian center**

Lee SY et al. World Journal of Surgical Oncology 2011





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# Thank You