Invasive Cancer of the Vagina and Urethra

Fred Ueland, MD
“No matter what you accomplish in your life, the size of your funeral will still be determined by the weather”
Vaginal Cancer

- 1-2% of all gynecological cancers
- Incidence 0.6/100,000
- Occurs less commonly than metastatic disease to vagina
- 60% have had previous hysterectomy
Etiology

- 3-10% associated with VAIN
- High association with HPV
  - 30% with prior CIN
- Consider
  - Residual disease from other primary
  - New primary
  - Association with radio-oncogenicity
Symptoms

- Painless bleeding
- 5% with pain from advanced disease
- 5% completely asymptomatic

...20% missed on speculum exam
Relationships

- Uterus and cervix
- Pelvic lymph nodes
- Bladder and rectum
  - TD 5/5 = 5500 cGy
  - TD 50/5 = 8500 cGy
# Vaginal Cancer Location

<table>
<thead>
<tr>
<th>Location</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper 1/3</td>
<td>40%</td>
</tr>
<tr>
<td>Middle 1/3</td>
<td>13</td>
</tr>
<tr>
<td>Lower 1/3</td>
<td>31%</td>
</tr>
<tr>
<td>Entire</td>
<td>30%</td>
</tr>
</tbody>
</table>

- Anterior: 40%
- Posterior: 30%
- Lateral: 30%
Dissemination

- Local
- Lymphatic drainage
  - Obturator, iliac, pelvic
  - Inguinal
  - Unpredictable
- Hematogenous
  - Less common
Fig. II. — La division de l’a. utérine U en ses branches terminales : marginale M et cervico-vaginale CV :

1. division tardive après le croisement avec l’uretère.
2. division au niveau du croisement avec l’uretère.
3. les branches cervicales et vaginale naissent indépendamment.
4. division précoces avant le croisement avec l’uretère.
5. les a. marginale et cervico-vaginale naissent séparément de l’a. hypogastrique.
Lymphatic Drainage

- **Upper vagina**
  - Common or external iliac lymph nodes
- **Middle vagina**
  - Iliac or femoral triangle
- **Lower vagina**
  - Femoral triangle, inguinal nodes
- **Unpredictable drainage. Any pelvic node can be involved by a vaginal cancer in any location**
Incidence of Vaginal Cancer

Age Dependent
Histology

- Squamous 85%
- Adenocarcinoma 6%
- Melanoma 3%
- Sarcoma 3%
- Miscellaneous 3%
Adenocarcinoma of Vagina

- Only 6% of all vaginal cancers
- Arise from
  - Mullerian adenosis
  - Endometriosis
  - Gartner’s ducts
- Treatment is same
- May be more chemosensitive
Vaginal Cancer Staging

- **Stage I**: Limited to vaginal mucosa
- **Stage II**: Subvaginal tissue
- **Stage III**: Pelvic sidewall
- **Stage IVa**: Adjacent organs or direct extension beyond true pelvis
- **Stage IVb**: Distant spread
Vaginal Cancer

...Treatment
Picric Acid

- Used to manufacture explosives
- High explosive
  - < 30% water
- Flammable solid
  - >30% water
<table>
<thead>
<tr>
<th>Stage I</th>
<th>RH, lymphadenectomy</th>
<th>5000 cGy for (+) LNs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage IIa</td>
<td>…plus upper vaginectomy</td>
<td>5000 cGy for (+) LNs</td>
</tr>
<tr>
<td>Stage IIb</td>
<td>Exenteration if XRT failure</td>
<td>5000 cGy</td>
</tr>
<tr>
<td>Stage IIIa,b</td>
<td>Exenteration if XRT failure</td>
<td>6000 cGy</td>
</tr>
<tr>
<td>Stage IV</td>
<td>Individualize</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage I (upper)</th>
<th>RH, upper vag, lymphad</th>
<th>5000 cGy for (+) LNs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I (lower)</td>
<td>RH, total vag, lymphad</td>
<td>5000 cGy + brachy</td>
</tr>
<tr>
<td>Stage II</td>
<td>Exenteration if XRT failure</td>
<td>5000 cGy + brachy</td>
</tr>
<tr>
<td>Stage III</td>
<td>Exenteration if XRT failure</td>
<td>6000 cGy + brachy</td>
</tr>
<tr>
<td>Stage IV</td>
<td>Individualize</td>
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</table>
Vaginal Brachytherapy
Vaginal Brachytherapy

- Lesion depth < 0.5cm
  - Cylinder implant
- Lesion depth > 0.5cm
  - Syed-Neblett interstitial applicator
  - Iridium ($^{192}$I)
  - Consider laparoscopic visualization and omental J-flap
Vaginal Brachytherapy
Tandem and Ovoids

- Locally advanced disease with uterus in-situ
- Cervical involvement
- Dosimetry like cervical cancer
Vaginal Brachytherapy
Syed-Neblet

- Needle applicator
- Iridium-192
  - Alluvial deposits, rare
  - Half-life of 73.83 days
  - $^{192}$I beta decays into platinum-192
- Laparoscopy and omental J-flap may be required
Recurrence

- Similar to vulvar and cervical cancers
  - Epidermoid
- 80% found clinically
- 80% in pelvis and within 2 years
- Exenterative surgery for pelvic recurrence
  - 40% success
- Chemotherapy often ineffective
Vaginal Cancer

...Survival
# Vaginal Cancer

## Five-Year Survival

<table>
<thead>
<tr>
<th>Author</th>
<th>Patients</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>All Stages</th>
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<tbody>
<tr>
<td>Eddy '91</td>
<td>84</td>
<td>70</td>
<td>45</td>
<td>35</td>
<td>28</td>
<td>50</td>
</tr>
<tr>
<td>Stock '95</td>
<td>100</td>
<td>67</td>
<td>53</td>
<td>0</td>
<td>15</td>
<td>46</td>
</tr>
<tr>
<td>Creasman '98</td>
<td>792</td>
<td>73</td>
<td>58</td>
<td>58</td>
<td>58</td>
<td>NA</td>
</tr>
</tbody>
</table>
Vaginal Cancer
Stock et al Gyn Onc 56:45, 1995
Vaginal Cancer

...Unusual Cell Types
Unusual Vaginal Cancers

- Adenocarcinoma
  - Clear cell CA
- Verrucous
  - Locally invasive, rarely metastatic
- Melanoma
  - Problematic
- Sarcoma
  - Sarcoma botryoides
  - Leiomyosarcoma
- Endodermal sinus tumor
Clear Cell Adenocarcinoma

- Herbst and Scully, April 1970
- Age 15-22 offspring of DES exposed mothers
- Polypoid tumor
  - 60% upper vagina
  - 40% involve cervix also
- DES exposure before 18 weeks in utero
- Teratogenic (adenosis) not carcinogenic
Clear Cell Adenocarcinoma

Treatment

- Radical surgery
  - Ovarian preservation
- Adjuvant therapy
  - VAC
  - Pelvic radiotherapy
Clear Cell Cancer
Survival

Stage
Melanoma of Vagina

- Surgical therapy is mainstay
- Location
  - Distal 1/3 55%
  - Anterior 45%
- Overall survival < 20%
- No proven adjuvant therapy
Sarcoma Botryoides

- Embryonal rhabdomyosarcoma
  - Undifferentiated mesenchyme of vaginal lamina propria
  - Grape-like masses
- Vaginal cancer in children
  - Age 3-5 years
  - Peak incidence age 3 years
- Cervical origin in teens
- Treatment
  - Surgery + VAC + XRT
- Survival
  - 85-90%
Endodermal Sinus Tumor

- Rare
  - 50 case reports
- Peak age 10 months (usually under 1 year)
- αFP
  - Non-dysgerminomatous germ cell tumor
- Treatment
  - Chemotherapy and partial vaginectomy
- Survival
  - 85-90%
Conclusions

1. Clinical staging system
2. Radiotherapy
3. Modest cure rates
4. Prevention
Urethral Cancer

...Rare
Urethral Cancer

- Rare
  - < 1% (600 reported cases)
- Poor prognosis
- Radical cystourethrectomy in early disease
- Radiotherapy
- Consider inguinal lymphadenectomy or pelvic imaging (fusion PET/CT)
  - If (+), pelvic XRT
Urethral Cancer
Risk Factors

- Age > 60
- White female
- Chronic inflammation: UTI, STD
- HPV
Signs and Symptoms

- Hematuria, vaginal spotting
- Pain or voiding dysfunction
- Dyspareunia
- Palpable mass in urethra or vagina
- Inguinal adenopathy
- Recurrent UTI
- Urinary fistula
Histology

- Squamous- distal $\frac{2}{3}$
  - 60%
- Transitional- proximal $\frac{1}{3}$
  - 20%
- Adenocarcinoma
  - 10%
  - Submucosa of periurethral (Skene) glands
- Other
  - Sarcoma 8%
  - Melanoma 2%
Lymphatic Drainage

- Distal urethra $\frac{1}{3}$
  - Superficial and deep inguinal lymph nodes

- Proximal urethra $\frac{2}{3}$
  - Pelvic lymph nodes
Treatment

- **Surgery**
  - Local excision
  - Radical cystourethrectomy and lymphadenectomy

- **Radiation**
  - Preop ChemoRT
  - Postoperative RT

- **Chemotherapy**
  - Mtx, Vinblastine, Adriamycin, Cisplatin
  - Protocol