Radiotherapy in Cervix & Uterine Cancer

A/Prof Raphael Chee
Radiation Oncologist
Multi-Disciplinary Management

• WA Gynaecological Oncology Team
  – Gynae-Oncological Surgeons
  – Medical Oncologist
  – Radiation Oncologist
  – Radiologist/Nuclear medicine physicians
  – Pathologists
  – Gynae-Oncology Clinical Nurse Specialists
  – Palliative Care Physicians (KEMH)

• Centralised management plan
  – Tumour Board Conference every Thursday 8-10am
Types of Radiotherapy Used in Treatment for Gynaecological Cancer

External Beam RT

Brachytherapy
How Radiotherapy Works

**CONSEQUENCES:**
- Mis-repair
- Impaired Regulation
- Dysfunction
- Apoptosis
Cervix Cancer

• Majority squamous cell carcinoma
• Rarely, adenocarcinoma, sarcoma, melanoma, lymphoma, small cell carcinoma
• Role of radiotherapy
  – Adjuvant (post-operative)
  – Definitive (radical treatment)
  – Salvage (locoregional recurrence post surgery)
  – Palliation
Cervix Cancer
Adjuvant Setting

- In early stage, surgery main modality
- Adjuvant RT for high risk features
  - Close/+ margins
  - Parametrial involvement
  - Deep stromal invasion
  - Size
  - LVSI
- GOG scores

Stage 1a
Stage 1b

1b₁ ≤ 4cm
1b₂ > 4cm
Cervix Cancer
GOG Scores


• As a guide in utility of adjuvant whole pelvic RT with score >120
• Consider for adjuvant central pelvic RT score 40-120
• Score = Relative risks assigned to depth of tumour penetration x clinical tumour size x presence LVSI
<table>
<thead>
<tr>
<th>Variable</th>
<th>Relative risk</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Depth of tumor penetration (mm)</strong></td>
<td></td>
</tr>
<tr>
<td>Superficial</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1.0</td>
</tr>
<tr>
<td>4</td>
<td>3.0</td>
</tr>
<tr>
<td>5</td>
<td>7.2</td>
</tr>
<tr>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td>8</td>
<td>26</td>
</tr>
<tr>
<td>10</td>
<td>21</td>
</tr>
<tr>
<td>Middle</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
<td>22</td>
</tr>
<tr>
<td>7</td>
<td>23</td>
</tr>
<tr>
<td>8</td>
<td>25</td>
</tr>
<tr>
<td>10</td>
<td>28</td>
</tr>
<tr>
<td>12</td>
<td>32</td>
</tr>
<tr>
<td>14</td>
<td>36</td>
</tr>
<tr>
<td><strong>Clinical tumor size (cm)</strong></td>
<td></td>
</tr>
<tr>
<td>Occult tumor</td>
<td>1.0</td>
</tr>
<tr>
<td>1</td>
<td>1.6</td>
</tr>
<tr>
<td>2</td>
<td>1.9</td>
</tr>
<tr>
<td>3</td>
<td>2.4</td>
</tr>
<tr>
<td>4</td>
<td>2.9</td>
</tr>
<tr>
<td>6</td>
<td>4.4</td>
</tr>
<tr>
<td>8</td>
<td>6.6</td>
</tr>
<tr>
<td><strong>Capillary/lymphatic space involvement</strong></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.0</td>
</tr>
<tr>
<td>Yes</td>
<td>1.7</td>
</tr>
</tbody>
</table>

"GOG score" is calculated by multiplying the relative risk for the depth × tumor size × capillary space involvement e.g. 8 mm superficial tumor, measuring 2 cm with LVSi would be $26 \times 1.9 \times 1.7 = 84$.

Table 1. Delgado’s prognostic risk scoring system.

Relative risk of recurrence after radical hysterectomy for cervical cancer.
Cervix Cancer
Definitive Setting

• ChemoRT main modality
• Cisplatin + WPRT + HDR intrauterine brachytherapy
• *Nodal involvement halves survival figures

Stage IIA
5yr OS 60-75%*

Stage IIB
5yr OS 60-75%*

Stage IIIA
5yr OS 30-50%*

Stage IIIB
5yr OS 30-50%*

Stage IV
5yr OS 10%*
Cervix Cancer
External Beam WPRT

45Gy/25#
Over 5 wks
Cervix Cancer
HDR Brachytherapy
Cervix Cancer
Post Therapy Surveillance

• 3 monthly, in conjunction with Gynae-Oncologist for 2 years
  – Clinical review & PAP smear
  – Imaging as indicated
• 4 monthly year 3
• 6 monthly year 4-5

• Local only recurrence (node negative, mobile cervix) can be surgically salvaged
• Otherwise, consider palliative chemo when symptomatic
Uterine Cancer

- Role of radiotherapy:
  - Adjuvant (post-operative)
  - Salvage
  - Palliation
Uterine Cancer
Adjuvant Setting

• Management paradigm dependent on
  – Histology
    • Endometrioid adenocarcinoma
    • Papillary serous, Clear cell, Mucinous
    • Carcinosarcoma (MMMT), Sarcoma, Leimyosarcoma
  – Grade
  – Degree of myometrial invasion (<50% vs ≥50%)
  – Tumour size
  – Surgical margins
  – Level of surgical staging
    • Complete staging is hysterectomy, BSO, PLND, +/- omentectomy
  – Biomarkers (oestrogen receptors)
  – FIGO staging
  – TNM staging
Uterine Cancer
Adjuvant Setting

- FIGO II, III & IV, node positive requires chemotherapy & radiotherapy
Uterine Cancer
FIGO I Setting

- **Low Risk**
  - G1/2
  - Endometrioid histology
  - <50% myo invasion

- **Intermediate**
  - G1/2 endometrioid AND >50% myo invasion
  - G3 endometrioid AND <50% myo invasion

- **High Risk**
  - G3 endometrioid AND >50% myo invasion
  - All Non endometrioid histology
Uterine Cancer
FIGO I Setting

• Completely staged
  • LR & IR → surveillance
  • HR → RT

• Incompletely staged
  • LR → surveillance
  • HR → RT
  • IR → consider RT

• 5yr Overall survival FIGO I = 80-90%
Uterine Cancer
Outcomes

• 5yr overall survival
  – FIGO I = 80-90%
  – FIGO II = 75-80%
  – FIGO III = 40-60%
  – FIGO IV = 15-20%

• Adjuvant RT in FIGO I have not shown to improve overall survival
  – Better local DFS (*improves fm 15% → 2% at 2yrs*)
  – 90% of recurrences within first 3 years
  – Recurrences usually at vaginal cuff and mostly salvageable
Uterine Cancer
Radiotherapy

• Whole pelvic EBRT
  – 45Gy/25# once daily over 5 weeks (Mon-Fri)

• Vaginal cuff brachytherapy boost
  – 30Gy/3# adjuvant brachy only
  – 13Gy/2# adjuvant, post pelvic EBRT
  – 19.5Gy/3# salvage, post pelvic EBRT
Uterine Cancer
Vault Brachytherapy
FDG-PET Scan

- NM Staging
- Assess response to therapy
  - @ 6-8 weeks post
- Complimentary in assessment & restaging in suspected/confirmed recurrence
- Role in post therapy surveillance?
FDG-PET Scan

PET response 6 wks following salvage chemoRT following para-aortic EBRT 45Gy/25#
Pelvic RT
Acute Radio-toxicities

- Lethargy
- Nausea/anorexia
- Dermatitis pelvis/perineum
- Abdo pain – crampy, discomfort, flatulence
- Bowel frequency, loose, diarrhoea
- Dysuria, frequency

- Uterine perforation
  - Infection
  - Bleeding
- Vaginal laceration
- DVT

Only in Tandem & Ovoids for cervix
Pelvic RT
Late Radio-toxicities

- Vaginal stenosis, dryness
- Femoral neck/head insufficiency fracture
- Menopause
- Infertility
- Loss of uterine reproductive function (*but few reports of spontaneous & successful pregnancies*)
- Lower limb lymphoedema (*20% risk PLND + WPRT*)
- Carcinogenesis

- Vaginal necrosis (<5%)
- Bowel (sigmoid, small bowel) necrosis (<3%)
- Proctitis – PR bleed (2-3%)
- Cystitis – haematuria (2-3%)
- Fistula (<2%) – urogenital, GI
Allied Health Supports

- Nurse-led education
  - Vaginal dilators
- Physiotherapy
  - Lymphoedema
  - Vaginal stenosis
- Psychosocial support
  - Counselling
- KEMH Menopause After Cancer Clinic
Role of RT in Other

• Vulva SCC
  – Adjuvant, definitive, palliation

• Vaginal SCC
  – Adjuvant, definitive, palliation

• Ovarian cancer
  – Palliation
“The Gynaecologist”
Jo McIntyre, oil on paper 1994