Para-Testicular Rhabdomyosarcoma

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PUOWG
Pediatric Urologic Oncology Working Group

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Acknowledgement

- Thank you to Dr. Jonathan Routh for the slides!

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General Pearls about RMS

- 350 new cases per year in US
  - 2/3 in kids < 6 years
  - GU (25% of RMS cases)

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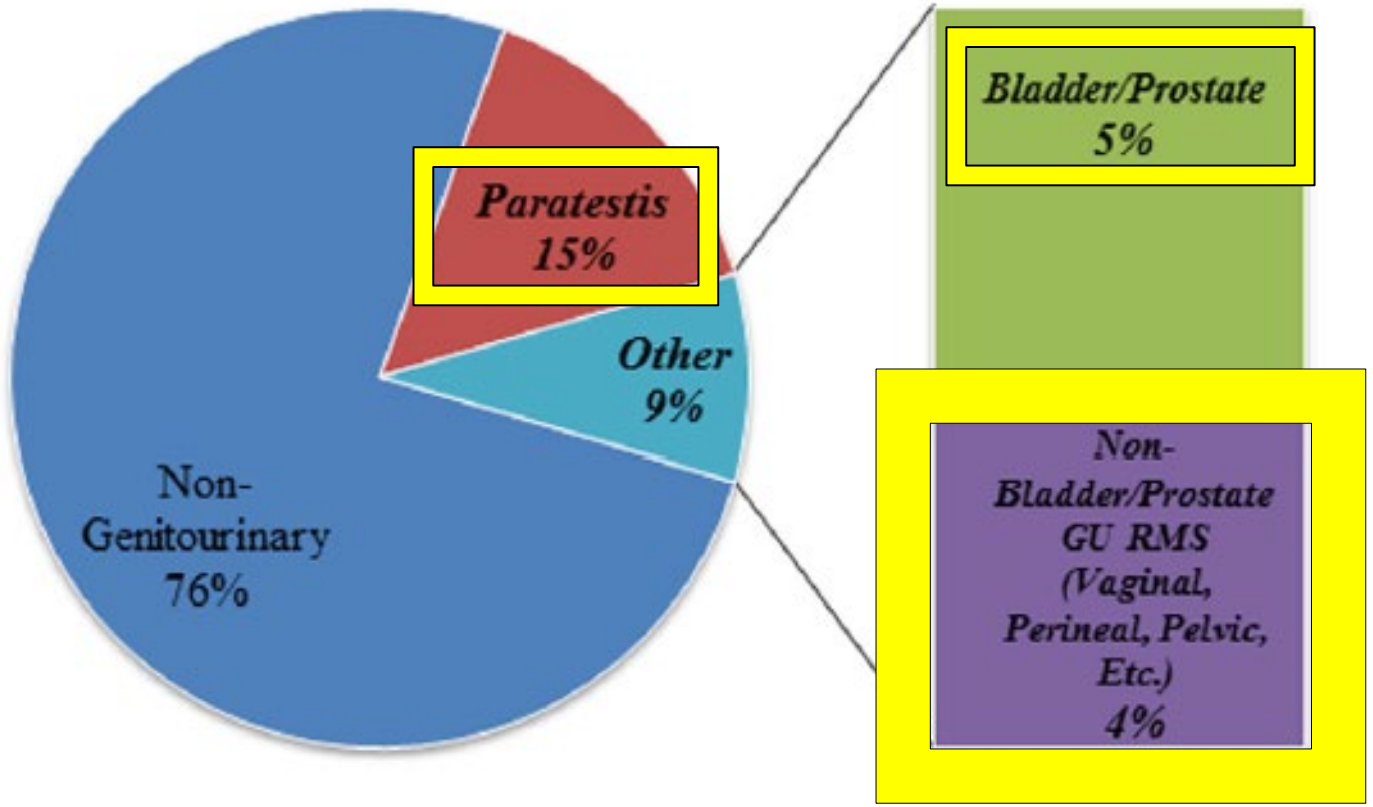
Pediatric and Adolescent GU RMS



Cost et al. *Urol Oncol.* 2014

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General Pearls about Para-testicular RMS

- Bimodal age distribution
  - 40% being diagnosed between age 1 to 5 years-old
  - 40% diagnosed after 10 years of age
  - 20% “other times” (<1yr or 5-10yr)
- Arises in the muscle of the distal portion of the spermatic cord
  - Presentation is often a unilateral painless scrotal swelling or mass
  - Because of superficial location and ease of exam, PT RMS usually detected earlier

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General Pearls about Para-testicular RMS

- At diagnosis:
  - 60% to 80% of PT RMS are Stage I
  - Compared with 10 to 15% of all primary RMS locations.
- > 90% of PT RMS have embryonal histology
  - Even alveolar PT-RMS have a better prognosis than other alveolar RMS primaries

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Prognosis by Site

Most Favorable

Orbit/Head and Neck

GU, Non-bladder/prostate (Think, Para-testis and GYN)

GU, Bladder/Prostate

Parameningeal

Other

Extremity

Least favorable

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Stage

	Stage	Sites	T	Size	N	M
Favorable	1	Orbit Head and neck (excluding parameningeal) GU – non-bladder/ non-prostate Biliary Tract/Liver	T_1 or T_2	a or b	N_0 or N_1 or N_x	M_0
Unfavorable, Small	2	Bladder/Prostate Extremity, Cranial Parameningeal, Other (includes trunk, retroperitoneum, etc.) Except Biliary tract/Liver	T_1 or T_2	a	N_0 or N_x	M_0
Unfavorable, Large, or Nodes	3	Bladder/Prostate Extremity Cranial Parameningeal, Other (includes trunk, retroperitoneum, etc.) Except Biliary tract/Liver	T_1 or T_2	a b	N_1 N_0 or N_1 or N_x	M_0 M_0
Metastatic	4	All	T_1 or T_2	a or b	N_0 or N_1	M_1

Para-Testis

Site → T1= confined to anatomic site of origin, T2= extension to surrounding tissue
Size → a= ≤5 cm, b= >5 cm
Nodes→ N0= no regional nodes, N1= regional nodes clinically involved, Nx= status of nodes not known
Mets → M0= no distant mets, M1= + mets

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Group

Group 1: Localized disease, completely resected

Group 2: Gross total resection with evidence of regional spread

a. Grossly resected tumor with microscopic residual
b. Regional disease with involved nodes, completely resected without residual disease
c. Regional disease with involved nodes, grossly resected but with microscopic residual and/or involvement of the most distal node in the dissection

Group 3: Incomplete resection with gross residual disease

a. After biopsy only

Group 4: Distant mets

- Includes lung, liver, bones, BM, brain, distant muscle, nodes, + CSF, or implants on pleural or peritoneal surface

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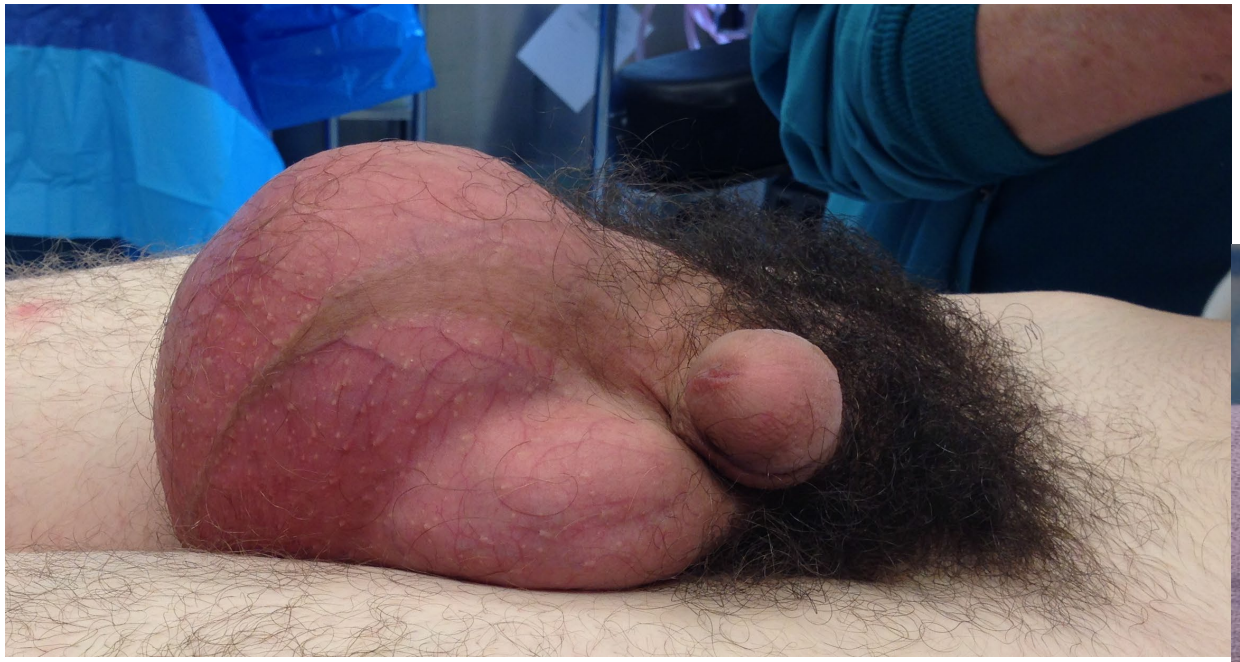
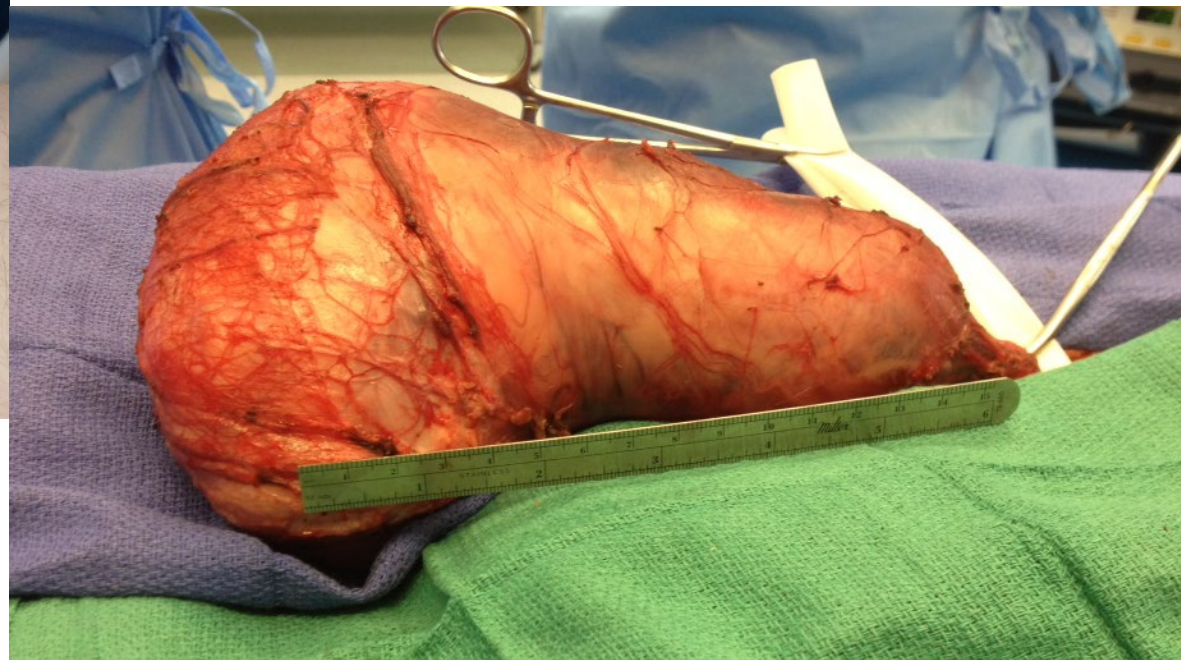
New para-testicular mass





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New para-testicular mass

- Likely need to make diagnosis first:
  - Inguinal exploration
    - If low suspicion for malignancy, can attempt excision with frozen section
      - Important to be able to convert to radical if needed based on frozen
    - If high suspicion for malignancy then proceed with radical orchiectomy
    - Low threshold to take a “cap” of skin with the mass if it won’t dissect free

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New para-testicular mass

- If RMS, then need full staging:
  - CT C/A/P
  - Bone Marrow biopsies/aspirates
  - Consider PET scan

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New para-testicular mass

- Will need multidisciplinary discussion
  - Oncology, Urology, Radiation Oncology, Oncofertility
  - Do they need RPLND?
    - Retroperitoneal LN on CT?
    - ≥ 10yo?
  - They will need adjuvant chemotherapy regardless so think Mediport
    - Can combine RPLND, Mediport and Bone Marrows all in one OR session
  - ***Have them sperm bank prior to RPLND or Chemotherapy!***

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Controversies in the Management of Paratesticular Rhabdomyosarcoma: Is Staging Retroperitoneal Lymph Node Dissection Necessary for Adolescents With Resected Paratesticular Rhabdomyosarcoma?

By Eugene S. Wiener, James R. Anderson, Jacqueline I. Ojimba, Thomas E. Lobe, Charles Paidas, Richard J. Andrassy, R. Beverly Raney, Stephen J. Qualman, Sarah S. Donaldson, Harold M. Maurer, Michael P. Link, William M. Crist, and Holcombe E. Grier
Pittsburgh, Pennsylvania

- Intergroup Rhabdomyosarcoma Study III vs. IV
  - III: prophylactic ipsilateral RPLND
  - IV: wait until there is CT evidence of N+

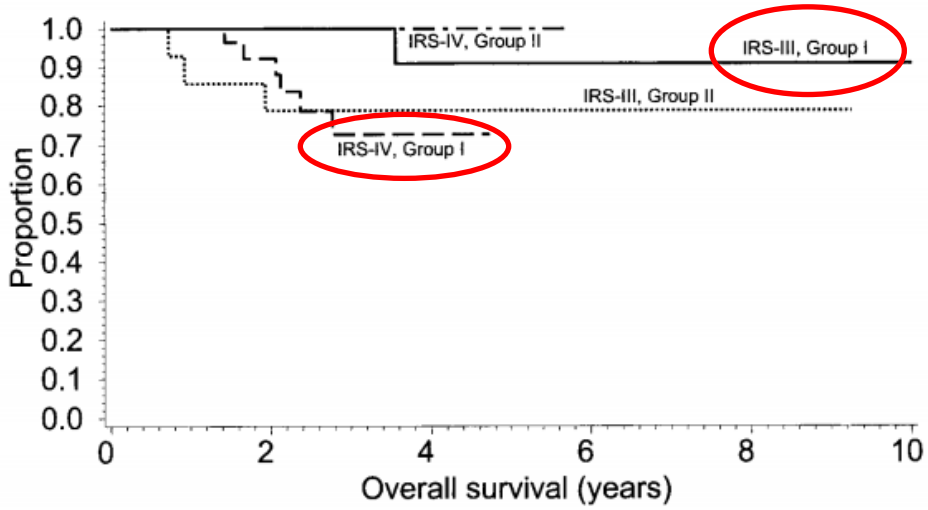

Fig 4. Survival rate of adolescents with group I or II, paratesticular RMS according to clinical group and therapy protocol (ie, IRS-III and -IV). Age ≥ 10 years. IRS-III group I, ——; IRS-III group II, ------; IRS-IV group I, – – – –; IRS-IV group II, – · – · –.

Table 5. Distribution of Node-Positive Group II PTRMS by Age Group

Age (yr)	IRS-III No. Cases (%)	IRS-IV No. Cases (%)
0-4	6 of 40 (15)	0 of 39
5-9	4 of 30 (13)	3 of 48 (6)
All < 10	10 of 70 (14)	3 of 87 (4)
10-14	7 of 14 (50)	0 of 22
>15	7 of 16 (44)	6 of 25 (24)
All > 10	14 of 30 (47)	6 of 47 (13)

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COG Data: PT-RMS

- 279 patients
  - 121 ≥10 years old
  - 92% low risk
  - 78% negative resection margins
  - 90% N0 on imaging
- 5-year EFS 92%
- 5-year OS 98%

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COG Data: RPLND

- Only 21% ≥10yo underwent RPLND
  - 29% underwent sampling
  - 10% technique unknown
  - 40% no nodes sampled

- Imaging alone missed 52% of pathologically positive RPLN pts

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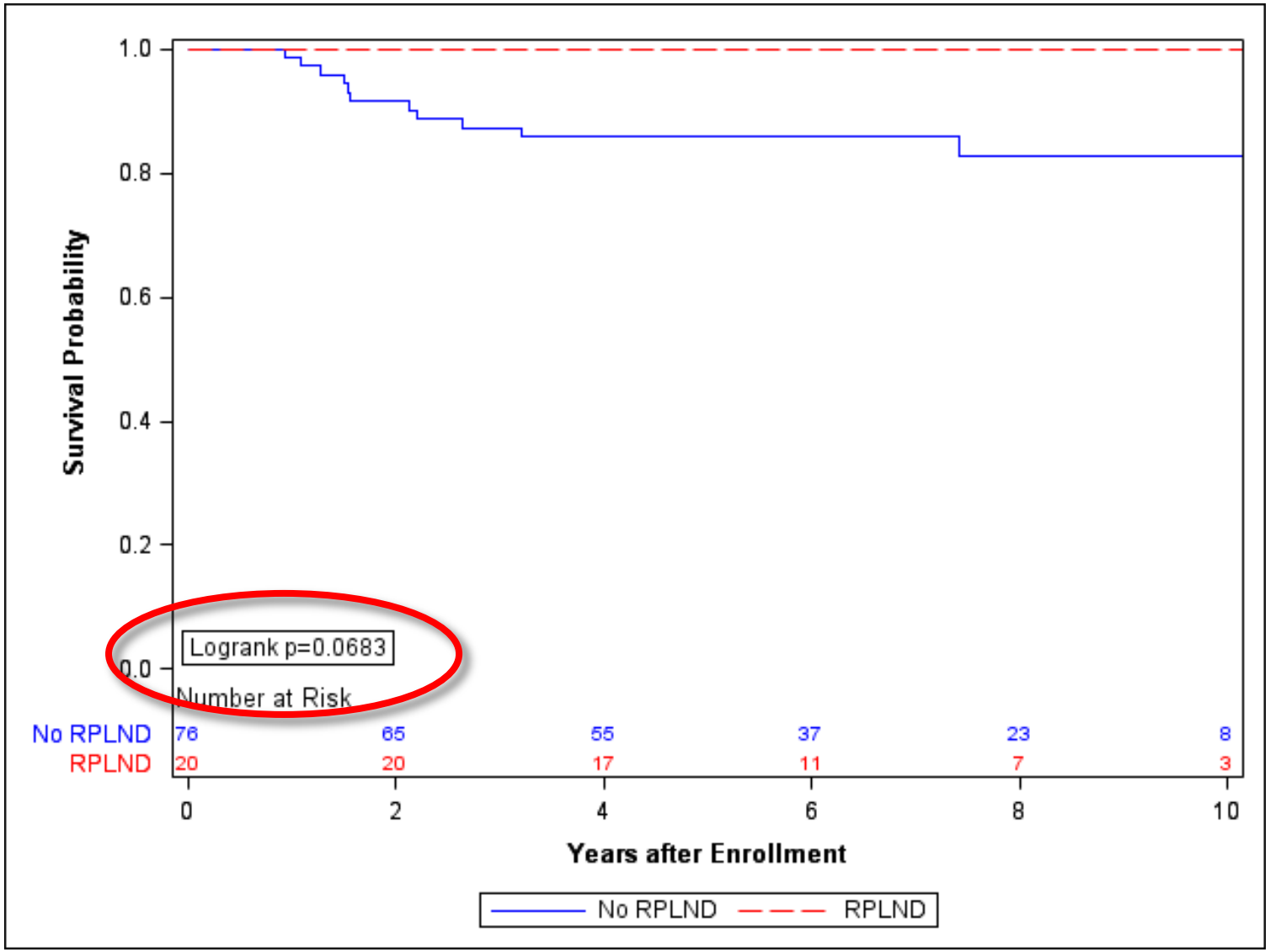

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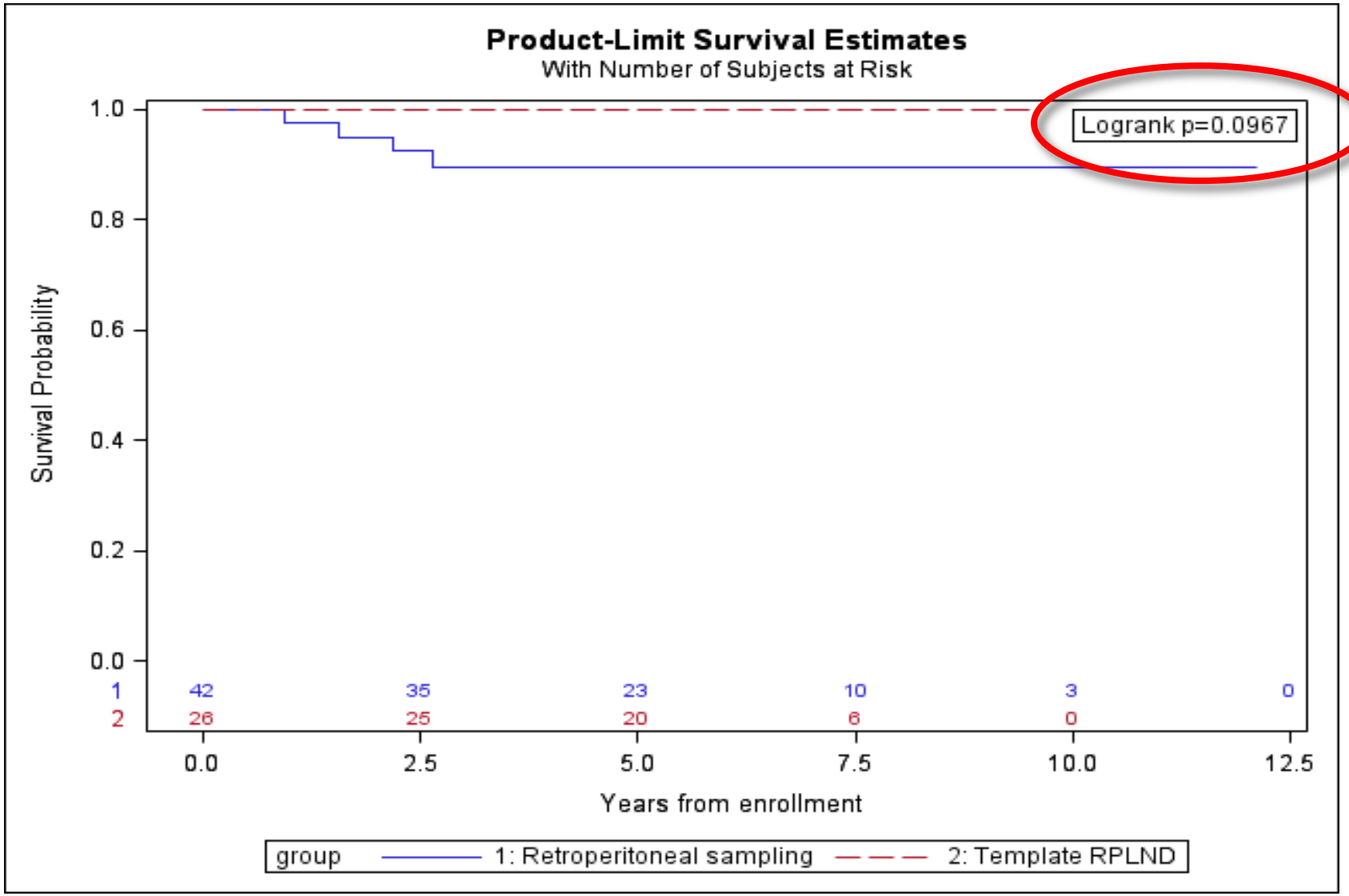

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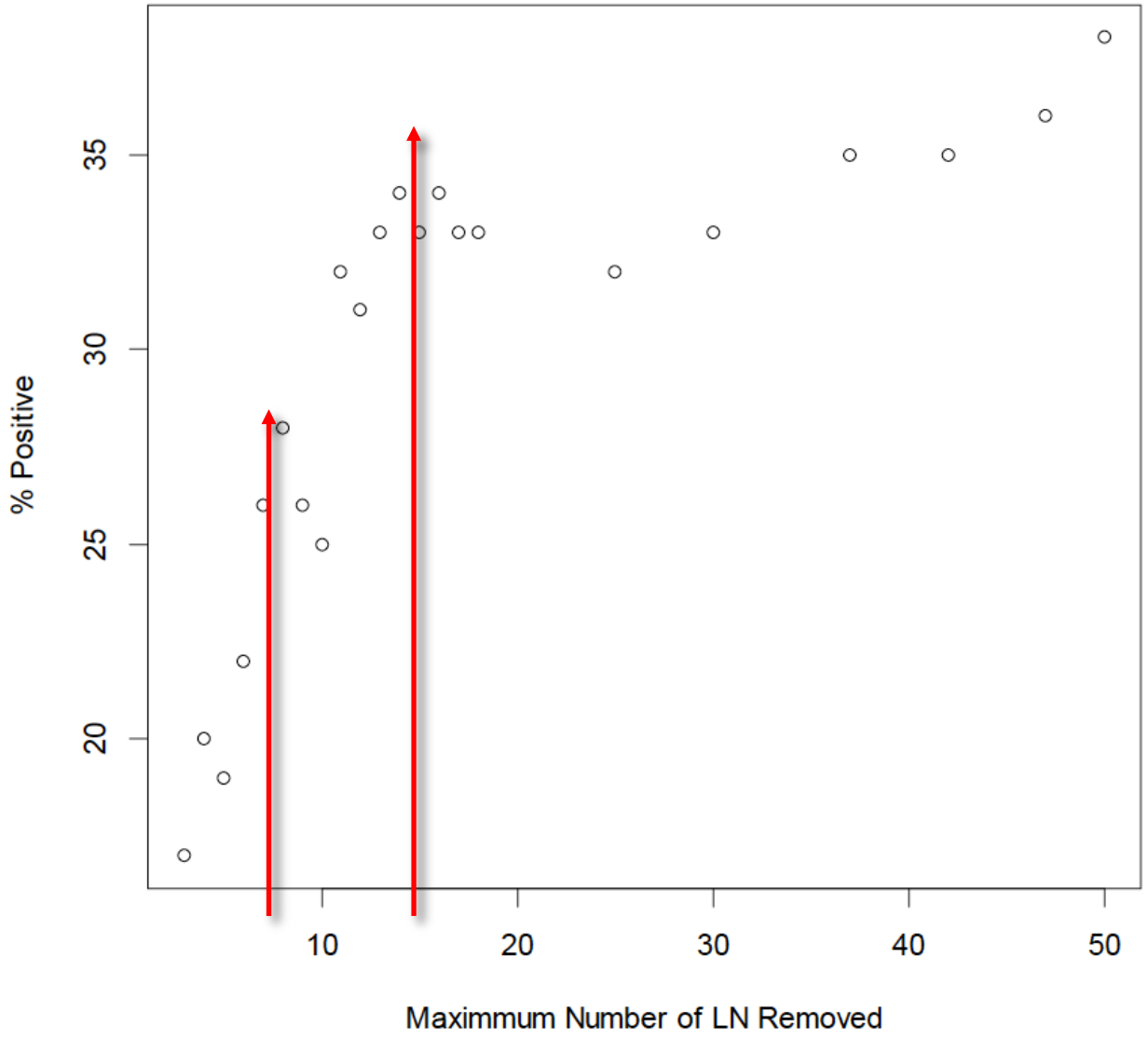
Ideal: 7-13 nodes



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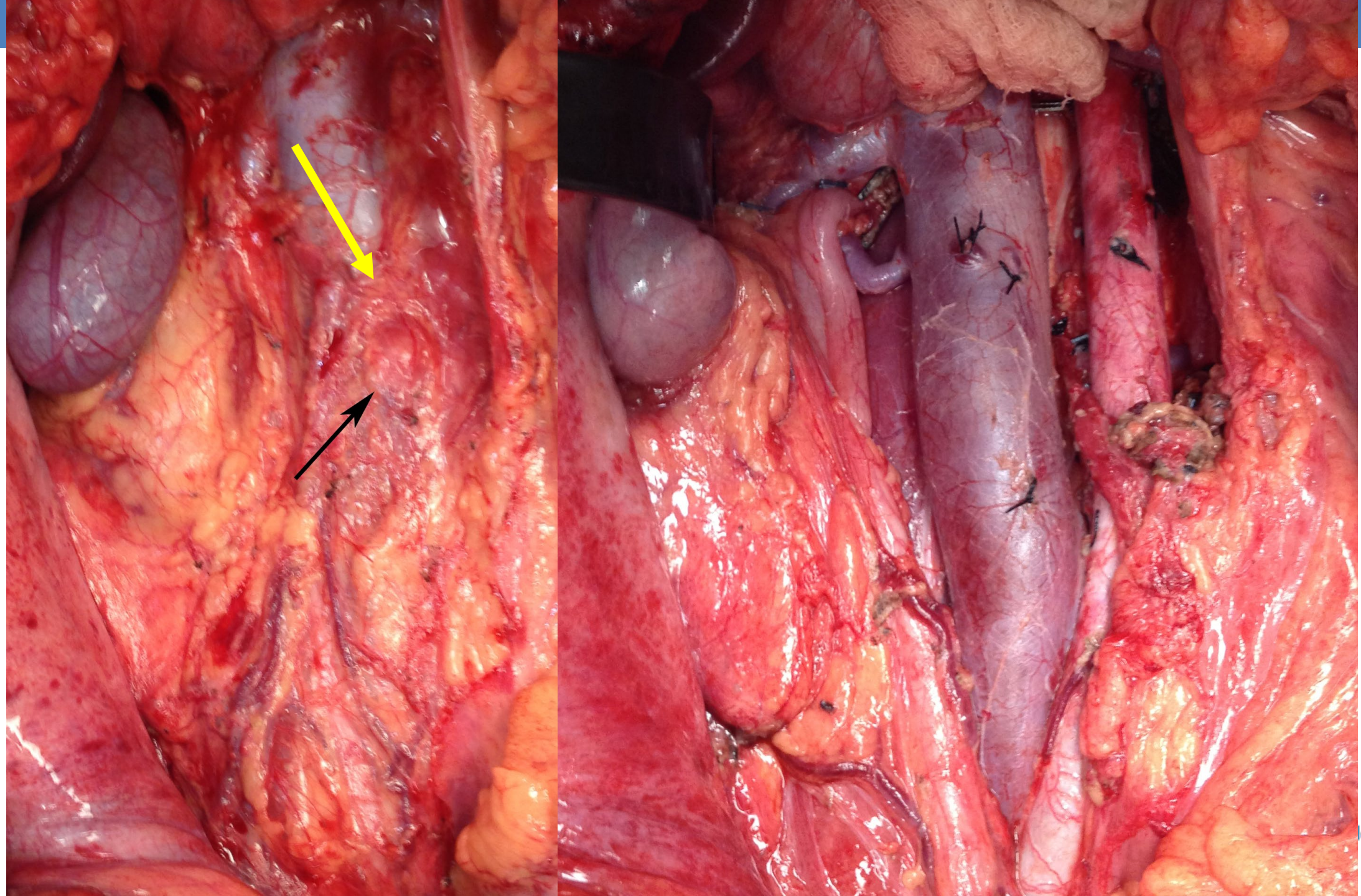
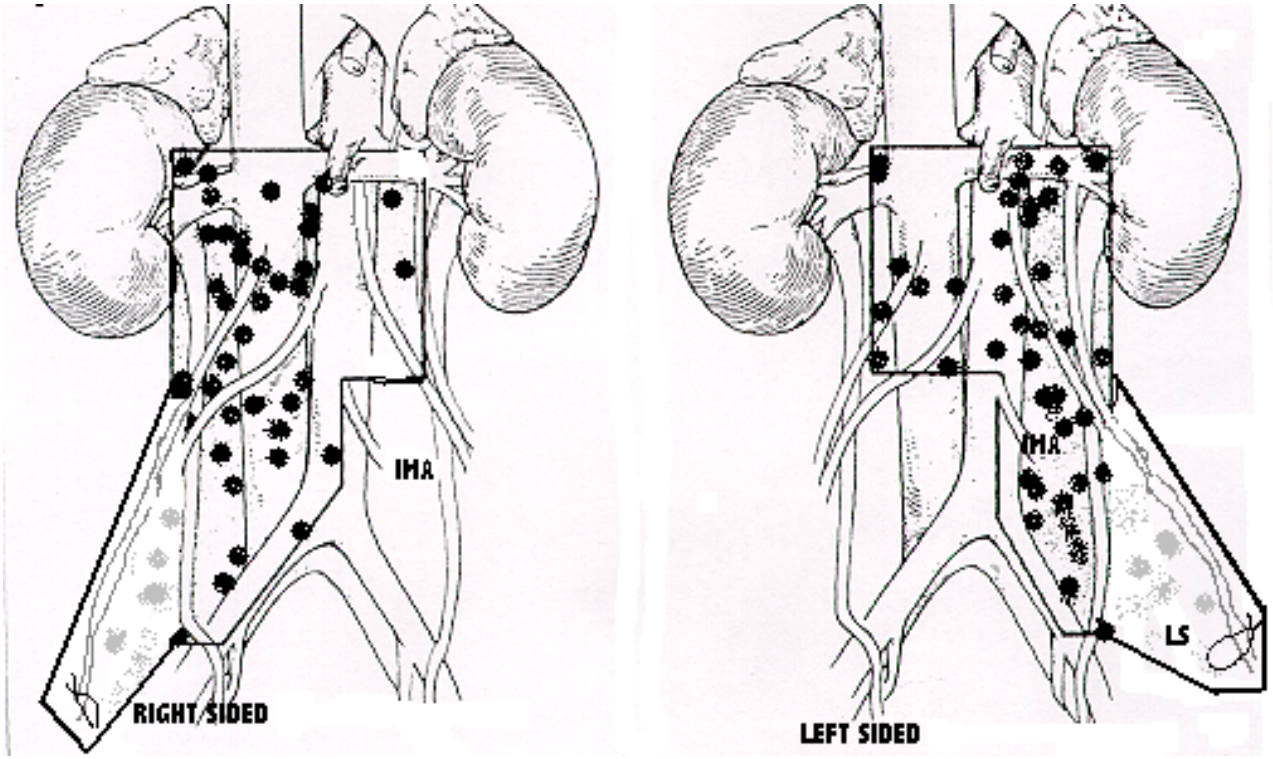


Ipsilateral RPLND

- Approach – Unilateral Template



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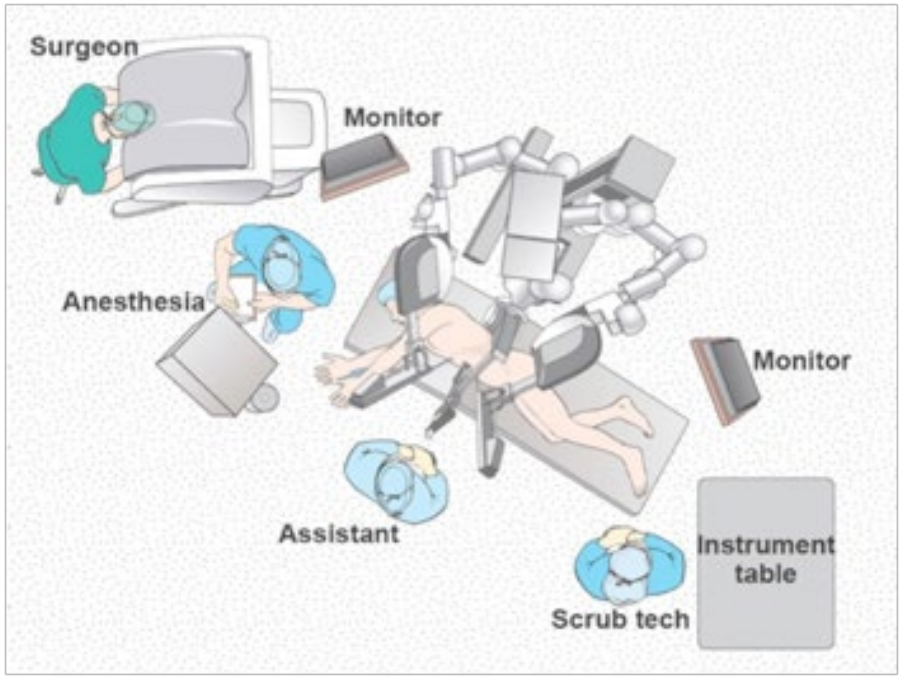
Robotic RPLND

- Approach
  - Right Lateral – Right Unilateral Template
  - *Left Lateral – Left Unilateral Template*
  - Trendelendberg – Either Template



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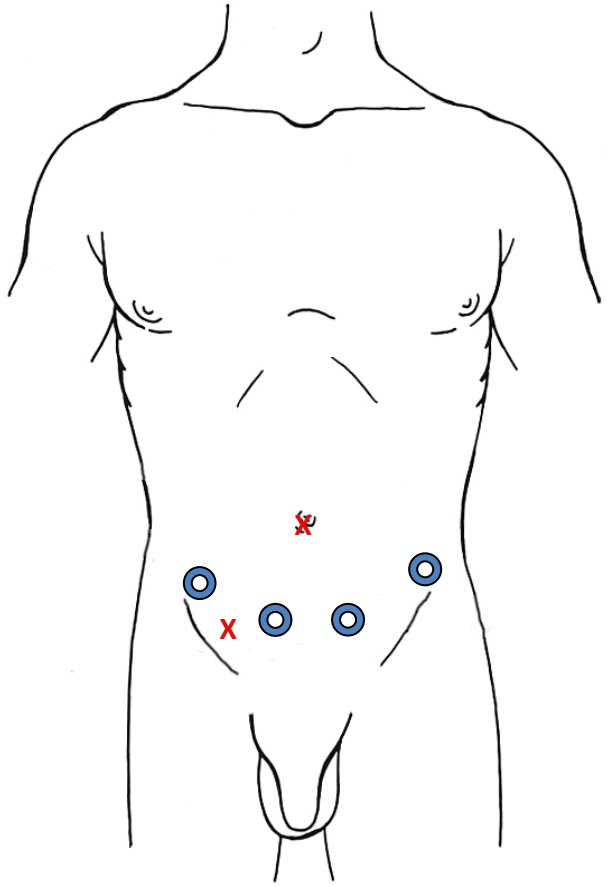
Robotic RPLND

- Approach
  - Head Down



8mm working ports

X: assist port(s)

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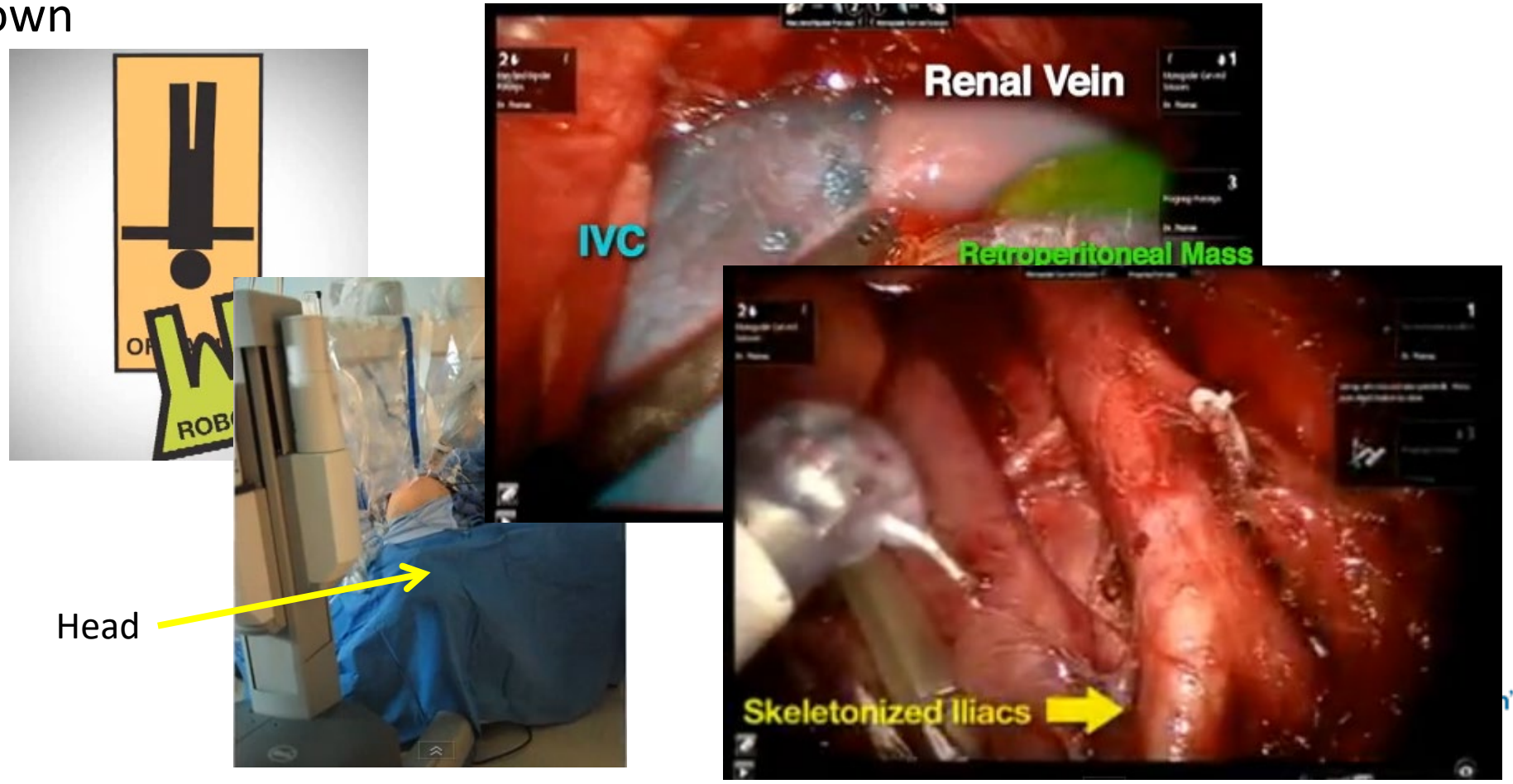
Robotic RPLND

- Approach
  - Head Down



Role for hemi-scrotectomy

- Currently debated
  - Not good data to support either way . . .

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Impact of Hemiscrotectomy on Outcome of Patients with Embryonal Paratesticular Rhabdomyosarcoma—Results from the Cooperative Soft Tissue Sarcoma Group Studies CWS-86, 91, 96 and 2002P

Guido Seitz,* Tobias M. Dantonello, Daniel Kosztyla, Thomas Klingebiel, Ivo Leuschner, Jörg Fuchs† and Ewa Koscielniak† on behalf of the Cooperative Soft Tissue Sarcoma Study Group

Results: Mean ± SD 5-year overall survival rate was 91.5% ± 2.4% for patients with embryonal rhabdomyosarcoma. A total of 28 patients underwent transscrotal approaches initially. Of these patients 12 were treated with hemiscrotectomy (mean ± SD 5-year event-free survival 91.7% ± 8%) and 16 without hemiscrotectomy (93.8% ± 6.1%). Additionally 13 of 156 patients underwent an inguinal approach with hemiscrotectomy due to suspicious tumor infiltration of the scrotal skin (mean ± SD 5-year event-free survival 84.6% ± 10%). Relapse was observed in 3 of 12 patients after transscrotal approach with hemiscrotectomy (locoregional lymph node in 1 and metastasis in 2). One metastatic relapse was observed in the group undergoing a transscrotal approach without hemiscrotectomy. One of 13 patients treated with an inguinal approach and hemiscrotectomy had locoregional relapse and died of disease.

Conclusions: Hemiscrotectomy seems not to be mandatory in patients after transscrotal approaches regarding outcome and local relapse. Nevertheless, hemiscrotectomy probably should be performed if the scrotal skin is infiltrated.

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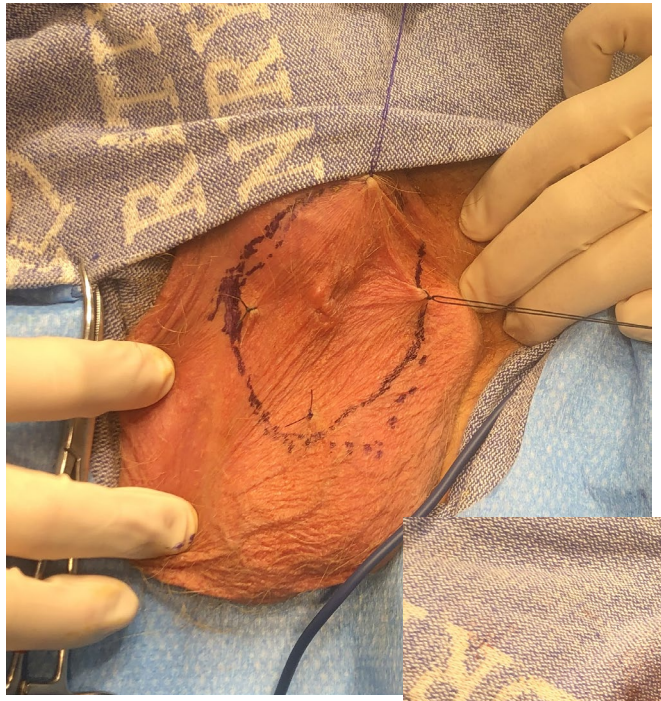
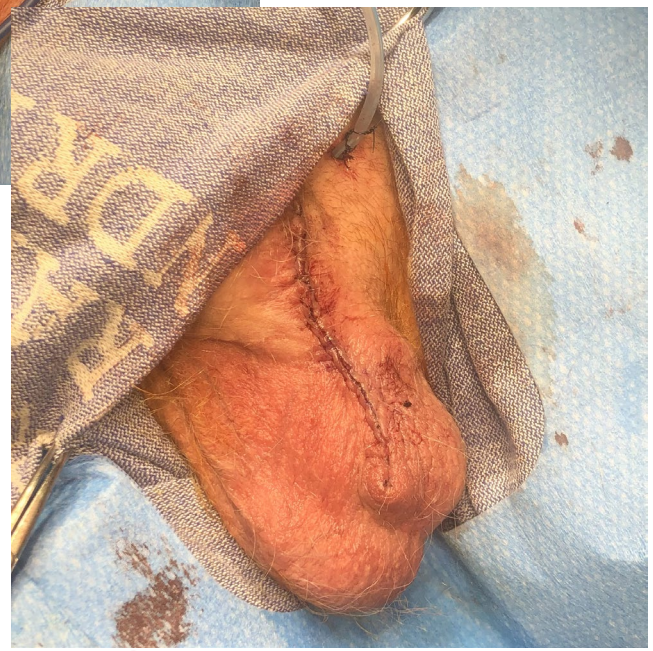
Role for hemi-scrotectomy

- Currently debated
- I would offer for:
  - Prior scrotal approach
  - Positive margin/Tumor spill
- Do not approach such a case via scrotum if you have a suspicion
- Low threshold to take some of the scrotum with primary specimen if tumor is not easily dissecting from inner scrotum
- Can combine hemi-scrotectomy with RPLND





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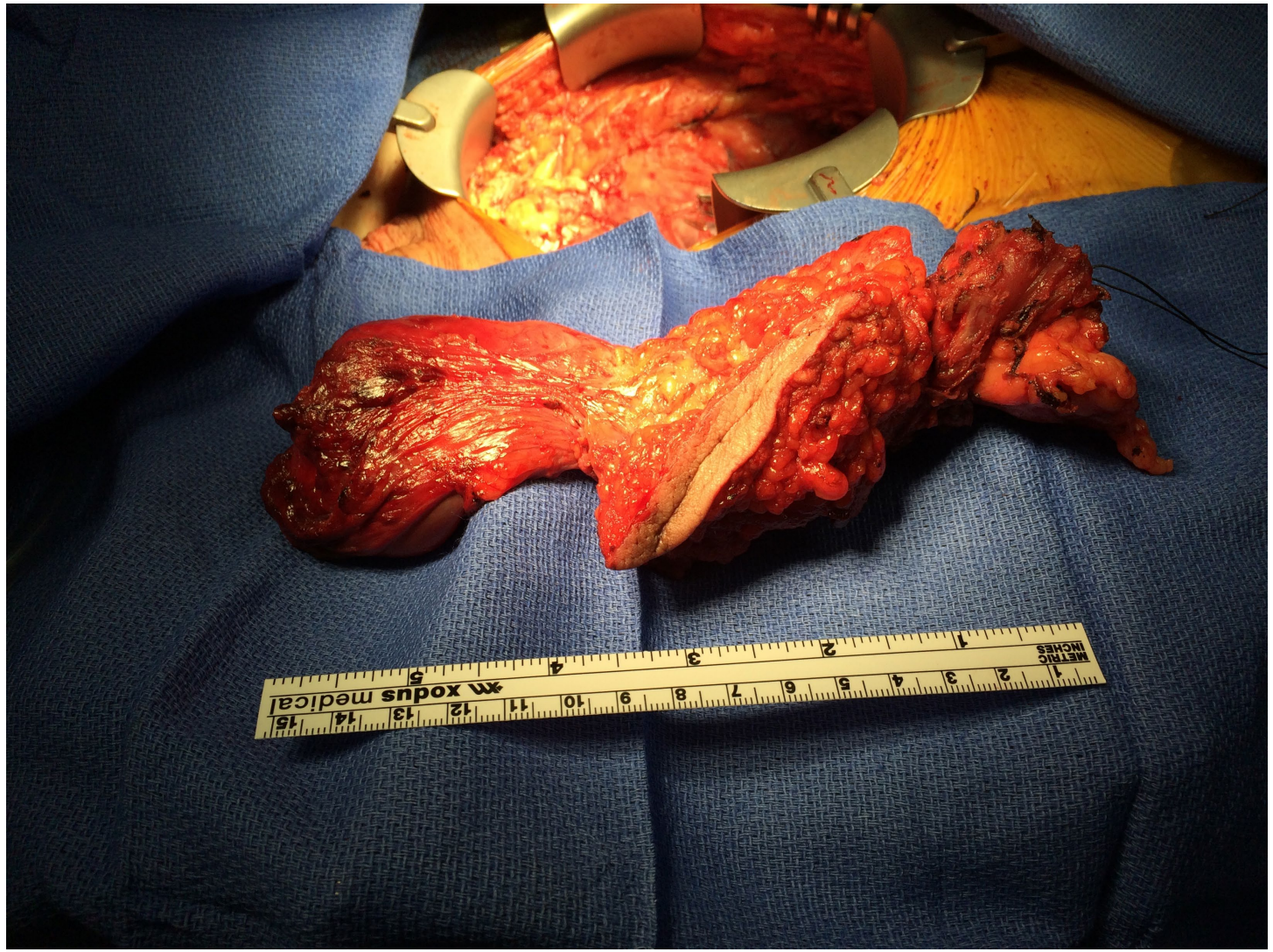
Sarcomas = Need for complete resection



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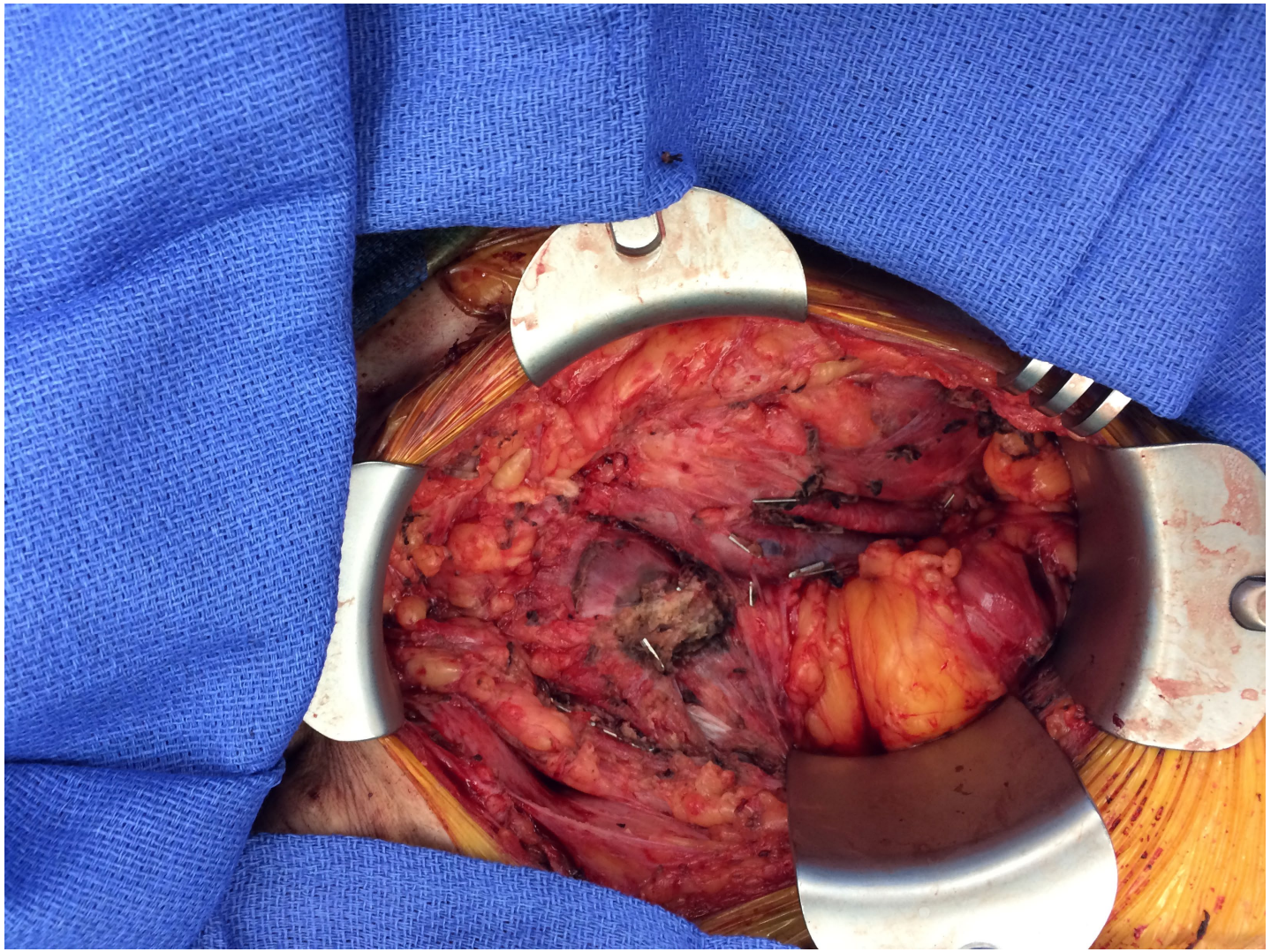
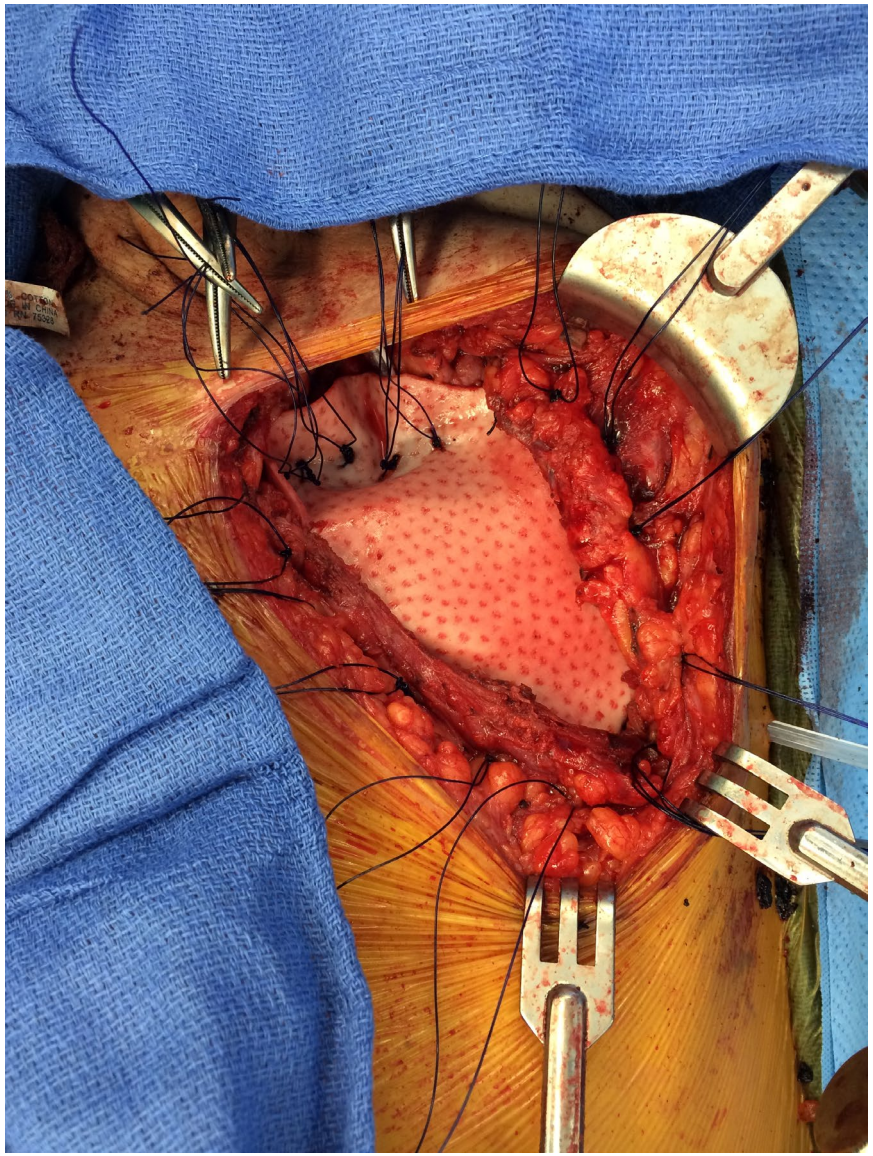
Sarcomas = Need for complete resection





Chemotherapy

- All get some adjuvant chemotherapy . . . VA + C
- Most advanced disease and alveolar histology get more
  - VAC plus Irinotecan, Ifosfamide, Etoposide, and Doxorubicin.

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Radiation

- Stage I, Group I = no Radiation
  - Importance of complete surgical resection
  - Negative retroperitoneum
- Group II = local spillage
  - Require radiotherapy to this local site
- + Disease in Retroperitoneum = Radiation
  - + LNs are grossly excised at RPLND, dose is 4140cGy
  - Gross residual retroperitoneal disease (Group III) either by incomplete excision or biopsy-only, dose is increased to 5040cGy
- Group IV/Stage IV = Radiation to metastatic sites

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Prognosis

- Generally excellent in the setting of localized (non-distant) disease (Stage 1, Group I-III) and embryonal histology
  - Stage 1, Group I and II disease, OS = 94-96%, EFS = 91-95%
  - Group III disease have a slightly worse prognosis with 5-year EFS 75%, OS of 76%
- Outcomes appear to be somewhat independent of histology
  - Alveolar PT-RMS, Stage 1 and Group I-III, 5-year EFS 78% and OS 89%
- Metastatic Stage IV disease have the worst prognosis with a 5-year OS = 20-25%

Treatment Guidelines

- COG
  - RPLND for N1 or patients ≥10 yo
  - Scrotal resection only for direct invasion
- EpSSG
  - RPLND for N1 or patients ≥10 yo
  - “No clear benefit” to hemiscrotectomy as PRE/DPE
- INSTRuCT
  - COG STS + EpSSG + CWS + SIOP MMT
  - RPLND for N1 or patients ≥10yo
  - Scrotal resection only for direct invasion

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Take-home Points

- Best prognosis of all GU RMS
  - Remember fertility preservation
- Don’t approach via scrotum
- Most will only require orchiectomy and chemotherapy
- All ≥10yo **or** <10yo with +LNs on imaging = RPLND

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