

RETROPERITONEAL SARCOMA

Local Control

Dirk Strauss

Royal Marsden Hospital, London, UK

DISCLOSURE SLIDE

None

Conclusion

The current standard of care for retroperitoneal sarcoma:

- SURGERY

extended en bloc complete resection of the tumour and surrounding viscera (which may be adherent to but not necessarily invaded by the tumour)

- in an attempt to include a surrounding cuff of normal tissue around the tumour to minimise the marginality of the resection –
- safely performed in high-volume centres.



But...

Retroperitoneal sarcomas is not a single disease!

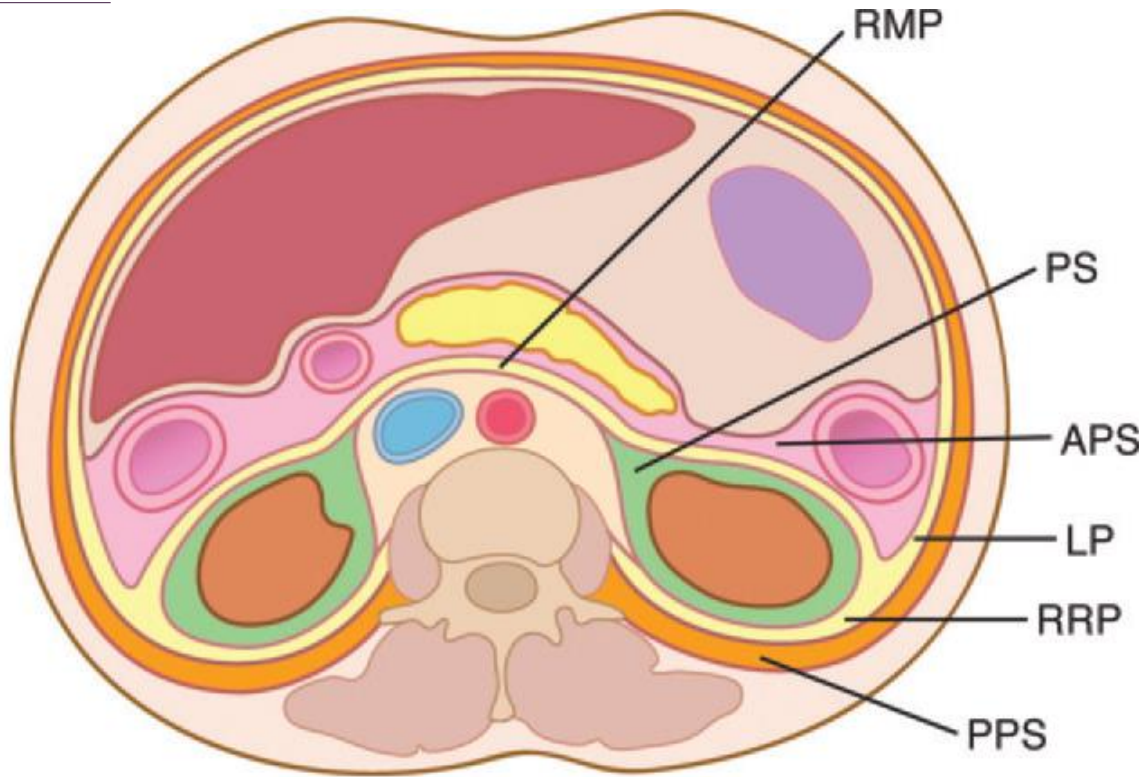
- a group of heterogeneous neoplasms
- different places/organs/structures.

Biologic behaviour, response to treatment and clinical outcomes vary by histological subtype/grade.

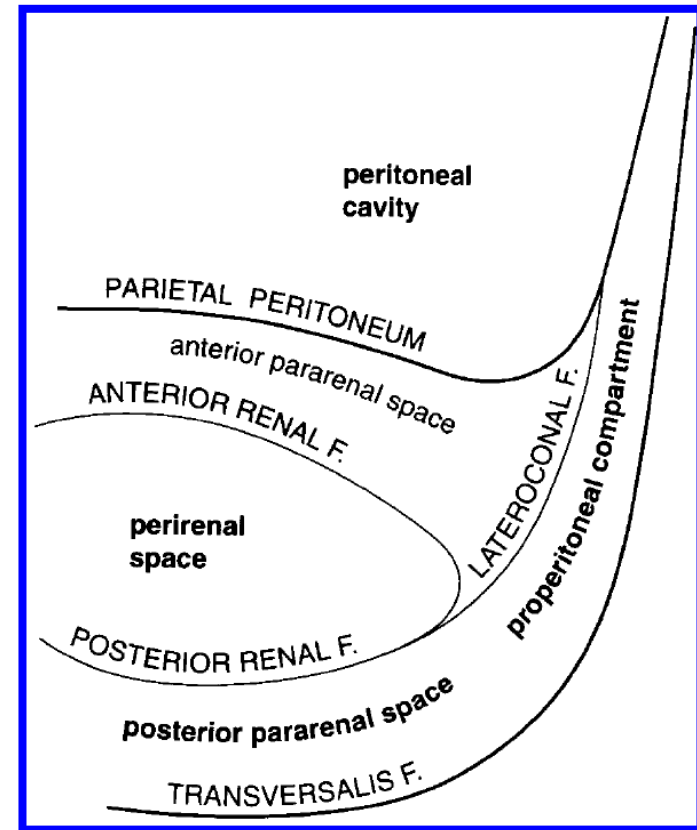
The management plan, including extent of resection and neoadjuvant strategies, should be formulated accordingly.



Anatomy



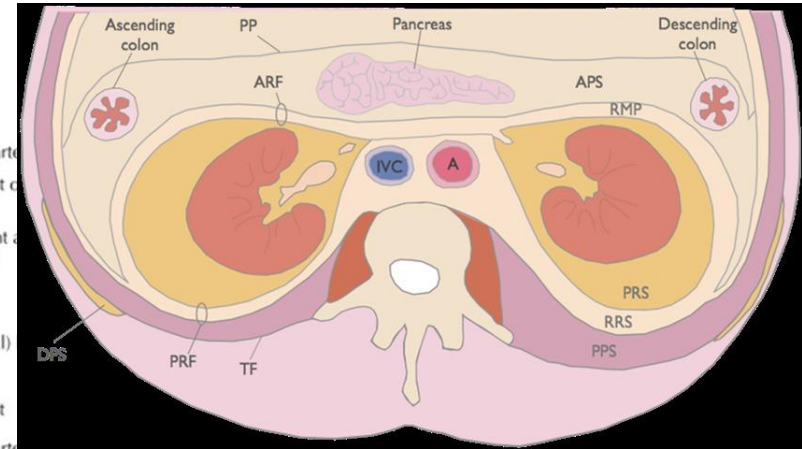
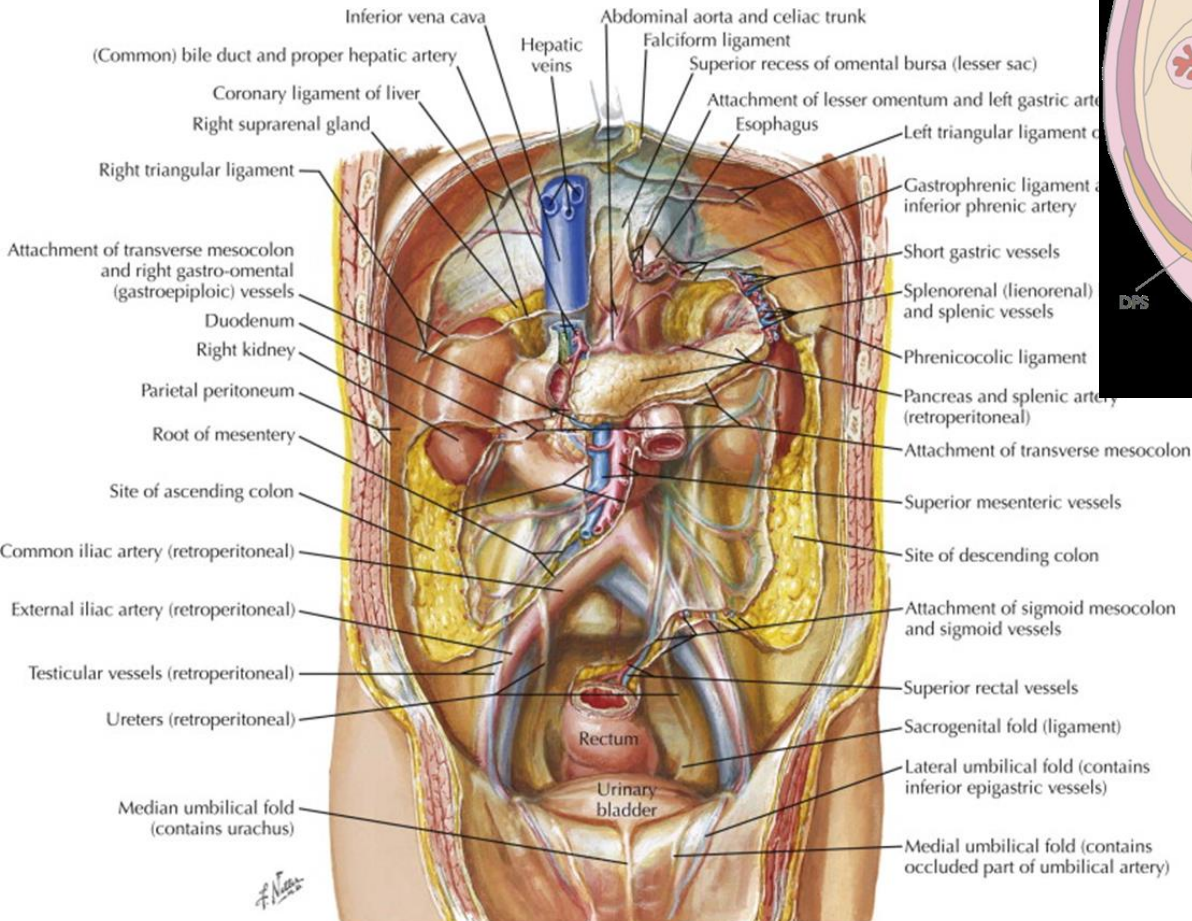
© IUSM Visual Media



(b)



Anatomy



A = Aorta

IVC = Inferior vena cava

PP = Parietal peritoneum

RMP = Retromesenteric plane

RRS = Retrorenal space

APS = Anterior pararenal space

PRS = Perirenal space

PPS = Posterior pararenal space

TF = Transversalis fascia

PRF = Retrorenal fascia

ARF = Anterior renal fascia

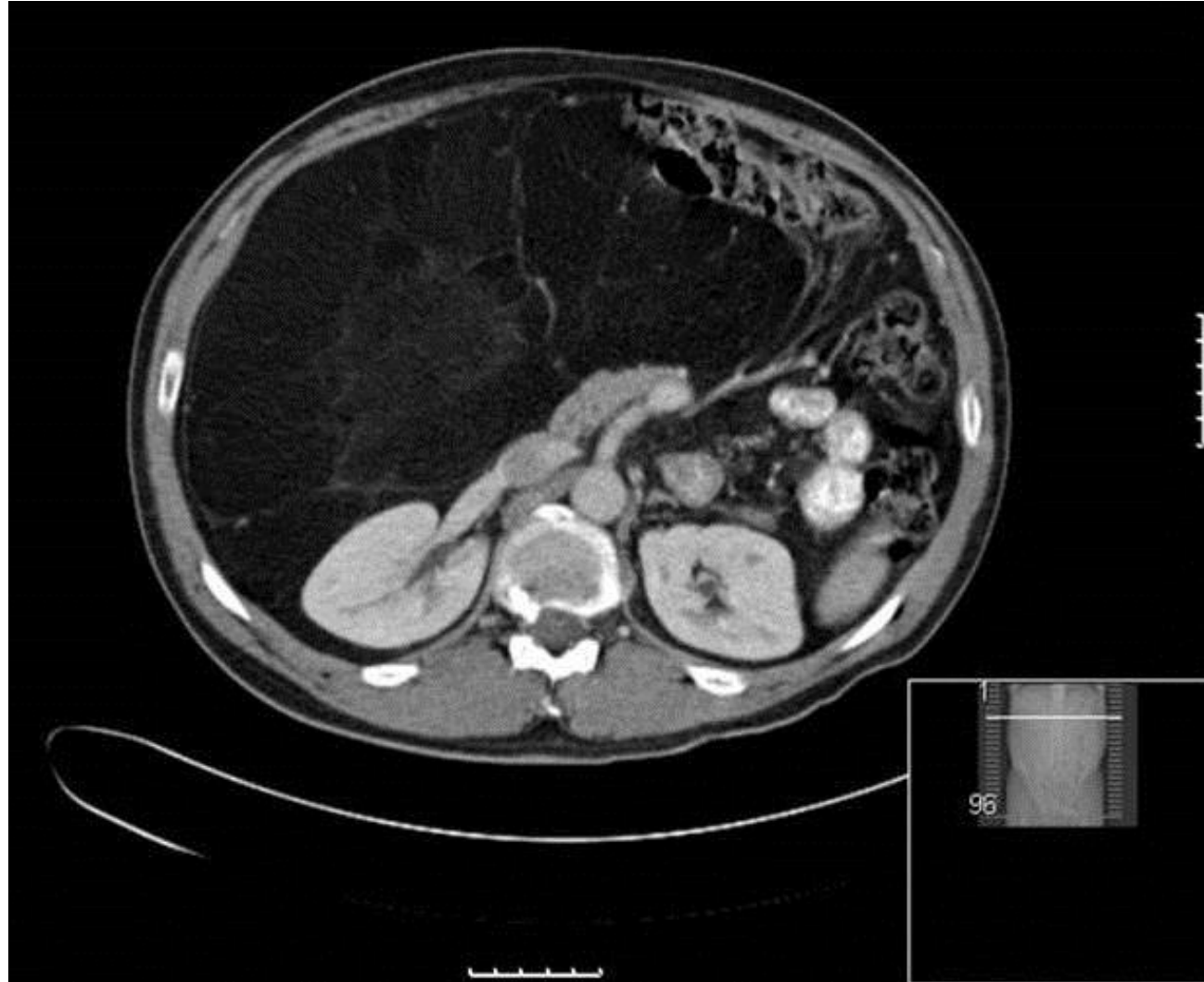


Retroperitoneal margins

RETROPERITONEAL COMPARTMENT MARGIN

ANTERIOR	– posterior parietal peritoneum, ipsilateral colon and mesocolon, tail of pancreas + spleen or head of pancreas, duodenum
POSTERIOR	– psoas, iliacus, quadratus lumborum, transverses abdominis, muscles, diaphragm
MEDIAL	<ul style="list-style-type: none"> • IVC (right-sided tumours), duodenum, head of pancreas. • Aorta + branches (left-sided tumours), spine, paraspinous muscles
LATERAL	– lateral abdominal musculature, kidney and colon (depending on tumour location)
SUPERIOR	– transverse colon/mesocolon, tail of pancreas or spleen <ul style="list-style-type: none"> • diaphragm, the right lobe of the liver, the duodenum
INFERIOR	– iliopsoas muscle <ul style="list-style-type: none"> • femoral nerve, iliac vessels or pelvic sidewall, bladder/rectum

Anatomy



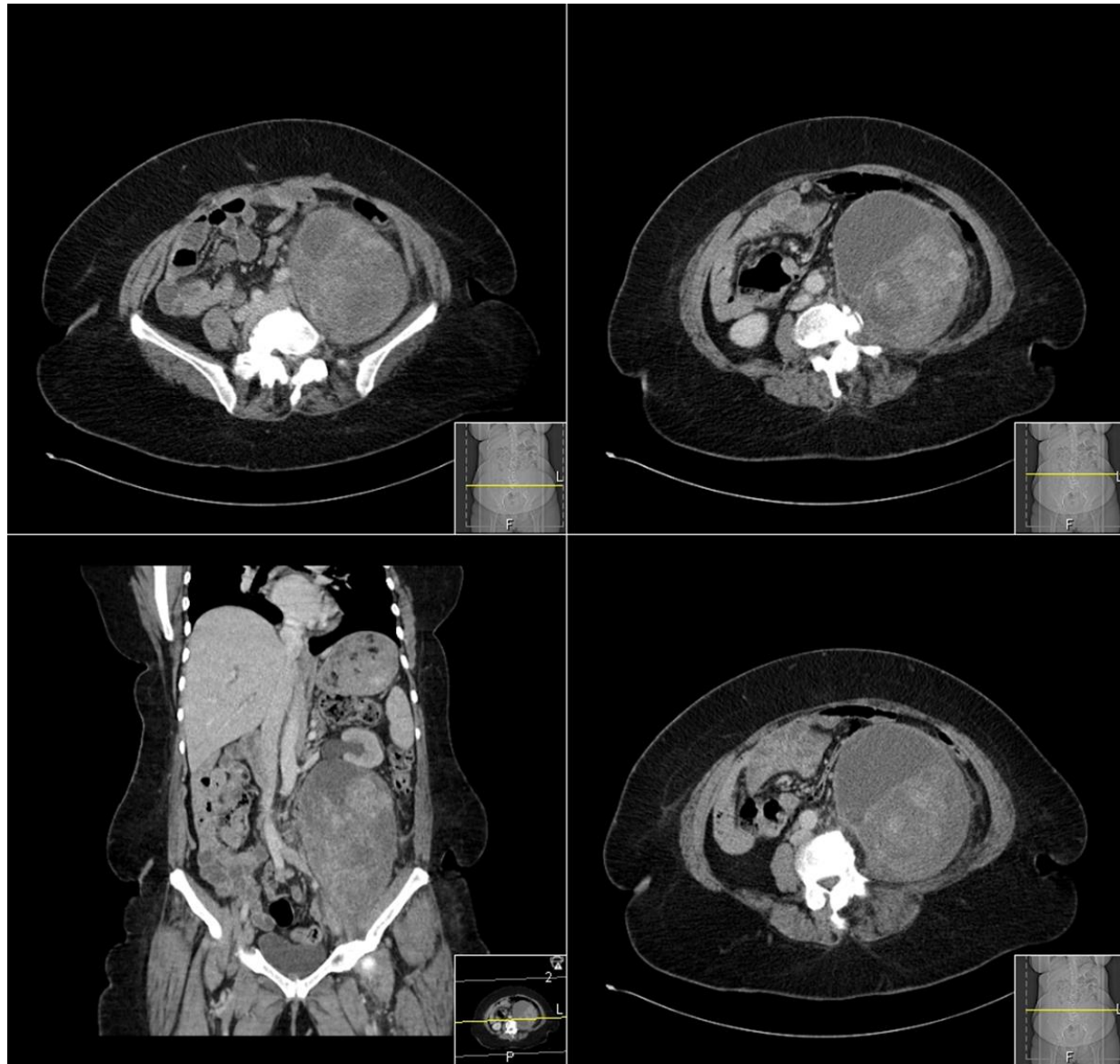
Anatomy



Anatomy



Psoas/posterior abdominal wall sarcoma



Subtypes

Primary retroperitoneal sarcoma

- Liposarcomas (well-diff, dedifferentiated)
- Leiomyosarcoma
- Solitary fibrous tumours
- Malignant PNST
- Synovial sarcoma, Ewing's sarcoma, Pleomorphic sarcoma, Fibrosarcoma, Spindle cell sarcoma NOS, Pleomorphic rhabdomyosarcoma, Undifferentiated round cell sarcoma, Epithelioid smooth muscle tumour, Desmoplastic small round cell tumour



ORIGINAL ARTICLE

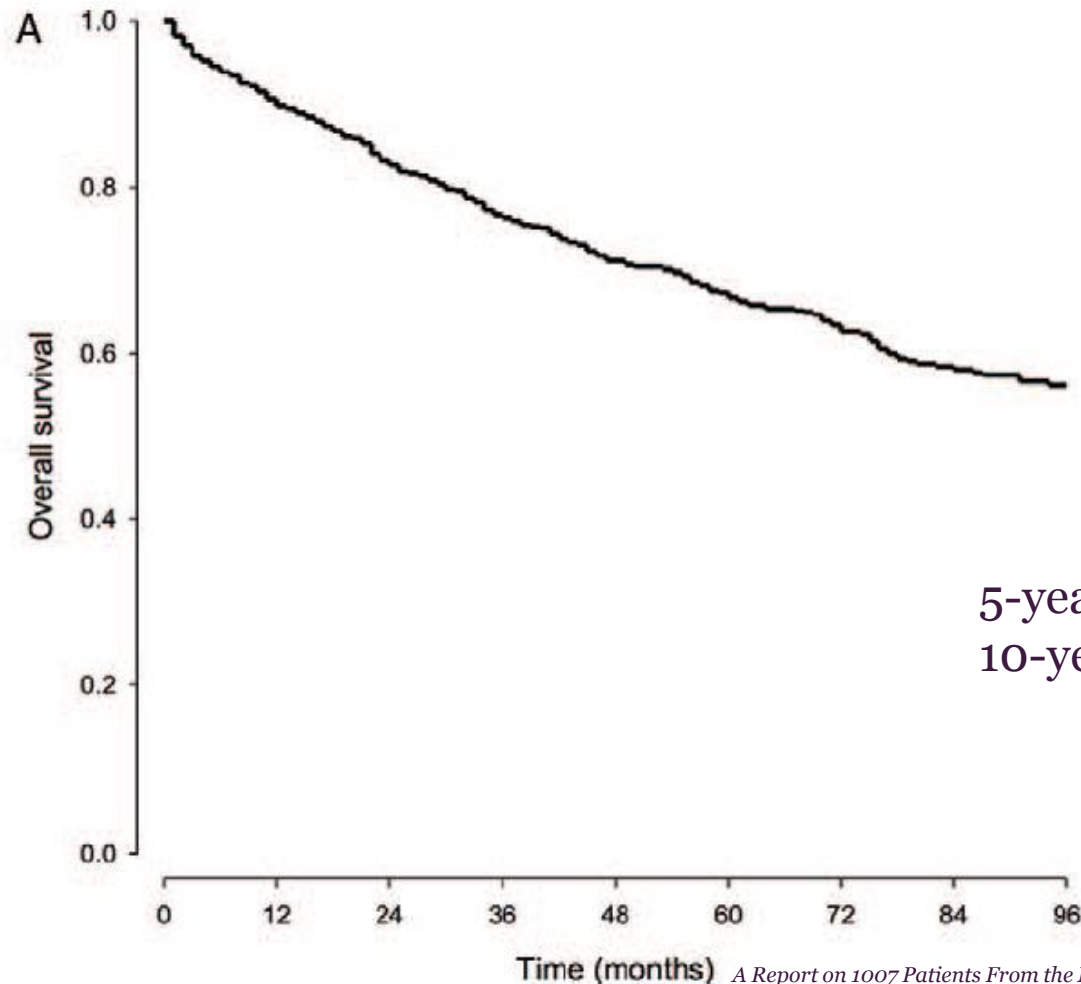
Variability in Patterns of Recurrence After Resection of Primary Retroperitoneal Sarcoma (RPS)

A Report on 1007 Patients From the Multi-institutional Collaborative RPS Working Group

Alessandro Gronchi, MD, Dirk C. Strauss, MD,† Rosalba Miceli, MD, PhD,‡ Sylvie Bonvalot, MD, PhD,§ Carol J. Swallow, MD,¶ Peter Hohenberger, MD,|| Frits Van Coevorden, MD,** Piotr Rutkowski, MD,†† Dario Callegaro, MD,* Andrew J. Hayes, MD, PhD,† Charles Honoré, MD,§ Mark Fairweather, MD,‡‡ Amanda Cannell, MD,¶ Jens Jakob, MD,|| Rick L. Haas, MD,§§ Milena Szacht, MD,†† Marco Fiore, MD,* Paolo G. Casali, MD,¶¶ Raphael E. Pollock, MD, PhD,||| and Chandrajit P. Raut, MD‡‡*



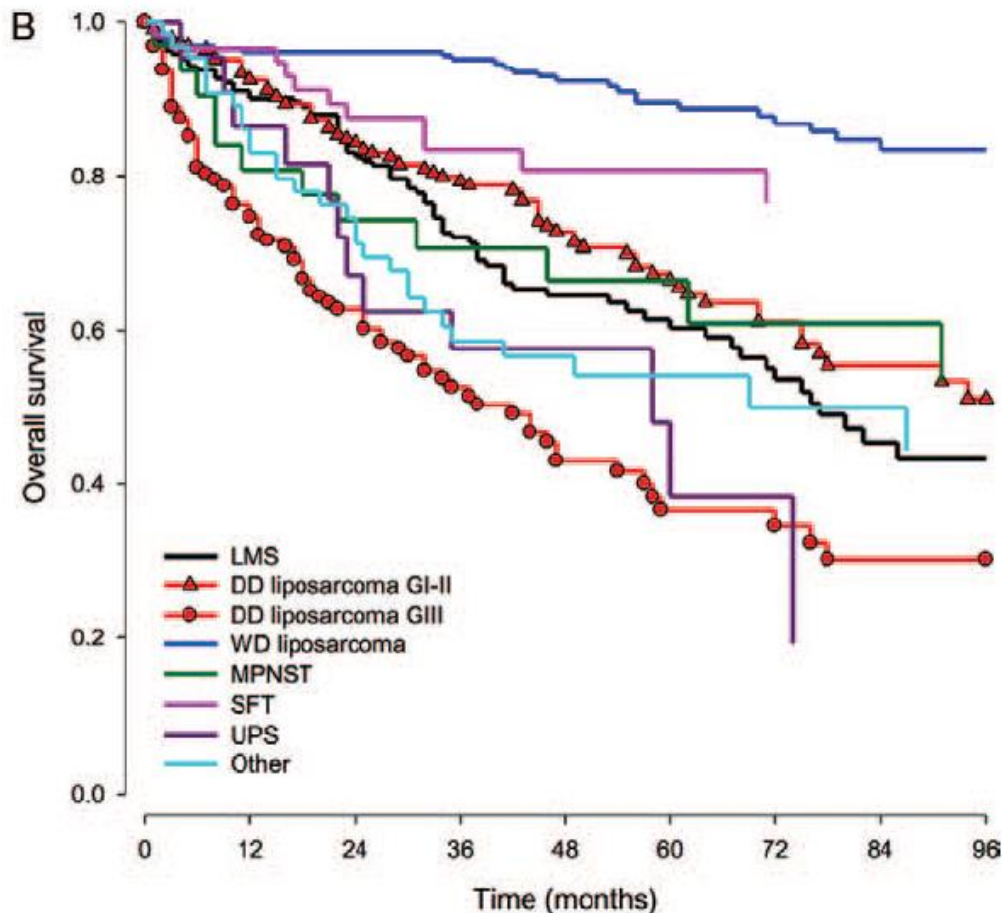
Overall survival curve in the whole series



5-year OS = 67%
10-year OS = 46%



Overall survival curve in the whole series

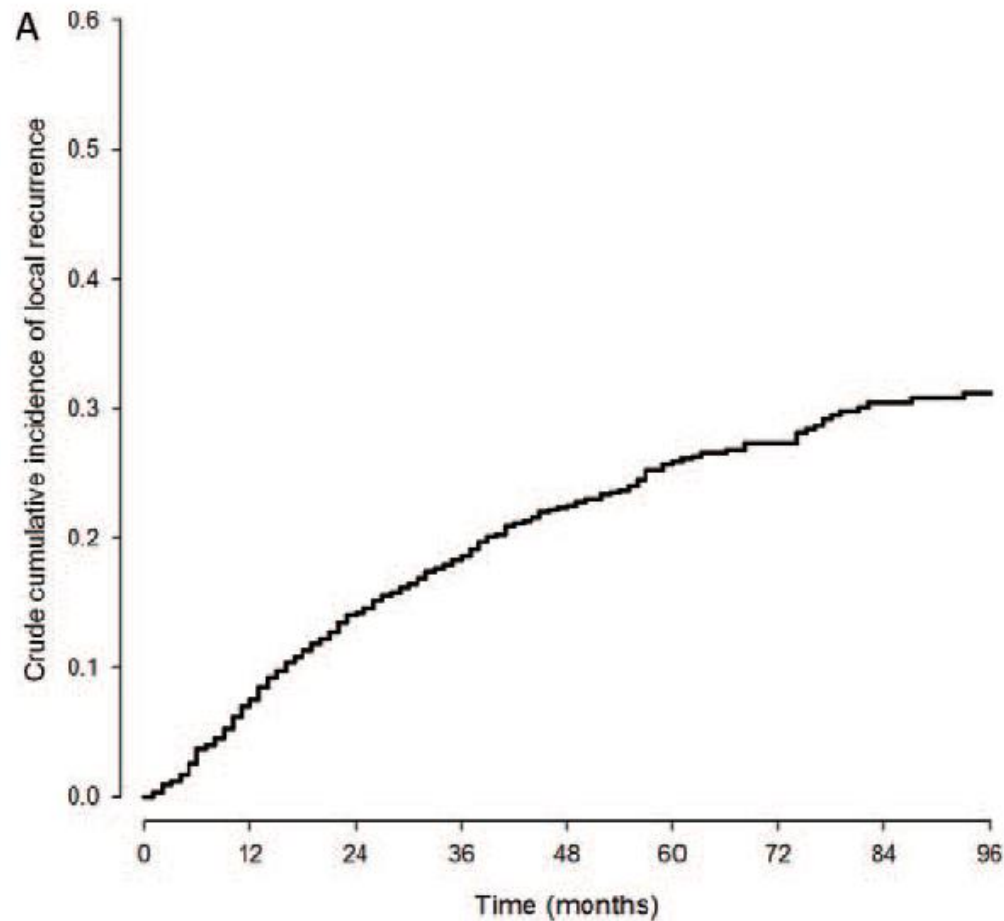


WD LPS 8-yr OS ~ 80%

LeiMS 8-yr OS ~ 40%

DD LPS Gr3 8-yr OS ~ 30%

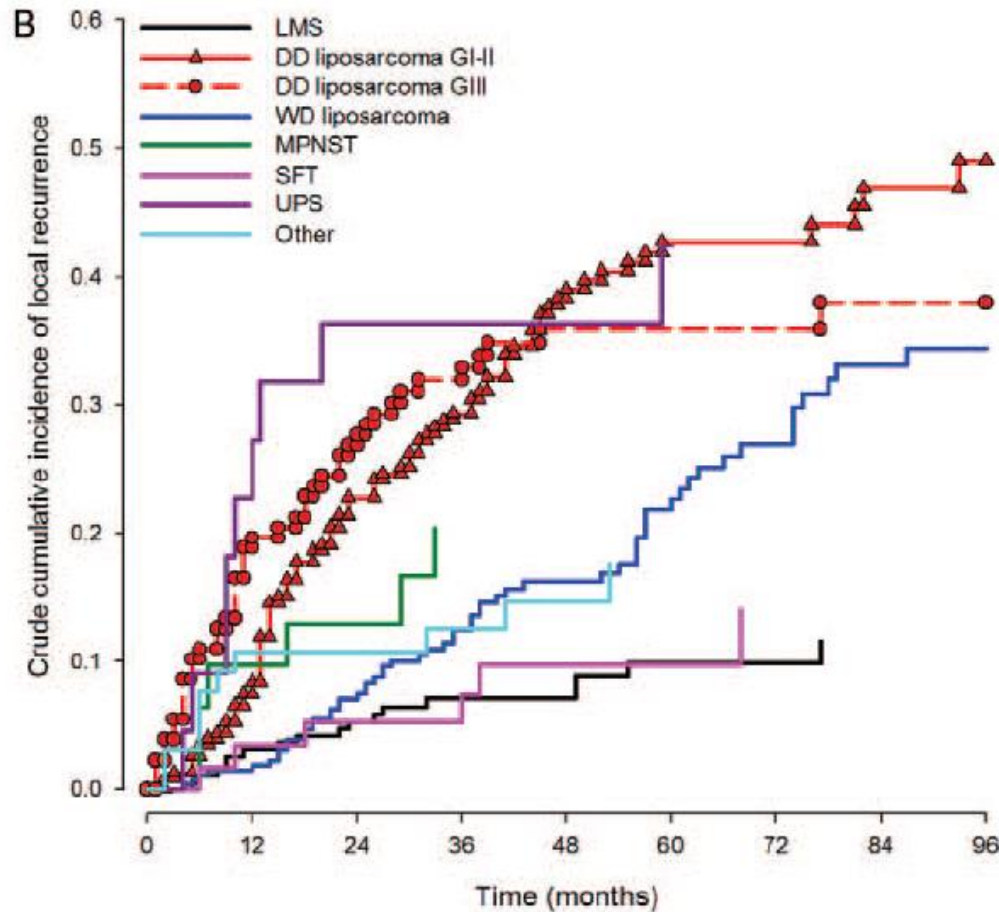
Cumulative incidence of local relapse



5-year CCI = 26%

10-year CCI = 35%

Cumulative incidence of local relapse



DD LPS Gr2 ~ 50%

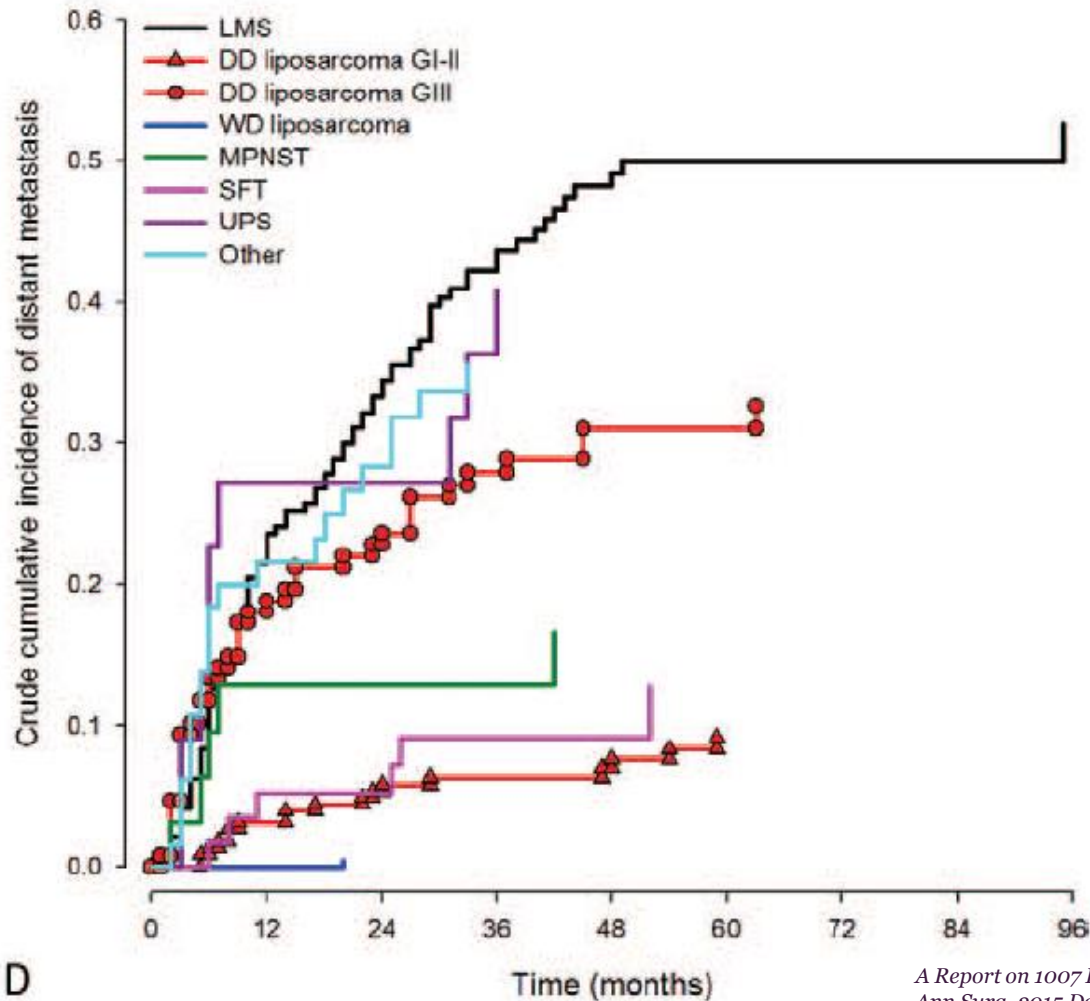
DD LPS Gr3 ~ 40%

WD LPS ~ 35%

LeiMS ~ 10%



Cumulative incidence of distant metastasis



LeiMS ~ 50%

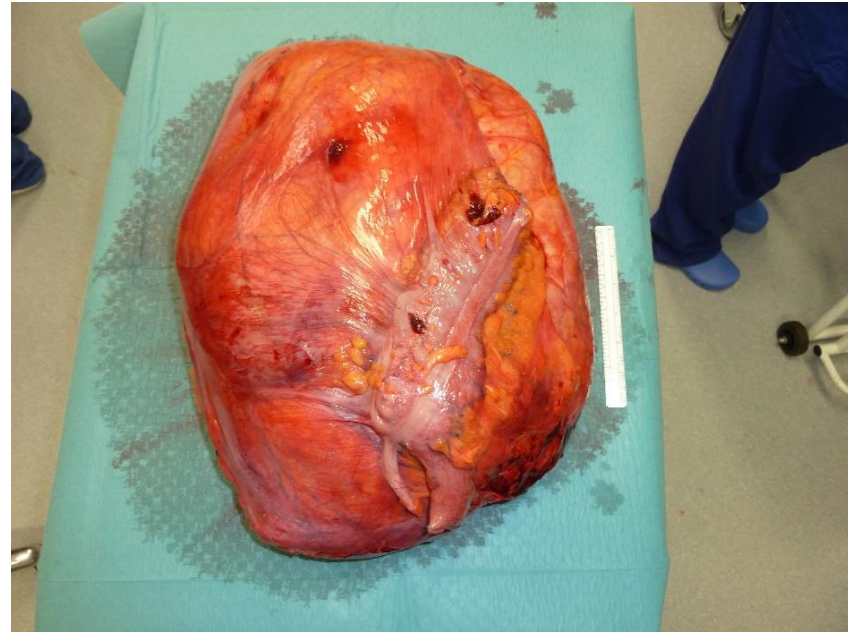
DD LPS Gr3 ~ 30%

DD LPS Gr2 ~ 6%

WD LPS = 0%

Surgical extent according to biologic behaviour

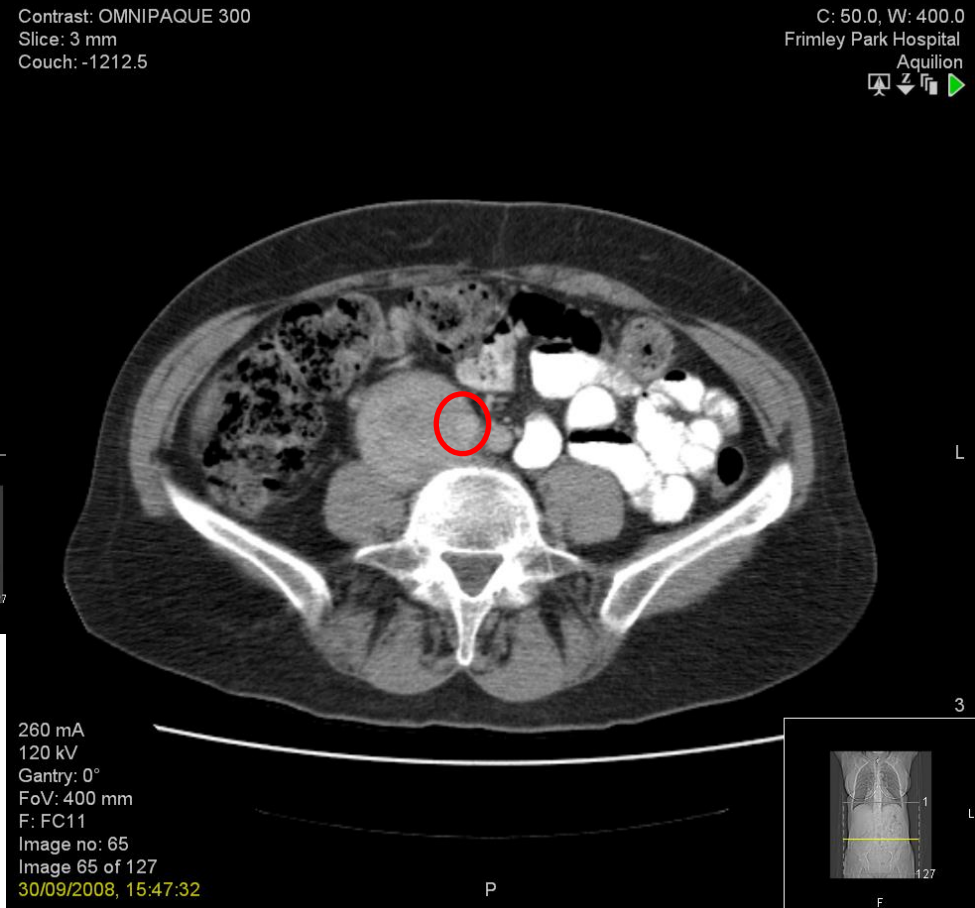
Well-differentiated Liposarcoma



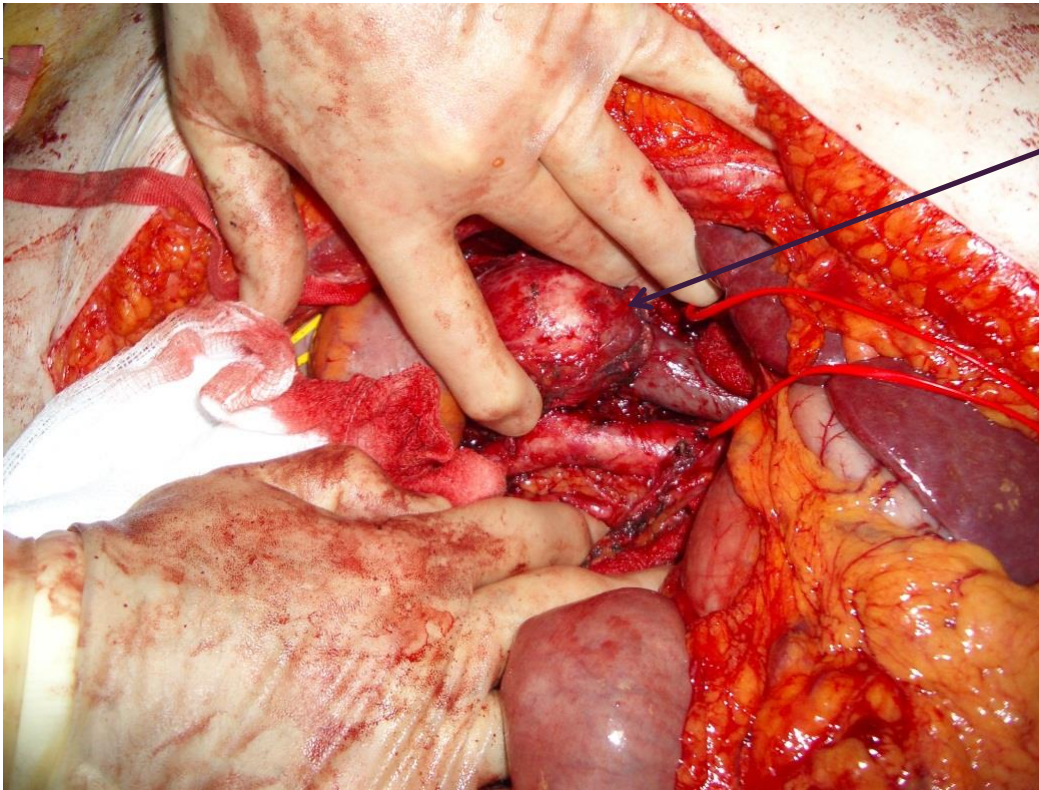
Surgical extent according to biologic behaviour



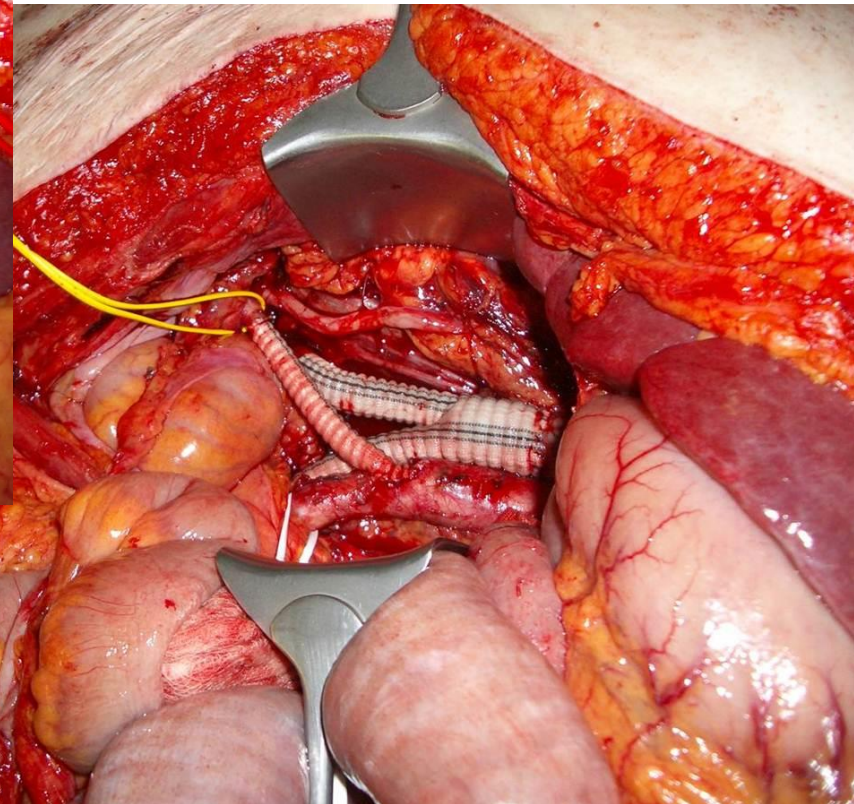
IVC Leiomyosarcoma



Surgical extent according to biologic behaviour

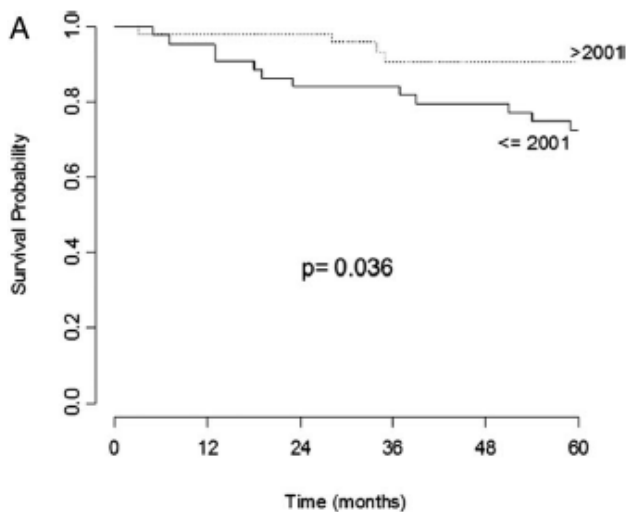


IVC leiomyosarcoma

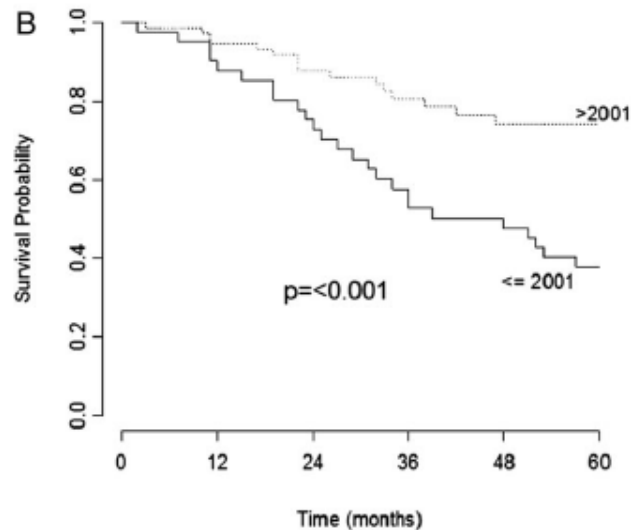


Frontline extended surgery

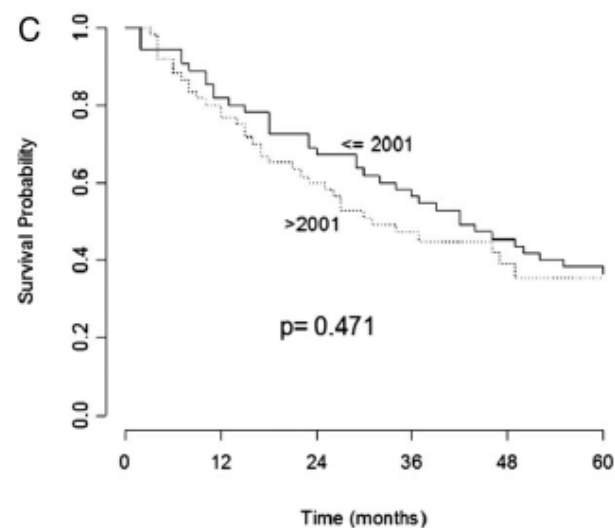
Grade 1



Grade 2



Grade 3

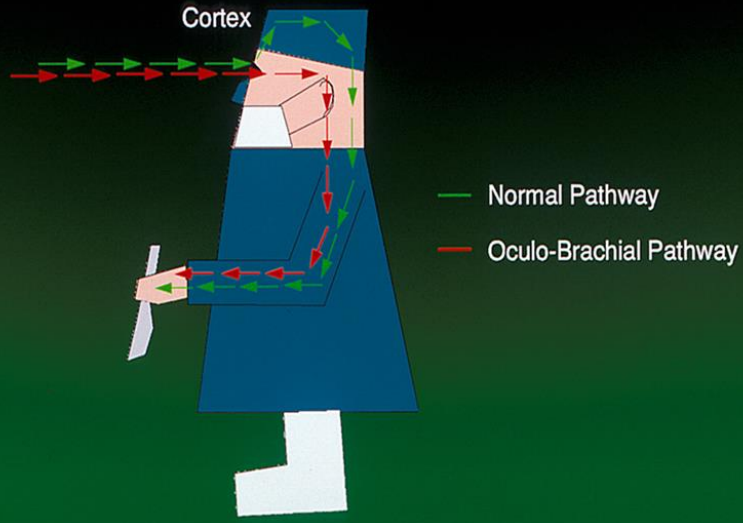


Gronchi A et al, Frontline extended surgery is associated with improved survival in retroperitoneal low- to intermediate-grade soft tissue sarcomas. *Ann Oncol.* 2011 Jul 16. [Epub ahead of print]

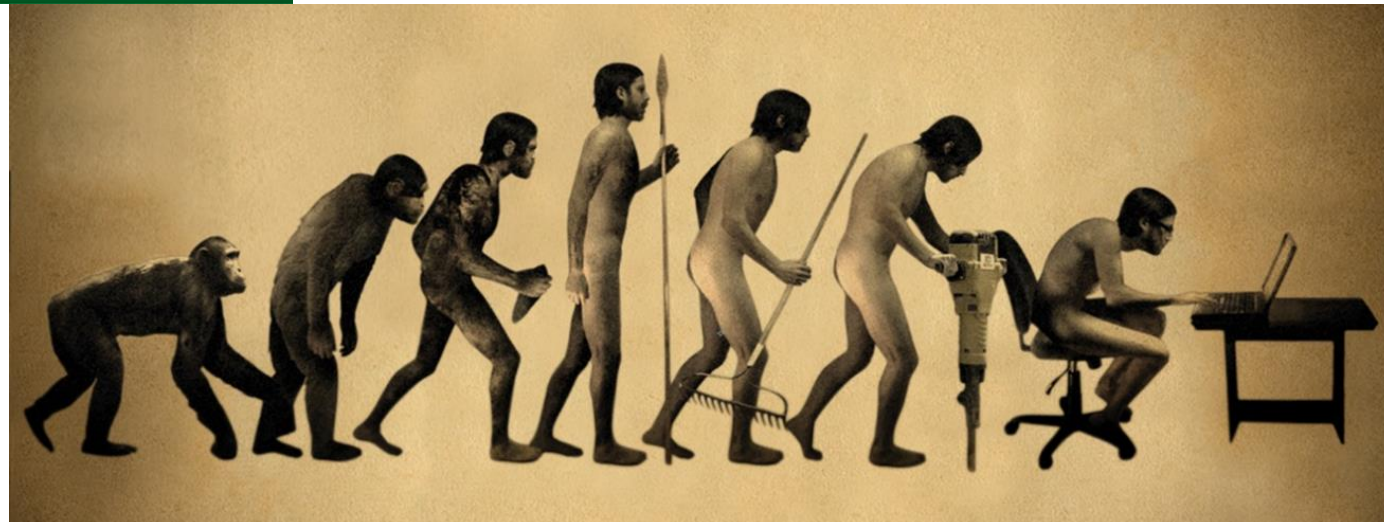
Initial approach to RP mass

“The Oculo-Brachial Reflex”

A new pathway with no discernable cortical connections



1. Diagnosis?
2. Should it be taken out?
3. Should I be taking it out?
4. What will it involve taking it out?
5. Is it possible/beneficial/risks to resect?



Role of core needle biopsy

Retroperitoneal mass	
Biopsy not essential	<ul style="list-style-type: none">• imaging reviewed in Sarcoma MDT and is diagnostic and absolutely certain of a resectable retroperitoneal liposarcoma• and no neoadjuvant treatment planned
Biopsy	<ul style="list-style-type: none">• lipomatous lesion when radiological uncertainty• include non-lipomatous soft tissue sarcomas, GIST, benign soft tissue tumours, suspected lymphomas, germ-cell tumours or primary/metastatic carcinoma.



Role of core needle biopsy

Advantage

1. Accurate

Differentiate malignant and benign STT (n = 530)

–Sensitivity = 96.3%

–Specificity = 99.4%

–Positive predictive value = 99.5%

–Negative predictive value = 95.1%

Accuracy = 98%



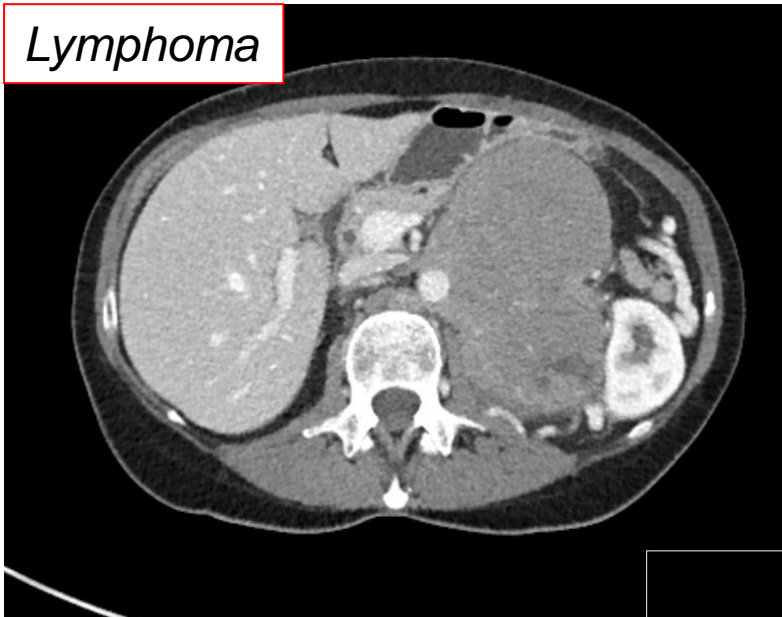
Strauss DC, Qureshi YA, Hayes AJ, et al JSO 2010

Role of core needle biopsy

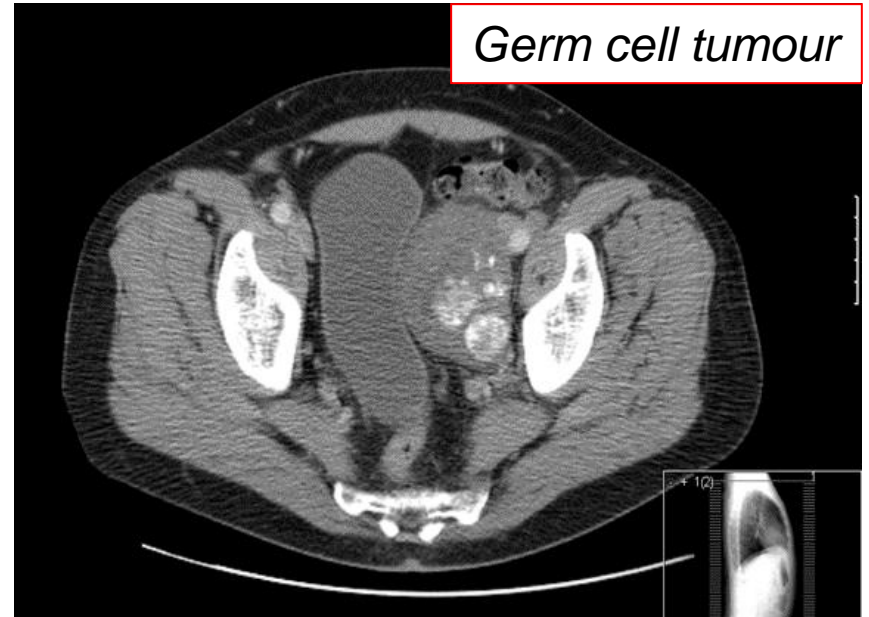
Advantage

2. To identify the non-STs malignancies (lymphoma, metastatic carcinoma, germ cell tumours)

Lymphoma



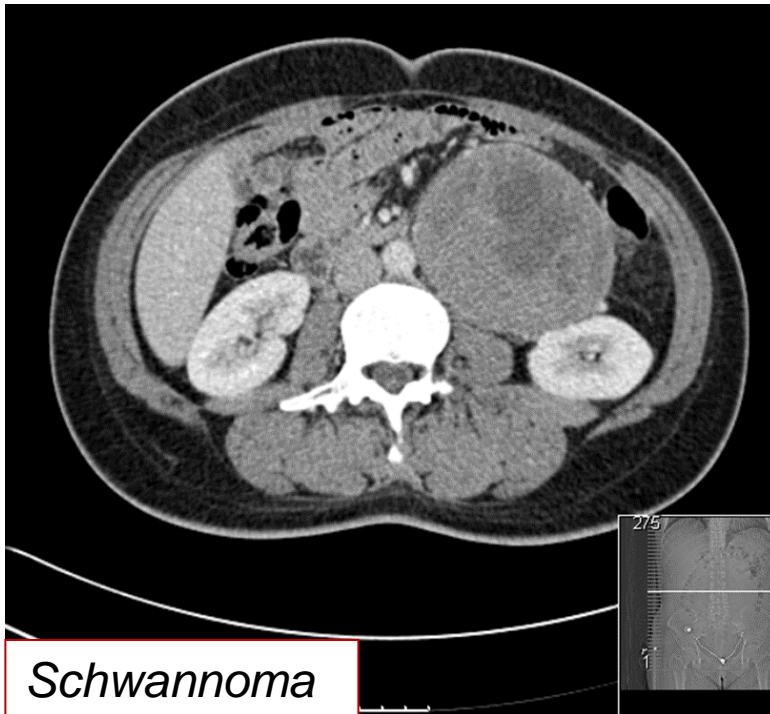
Germ cell tumour



Role of core needle biopsy

Advantage

3. To differentiate benign from malignant



Role of core needle biopsy

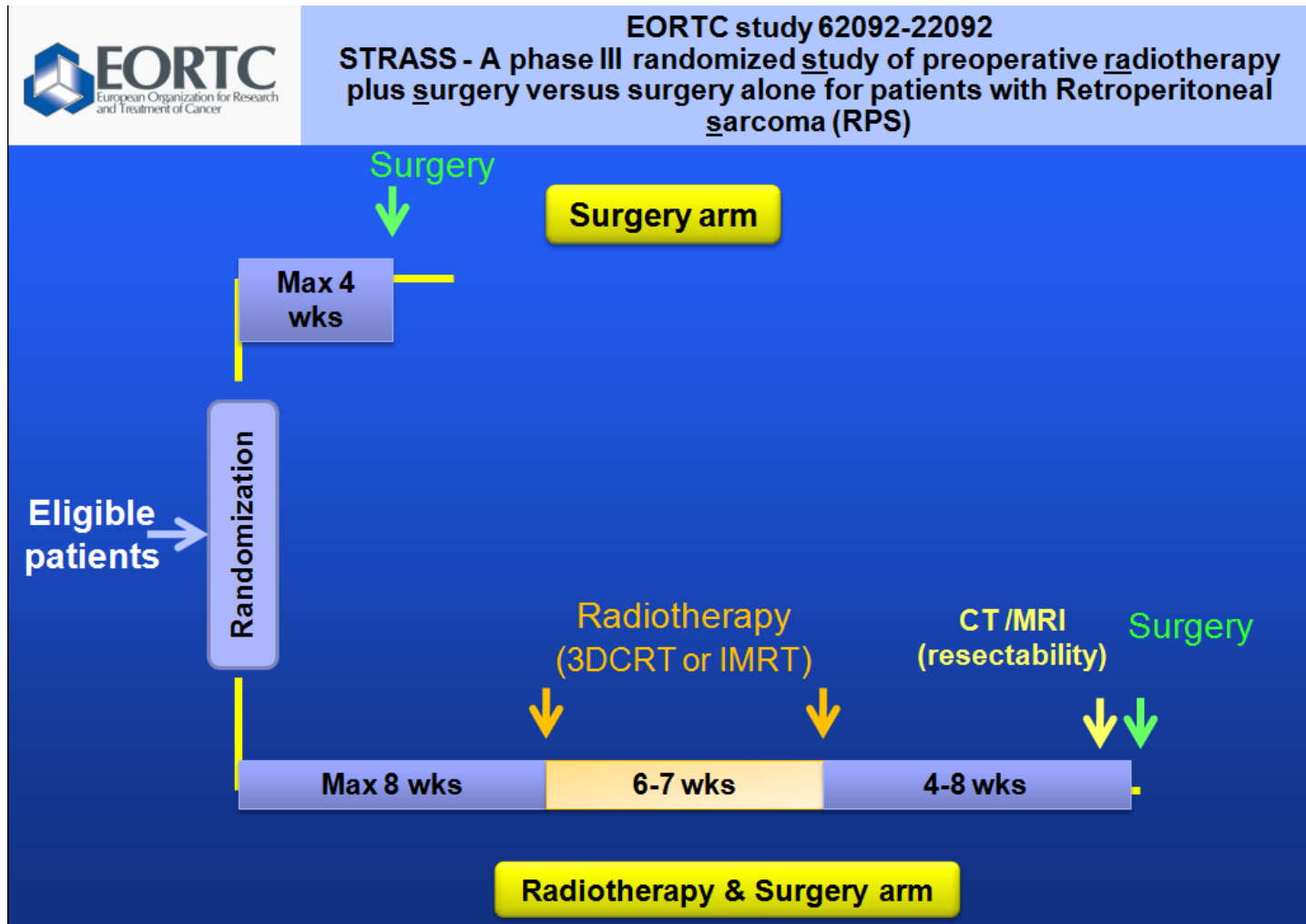
Advantage

4. To subtype and grade soft tissue sarcomas

Preoperative biopsy allows to plan the optimal surgical + neoadjuvant treatment for each patient and to tailor treatment according to the individual sarcoma subtype



Prognostic factors predicting outcome

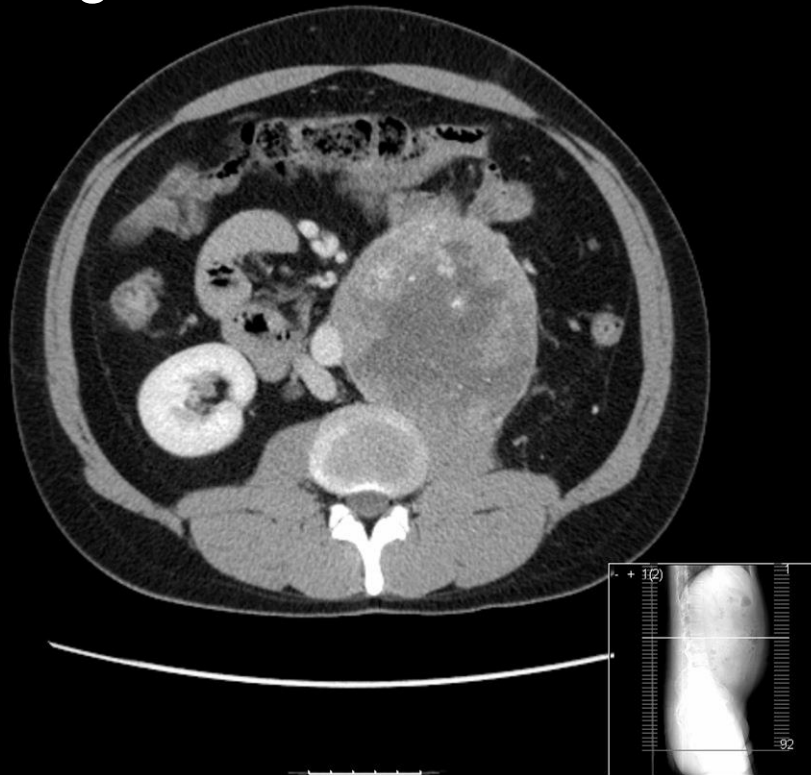


Role of core needle biopsy

Advantage

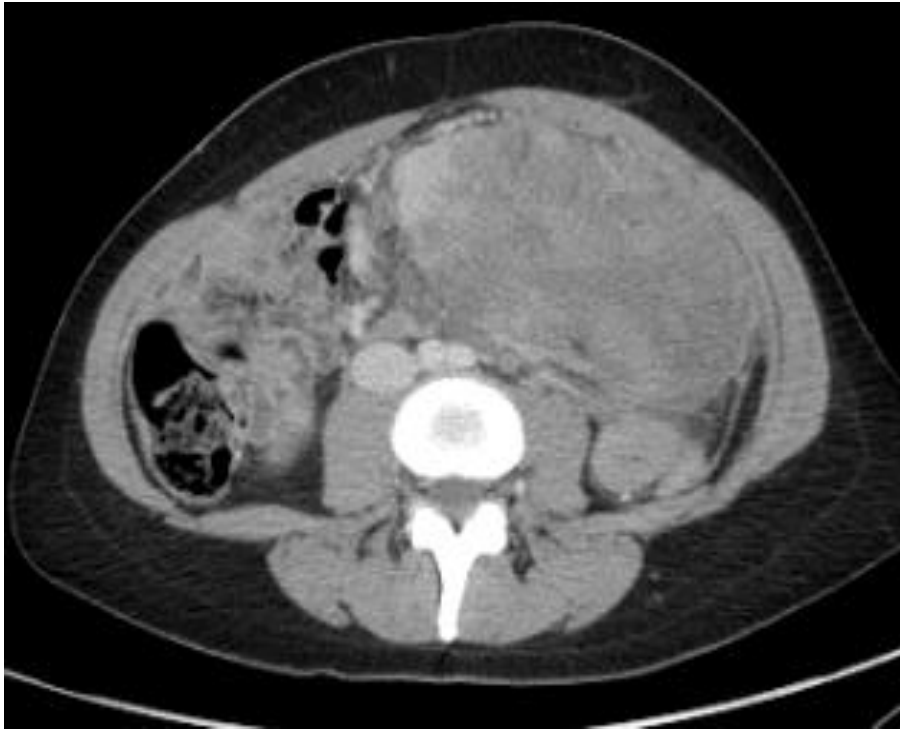
To identify chemo-sensitive sarcoma subtypes

Ewing's sarcoma



- Core needle biopsy:
- Extraskkeletal Ewing's sarcoma
- Preoperative chemotherapy (vincristine, doxorubicin, cyclophosphamide, ifosfamide, and etoposide)
- Resection specimen:
 - marked treatment-related changes and <10% viable tumour.

Chemo-sensitive subtypes



Aug 2012



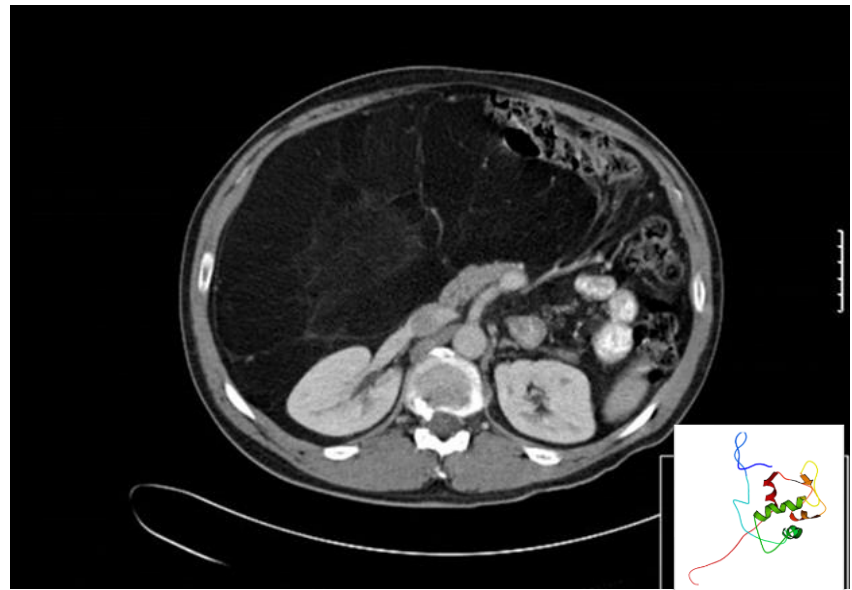
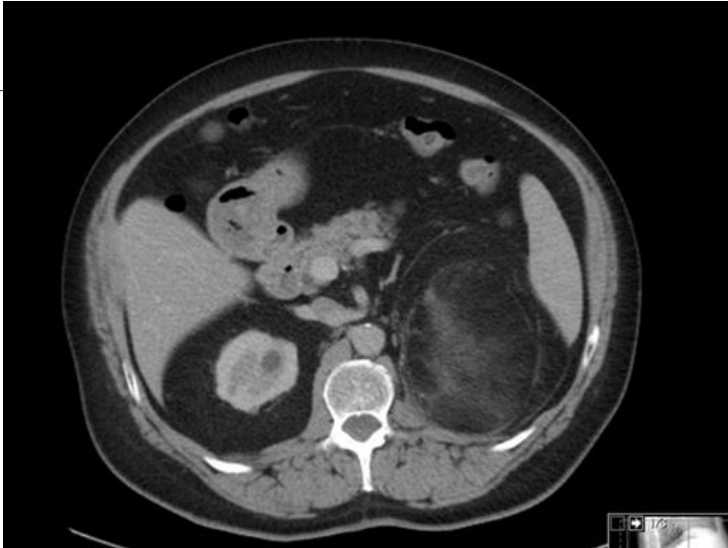
Nov 2012 – post
chemotherapy (4 cycles
ifosfamide and doxorubicin)

Chemo-sensitive subtypes

Leiomyosarcoma
04/2013 – 11/2013
6 cycles gemcitabine

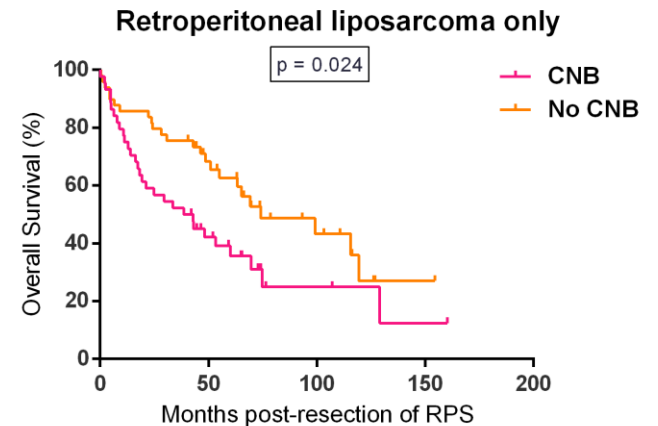
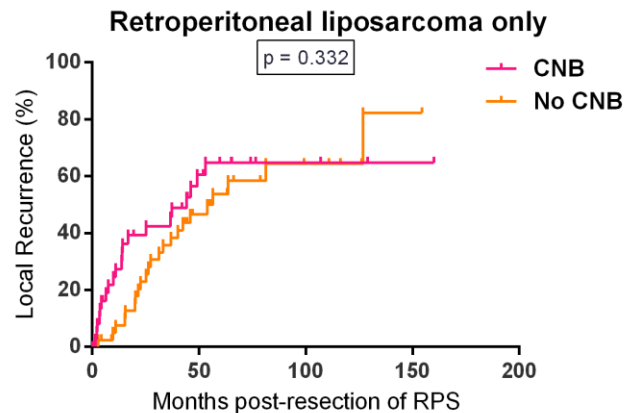
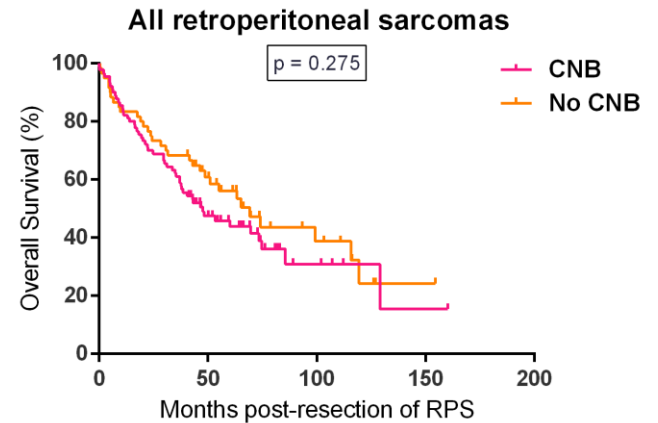
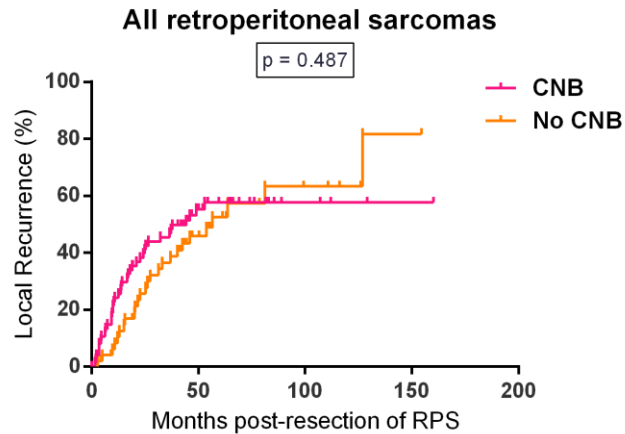


Role of core needle biopsy - lipomatous lesions



Role of core needle biopsy

Safe:



Resectability

Is it beneficial/oncologically sensible to resect the tumour?

Patient benefit v treatment morbidity

“In the field of surgical oncology:
tumour biology is king,
patient selection is queen,
and **technical manoeuvres** are the prince and princess.



Occasionally the prince and princess try to overthrow the powerful forces of the King and Queen, sometimes with temporary apparent victories, usually to no long term avail.”



Resectability

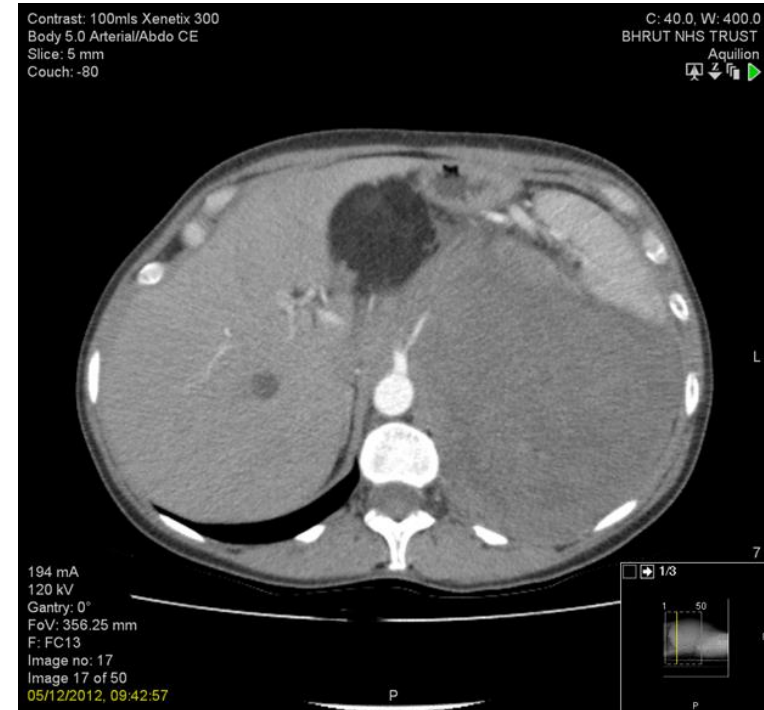
Is it beneficial/oncologically sensible to resect the tumour?

- Systemic metastasis
- Incomplete resection of high-grade tumour
- Tumour rupture
- Aggressive tumour biology



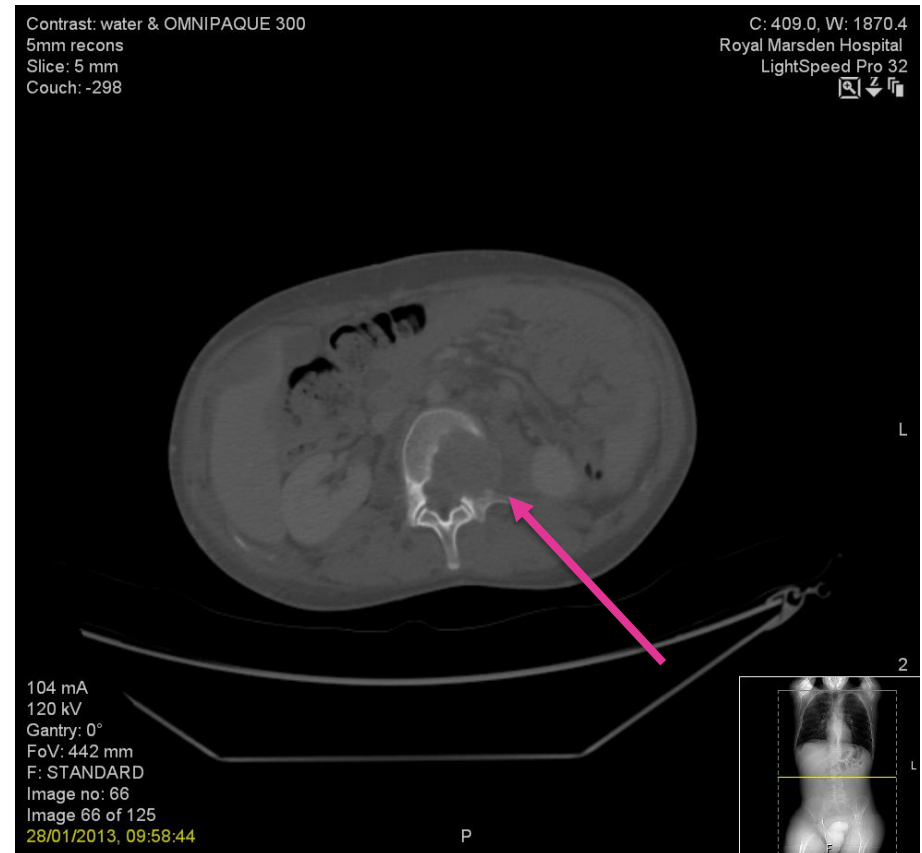
Resectability

– Encasement of vessels



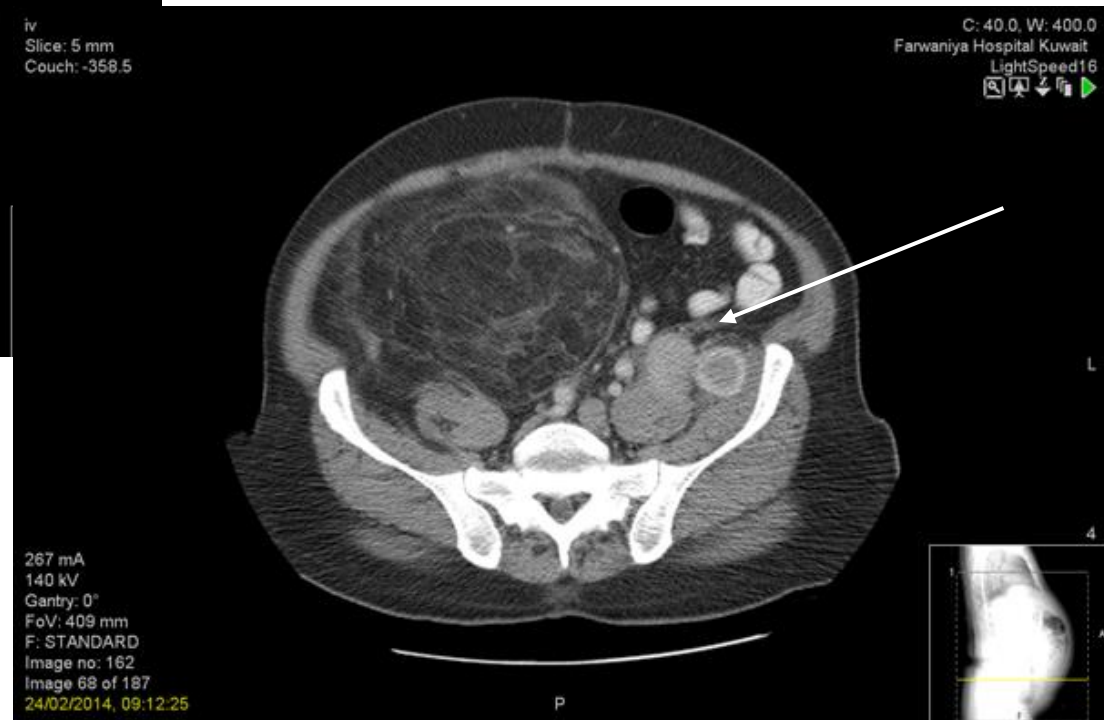
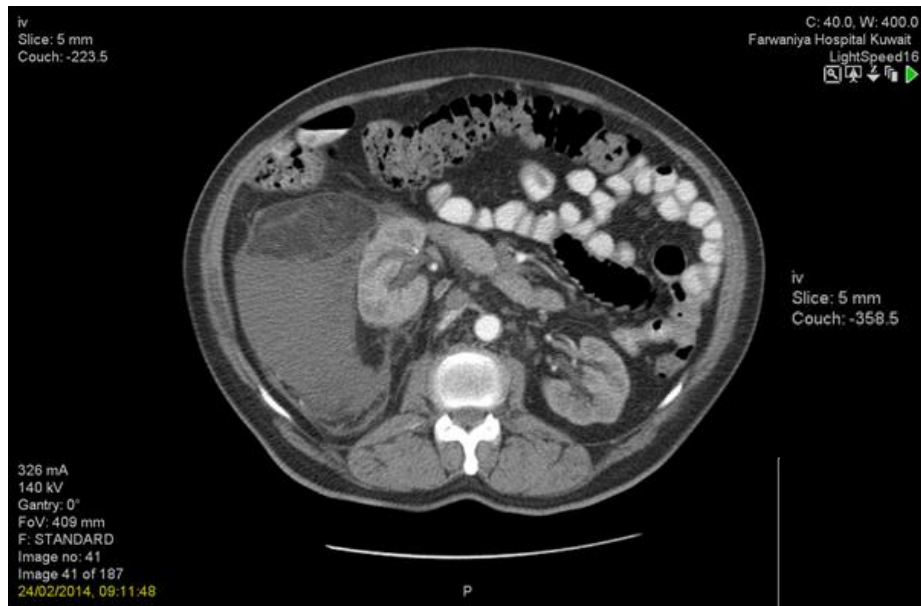
Resectability

Spinal involvement



Resectability

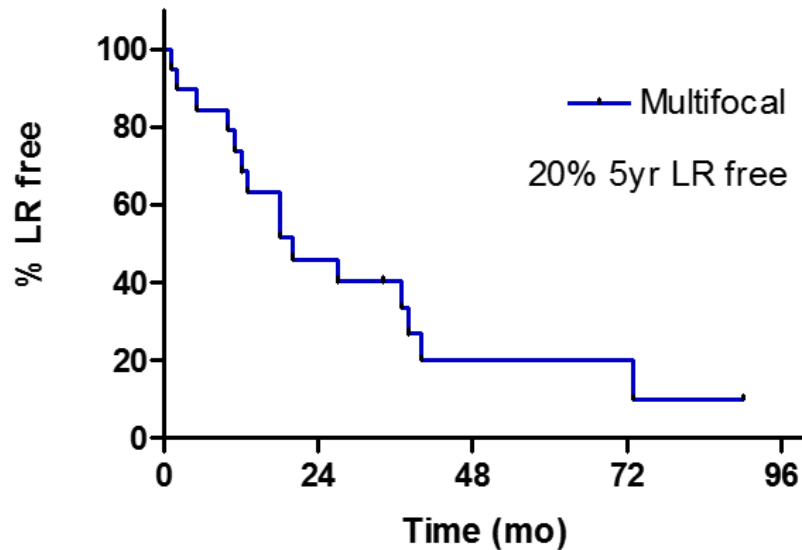
Multifocality



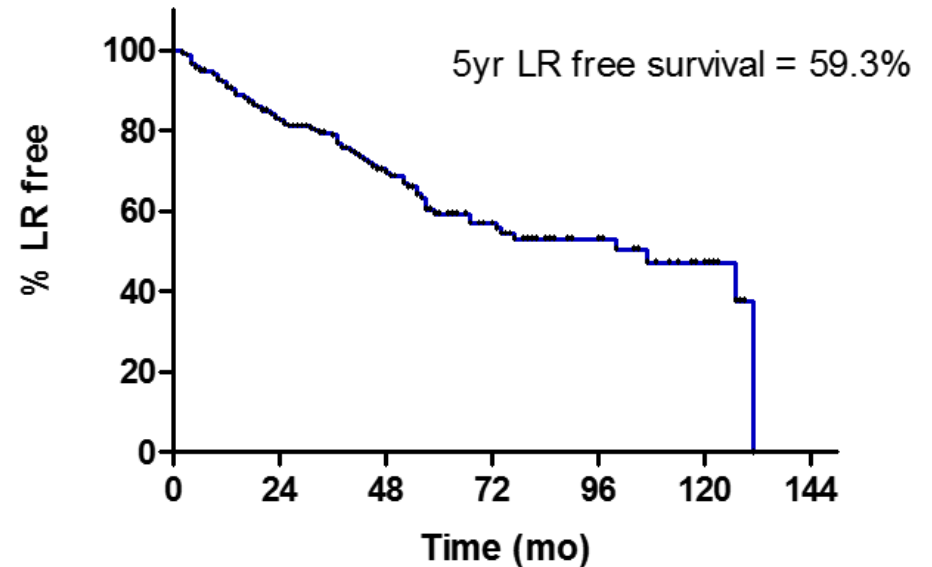
Resectability

Multifocality

Local recurrence



Local control



Surgical principle of resection

Liberal visceral en bloc resection in an attempt to include an envelope of normal tissue around the tumour to minimise the marginality of the resection - in the hope of improving outcome.



Compartmental resection

The objective is to achieve an envelope of normal tissue along some tumour surfaces by removing adjacent, easily disposable organs

while performing what is essentially a marginal excision along critical structures.



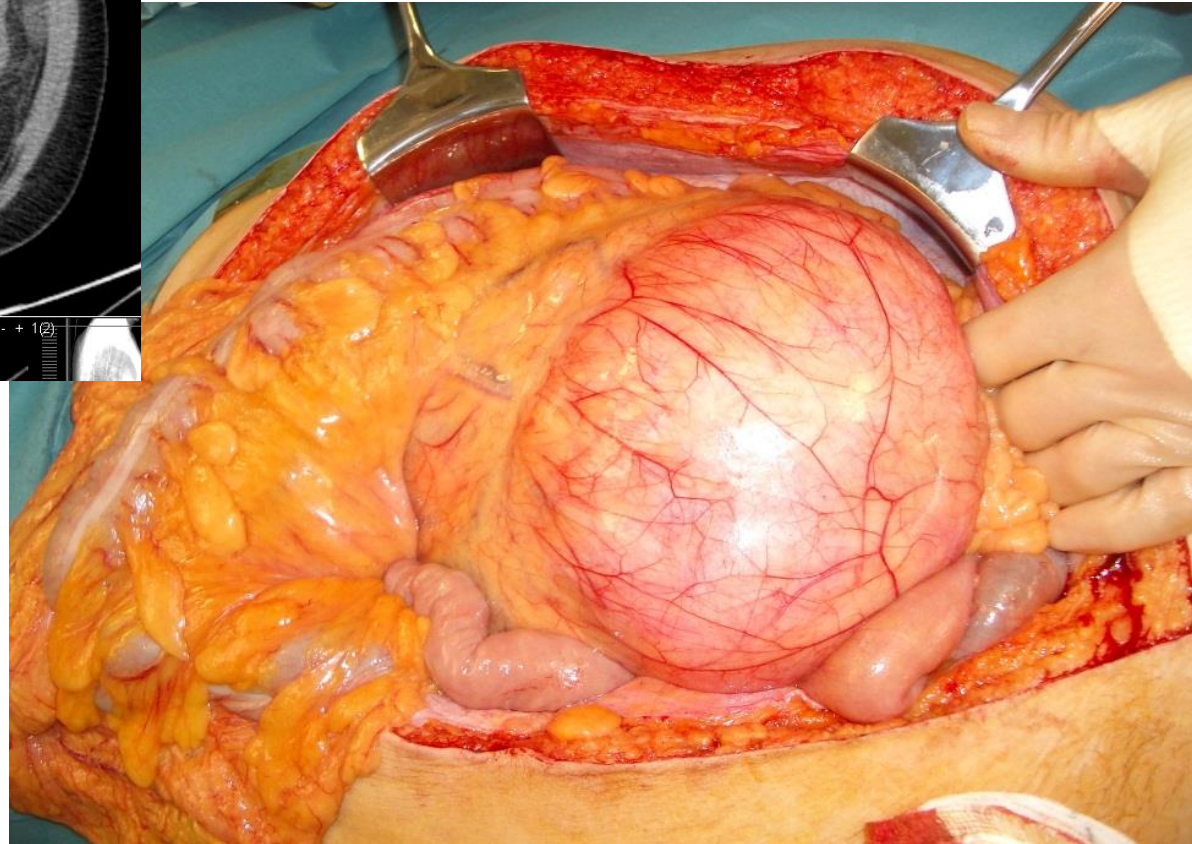
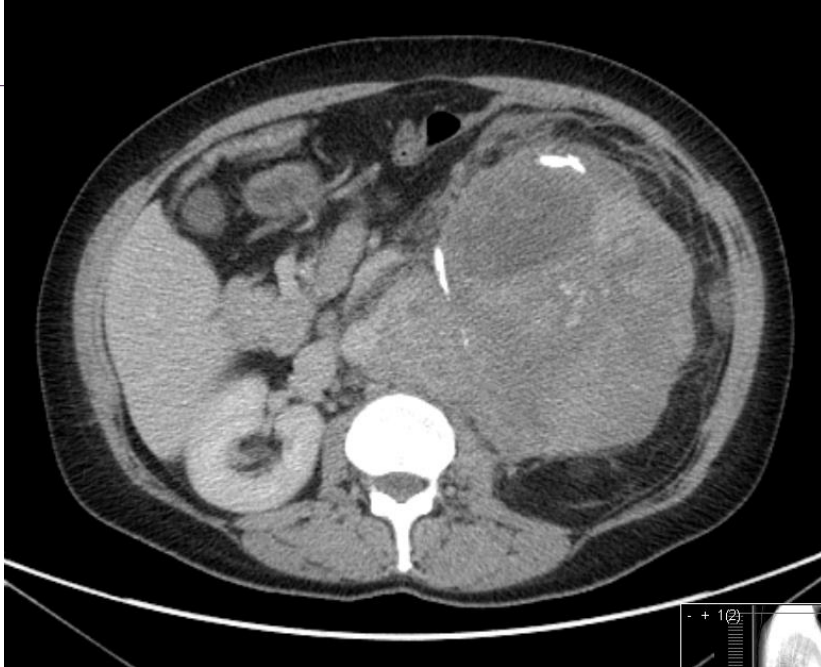
Compartmental resection



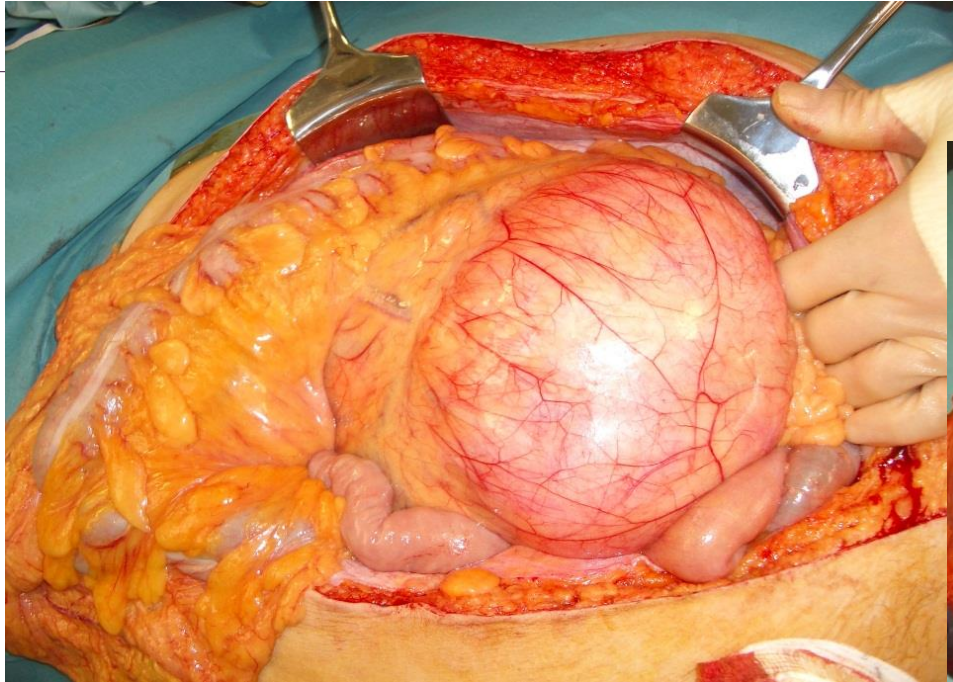
Compartmental resection



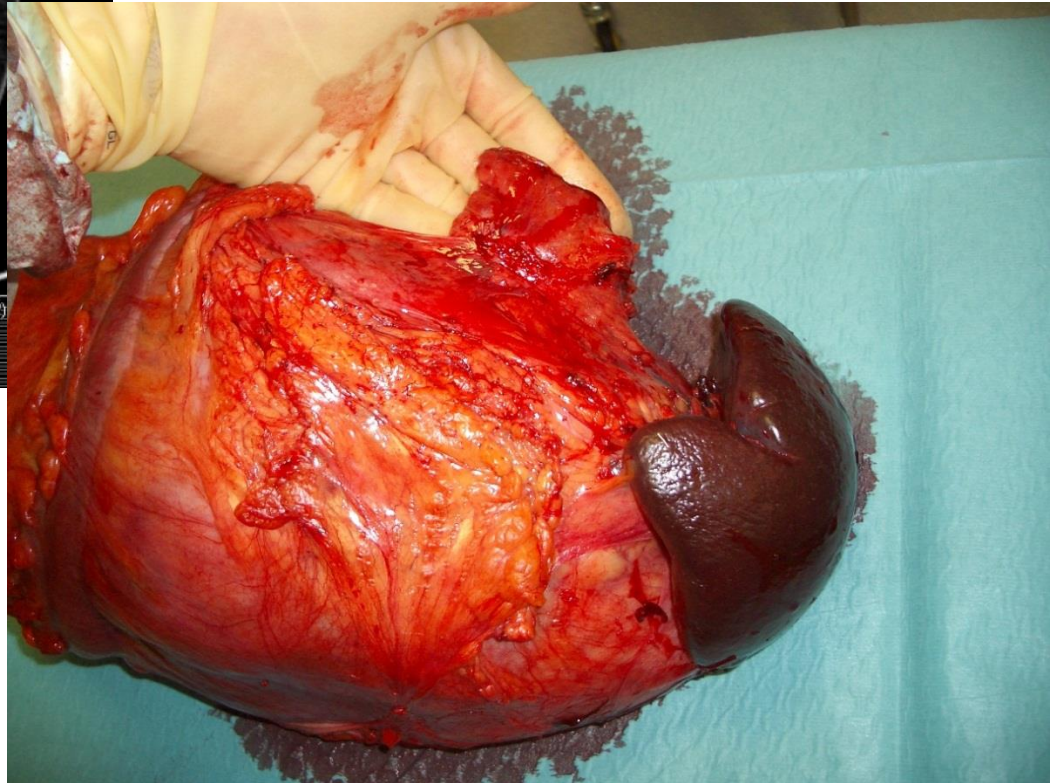
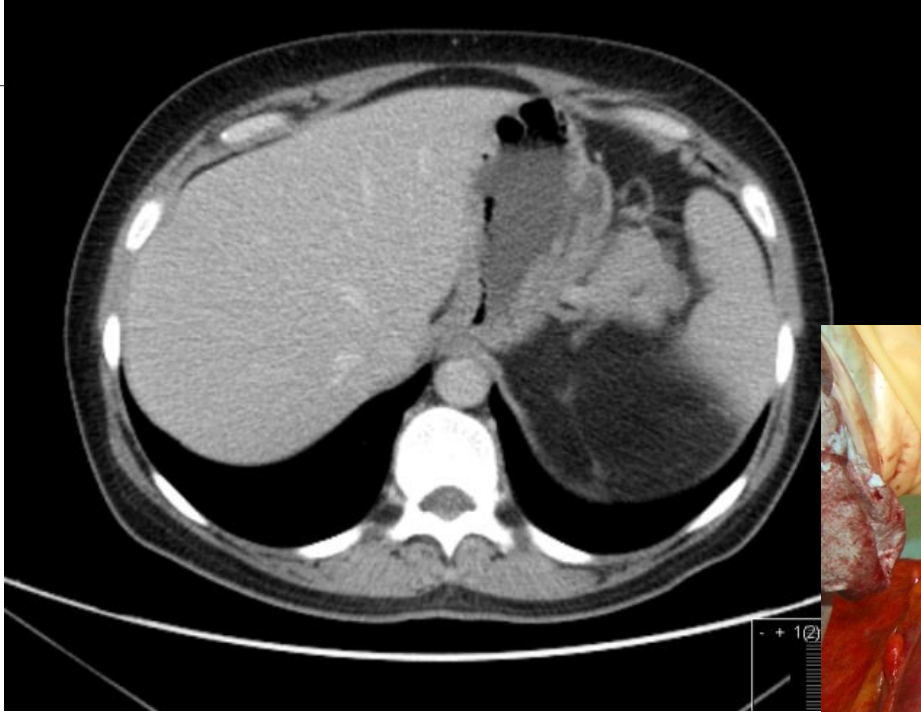
Anterior colon/mesentery



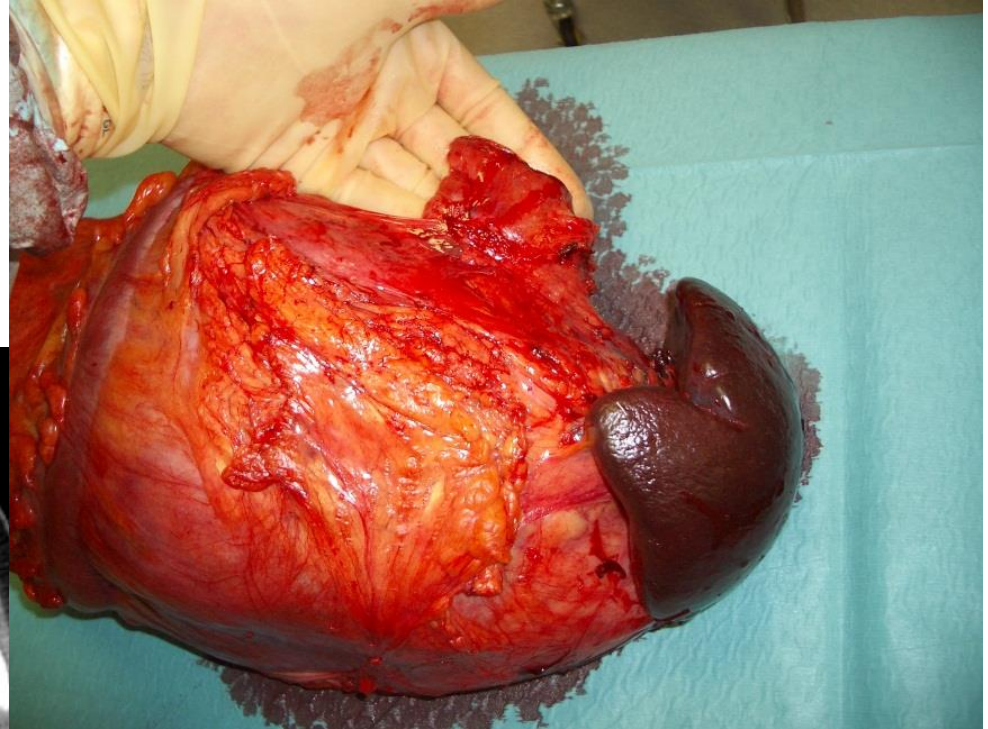
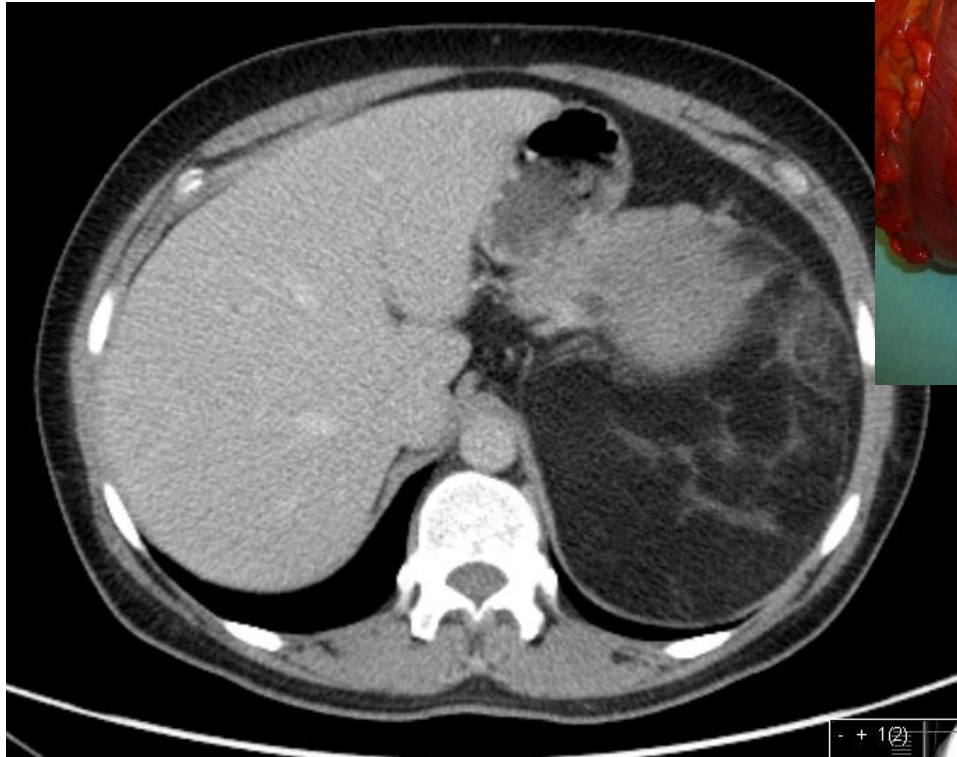
Anterior colon/mesentery



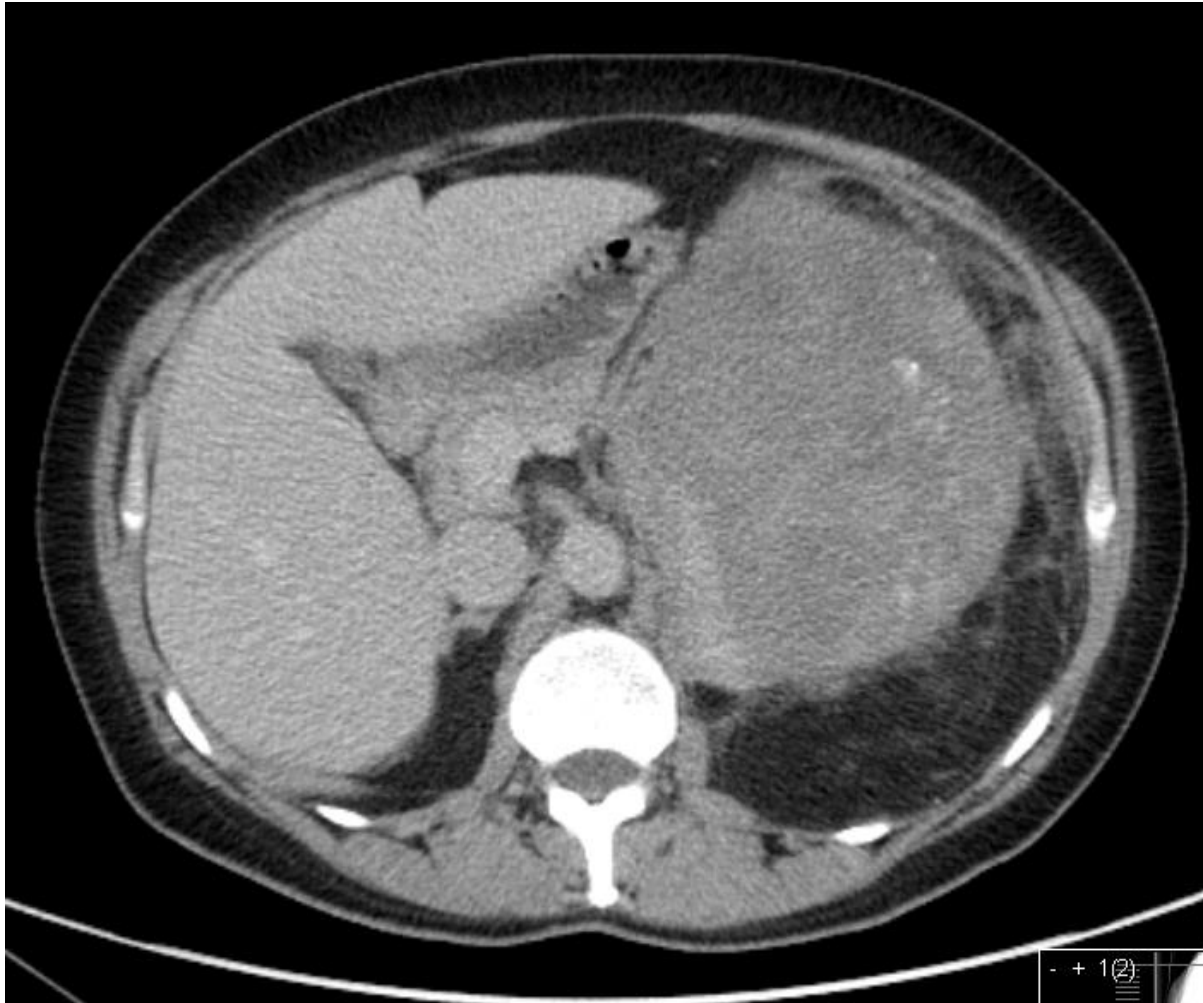
Superior margin -spleen



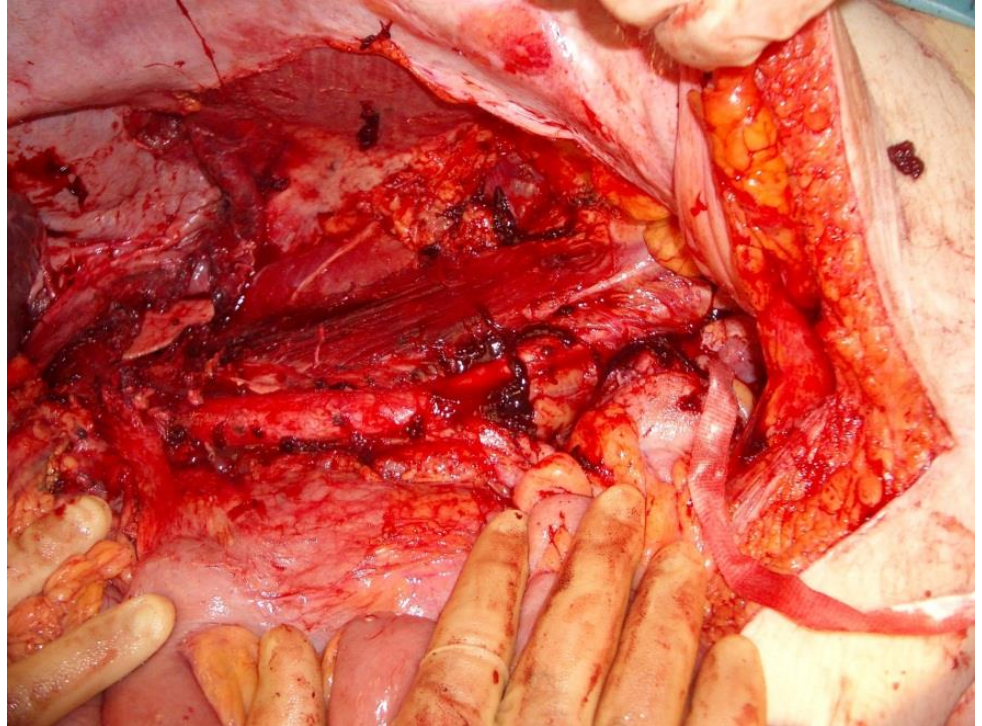
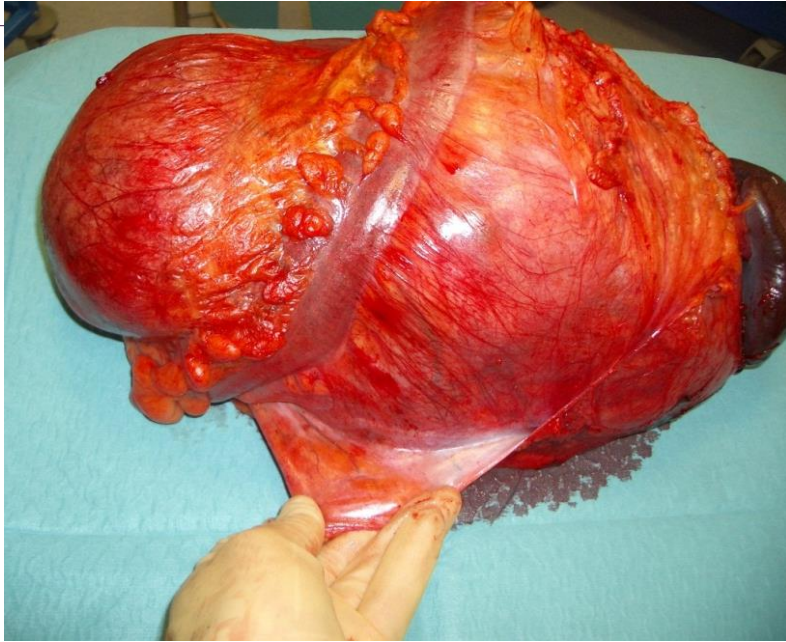
Superio-medial margin -pancreas



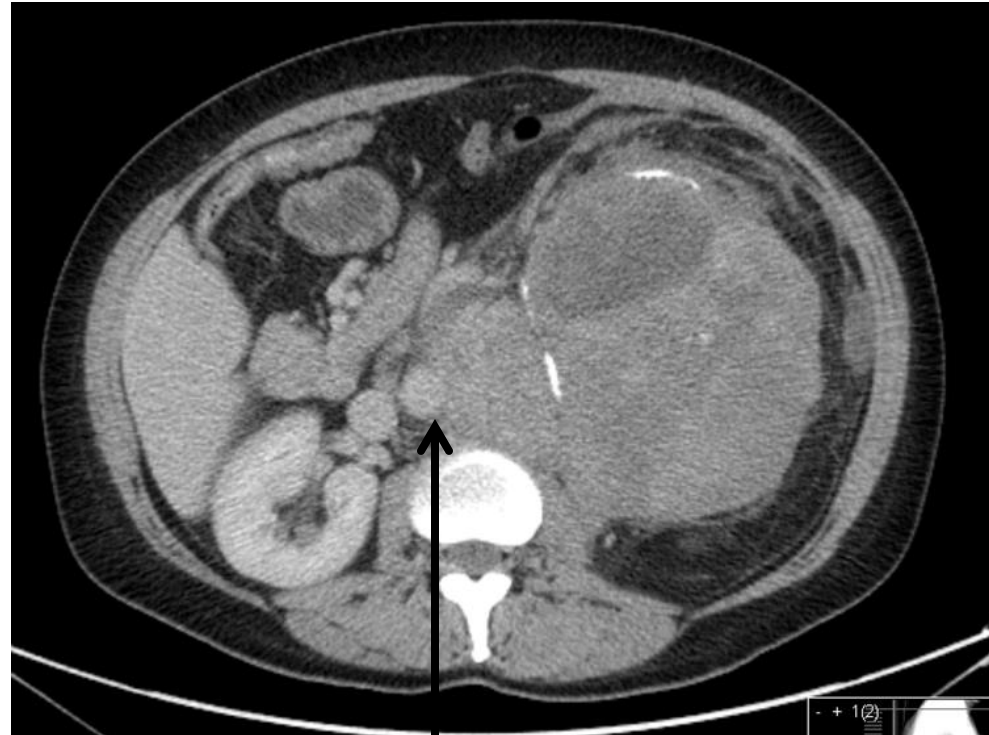
Lateral margin - peritoneal



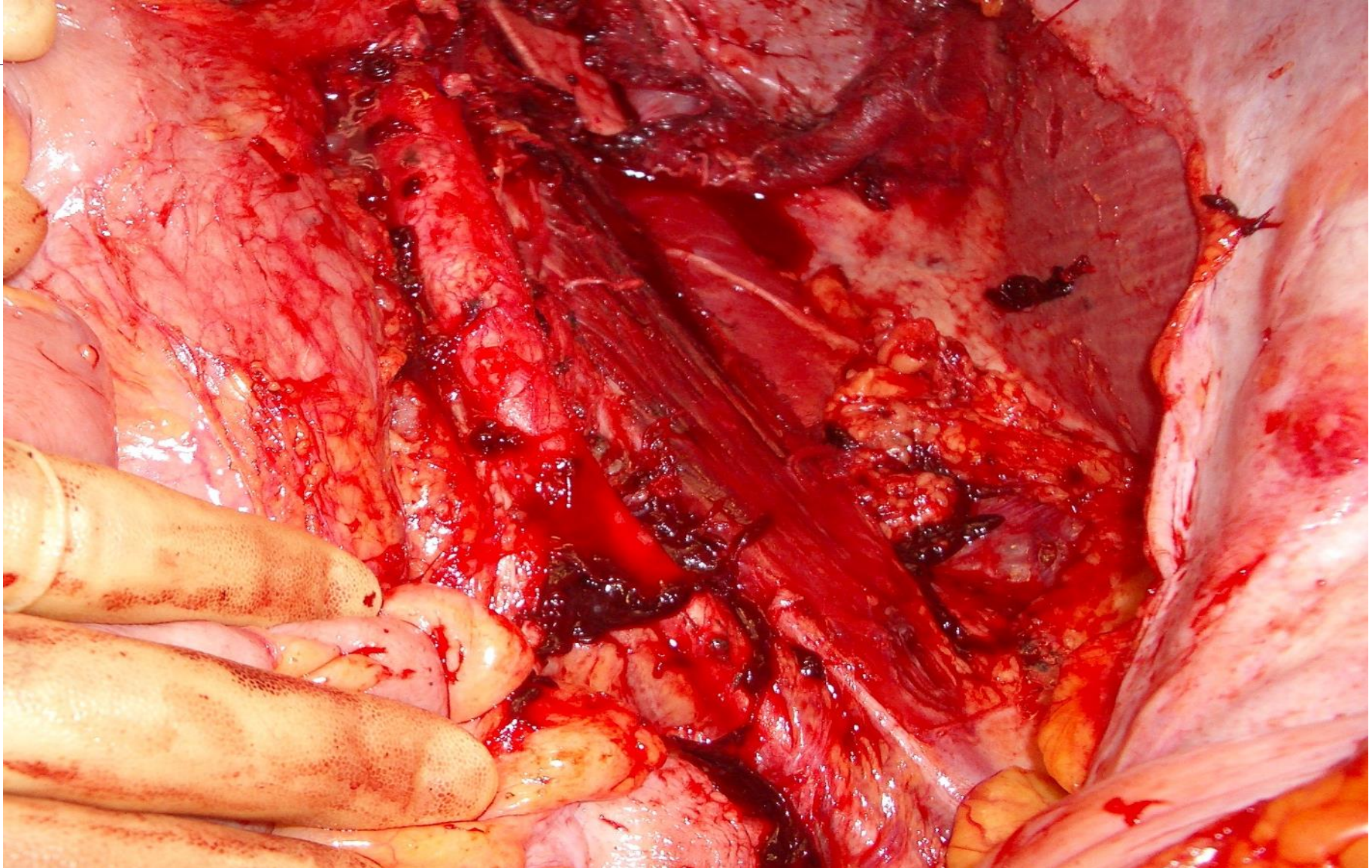
Lateral margin - peritoneal



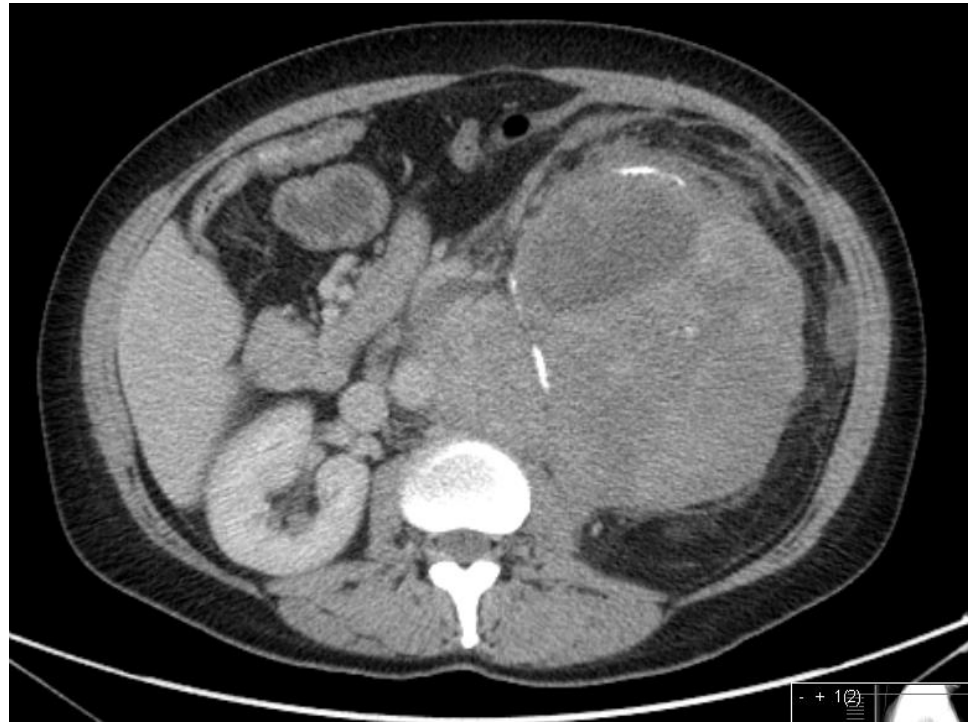
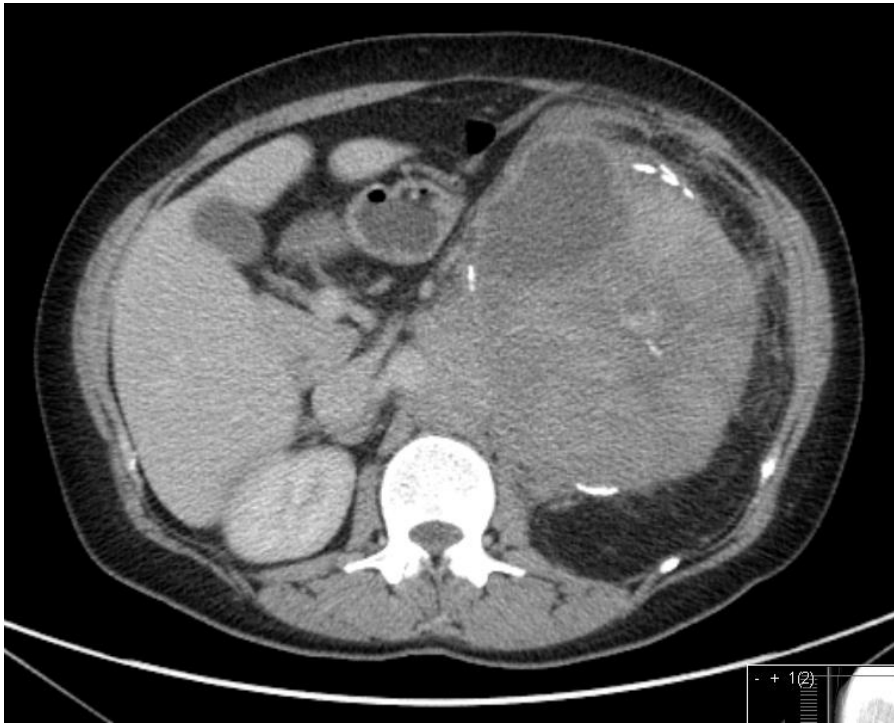
Medial margin - aorta



Medial margin - aorta

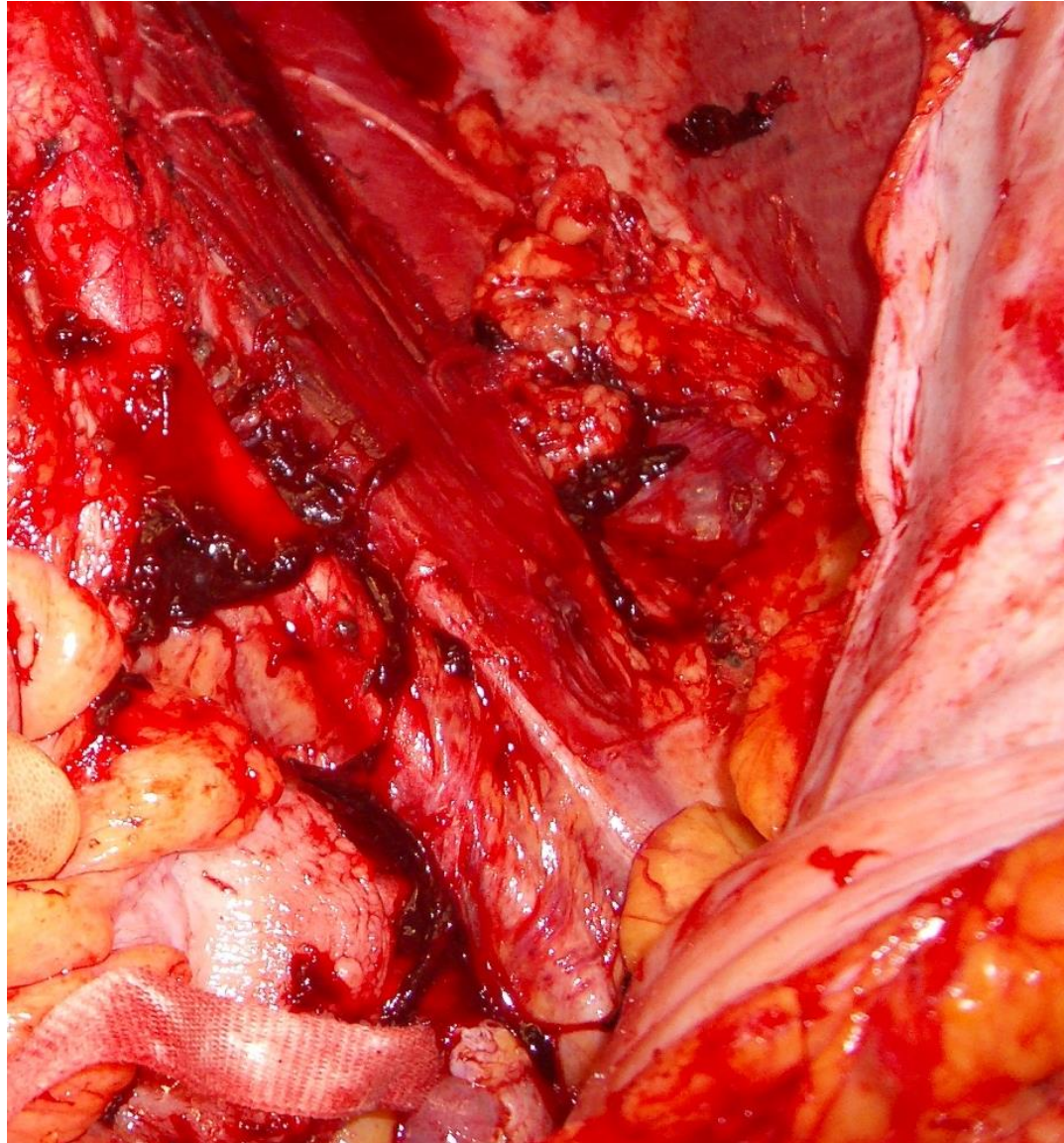


Posterior margin -psoas muscle

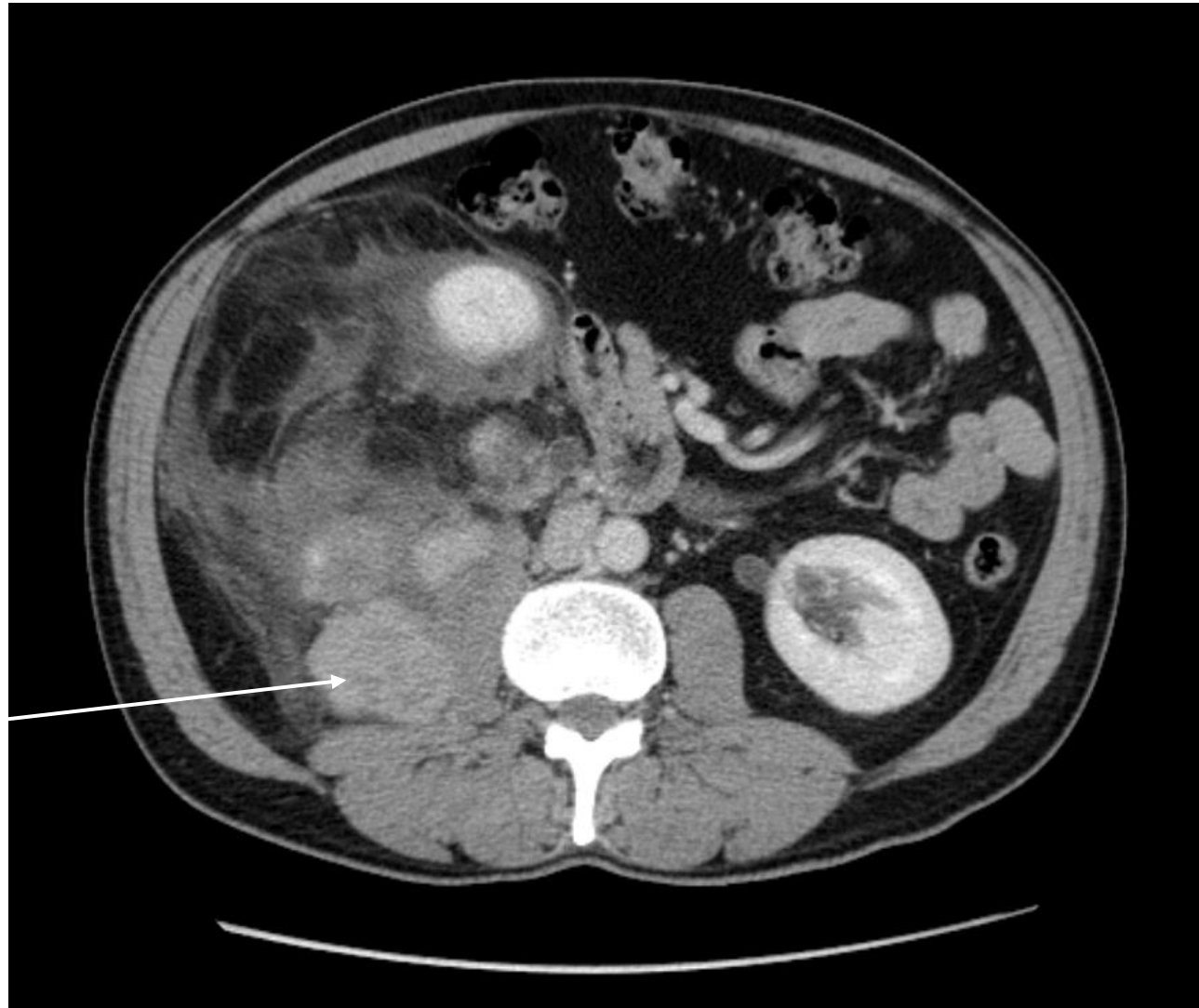


Psoas muscle or psoas aponeurosis?

Posterior margin -psoas muscle



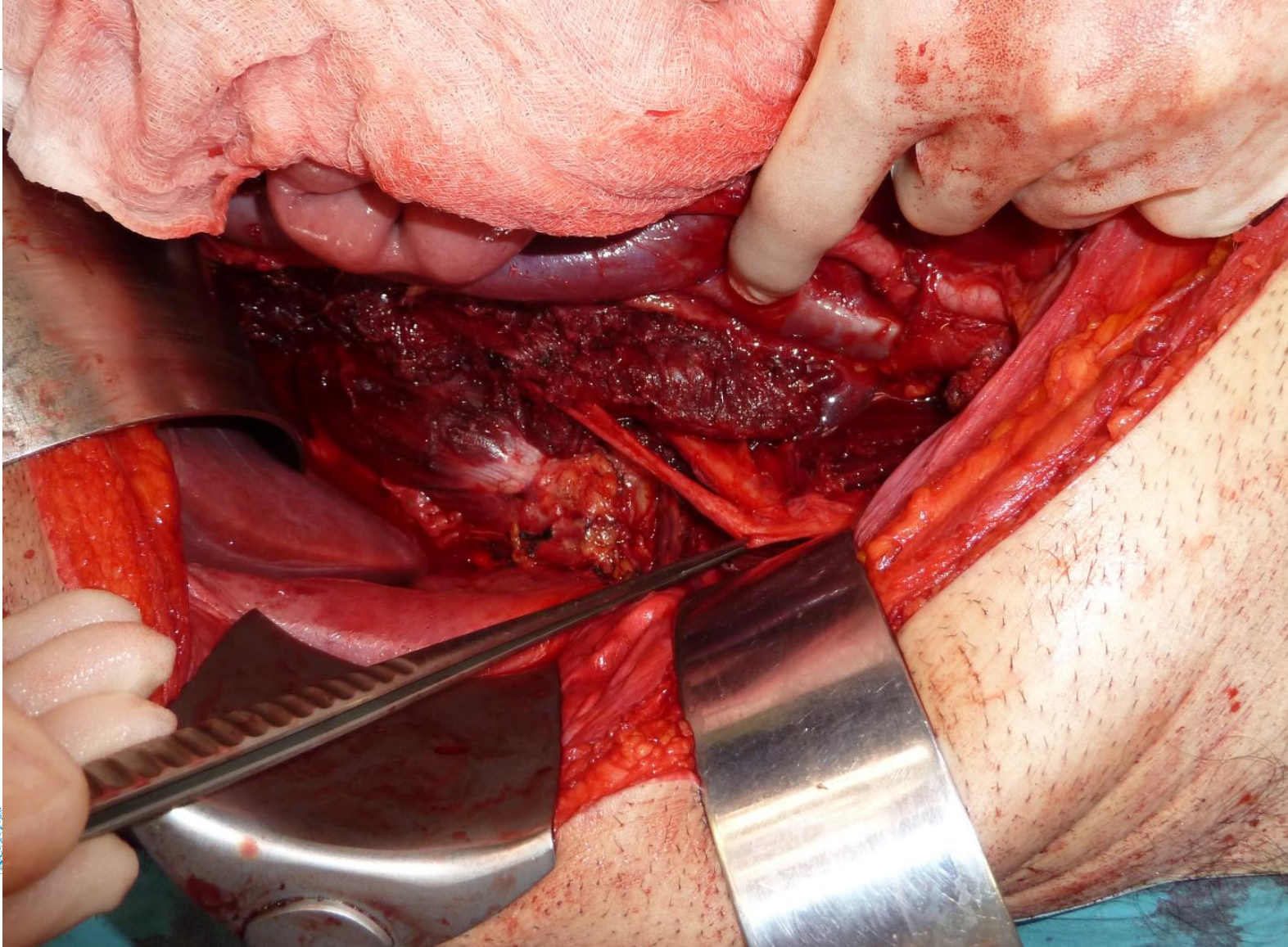
Posterior margin -psoas muscle



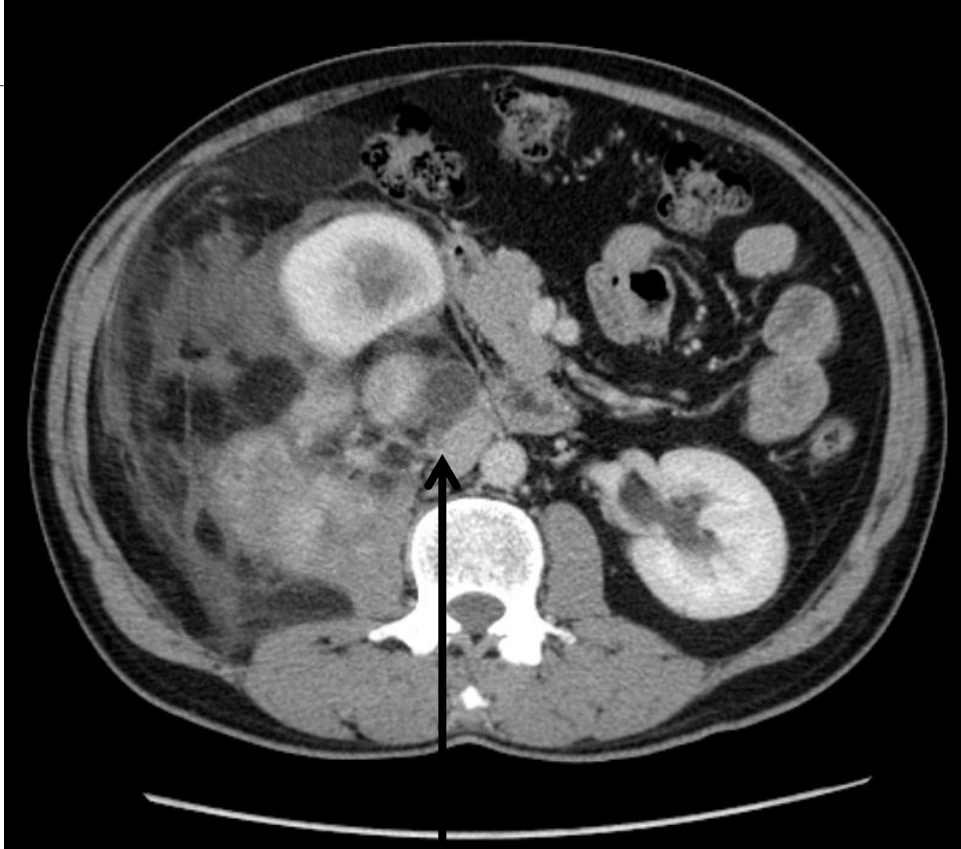
High-grade
component



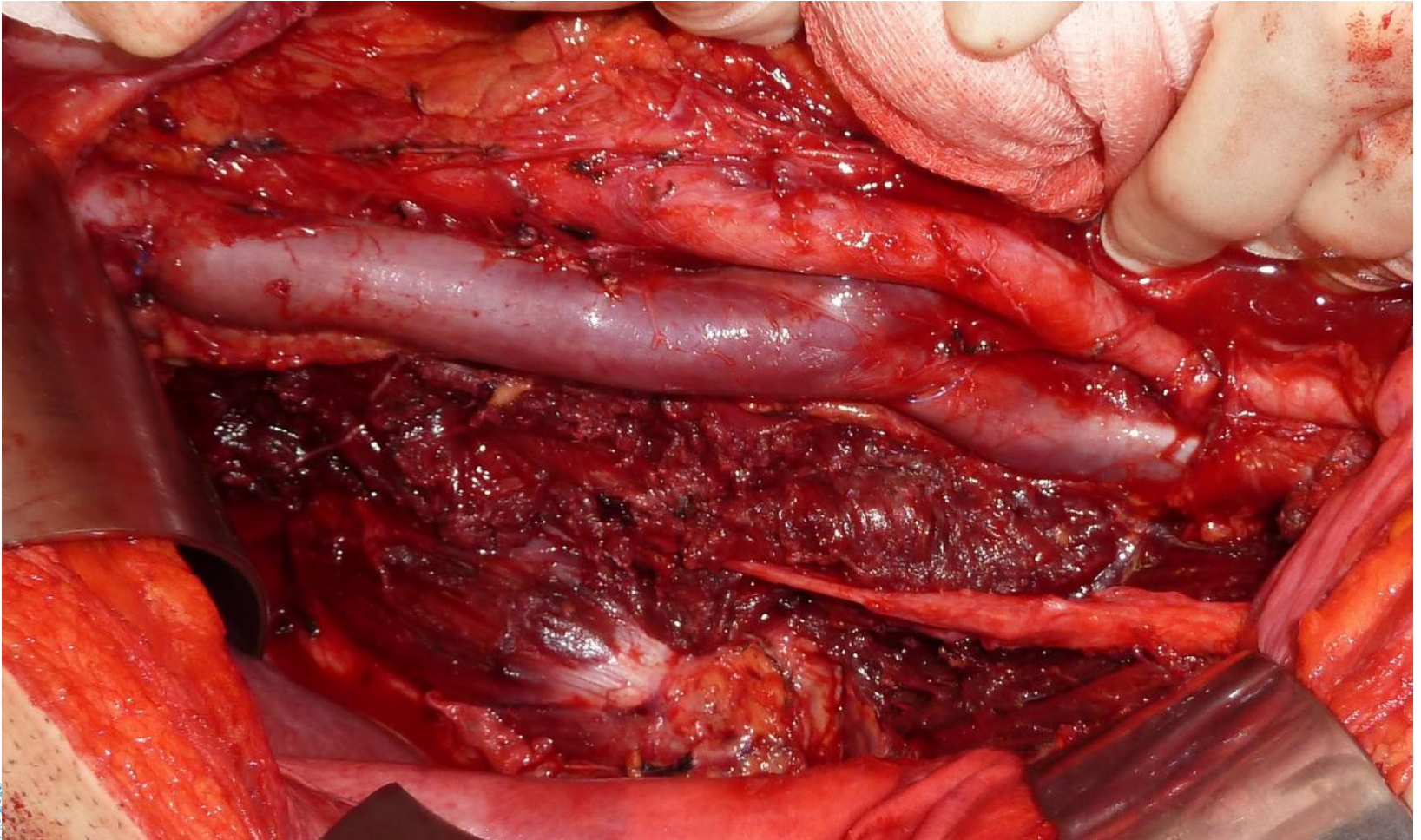
Posterior margin -psoas muscle



Inferior vena cava, aorta



Inferior vena cava, aorta

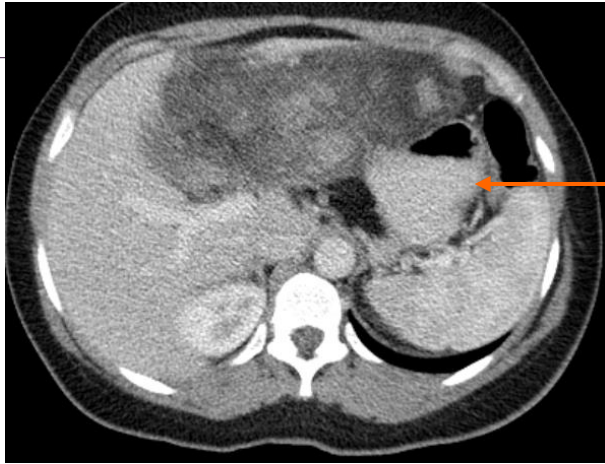


Direct infiltration

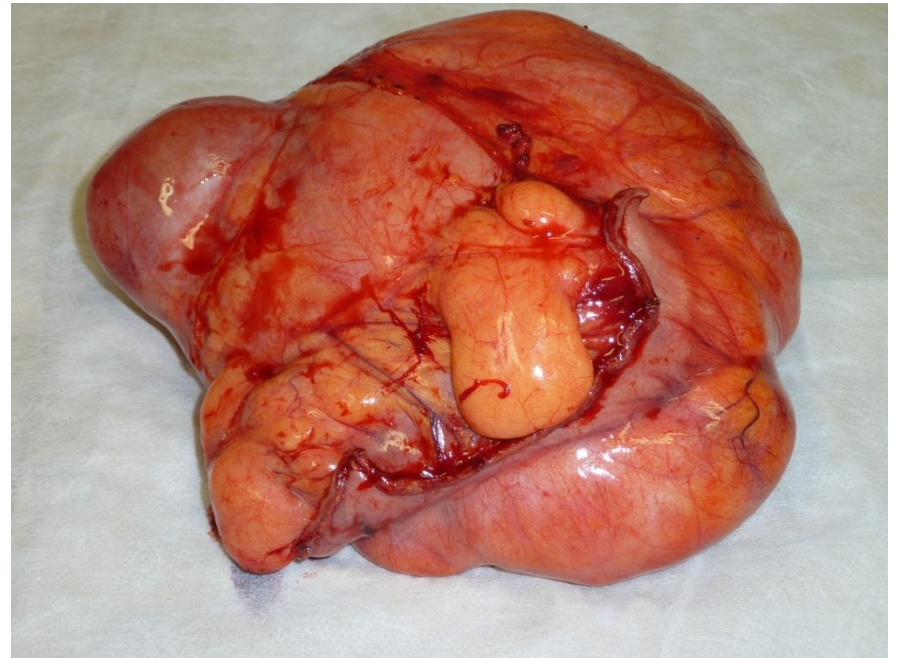
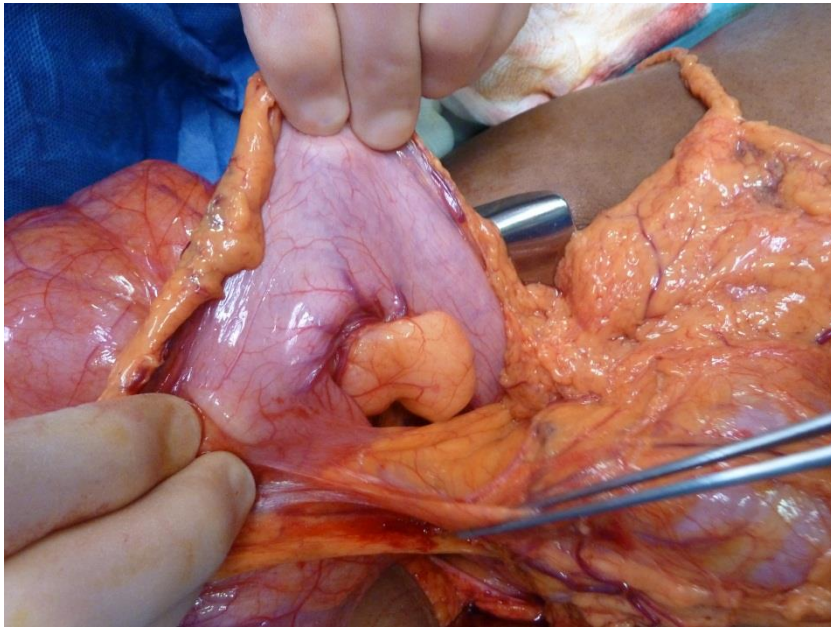
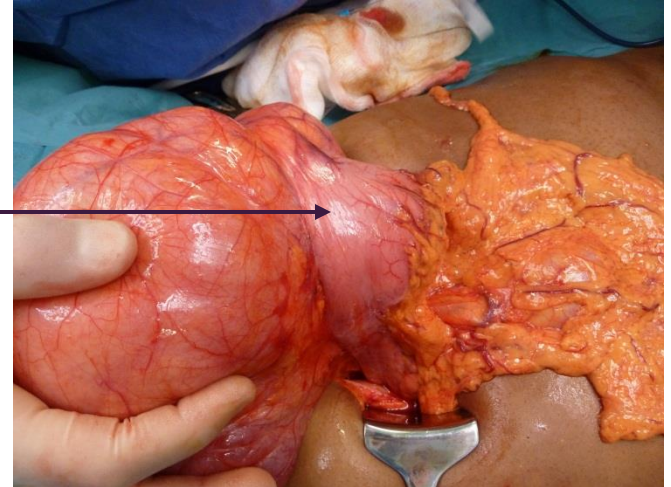
Organs or structures should be resected only if directly infiltrated: duodenum, head of pancreas, liver, stomach, diaphragm, major abdominal vessels, bladder/rectum and nerves, bone.



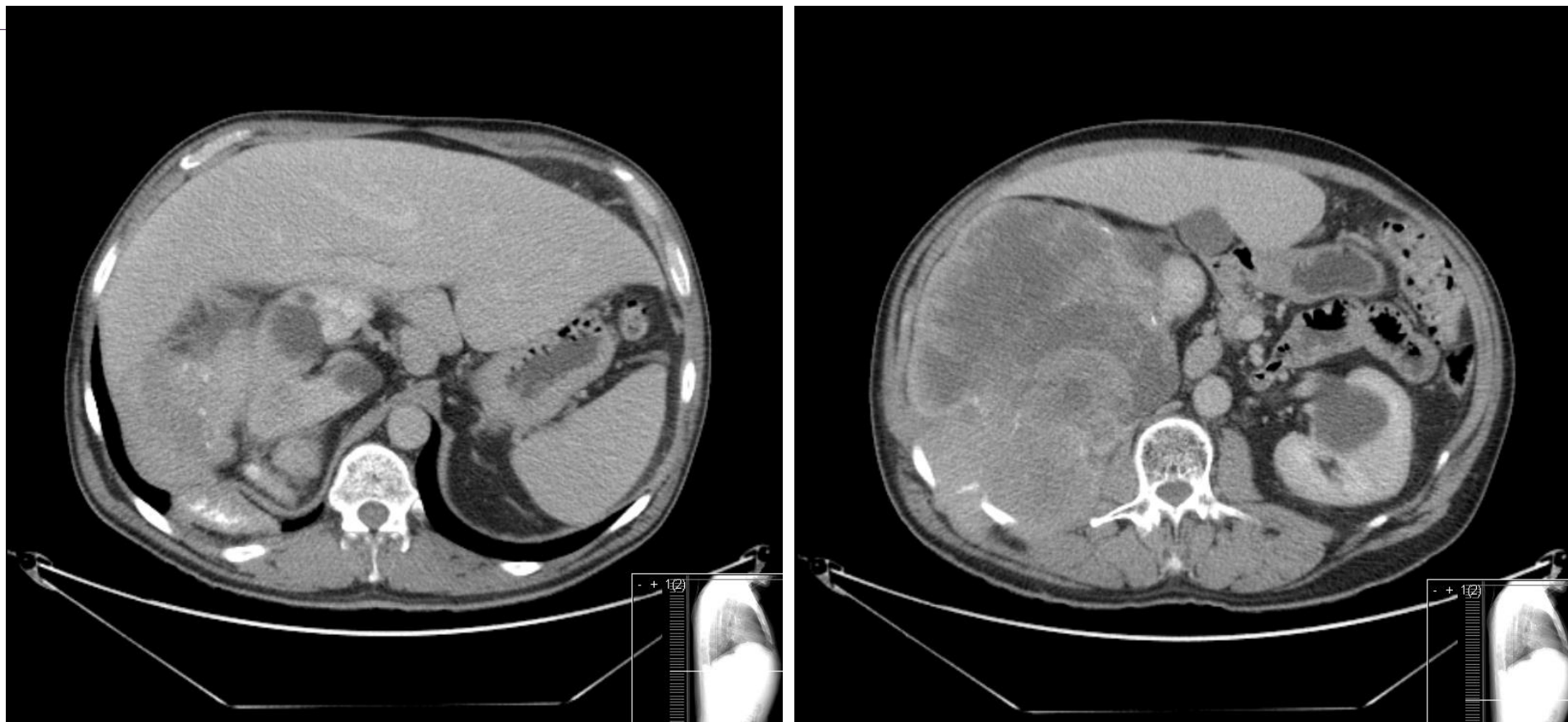
Direct infiltration



Stomach

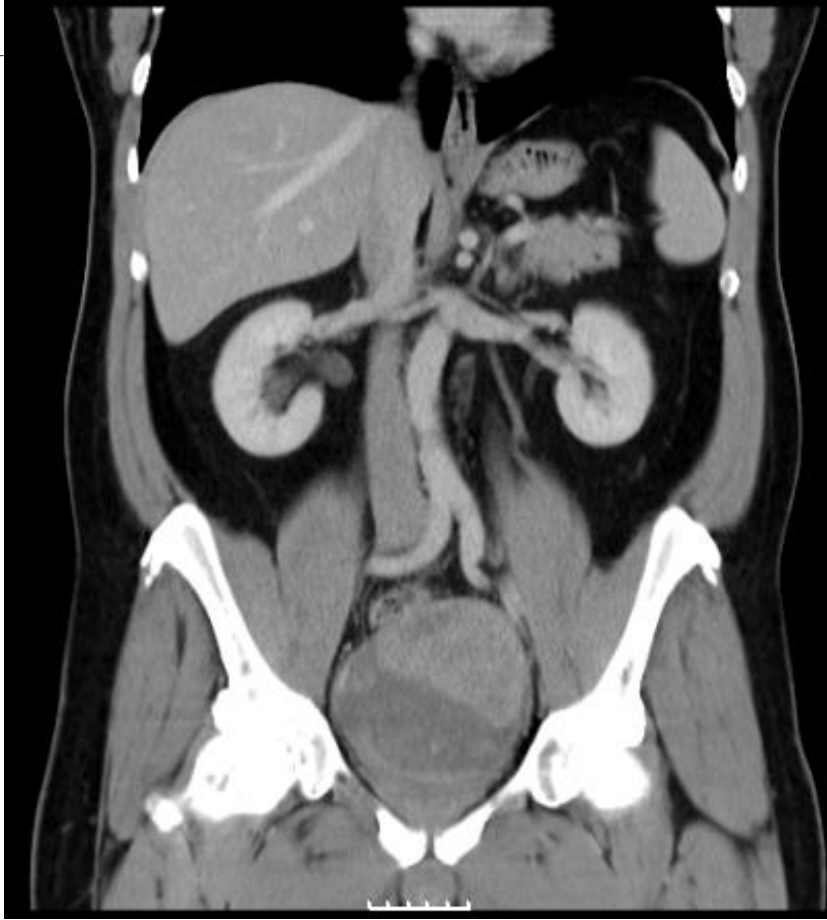


Direct infiltration



R kidney, liver, diaphragm, abdominal wall and chest wall

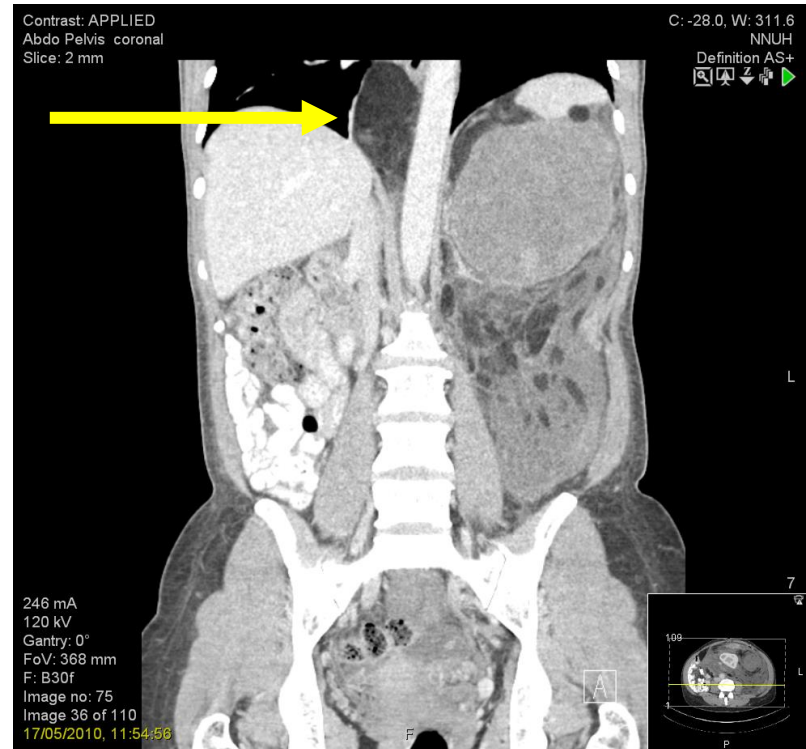
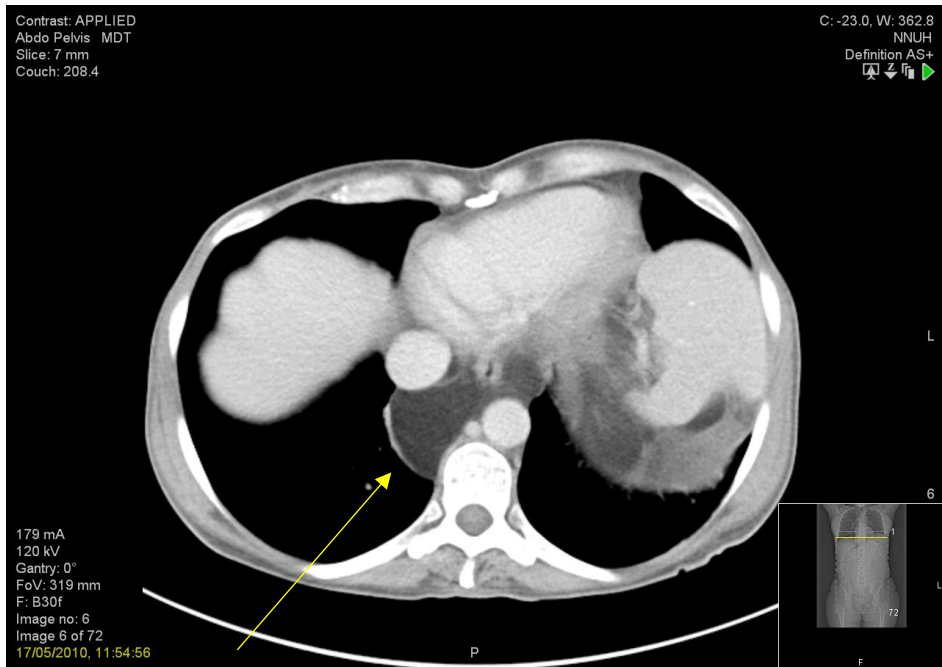
Pleomorphic sarcoma



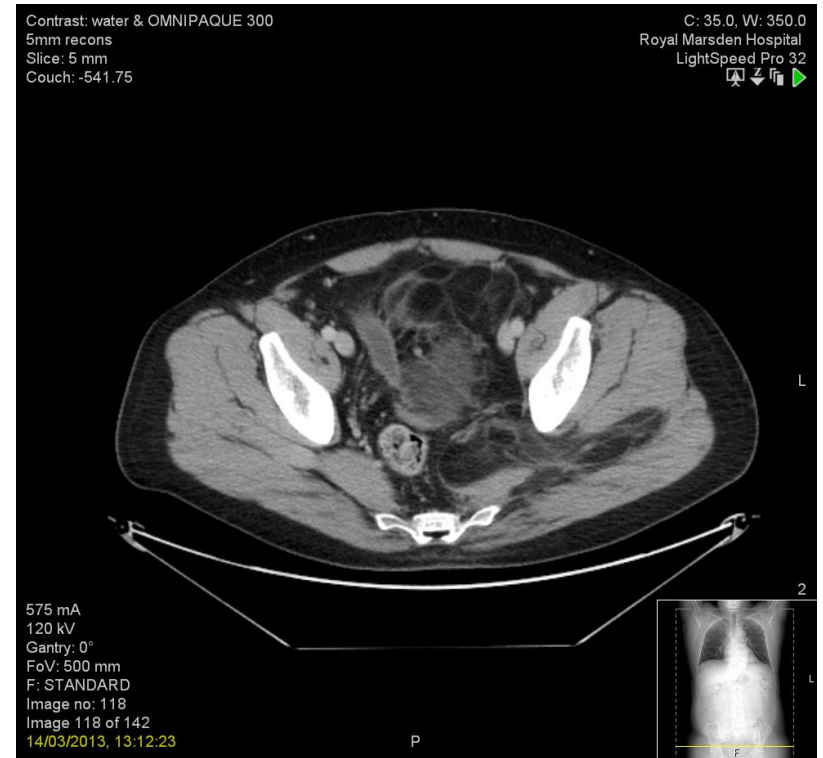
Pelvic exenteration

Extra-abdominal extension

Surgical extent



Extra-abdominal extension



Conclusion

- The retroperitoneum can host a wide spectrum of pathologies, including a variety of rare benign tumours and malignant neoplasms which can be primary or metastatic lesions.
- Other diagnoses must be considered when the radiological appearance is not typical of a retroperitoneal liposarcoma.



Conclusion

- The optimal management of retroperitoneal sarcoma (RPS) is facilitated by pre-treatment diagnosis and staging.
- Image-guided percutaneous core needle biopsy of RPS is strongly recommended.
- A preoperative core needle biopsy is safe and does not affect oncological outcome.
- An open or laparoscopic surgical incision biopsy must be strongly discouraged.



Conclusion

-
- The best chance of a curative resection is at the time of primary presentation.
 - The individual management plan should be determined taking into account both imaging and pathologic findings.



Conclusion

- Biologic behaviour, response to treatment, and clinical outcomes vary by histological subtype of RPS. The management plan, including extent of resection and neoadjuvant strategies, should be formulated accordingly.
- The current standard of care for retroperitoneal sarcoma is extended en bloc complete resection of the tumour and surrounding viscera performed in high-volume centres.



The ROYAL MARSDEN

NHS Foundation Trust



Dirk.Strauss@rmh.nhs.uk



Thank you