Diagnosis and management of retroperitoneal sarcoma

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Histologic Subtypes of STS

RP Subtypes (n=684)
- Desmoid (2%)
- Fibrosarcoma (1%)
- Leiomyosarcoma (21%)
- Liposarcoma (59%)
- MPNST (3%)
- MFH (3%)
- Sarcoma-NOS (2%)
- SFT/Hemangiopericytoma (2%)
- Undifferentiated (1%)
- Other (5%)

Extremity Subtypes (n=3,039)
- DFSP (3%)
- Desmoid (5%)
- Leiomyosarcoma (8%)
- Liposarcoma (23%)
- MPNST (3%)
- MFH (28%)
- Synovial (11%)
- Other (19%)

MSKCC STS Database
Outcomes in STS

Overall Survival after Resection by Primary Site of STS (Princess Margaret Hospital)

Local failure kills

- Local failure leading cause of disease-specific mortality
- Anatomic constraints often preclude R0 resection
  ✓ Complete (R0/1) vs Incomplete (R2)
Evolution of Surgical Approach to RPS
Extended resection leads to improved local control

Fig 1. Crude cumulative incidence of local recurrence by period of surgical resection at a single institution.
Extended resection is associated with improved overall survival

Extended resection
operative approach

Principle – liberal resection of all “involved” organs

<table>
<thead>
<tr>
<th>Right side RPS</th>
<th>Left side RPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Colon</td>
<td>• Colon</td>
</tr>
<tr>
<td>• Kidney</td>
<td>• Kidney</td>
</tr>
<tr>
<td>• Psoas fascia</td>
<td>• Psoas fascia</td>
</tr>
<tr>
<td>• +/- Duodenum</td>
<td>• Distal pancreas + spleen</td>
</tr>
<tr>
<td>• +/- Liver capsule</td>
<td>• +/- Aorta/iliac vessels</td>
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<tr>
<td>• +/- IVC/iliac vessels</td>
<td>• +/- Diaphragm</td>
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How to work up a retroperitoneal mass

<table>
<thead>
<tr>
<th>Labs</th>
<th>Imaging</th>
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<tbody>
<tr>
<td>• B-HCG</td>
<td>• CT abdomen preferable to MRI</td>
</tr>
<tr>
<td>• AFP</td>
<td>• CT chest for staging</td>
</tr>
<tr>
<td>• LDH</td>
<td>• Differential renal scan if nephrectomy</td>
</tr>
<tr>
<td>• Metanephrines/catecholamines if appropriate</td>
<td>anticipated</td>
</tr>
</tbody>
</table>
Why Biopsy?

Establish diagnosis:
- eliminate nonoperative pathology
Why Biopsy?

Establish diagnosis: eliminate nonoperative pathology

Identify histologic subtype: tailor treatment strategy
How do histologic subtype and management strategy AFFECT RECURRENCE?

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

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

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Background: Retropertitoneal sarcomas (RPS) are rare tumors composed of several well-defined histologic subtypes. The aim of this study was to analyze patterns of recurrence and treatment variations in a large population of patients, treated at reference centers.

Methods: All consecutive patients with primary RPS treated at 6 European and 2 North American institutions between January 2002 and December 2011 were included. Five, 8, and 10-year overall survival (OS) and crude cumulative incidence (CCI) of local recurrence (LR) and distant metastasis (DM) were calculated. Multivariate analyses for OS, CCI of LR, and DM were performed.

Results: In all, 1007 patients were included. Median follow-up was 58 months (first and third quartile range 36–90). The 5, 8, and 10-year OS were 67% (95% confidence interval (CI), 63–70), 56% (95% CI, 52–61), and 46% (95% CI, 41–51), respectively.

Different treatment policies at participating institutions influenced LR of well-differentiated liposarcoma without impacting OS, whereas discrepancies in adjuvant systemic therapies did not impact LR, DM, or OS of leiomyosarcoma.

Conclusions: Reference centers are critical to outcomes of RPS patients, as the management strategy requires specific expertise. Histologic subtype predicts patterns of recurrence and should inform management decision. A prospective international registry is under preparation, to further define our understanding of this disease.

Keywords: leiomyosarcoma, liposarcoma, prognostic factors, retropertitoneal sarcoma, sarcoma, solitary fibrous tumor, surgery, survival

(Am Surg 2015;xx:xxx–xxx)
Local Recurrence

5y LR 24%
10y LR 33%
Distant Metastasis

5y DM 21%
10y DM 21.6%
Institutional Management Strategies: WDLPS
Institutional Management Strategies: LMS
Why Biopsy?

Establish diagnosis: eliminate nonoperative pathology

Identify histologic subtype: tailor treatment strategy

Consider neoadjuvant therapy: radiate first
Radiation Therapy in RPS

Goal:
- Increase R0 resection rate
- Decrease local recurrence rate

Level 1 evidence of improved local control in extremity STS, no survival benefit

EORTC study 62092-22092
STRASS - A phase III randomized study of preoperative radiotherapy plus surgery versus surgery alone for patients with Retroperitoneal sarcoma (RPS)
Pre-op RT

- More accurate targeting of tumour volume
- Minimal toxicity
- Improved delivery to well-oxygenated tissues
- Increased likelihood of negative margin
- Reduced chance of intraoperative contamination/tumour rupture
<table>
<thead>
<tr>
<th>Pre-op RT</th>
<th>Post-op RT</th>
</tr>
</thead>
<tbody>
<tr>
<td>• More accurate targeting of tumour volume</td>
<td>• NOT POSSIBLE!</td>
</tr>
<tr>
<td>• Minimal toxicity</td>
<td></td>
</tr>
<tr>
<td>• Improved delivery to well-oxygenated tissues</td>
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How (not) to Biopsy?

At sarcoma referral centre
Via RP approach
Targeting dedifferentiated areas
With expert pathology review
How (not) to Biopsy?

Establish diagnosis: eliminate nonoperative pathology

Targeting dedifferentiated areas

Via RP

At sarcoma referral centre

With expert pathology review

No role for transperitoneal/ laparoscopic/open biopsy
Principles and Pitfalls

- Best outcomes achieved at high-volume centres
Overall Survival – TARPSWG centres

5y OS 67%
10y OS 46%
Principles and Pitfalls

- Best outcomes achieved at high-volume centres
- All RPS require MDC review
Principles and Pitfalls

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- All RPS require MDC review

- Large mass ≠ emergency
Principles and Pitfalls

• Best outcomes achieved at high-volume centres
• All RPS require MDC review

• Large mass ≠ emergency
• Incidental finding at laparotomy/inguinal hernia repair – do not biopsy, avoid mesh
• RPS is a family of diseases
• Management is multidisciplinary and must be tailored to histology
• Preoperative tissue diagnosis is imperative
• Outcomes have improved with extended resection, referral to high-volume centres