VISCERAL SARCOMA
Update 2015-2016

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VISCERAL SARCOMA: update

- Update in Retro Peritoneal Sarcoma
- Nomograms
- Evaluation of response after neoadjuvant treatment
- Other topics
  - Uterine Leiomyosarcoma and laparoscopic morcellation
  - Needle biopsy and GIST
  - Desmoplastic tumors
  - Vascular resection and reconstruction
Preoperative or postoperative radiotherapy versus surgery alone for retroperitoneal sarcoma: a case-control, propensity score-matched analysis of a nationwide clinical oncology database

Daniel P Nussbaum, Christel N Rushing, Whitney O Lane, Diana M Cardona, David G Kirsch, Bercedis L Peterson, Dan G Blazer 3rd
Figure 1: CONSORT diagram
Update in Retro Peritoneal Sarcoma
Defining the role of radiotherapy for retroperitoneal sarcoma

As we await the results of the EORTC (62092-22092; NCT01344018) randomised trial of preoperative radiotherapy and surgery versus surgery alone, we must continue to study retroperitoneal sarcoma cases carefully, stratify treatment strategy by histological subtype, and collect quality of life data. Retroperitoneal sarcoma should be diagnosed by core biopsy rather than marginal excision, and referral to high-volume centres involved in clinical trials and with prospective data registries is strongly advised.

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Update in Retro Peritoneal Sarcoma

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†††


Transatlantic Sarcoma Group
>1000 Primary RPS
5yr OS - 67%

SEER:
1365 Primary RPS
5yr OS - 47%

Median OS (months):
SEER: 60
RPS WG: 108
Δ 48 months
Impact of chemotherapy on survival in surgically resected retroperitoneal sarcoma

J.T. Miura, J. Charlson, T.C. Gamblin, D. Eastwood, A. Banerjee, F.M. Johnston, K.K. Turaga

Background: The role of systemic chemotherapy (CT) in the multimodality treatment strategy for retroperitoneal sarcomas (RPS) remains controversial. We hypothesized that chemotherapy does not improve overall survival for patients with surgically resected RPS.

Methods: The National Cancer Database was used to identify all patients with RPS that underwent surgical resection from 1998 to 2011. Univariate and multivariable Cox proportional hazards modeling were used to assess overall survival (OS) and logistic regression was used for associations. Propensity score (PS) modeling was performed to create balanced cohorts for analysis.

Results: A total of 8653 patients with surgically resected RPS were identified; 1525 (17.6%) received CT. 10.6% of patients (n = 163) in the neoadjuvant setting. Factors associated with receipt of CT included moderate (OR 2.3) to poorly differentiated (OR 4.3) tumors, leiomyosarcoma (OR 1.8) or undifferentiated pleomorphic sarcoma (OR 2.3) histology, and R2 resection status (OR 2.2) (all p < 0.05). Unadjusted median OS for patients receiving CT compared to surgery alone was 40 vs 68.2 months respectively (p < 0.01). Following propensity score matching, worse median OS persisted among the CT cohort (40 vs 52 months, p = 0.002). Receipt of chemotherapy was not associated with improved long term survival in adjusted models for the raw and propensity matched cohorts (HR 1.17, 95% CI: 1.04–1.31; p = 0.009).

Conclusion: Current available chemotherapy regimens for RPS do not confer a survival benefit. Routine use of chemotherapy for RPS should be discouraged until new effective systemic agents become available.

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Figure 1. Kaplan–Meier survival curves of overall survival comparing surgery plus chemotherapy (CT) to surgery alone before (A) and after (B) propensity score matching.
Nomograms

• Background

  – American Joint Committee on Cancer 7th edition
    • >5 cm
    • Deep
  94% of RPS: T2b

  – Nomogram
    • Kattan 2002 on Soft Tissue Sarcoma

    • RPS specific nomogram 2010
      13% of RPS...

One center ...

Ardoino et al. Cancer 2010
Anaya et al. Ann Oncol 2010
Nomograms

Outcome Prediction in Primary Resected Retroperitoneal Soft Tissue Sarcoma: Histology-Specific Overall Survival and Disease-Free Survival Nomograms Built on Major Sarcoma Center Data Sets

Alessandro Gronchi, Rosalba Miceli, Elizabeth Shurell, Fritz C. Eilber, Frederick R. Eilber, Daniel A. Anaya, Michael W. Kattan, Charles Honoré, Dina C. Lev, Chiara Colombo, Sylvie Bonvalot, Luigi Mariani, and Raphael E. Pollock

Development sets: 523 patients
3 Reference Centers
Nomograms

External Validation of a Multi-Institutional Retroperitoneal Sarcoma Nomogram

Chandrajit P. Raut, MD, MSc1; Rosalba Miceli, PhD; Dirk C. Strauss, MD4; Carol J. Swallow, MD, PhD5,6; Peter Hohenberger, MD7; Frits van Coevorden, MD8; Piotr Rutkowski, MD9; Marco Fiore, MD10; Dario Callegaro, MD10; Paolo G. Casali, MD11; Rick L. Haas, MD12; Andrew J. Hayes, MD4; Charles Honore, MD13; Amanda J. Cannell, BS5,6; Jens Jakob, MD7; Milena Szacht, MD, PhD9; Mark Fairweather, MD1,2; Raphael E. Pollock, MD, PhD14; Sylvie Bonvalot, MD15; and Alessandro Gronchi, MD10

Validation sets: 631 patients
6 Reference Centers

Exclusion: Incomplete resection referral: only primary!
GIST, Rhabdo, Desmoid, Ewing
Development and external validation of two nomograms to predict overall survival and occurrence of distant metastases in adults after surgical resection of localised soft-tissue sarcomas of the extremities: a retrospective analysis

Dario Callegaro, Rosalba Miceli, Sylvie Bonvalot, Peter Ferguson, Dirk C Strauss, Antonin Levy, Anthony Griffin, Andrew J Hayes, Silvia Stacchiotti, Cecile Le Pechoux, Myles J Smith, Marco Fiore, Angelo P Dei Tos, Henry G Smith, Luigi Mariani, Jay S Wunder, Raphael E Pollock, Paolo G Casali, Alessandro Gronchi

<table>
<thead>
<tr>
<th></th>
<th>Overall survival</th>
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<th>Distant metastasis</th>
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<tbody>
<tr>
<td></td>
<td>HR (95% CI)</td>
<td>p value*</td>
<td>HR (95% CI)</td>
<td>p value*</td>
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<td>Age</td>
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<tr>
<td>66 years vs 40 years</td>
<td>1.58 (1.30-1.93)</td>
<td>&lt;0.0001</td>
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<td>Tumour size</td>
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<td>10 cm vs 4 cm</td>
<td>2.48 (1.92-3.21)</td>
<td>&lt;0.0001</td>
<td>2.98 (2.29-3.87)</td>
<td>&lt;0.0001</td>
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<td>FNCLCC grade</td>
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<td>II vs I</td>
<td>2.68 (1.64-4.39)</td>
<td>&lt;0.0001</td>
<td>3.83 (2.75-5.52)</td>
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<tr>
<td>III vs I</td>
<td>4.25 (2.64-6.84)</td>
<td>&lt;0.0001</td>
<td>6.09 (3.64-10.20)</td>
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<td>Histological subtype</td>
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<td>Leiomiosarcoma vs myxoid liposarcoma</td>
<td>2.50 (1.51-4.16)</td>
<td>&lt;0.0001</td>
<td>2.93 (1.91-4.49)</td>
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<tr>
<td>DD pleom lipo vs myxoid liposarcoma</td>
<td>1.48 (0.80-2.74)</td>
<td></td>
<td>1.13 (0.62-2.05)</td>
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<td>MPNST vs myxoid liposarcoma</td>
<td>1.89 (1.06-3.36)</td>
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<td>1.53 (0.89-2.64)</td>
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<td>Myxofibrosarcoma vs myxoid liposarcoma</td>
<td>1.64 (0.99-2.70)</td>
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<td>0.97 (0.60-1.57)</td>
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<td>Synovial vs myxoid liposarcoma</td>
<td>2.70 (1.59-4.60)</td>
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<td>2.10 (1.31-3.36)</td>
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<td>UPS vs myxoid liposarcoma</td>
<td>1.27 (0.76-2.11)</td>
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<td>1.43 (0.93-2.19)</td>
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<td>Vascular vs myxoid liposarcoma</td>
<td>5.81 (2.71-12.45)</td>
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<td>3.16 (1.31-7.58)</td>
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<tr>
<td>Other vs myxoid liposarcoma</td>
<td>1.99 (1.23-3.21)</td>
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<td>1.87 (1.23-2.83)</td>
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HR = hazard ratio. FNCLCC = Fédération Française des Centres de Lutte Contre le Cancer. DD pleom lipo = dedifferentiated/plaomorphic liposarcoma, MPNST = malignant peripheral nerve sheath tumour, UPS = undifferentiated pleomorphic sarcoma. 
*p value was calculated as a two-sided Wald test. †Variable excluded after the Akaike information criterion-based backward selection. "The two values are the third and first quartiles, respectively, of the variable distribution.

Table 2: Results of the multivariable Cox models, including the nomogram variables for overall survival and distant metastases.
Nomograms

Results: 7 years DFS
7 years OS

AJCC 8th Edition inclusion
Evaluation of response after neoadjuvant treatment in soft tissue sarcomas; the European Organization for Research and Treatment of Cancer—Soft Tissue and Bone Sarcoma Group (EORTC—STBSG) recommendations for pathological examination and reporting

E. Wardelmann a, 1, R.L. Haas b, * , 1, J.V.M.G. Bovée c, Ph Terrier d, A. Lazar e, C. Messiou f, C. LePechoux g, W. Hartmann a, F. Collin h, C. Fisher i, G. Mechtersheimer j, A.P. DeiTos k, S. Stacchiotti l, R.L. Jones m, A. Gronchi n, S. Bonvalot o
**Response**

Fig. 3. This figure illustrates how to embed a representative slab from a sarcoma after neoadjuvant treatment. The slab is photographed before and after complete embedment. Of note, cassette no. 10 was used for a tangential embedment of slice no. 11 and was not photographed.

A — no stainable tumor cells  
B — single stainable tumor cells or small clusters (overall below 1% of the whole specimen)  
C — $\geq 1\% - <10\%$ stainable tumor cells  
D — $\geq 10\% - <50\%$ stainable tumor cells  
E — $\geq 50\%$ stainable tumor cells.
Uterine Leiomyosarcoma and laparoscopic morcellation

« Uterine tissue may contain unsuspected cancer. The use of laparoscopic power morcellators during fibroid surgery may spread cancer ... »
April 2014

Restrospective review
3523 laparoscopic HR
941 Morcellation
6 Uterine Sarcoma

AJOG May 2015
Uterine Leiomyosarcoma and laparoscopic morcellation

Laparotomy with removal of intact specimen

Power morcellator

Risk of parasitic myoma

0.6% Uterin Sarcoma

No significant preoperative factor

Minimal invasive surgery

The use of clinical selection factors

Age ≤45 y, non-black, intrauterine disease, tumors ≤5 cm

American Journal of Obstetrics & Gynecology DECEMBER 2015

Research Letters

The use of clinical characteristics to help prevent morcellation of leiomyosarcoma: An analysis of 491 cases
Original Research

Needle biopsy through the abdominal wall for the diagnosis of gastrointestinal stromal tumour — Does it increase the risk for tumour cell seeding and recurrence?

Mikael Eriksson a, *, Peter Reichardt b, Kirsten Sundby Hall c, Jochen Schütte d, Silke Cameron e, Peter Hohenberger f, Sebastian Bauer g, Mika Leinonen h, Annette Reichardt b, Maria Rejmyr Davis i, Thor Alvegård j, Heikki Joensuu k
Fig. 1. A CONSORT diagram of the study. SSG, Scandinavian Sarcoma Group.
Needle biopsy through the abdominal wall for the diagnosis of gastrointestinal stromal tumour — Does it increase the risk for tumour cell seeding and recurrence?

Mikael Eriksson a,*, Peter Reichardt b, Kirsten Sundby Hall c, Jochen Schütte d, Silke Cameron e, Peter Hohenberger f, Sebastian Bauer g, Mika Leinonen h, Annette Reichardt b, Maria Rejmyr Davis i, Thor Alvegård j, Heikki Joensuu k

**DFS**

Alive without recurrence %

- Biopsy
  - HR 0.63 (0.36-1.12)
  - P = .117

- No biopsy

**OS**

Alive %

- Biopsy
  - HR 0.69 (95% CI, 0.24-1.96)
  - P = .491

- No biopsy
Desmoplastic small round cell tumor

Survival and toxicity following sequential multimodality treatment including whole abdominopelvic radiotherapy for patients with desmoplastic small round cell tumor

Eleanor Marshall Osborne, Tina Marie Briere, Andrea Hayes-Jordan, Lawrence B. Levy, Winston W. Huh, Anita Mahajan, Peter Anderson, Mary Frances McAleer

*Anderson Cancer Center, Houston, United States; \(^{b}\) The Cleveland Clinic, Cleveland, United States

Median LPFS
16.4 mon
vs. 8.8 mon
\(p = 0.0047\)

Abdominal Progression Free Survival (months)
Sarcoma Resection With and Without Vascular Reconstruction: A Matched Case-control Study

George A. Poultsides, MD,* Thuy B. Tran, MD,* Eduardo Zambrano, MD,† Lucas Janson, MS,‡ David G. Mohler, MD,§ Matthew W. Mell, MD,¶ Raffi S. Avedian, MD,§ Brendan C. Visser, MD,* Jason T. Lee, MD,∥ Kristen Ganjoo, MD,∥∥ E. John Harris, MD,∥∥ and Jeffrey A. Norton, MD*


From the *Department of Surgery, Division of Surgical Oncology, Stanford

Results: From 2000 to 2014, 50 sarcoma patients underwent VASC resection. These were matched with 100 NO-VASC patients having similar clinicopathologic characteristics. The rates of any complication (74% vs. 44%, P=0.002), grade 3 or higher complication (38% vs. 18%, P=0.024), and transfusion (66% vs. 33%, P<0.001) were all more common in the VASC group. Thirty-day (2% vs. 0%, P=0.30) or 90-day mortality (6% vs. 2%, P=0.24) were not significantly higher. Local recurrence (5-year, 51% vs. 54%, P=0.11) and overall survival after resection (5-year, 59% vs. 53%, P=0.67) were similar between the 2 groups. Within the VASC group, overall survival was not affected by the type of vessel involved (artery vs. vein) or the presence of histology-proven vessel wall invasion.
FIGURE 2. Comparison of overall survival (A) and time to local recurrence (B) between the VASC and NO-VASC groups. Comparison of overall survival (C) based on whether vascular resection involved arterial or venous structures only (VASC patients only). Comparison of overall survival (D) based on whether the vessel removed was histologically invaded by sarcoma (VASC patients only). VASC, vascular reconstruction; NO-VASC, without vascular reconstruction.
Vascular resection and reconstruction

The use of autologous peritoneum for complete caval replacement following resection of major intra-abdominal malignancies

Coubeau Laurent, Rico Juri JM, Ciccarelli Olga, Jabbour Nicolas, Lerut Jan
Surgery and Abdominal Transplantation Division, Université catholique de Louvain,
Cliniques universitaires Saint-Luc, Brussels

5 cases of complete Inferior Vena Cava reconstruction with single layer non fascial peritoneum
Peritoneal patch harvesting

Circumference ($C=2\pi r$) length and patient IVC defect width
Tubulization
Implantation