Immature Teratoma

*Histologic Grading*

<table>
<thead>
<tr>
<th>Grade</th>
<th>Immature Tissue</th>
<th>Neuro-epithelium</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+</td>
<td>Rare; Not &gt; 1 LPF/slide</td>
</tr>
<tr>
<td>2</td>
<td>++</td>
<td>Common; not &gt; 3 LPF/slide</td>
</tr>
<tr>
<td>3</td>
<td>+++</td>
<td>Prominent ≥ 4 LPF on any slide</td>
</tr>
</tbody>
</table>

>1 cm = PNET

Grade 3 Immature Teratoma
Significance of Microscopic Foci of Immaturity in a Benign Cystic Teratoma

• 350 cases of IT and 10 cases of dermoid cysts with microfoci of immature tissue
• Followup available in 9/10
• No recurrences 11 m to 7 y
• Minimal immature tissue does not warrant a diagnosis of IT


Immature Teratoma
Types of Metastases

• Mature tissues only (G0)
  – Usually “glial” implants on peritoneum or in LN
  – Adequate sampling to rule out higher grades

• Immature tissues present (G1-G3)
“Gliomatosis” in Lymph Node

GFAP
‘Glia’ implants are really neural implants

Metastatic Immature Teratoma

### Immature Teratoma

**Histologic Grading of Implants**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Immature Tissue</th>
<th>Neuro-epithelium</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Absent</td>
<td>None</td>
</tr>
<tr>
<td>1</td>
<td>+</td>
<td>Rare; Not &gt; 1 LPF/slide</td>
</tr>
<tr>
<td>2</td>
<td>++</td>
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Immature Teratoma

- Prognosis depends on:
  - Patient age
  - Grade of primary tumor (range: 1-3)
  - Stage
  - Grade of metastases (range 0-3)

- Treatment and survival:
  - Stage I, G1
    - Surgery only ~ 100% survival
  - Stage I, G2, G3 or stage II-IV
    - NCCN guidelines suggest 3 to 4 cycles of BEP
    - > 90% survival if optimally debulked

Immature Teratoma of the Ovary
Stage, Grade and Outcome in 34 Patients

Germ Cell Tumors
Survival Changes – SEER Data – All Stages

<table>
<thead>
<tr>
<th>Type</th>
<th>1973-1977 %</th>
<th>1998-2002 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dysgerminoma</td>
<td>83.5</td>
<td>96.9</td>
</tr>
<tr>
<td>Immature Teratoma</td>
<td>71.6</td>
<td>92.6</td>
</tr>
<tr>
<td>MGCT</td>
<td>43.4</td>
<td>90.7</td>
</tr>
</tbody>
</table>

Obstet Gynecol 2006;107:1075-1085
POG/CSG Study of Immature Teratoma
J Clin Oncol 17:2137-2143, 1999

44 patients, median age 10.8 y
13 (30%) had gliomatosis peritonei

31 pure Immature Teratoma
(17 G1, 12 G2, 2 G3)
8 (26%) had elevated AFP

13 Immature Teratoma +
micro Yolk Sac Tumor
(1 G1, 6 G2, 6 G3)
9 (69%) had elevated AFP

No recurrences
1 Metastatic yolk sac tumor in liver;
ANED after treatment

Immature Teratoma
Differential Diagnosis

• Carcinosarcoma (Mixed mesodermal tumor)
• Mature solid teratoma
• Microscopic foci of yolk sac tumor an immature teratoma
• Mixed germ cell tumor

Carcinosarcoma
(Mixed Mesodermal Tumor)

• Postmenopausal women
• Pattern of spread similar to carcinoma of the ovary
• Usually present with advanced stage disease
• Biphasic tumor - Carcinoma + sarcoma
• All elements of mesodermal derivation
• Poor prognosis