A Practical Approach to the Management of Testicular Cancer

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Disclosures

• Investigator
  – Photocure
  – Karl Storz
  – Heat Biologics
Objectives

• Pure Seminoma

• Non-seminomatous germ cell tumors (NSGCT)

• Retroperitoneal lymph node dissection (RPLND)
Evaluation/Diagnosis

- Scrotal U/S
- Serum tumor markers (STM)
  - bHCG, AFP, LDH
- Radical Orchiectomy
  - High ligation of cord important (RPNLD)
Evaluation/Diagnosis

• Staging/Imaging
  – CT Chest/abdomen/pevis
    • CXR ok in seminoma if markers wnl, ct a/p wnl
    • NO utility of PET imaging at initial diagnosis
    • MRI does not

• Radical Orchiectomy
  – High ligation of cord important (RPNLD)
Seminoma Treatment-Overview

Stage I
- Chemortherapy
- XRT
- Surveillance

Stage IIa,IIb
- XRT vs. Chemo

Stage IIc-III
- Chemotherapy
- Resection if large residual mass (PET Scan)
Seminoma Stage I Treatment

- Stage I
  - Chemotherapy (carboplatin)
  - XRT
  - Surveillance
Seminoma Stage I Treatment

- Surveillance
- XRT
- Chemotherapy (carboplatin)

Preferred
Clinical Stage I Seminoma
RATIONALE FOR SURVEILLANCE

- 1,139 stage I seminoma patients
- 13% relapse
- Mean time to relapse: 14mo
- 92% relapse w/i 3yrs
- 5 yr DSS: 99.7%
Clinical Stage I Seminoma
RATIONALE FOR SURVEILLANCE

Radiotherapy versus single-dose carboplatin in adjuvant treatment of stage I seminoma: a randomised trial

R T D Oliver, M D Mason, G M Mead, H van der Maase, G J S Rustin, J K Joffe, R de Wit, N Aass, J D Graham, R Coleman, S J Kirk, S P Stenning, for the MRC TE19 collaborators and the EORTC 30982 collaborators*

Lancet 2005; 366: 293–300

- 1,477 patients randomized between RT vs single cycle carboplatin
- Relapse free survival 3yrs: 95.9% vs 94.8% (p=0.32)
- Carboplatin arm: less fatigue, missed less work
- Rate of new second primary GCT favors chemotherapy (0.54% vs 1.96%, p=0.04)
Clinical Stage I Seminoma
RATIONALE FOR SURVEILLANCE

• Late Toxicity from Adjuvant RT
  – Secondary malignancy
  – Cardiovascular disease
  – Fertility

NIH Study
  • 14 population based registries
  • 22,424 patients with Seminoma
Seminoma Stage II/III Treatment

Stage IIA → XRT vs. Chemo

Stage IIB → XRT vs. Chemo

Stage IIC-III → Chemotherapy → Resection if large residual mass (PET Scan)
Seminoma Stage II/III

Treatment

Stage IIA

Stage IIB

Stage IIC-III

XRT vs. Chemo

XRT vs. Chemo

Chemotherapy

Resection if large residual mass (PET Scan)
Seminoma Stage II/III Treatment

Stage IIA  →  XRT vs. Chemo

Stage IIB  →  XRT vs. Chemo

Stage IIC-III  →  Chemotherapy  →  Resection if large residual mass (PET Scan)
Seminoma Stage II/III Treatment

Stage IIA → XRT vs. Chemo

Stage IIB → XRT vs. Chemo

Stage IIC-III ← Chemotherapy → Possible RPLND if large residual mass
Management of post chemotherapy seminoma mass

- Different approach compared to NSGCT
- Lack of teratoma
- Technical challenges of PC-RPLND in seminoma
- Dictated by size and PET activity
Non-Seminomatous Germ Cell Tumor (NSGCT) Treatment - Overview

Stage I, IIa
- Surveillance (except IIa)
- Chemotherapy - 2 cycles (Europe)

Stage IIb-III
- Chemotherapy
  - PR
  - C
  - R
- RPLND
  - Observation
Stage I NSGCT
TREATMENT OPTIONS

- Surveillance
- RPLND
  - Modified template
  - Nerve-sparing
- Chemotherapy
  - BEP x 2 cycles

Cure rates ~100%
Clinical Stage I NSGCT
RESULTS OF SURVEILLANCE

Meta-analysis of 15 surveillance trials
n = 1,691 patients

- % relapse → 28% (13 – 36%)
- % RPLN relapse → 15% (4 – 28%)
- Months to relapse → 6 (0 – 58)
- Median F/U (months) → 54 (3 – 144)
- Overall Survival → 98% (96 – 100%)

Retroperitoneal Lymph Node Dissection
Testis Cancer Spread

Left Testis Drainage

Right Testis Drainage
RPLND
Bilateral Non-Modified Template
RPLND
Right Modified Template
Nerve-Sparing Left RPLND (Stage I)

R renal artery

L renal artery

Sympathetic nerves from right sympathetic trunk
Post-Chemotherapy RPLND (full bilateral template)
28 yo with left side metastatic mixed NSGCT s/p 4 cycles of EP
Post-Chemotherapy RPLND

R renal vein

R ureter

IMA
Post-Chemotherapy RPLND
Robot assisted RPLND

Positioning

- Lithotomy
- Slight trendelenburg
- Left tilt
Robot assisted RPLND
Robot assisted RPLND
Robot assisted RPLND
Robot assisted RPLND
Robot assisted RPLND
Robot assisted RPLND
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Robot assisted RPLND
Perioperative and Early Oncological Outcomes Following Robot Assisted Retroperitoneal Lymph Node Dissection For Testicular Cancer: A Multi-Institutional Study

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³University of North Carolina, NC, USA
⁴Swedish Medical Center, Seattle, WA, USA
Methods

• Retrospective study.
• Four surgeons at four teaching institutions.
• Number of patients: 103 patients.
• Transperitoneal approach, lithotomy (n=94) and lateral position (n=9).
• Nerve sparing and template of dissection based on surgeon preference.
• Staging: AJCC 2010.
• Follow up: NCCN guidelines.
• Complication were reported based on the Clavien grading system.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (±SD)/Frequency</th>
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<tbody>
<tr>
<td>Clinical stage (%)</td>
<td>• I = 63 (61.1%)</td>
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<td></td>
<td>• II = 24 (23.3%)</td>
</tr>
<tr>
<td></td>
<td>• III = 11 (10.6%)</td>
</tr>
<tr>
<td>Chemotherapy (%)</td>
<td>• Post chemotherapy = 33 (32%)</td>
</tr>
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<td></td>
<td>• Primary = 70 (68%)</td>
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Variable Frequency

Template of dissection (%)
  • Bilateral= 65 (63.1%)
  • Modified= 36 (35%)

Nerve Sparing (%)
  • Nerve Sparing = 68 (66%)
  • Non Nerve Sparing = 28 (27.2%)

Operative time (min) 399 (±108)
EBL (mL) 244.6 (±483)
Conversion Rate (%) 6 (5.8%)
Intraoperative complications 2 (1.9%)

Complications

<table>
<thead>
<tr>
<th>Grade</th>
<th>Occurrence (n)</th>
<th>Incidence %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 1</td>
<td>24</td>
<td>23.3%</td>
</tr>
<tr>
<td>Grade 2</td>
<td>4</td>
<td>3.8%</td>
</tr>
<tr>
<td>Grade 3B</td>
<td>3</td>
<td>2.9%</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>30%</td>
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Pathological and Oncological Outcomes

<table>
<thead>
<tr>
<th>Outcome</th>
<th>IIA</th>
<th>IIB</th>
<th>IIC</th>
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<tbody>
<tr>
<td>Pathological Stage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• I=58</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• II= 36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• III= 8</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Lymph node yields (LN)</td>
<td>24.1 (± 10.8)</td>
<td></td>
<td></td>
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<tr>
<td>Median follow up (months)</td>
<td>25.3 (IQR 6.9-42.7)</td>
<td></td>
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</tr>
<tr>
<td>Recurrences</td>
<td>5 (4.8%) (lung)</td>
<td></td>
<td></td>
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</tbody>
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<thead>
<tr>
<th>Adjuvant Chemotherapy</th>
<th>IIA</th>
<th>IIB</th>
<th>IIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>No adjuvant chemotherapy</td>
<td>11/14</td>
<td>3/6</td>
<td>1/2</td>
</tr>
<tr>
<td>Adjuvant chemotherapy</td>
<td>3/14</td>
<td>3/6</td>
<td>1/2</td>
</tr>
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<tr>
<th>Group</th>
<th>Antegrade Ejaculation</th>
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<td>Nerve Sparing RPLND with ≥1 year of follow up</td>
<td>82.2 %</td>
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Conclusions

• Surveillance is preferred approach for all stage I seminoma (Chemo if tx needed)
• Surveillance is acceptable approach for all stage I NSGCT (RPLND if tx needed)
• RPLND provides important pathologic data for NSGCT Stage Ila (lower burden of tx)
• Modified template RPLND acceptable for stage I NSGCT, all other situations should undergo full bilateral template
Conclusions

- Post chemo seminoma RPLND base on size and PET activity of mass (obtain 6 weeks post chemo)
- Robotics playing an emerging role in RPLND