Interesting Case Conference
Hx

• 51 yo M with bile duct strictures

• August 2013 painless jaundice

• s/p stent

• Possible superimposed primary sclerosing cholangitis

• Prior atypical cytology on bile duct brushings
Procedure note

• Common hepatic duct stricture

• No evidence for PSC or PBC

• Biliary tree successfully swept with balloon, clot and blood seen

• Small irregular mass seen with intraductal US (IDUS)
  – Brushing
  – Biopsy
How far would you go?

- Atypical
- Suspicious for adenocarcinoma
- Positive for adenocarcinoma
How far would you go?

• Atypical

• Suspicious for adenocarcinoma

• Positive for adenocarcinoma
Cytologic Diagnosis

• Positive for adenocarcinoma
Biopsy
Biopsy
Biopsy Diagnosis

- Positive for adenocarcinoma
Bile duct brushings

- **Sensitivity** of between 30 and 60%
- **Specificity** ranging from 87 to 100%.
- **Features of malignancy** include:
  - chromatin *clumping*, nuclear molding
  - increased N/C ratio
  - loss of honeycomb pattern or polarity
  - greater than three- or fourfold variation in nuclear size within the same cluster of cells
  - cell-in-cell arrangements
### Table I. Overall Risk of Malignant Outcome With Respect to Cytology Brushing Result

<table>
<thead>
<tr>
<th>Brushing cytology result</th>
<th>Benign outcome</th>
<th>Malignant outcome</th>
<th>Total</th>
<th>% Malignant</th>
<th>Relative risk</th>
<th>$P^a$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benign</td>
<td>79</td>
<td>26</td>
<td>105</td>
<td>25% (16–33)</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Atypical favor reactive</td>
<td>8</td>
<td>2</td>
<td>10</td>
<td>20% (0–50)</td>
<td>0.8 (0.2–2.9)</td>
<td>0.74</td>
</tr>
<tr>
<td>Atypical, NOS</td>
<td>17</td>
<td>28</td>
<td>45</td>
<td>62% (47–77)</td>
<td>2.5 (1.7–3.8)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Atypical suspicious</td>
<td>8</td>
<td>23</td>
<td>31</td>
<td>74% (58–91)</td>
<td>3.0 (2.0–4.4)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Malignant</td>
<td>0</td>
<td>25</td>
<td>25</td>
<td>100% (NA)</td>
<td>4.2 (3.0–5.9)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Total</td>
<td>112</td>
<td>104</td>
<td>216</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*$P^a$ values are for the relative risk compared to a brushing result of benign.
NA, not available (unable to calculate).

### Table II. Accuracy Data for Differing Definitions of a Positive Cytology Brushing Test

<table>
<thead>
<tr>
<th>Definition of positive test</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>PPV</th>
<th>NPV</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atypical NOS, atypical</td>
<td>73.1% (64.4–81.7)</td>
<td>77.7% (69.8–85.5)</td>
<td>75.2% (66.7–83.8)</td>
<td>75.7% (67.7–83.6)</td>
<td>75.5% (69.7–81.2)</td>
</tr>
<tr>
<td>suspicious, malignant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suspicious, malignant</td>
<td>46.2% (36.4–55.9)</td>
<td>92.9% (88.0–97.7)</td>
<td>85.7% (76.3–95.1)</td>
<td>65.0% (57.7–72.5)</td>
<td>70.4% (64.2–76.5)</td>
</tr>
<tr>
<td>Malignant</td>
<td>26.3% (15.7–32.4)</td>
<td>100.0% (NA)</td>
<td>100.0% (NA)</td>
<td>58.6 (51.6–65.7)</td>
<td>63.4 (57.0–69.9)</td>
</tr>
</tbody>
</table>