Staging of Rectal Cancer

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SCOAP Retreat – June 17, 2011
Why does it matter?

• Obviously, because it changes management
  - Decision points:
    • Local/Regional Disease vs widely metastatic
    • T3/T4 vs T2
    • T2+ vs T1
    • Nodal Disease
  - Surgery?
    • Which?
  - Radiation/Chemotherapy?
WHY NOT JUST RESECT EVERYONE?
Neoadjuvant Therapy

- Swedish (no relation) Rectal Cancer trial
  - Journal of Clinical Oncology, Vol 23, No 24
    - (18 year followup)
    - Preoperative Radiation improves local recurrence and long term survival
Neoadjuvant Therapy

• Dutch Rectal Cancer Trial
    • Neoadjuvant therapy improved local control more than of TME alone

• German Rectal Cancer Study Group
  – N. Engl J. Med 351;17, 2004
    • Preop radiation has better local control and lower toxicity than postop
Why not just resect everyone?

• Neoadjuvant therapy will
  - Down size
  - Down stage
  - Potentially improve resectability and sphincter preservation
  - Reduce local recurrence
  - Improved overall survival

Local recurrence is difficult to manage and salvage
DON’T JUST RESECT EVERYONE!
WHY NOT JUST GIVE EVERYONE PREOPERATIVE THERAPY?
Why Not just give everyone Preoperative Therapy?

• Over treating unnecessarily early stage cancers
  – Complications and toxicity
  – Expensive
  – Delay in surgery
• More stomas?

• Risk benefit analysis does not favor preoperative treatment of early stage rectal cancer like it does for advanced stage rectal cancer
SO, DEFINING STAGE MAKES A DIFFERENCE IN TREATMENT
Rectal Cancer Decision Tree

- Rectal Cancer diagnosed on Biopsy
  - PET/CT
  - MRI or TRUS
    - T1: Transanal Excision or TEM or LAR if high
    - T2: LAR/APR
    - T3: Neoadjuvant ChemoRT + Resection
    - T4: Neoadjuvant ChemoRT + Radical Resection
    - N1/2: Neoadjuvant ChemoRT + Resection
    - M1: Systemic Chemotherapy
      - Treat local disease when symptomatic
Staging methods

- Transrectal ultrasound
- Pelvic MRI
- CT abdomen/pelvis (chest?)
- PET/CT
- Combination
Accuracy of rectal US in staging rectal cancer compared with surgical pathology

<table>
<thead>
<tr>
<th></th>
<th>T Staging</th>
<th>N Staging</th>
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<tbody>
<tr>
<td>Ultrasound</td>
<td>80-95%</td>
<td>70-75%</td>
</tr>
<tr>
<td>CT</td>
<td>65-75%</td>
<td>55-65%</td>
</tr>
<tr>
<td>MRI</td>
<td>75-85%</td>
<td>60-70%</td>
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Siddiqui et al. International Seminars in Surgical Oncology 2006 3:36
Transrectal Ultrasound

- Technically easy
- Inexpensive
- Low risk
- High accuracy for T stage (up to 96%)

- Diagnostically challenging
- User variability
- Not so high accuracy for N stage (about 70%)
- No assessment of M stage
uT1 Rectal Cancer
uT2

PROBE

T

MP invasion
uN1
uT4N1

SR invasion

T

Probe

LN
MRI

- Special equipment and techniques
- When done properly, reproducible, accurate staging
- Will likely become the standard of care

- Expensive
- Requires special training
  - Protocol with contrast,
  - 1.5T
  - thin slices
  - small field of view

- When done poorly, no better than CT
Diffuse Rectal Wall Thickening
Suspicious Lymph Node
Stage T3 rectal carcinoma without involvement of the mesorectal fascia.

- thin slices
- small field of view
CT

- Standard staging for distant disease
- Suspicious nodal involvement
- Easy access
- Not as expensive as MRI

- Unable to determine T stage
- More useful when used with PET
PET/CT

- Helpful for distant disease detection
- Occult second cancers (thyroid, adrenal, etc.)
- Clarifies suspicious CT findings

- Can’t determine T stage
- Variable accuracy for N stage
- Expensive
- Not proven yet
  - Not standard of care yet
T3 Rectal Cancer

Contrast in Bladder

Tumor
T3 Rectal Cancer
T3 Rectal Cancer, Occult Liver Metastasis
T3N0 Multiplanar imaging helps in planning
CT vs MRI
## Correlation of staging with recommended treatment for rectal cancer

<table>
<thead>
<tr>
<th>Ultrasound (or MRI) staging</th>
<th>Histopathological Staging</th>
<th>Therapy</th>
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<tr>
<td>uT1</td>
<td>Invasion of mucosa and submucosa</td>
<td>Excision (including TEM)</td>
</tr>
<tr>
<td>uT2</td>
<td>Invasion into the muscularis propria</td>
<td>Excision (LAR)</td>
</tr>
<tr>
<td>uT3</td>
<td>Invasion through the serosa</td>
<td>Neoadjuvant chemoradiotherapy then resection</td>
</tr>
<tr>
<td>uT4</td>
<td>Invasion into adjacent organs</td>
<td>Neoadjuvant chemoradiotherapy then resection</td>
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Rectal Cancer diagnosed on Biopsy

PET/CT

MRI or TRUS

T1
- Transanal Excision or TEM or LAR if high

T2
- LAR/APR

T3
- Neoadjuvant ChemoRT + Resection

T4
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N1/2
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M1
- Systemic Chemotherapy

Treat local disease when symptomatic
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THANK YOU!
DISCUSSION