Surgical management of IPMN

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What is an IPMN?

Pancreatic IPMN is a tumor characterized by intraductal papillary proliferation of mucin-producing epithelial cells.
Intraductal papillary mucinous neoplasm of the pancreas
Is IPMN a single tumor type or rather a group of tumors?

- Main duct IPMN
- Mixed-type IPMN
- Branch Duct IPMN
Is IPMN a single tumor type or rather a group of tumors?

Gastric (49%-63%)
Intestinal (18-36%)
Pancreatobiliary (7-18%)
Oncocytic (1-8%)

H&E MUC1 MUC2 MUC5AC

Low-grade
High-grade
Intermediate-grade
Invasive carcinoma
Is IPMN a tumor or a group of tumors?

Is IPMN a tumor or a group of tumors?

Poultsides et al., Ann Surg 2010
Are all patients with an IPMN equivalent?

Patients WITH Symptoms \textbf{VS} Patients WITHOUT Symptoms

\begin{tabular}{|l|}
\hline
Pancreas \\
\hline
\end{tabular}

\textbf{ORIGINAL ARTICLE}

\textit{Prospective study on the incidence, prevalence and 5-year pancreatic-related mortality of pancreatic cysts in a population-based study}

Marie-Luise Kromrey,\textsuperscript{1} Robin Bülow,\textsuperscript{1} Jenny Hübner,\textsuperscript{1} Christin Paperlein,\textsuperscript{1} Markus M Lerch,\textsuperscript{2} Till Ittermann,\textsuperscript{3} Henry Völzke,\textsuperscript{3} Julia Mayerle,\textsuperscript{2,4} Jens-Peter Kühn\textsuperscript{1,5}

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Participants</td>
<td>2,333</td>
<td>1,718</td>
</tr>
<tr>
<td>WB-MR + MRCP</td>
<td>1,275</td>
<td>686</td>
</tr>
<tr>
<td>Included</td>
<td>1,077</td>
<td>676</td>
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Among the **1077** probands screened at baseline examination, a total of 1681 cysts > 2mm were detected in **494** subjects (45.8%).

Cysts were more frequent in **older patients** (p<0.001). Prevalence increased from **17.1%** (30-39 yrs) to **75.7%** (> 80 yrs). Patients with incidental cysts were **9 yrs older** (mean age 60.5 ± 11.6) than those without (51.7% ± 12.3).
**Prevalence**

**Number**

**Size**

(A) Prevalence of cyst occurrence vs. age in years.
(B) Mean cyst number vs. age in years.
(C) Mean max. cyst size in mm vs. age in years.
New cysts: 48/367

Weighted 5-year incidence: 12.9% (2.6% per year)

Cysts disappeared in 12 subjects

Cyst change during the 5-year follow-up

<table>
<thead>
<tr>
<th>Cyst number</th>
<th>Decreased</th>
<th>Stable</th>
<th>Increased</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Decreased</strong></td>
<td>1.3% (5)</td>
<td>0</td>
<td>2.3% (4)</td>
<td>3.6% (9)</td>
</tr>
<tr>
<td><strong>Stable</strong></td>
<td>6.5% (25)</td>
<td>30.8% (114)</td>
<td>23.3% (81)</td>
<td>60.6% (220)</td>
</tr>
<tr>
<td><strong>Increased</strong></td>
<td>2.1% (7)</td>
<td>9.7% (34)</td>
<td>24.1% (87)</td>
<td>35.9% (128)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>9.8% (37)</td>
<td>40.4% (148)</td>
<td>49.8% (172)</td>
<td>100% (357)</td>
</tr>
</tbody>
</table>

Death due to pancreatic cancer: 3/2,333 – 0.1%
Are all patients with an IPMN equivalent?

Should the management of these two patients be identical, in the presence of the same IPMN lesion?
What is the GOAL of SURGERY in the treatment of IPMNs?

1. Resect IPMNs before evolution to invasive cancer

1 bis. Avoid to resect IPMNs that will not progress to cancer
Resect IPMNs before evolution to invasive cancer
Guidelines for IPMNs and Cystis Tumors

1. Sendai Pancreatology 2006;
2. Fukuoka Pancreatology 2012;
3. Bulgarian World J Radiol 2012;
8. Revised Fukuoka Pancreatology 2017;
International Consensus Guidelines for Management of Intraductal Papillary Mucinous Neoplasms and Mucinous Cystic Neoplasms of the Pancreas

Pancreatology 2006;6:17–32

“Sendai Guidelines”

MD- and Mixed-IPMN

1. Resection if MD is dilated (> 6mm?)
2. If the patient is a good surgical candidate
3. If the patient has a reasonable life expectancy
4. If resection performed by pancreatic surgeons

“Size is very important”

BD-IPMN
Type of resection

If malignancy is suspected

Formal resection with adequate lymphadenectomy

Very small lesions without suspicion of malignancy

Limited resections can be planned

BD-IPMN

Can be candidate for limited pancreatectomy if negative margins can be obtained and safe pancreatectomy can be performed
International consensus guidelines 2012 for the management of IPMN and MCN of the pancreas

Pancreatology 2012

MD dilation

Relevance of MD dilation is graded

> 5mm

Indications for resection

MD-IPMN

All fit patients with MD-IPMN

BD-IPMN

Size is less important

- Possible in patients < 65yrs with cysts > 2 cm
- Size alone (> 3 cm) without mural nodules and positive cytology can be observed
- A BD-IPMN > 3 cm without HRS can be observed
BD-IPMN (2.8cm), showing progressive reduction in diameter during the CT exam, because of mucin excretion
Indications for resection

In patients with 2 or more affected first-degree relatives, the risk rapidly escalates. They merit aggressive surveillance by MRI/MRCP (or CT) and EUS.

“Worrisome features” are of more concern:
- ✓ If “worrisome features” → resection
- ✓ If no “worrisome features” → imaging follow-up at 3 months
- ✓ If growing BD-IPMN → resection
International consensus guidelines 2012 for the management of IPMN and MCN of the pancreas

Pancreatology 2012

**"Fukuoka Guidelines"**

<table>
<thead>
<tr>
<th>Type of resection</th>
<th>Formal pancreatectomy plus lymphadenectomy</th>
<th>Limited resections can be planned</th>
<th>May be good candidate for <strong>LAPAROSCOPIC SURGERY</strong></th>
<th>Further resection is warranted. ALL PATIENTS SHOULD BE INFORMED ABOUT THE POSSIBILITY OF A <strong>TOTAL PANCREATECTOMY</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard of treatment for invasive and non-invasive IPMNs</td>
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<tr>
<td>If no malignancy is suspected</td>
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<tr>
<td>Low-grade and possibly high-grade IPMN</td>
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<td>If positive FS margin (High-grade or invasive carcinoma)</td>
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Revisions of international consensus Fukuoka guidelines for the management of IPMN of the pancreas

Pancreatology 2017

"Revised Fukuoka Guidelines" (back to Sendai)

Indications for resection

MD-IPMN
✓ Strongly recommended if duct size > 10mm
✓ Duct size 5-9 mm is a worrisome feature with no indication for immediate surgery
✓ No cut-off value for mural nodules

BD-IPMN
✓ Size alone
✓ Patients aged < 65 yrs may be candidate for resection (controversial)
✓ Absolute indications POSITIVE CITOLOGY and MURAL NODULES (5 mm)
✓ Decisons have to be individualized

Mural nodules are more important than size
Revisions of international consensus Fukuoka guidelines for the management of IPMN of the pancreas

Pancreatology 2017

“Revised Fukuoka Guidelines” (back to Sendai)

Type of resection

IPMNs with an invasive component

Formal pancreatectomy plus lymphadenectomy

If no malignancy is suspected

Limited resections can be planned

Since HGD diagnosis is difficult by FS

Standard lymphadenectomy should be performed
Assessment of IMPN lesions on resection margins

A REVISED CLASSIFICATION SYSTEM AND RECOMMENDATIONS FROM THE BALTIMORE CONSENSUS MEETING FOR NEOPLASTIC PRECURSOR LESIONS IN THE PANCREAS

Olca Basturk, MD¹, et al.

1. Evidence is not strong.

2. In BD-IPMN evaluation of margin status is inconsequential, because of the low probability of a positive result.

3. Further resection is recommended for invasive carcinoma and high-grade dysplasia.

4. The grade of dysplasia at the margin may be reported without distinguishing IPMN from PanIn, because such distinction can be difficult based purely on histology.

Assessment of IMPN lesions on resection margins

1. Need for additional resection based on FS histology in 20-30% of the patients
2. Percentage of concordance between FS and definitive tends to be high although variable
3. Deepithelization (denudation) does not mean absence of neoplasia, and should indicate the need for extension of resection.
4. In MD-IPMN, because of the known possibility of skip lesions, pancreatoscopy as well as juice cytology permit the identification of multifocal IPMN that could otherwise be missed.
Conclusions

I believe that pancreatic surgeons should be “interventional pancreatologists”. Surgical management of IMPNs is the proof of this concept.

How to manage patients with pancreatic IPMNs?