Appendiceal Pathology

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Appendicitis
Appendicitis
Appendicitis

- Scattered groups of neutrophils in the mucosa alone do not indicate appendicitis.
- Eosinophils are normal in the mucosa.
- Neutrophils in the serosa alone do not indicate appendicitis - suggest an extra-appendiceal cause.
- Acute necrotising arteritis may be localised to the appendix.
- Always think about actinomycosis.
- Diverticulitis is quite common if you look for it.
Ulcerative Colitis
Ulcerative Colitis

- Appendix involved in 50% cases of UC
- “Skip” lesion in 37%
- Active disease with ulceration in colectomy specimens predicts subsequent pouchitis
- Appendiceal carcinoma occurs in UC
- Appendicectomy protects against subsequent ulcerative colitis
Crohn’s disease
Crohn’s Disease

- Appendix involved in 40-50% cases of CD resections
- “skip” lesion in 20%
- 20% had previous appendicectomy
- Appendiceal involvement associated with more extensive colonic disease
Crohn’s disease
Granulomatous Appendicitis

- Common in interval appendicectomies (60%)
  - Other Crohn’s-like changes in 50%
- Extra-appendiceal disease in <10%
- Consider other causes
  - Yersinia (PCR +ve in 10/40 cases vs 0/60 controls)
  - Tuberculosis
  - Schistosomiasis
Yersinial infection

*Yersinia enterocolitica*

*Yersinia pseudotuberculosis*

Meat (especially pork) and dairy products consumption and contact with untreated sewage

Usually matted mesenteric lymphadenopathy

May cause ileitis, appendicitis, colitis or enteric fever-like syndrome especially with *Y enterocolitica*

Granulomatous inflammation especially with *Y pseudotuberculosis*
Four stages of Yersinial infection

- Lymphoid hyperplasia
- Histiocytic hyperplasia
- Epithelioid granuloma formation
- Central granulomatous necrosis
Enterobius vermicularis (Pinworm)

Human only natural host

Worms usually live free in lumen

Female worm migrates to rectum after copulation and then on to perineum (at night) where ~10,000 eggs released

Ingested eggs hatch in duodenum, mature in 2 weeks and live for 2 months

May cause perineal irritation

Migration of gravid female into vagina may cause vaginitis, salpingitis or peritonitis.
Pinworms and Acute Appendicitis

Causality and symptomatology controversial

Luminal obstruction by large worm load may cause obstruction

Invasive enterobiasis

eosinophil-rich granulomatous inflammation around embedded worms

may be related to immunosuppression
Measles

Initial infection of respiratory lining cells followed by replication

Primary viraemia leads to dissemination in lymphoid tissue with formation of Warthin-Finkeldey cells

Secondary viraemia by infected lymphocytes giving epithelial infection (skin, gut, etc) with syncytial giant cells
Measles Appendicitis

Rarely causes clinical appendicitis

Prodromal:

• Hyperplasia of lymphoid tissue
• Warthin-Finkeldey giant cells (B-cells) in follicles

Full-blown:

• Syncytial epithelial giant cells
• Mucosal necrosis and sloughing

Few remaining W-F cells
Appendiceal Adenomas

• Incidental (including FAP)
• Appendicitis
• Mucocoele
Appendiceal Adenoma - Carcinoma
Appendiceal Adenomas

- Women > men
- Synchronous ovarian mucinous tumours 10%
- Synchronous colorectal neoplasms 33-89%
- CK20+
- 50% CK7+
Mucocoele

- **Obstructive**
  - rare
  - <1cm diameter
  - epithelium flattened, devoid of atypia
  - cystic fibrosis

- **Neoplastic**
  - >1cm diameter
  - Ulceration
  - calcification
Mucinous adenoma

“If there is acellular mucin in the appendiceal wall, the diagnosis of adenoma should only be made if the muscularis mucosae is intact, since this implies that the lesion is curable by local excision”

WHO Classification of Tumours, 2000
Pseudomyxoma peritonei

- Mucinous material on peritoneal surfaces
- Spares intestinal serosa
- Involves omentum, around liver, pelvis
- Hernial sacs
- Pleura
- Retroperitoneum
- Splenic mucous cysts
Pseudomyxoma peritonei

- Progressive accumulation and recurrent intestinal obstruction, often over years
- Most cases related to appendiceal or ovarian mucinous tumours, many not overtly invasive (borderline tumours)
- Prognosis related to
  - extent of disease
  - cellularity
  - degree of cytological atypia
  - presence of overt carcinoma
Sugarbaker Technique

• combines complete surgical tumour removal (complete cytoreduction) with intraoperative heated chemotherapy (10 hours):
  – removal of the right hemicolon, spleen, gallbladder, greater omentum and lesser omentum
  – stripping of the peritoneum from the pelvis and diaphragm
  – stripping of the tumour from the surface of the liver
  – removal of the uterus and ovaries in women
  – removal of the rectum in some cases
• followed by postoperative intraperitoneal chemotherapy
Misconceptions in Pseudomyxoma?

- only cases associated with an underlying carcinoma behave aggressively
- “localised” pseudomyxoma is always benign
- “acellular” mucous pools are always benign
- many cases arise from an ovarian mucinous tumour
Pseudomyxoma peritonei

- Great majority have an intestinal phenotype
  - CK20 + CK7±
  - MUC2 +
  - CDX-2 expression

Nonaka D et al 2006 Histopathology 49: 381
Appendiceal Mucinous Neoplasms

- **LAMN** - low grade appendiceal mucinous neoplasm
  - low grade cytological atypia
  - minimal architectural complexity
  - no destructive invasion
  - adenomucinosis

- **MACA** - mucinous adenocarcinoma of appendix
  - destructive invasion of appendiceal wall OR
  - high grade cytological atypia OR
  - complex papillary fronds or cribriform glandular structures

Appendiceal Mucinous Neoplasms

- **LAMN** - low grade appendiceal mucinous neoplasm
  - 88/107
  - 50% confined to appendix - no recurrence
  - 50% peritoneal mucinous tumour - 5 yr survival 86%, 10 yr 45%
  - connection with intramural tumour not always apparent
  - examples of acellular extracellular mucin with progression

- **MACA** - mucinous adenocarcinoma of appendix
  - 16/107 - 5 yr survival 44%
  - 75% peritoneal tumour
  - 8 invasive
  - 8 non-invasive

Appendiceal Mucinous Neoplasms

• Generous sampling essential
• LAMN - low grade appendiceal mucinous neoplasm
  – confined to appendix - benign
  – with extra-appendiceal peritoneal spread - guarded
  – role of hemicolecctomy unproven

• MACA - mucinous adenocarcinoma of appendix
  – never benign
  – invasive - adenocarcinoma
  – non-invasive caution
Hyperplastic (metaplastic) Polyp

Mucosal Hyperplasia (metaplasia)
Appendiceal Mucosal Hyperplasia

Diffuse flat mucosal changes resembling hyperplastic polyps

Associated with mucocoele

“Results from appendiceal obstruction that is insufficient to compromise blood flow”

No dysplasia

18% of 122 ileo-colectomy specimens

77% associated with colorectal cancer, predominantly right side

8.8% of 273 consecutive appendicectomies

25% associated with colorectal cancer

Younes M et al Histopathology 1995; 26: 33
Sessile Serrated Adenoma

Serrated, dilated and branched crypts with horizontal growth

Microsatellite instability
DNA methylation
MLH1 inactivation
BRAF mutation
NEUROENDOCRINE TUMOURS OF APPENDIX

NORMAL STRUCTURE AND FUNCTION

- Enterochromaffin cells
- Originally thought to be of neural crest origin (APUD)
- Now known to be of endodermal origin, from gut stem cells
- Ganglion cells of neural crest origin
NEUROENDOCRINE TUMOURS OF APPENDIX

GOBLET CELL

ENTERO-ENDOCRINE CELL

STEM CELL

ENTEROCYTE

PANETH CELL
NEUROENDOCRINE TUMOURS OF APPENDIX

NORMAL STRUCTURE AND FUNCTION

• Argyrophil cells (capable of reducing silver salts e.g. Grimelius)
• Argentaffin cells (require reducing agents e.g. Masson Fontana)
NEUROENDOCRINE TUMOURS OF APPENDIX

NORMAL STRUCTURE AND FUNCTION

- Foregut (lung, stomach, 1st part duodenum)
- Midgut (2nd part duodenum +, jejunum, ileum, appendix, right colon)
- Hindgut (transverse colon, left colon, rectum)
NEUROENDOCRINE TUMOURS OF APPENDIX

CARCINOID TUMOURS

• 74% GI, 25% lung, 1% other
• 2% of all malignant tumours (reported, ? actual)
• Most indolent, capable of metastasis
• Functional consequences
NEUROENDOCRINE TUMOURS OF APPENDIX

SECRETORY PRODUCTS

• Foregut: 5HT, tachykinins, gastrin, ACTH, HCG

➢ Carcinoid syndrome: flushing, diarrhoea, bronchoconstriction, cutaneous oedema

• Midgut: serotonin (5HT)

• Hindgut: tachykinins, somatostatin, PP, 5HT, dopamine, neurotensin
NEUROENDOCRINE TUMOURS OF APPENDIX

CARCINOID SYNDROME

- Diarrhoea (83%), flushing (49%), dyspnoea (20%), wheezing (6%), right heart valve fibrosis
- Related to histamine, 5HT etc.
- Develops in metastatic disease (midgut, hindgut)
- Hepatic artery chemoembolisation
- Octreotide
NEUROENDOCRINE TUMOURS OF APPENDIX

DISTRIBUTION

• Oesophagus 0.05%
• Stomach 4.3%
• Small bowel 39% (ileum 21%)
• Appendix 25.6%
• Colon 31% (rectum 17%)
## NEUROENDOCRINE TUMOURS OF APPENDIX

<table>
<thead>
<tr>
<th>SITE</th>
<th>Local 5YS</th>
<th>Reg</th>
<th>5YS</th>
<th>Dist</th>
<th>5YS</th>
</tr>
</thead>
<tbody>
<tr>
<td>STOMACH</td>
<td>52</td>
<td>64</td>
<td>10</td>
<td>40</td>
<td>21</td>
</tr>
<tr>
<td>SMALL BOWEL</td>
<td>25</td>
<td>64</td>
<td>39</td>
<td>65</td>
<td>31</td>
</tr>
<tr>
<td>APPENDIX</td>
<td>63</td>
<td>95</td>
<td>29</td>
<td>85</td>
<td>9</td>
</tr>
<tr>
<td>COLON</td>
<td>23</td>
<td>71</td>
<td>36</td>
<td>43</td>
<td>38</td>
</tr>
<tr>
<td>RECTUM</td>
<td>72</td>
<td>82</td>
<td>7</td>
<td>48</td>
<td>7</td>
</tr>
</tbody>
</table>
NEUROENDOCRINE TUMOURS OF APPENDIX

IMMUNOHISTOCHEMISTRY

- Chromogranin A: 88% foregut, 100% midgut, 60% hindgut
- Synaptophysin (100%!)
- Neurone specific enolase (NSE)
- Cytokeratin 18 (not appendix, not CK 20)
- N-CAM (CD56): 77% foregut, 58% midgut, 20% hindgut
- CEA 26%
- S-100 protein 100% appendix
NEUROENDOCRINE TUMOURS OF APPENDIX

APPENDIX CARCINOIDS

- 77% of tumours at this site
- Females 2 x male (others 1.15 M:F)
- Incidental gynae. procedures
- Most incidental at appendicitis
- 75% at tip, 10% at base
APPENDIX CARCINOIDS

- Appendix reaches adult size at 4 years
- Epithelial NE cells uniform throughout life
- Deep subepithelial NE cells ↑ with age
- Presumed cell of origin
- 5HT+, Masson Fontana+
- Yellow nodule
- Trabecular/nested, low mitoses
- <1cm: 70-90%, 1-2cm: 4-25%, >2cm: rare
NEUROENDOCRINE TUMOURS OF APPENDIX

GOBLET CELL CARCINOID

• Both glandular and neuroendocrine morphology
• More aggressive
• Increased atypia, mitoses
• Rare: most common in appendix, <5% of tumours at this site
• Also seen around ampulla
• Arise below crypts
• Goblet cells, tubular glands, mucin
• May be Paneth cells
NEUROENDOCRINE TUMOURS OF APPENDIX

GOBLET CELL CARCINOID

- Symptomatic presentation
- Appendicitis, mass, obstruction
- Leads to recurrent disease
- Dissemination within abdomen
- Peritoneal, ovarian involvement
- Indication for right hemicolecctomy
- If mitotically active, nuclear atypia, spread beyond appendix
### Appendix I  WHO classification of gastrointestinal\(^6\) and pancreatic endocrine tumours\(^{12}\)

<table>
<thead>
<tr>
<th>Site</th>
<th>Well differentiated endocrine tumour (Benign behaviour)</th>
<th>Well differentiated endocrine tumour (Uncertain behaviour)</th>
<th>Well differentiated endocrine carcinoma (Low grade malignant)</th>
<th>Poorly differentiated endocrine carcinoma (High grade malignant)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pancreas</td>
<td>Confined to pancreas Functioning insulinoma &lt;20mm Non-functioning tumours &lt;20mm No vascular invasion No perineural invasion &lt;2 mitoses/HPF / Ki-67 index ≤2%</td>
<td>Confined to pancreas and one or more of the following: ≥20mm Perineural invasion Vascular invasion 2-10 mitoses/HPF / Ki-67 index &gt;2%</td>
<td>Invasion of adjacent organs presence of metastases</td>
<td>High grade, poorly differentiated large cell, intermediate cell or small cell carcinoma. Ki-67 index &gt;30%</td>
</tr>
<tr>
<td>Stomach</td>
<td>Non-functioning Confined to mucosa-submucosa Size ≤10 mm. No vascular invasion</td>
<td>Non-functioning Confined to mucosa-submucosa Size &gt;10-20 mm without vascular invasion Size up to 20mm with vascular invasion</td>
<td>Non-functioning tumour of any size Non-functioning tumour &gt;20mm or of any size with invasion beyond submucosa and/or metastases. Ki-67 index 2-30%</td>
<td>High grade, poorly differentiated large cell, intermediate cell or small cell carcinoma. Ki-67 index &gt;30%</td>
</tr>
<tr>
<td>Duodenum and Upper jejunum</td>
<td>Non-functioning Confined to mucosa-submucosa Size ≤10 mm. No vascular invasion Gangliocytic paraganglioma of any size</td>
<td>Non-functioning tumour or functioning gastrinoma Confined to mucosa-submucosa Size &gt;10mm or ≤10mm with vascular invasion</td>
<td>Functioning or non-functioning tumour of any size with invasion beyond submucosa and/or metastases. Ki-67 index 2-30%</td>
<td>High grade, poorly differentiated large cell, intermediate cell or small cell carcinoma. Ki-67 index &gt;30%</td>
</tr>
<tr>
<td>Distal Jejunum, ileum</td>
<td>Non-functioning Confined to mucosa-submucosa Size ≤10 mm. No vascular invasion</td>
<td>Non-functioning Confined to mucosa-submucosa Size ≤10 mm. Vascular invasion</td>
<td>Functioning tumour of any size Non-functioning tumour &gt;10mm or of any size with invasion beyond submucosa and/or metastases. Ki-67 index 2-30%</td>
<td>High grade, poorly differentiated large cell, intermediate cell or small cell carcinoma. Ki-67 index &gt;30%</td>
</tr>
<tr>
<td>Appendix</td>
<td>Non-functioning Confined to appendiceal wall Size &lt;20 mm. No vascular invasion</td>
<td>Non-functioning Extension into mesoappendix Vascular invasion</td>
<td>Functioning tumour of any size Non-functioning Deep invasion into mesoappendix Size ≥25 mm and/or metastases. Ki-67 index 2-30%</td>
<td>High grade, poorly differentiated large cell, intermediate cell or small cell carcinoma. Ki-67 index &gt;30%</td>
</tr>
<tr>
<td>Colon, Rectum</td>
<td>Non-functioning Confined to mucosa-submucosa Size ≤20 mm. No vascular invasion</td>
<td>Non-functioning Confined to mucosa-submucosa Size &lt;20 mm. Vascular invasion</td>
<td>Functioning tumour of any size Non-functioning tumour &gt;20mm or of any size with invasion beyond submucosa and/or metastases. Ki-67 index 2-30%</td>
<td>High grade, poorly differentiated large cell, intermediate cell or small cell carcinoma. Ki-67 index &gt;30%</td>
</tr>
</tbody>
</table>

Note: the term functioning is defined as causing a hormonal syndrome, NOT containing an immunodetectable hormone within tumour cells
# NEUROENDOCRINE TUMOURS OF APPENDIX

## Grading system for gastrointestinal endocrine tumours

<table>
<thead>
<tr>
<th>Grade</th>
<th>Mitotic count (10HPF)*</th>
<th>Ki-67 index (%)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>&lt;2</td>
<td>≤2</td>
</tr>
<tr>
<td>G2</td>
<td>2–20</td>
<td>&gt;2–20</td>
</tr>
<tr>
<td>G3</td>
<td>&gt;20</td>
<td>&gt;20</td>
</tr>
</tbody>
</table>

* 10 HPF: high power field = 2 mm², at least 40 fields evaluated in areas at highest mitotic density

** MIB1 antibody; % of tumour cells in a 2000 cell sample from the areas of highest nuclear labelling.

Appendiceal Carcinoids

- EC-cell Carcinoids
- L-cell Carcinoids
- Goblet cell Carcinoids
EC-cell Carcinoids

- >95% Appendiceal Carcinoids
- insular pattern
- uncommon variants - clear cell, balloon cell, acinar
- may contain S-100-positive Schwann-like cells
L-cell Carcinoids

- <5% Appendiceal Carcinoids
- trabecular or tubular
- non-argentaffin but argyrophil
- contain enteroglucagons, PP or PYY
- usually chromogranin A negative
- chromogranin B and SV2 positive
Goblet Cell Carcinoids

- Females > males
- Incidental or appendicitis
- Often diffuse growth pattern, unsuspected grossly
- Genetically different from conventional carcinoids and adenocarcinomas (e.g. no K-ras mutations)
- Propensity for transcoelomic spread, especially to ovary
- Lymph node and liver metastases relatively unusual
- 80% 5 year survival
Goblet Cell Carcinoids

- Mucous cells
- Enterocytes/colonocytes
- Endocrine cells (EC-cells or L-cells)
- Paneth cells

Aggressive features
- Nuclear pleomorphism
- Mitotic rate (>2/10 HPF)
- Carcinomatous growth:
  - single file structures
  - diffusely infiltrating signet ring cells
  - cribriform glands
  - solid sheets
Management

Tumour confined to appendix with minimal invasion of mesoappendix
Minority component “carcinomatous”

Appendicectomy

Extensive invasion of mesoappendix
Involvement of resection line, invasion of caecum, lymph node involvement
Majority component “carcinomatous”

Right hemicolecctionomy
Signet Ring Carcinoma

- Rare
- Part of spectrum of goblet cell carcinoid and mucinous adenocarcinoma
- E-cadherin negative
- Beta-catenin negative
- Always consider metastasis
  - stomach
  - breast
FIGURE 1. PMP derived from an LAMN. The specimen in (A) is from the right subphrenic space. The specimen in (B) is from the omentum and shows the hyaline fibrosis that is a common feature. Both specimens are classified as low-grade mucinous carcinoma peritonei/disseminated peritoneal adenomucinosis.

FIGURE 2. This appendiceal mucinous lesion consists of epithelium showing minimal cytologic atypia that is pushing into the underlying appendiceal wall but without an infiltrative invasive pattern. In the consensus classification, the lesion is an LAMN.
<table>
<thead>
<tr>
<th>Lesion</th>
<th>Terminology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adenoma resembling traditional colorectal type, confined to mucosa, muscularis mucosae intact</td>
<td>Tubular, tubulovillous or villous adenoma, low-grade or high-grade dysplasia</td>
</tr>
<tr>
<td>Tumor with serrated features, confined to mucosa, muscularis mucosae intact</td>
<td>Serrated polyp with or without dysplasia (low grade or high grade)</td>
</tr>
<tr>
<td>Mucinous neoplasm with low-grade cytologic atypia and any of:</td>
<td>Low grade appendiceal mucinous neoplasm</td>
</tr>
<tr>
<td>Loss of muscularis mucosae</td>
<td></td>
</tr>
<tr>
<td>Fibrosis of submucosa</td>
<td></td>
</tr>
<tr>
<td>“Pushing invasion” (expansile or diverticulum-like growth)</td>
<td></td>
</tr>
<tr>
<td>Dissection of acellular mucin in wall</td>
<td></td>
</tr>
<tr>
<td>Undulating or flattened epithelial growth</td>
<td></td>
</tr>
<tr>
<td>Rupture of appendix</td>
<td></td>
</tr>
<tr>
<td>Mucin and/or cells outside appendix</td>
<td></td>
</tr>
<tr>
<td>Mucinous neoplasm with the architectural features of LAMN and no infiltrative invasion, but with high-grade cytologic atypia</td>
<td>High grade appendiceal mucinous neoplasm</td>
</tr>
<tr>
<td>Mucinous neoplasm with infiltrative invasion*</td>
<td>Mucinous adenocarcinoma—well, moderately, or poorly differentiated</td>
</tr>
<tr>
<td>Neoplasm with signet ring cells (≤ 50% of cells)</td>
<td>Poorly differentiated (mucinous) adenocarcinoma with signet ring cells</td>
</tr>
<tr>
<td>(Mucinous) signet ring cell carcinoma</td>
<td></td>
</tr>
<tr>
<td>Neoplasm with signet ring cells (&gt; 50% of cells)</td>
<td>Adenocarcinoma—well, moderately, or poorly differentiated</td>
</tr>
<tr>
<td>Nonmucinous adenocarcinoma resembling traditional colorectal type</td>
<td></td>
</tr>
</tbody>
</table>

*Features of infiltrative invasion include tumor budding (discohesive single cells or clusters of up to 5 cells) and/or small, irregular glands, typically within a desmoplastic stroma characterized by a proteoglycan-rich extracellular matrix with activated fibroblasts/myofibroblasts with vesicular nuclei.
FIGURE 3 . Infiltrative invasion in an appendiceal adenocarcinoma. Small, angulated glands are surrounded by desmoplasia.
FIGURE 4 . LAMN with hyaline fibrosis of the underlying tissue.
FIGURE 5 . HAMN resembles an LAMN at low power (A) but the cytologic atypia is marked (B).
FIGURE 6. Serrated polyp of appendix without dysplasia. It closely resembles a sessile serrated adenoma of the colon. Note that the muscularis mucosae is intact.
## TABLE 2

### Classification of PMP (Peritoneal Disease Component)

<table>
<thead>
<tr>
<th>Lesion</th>
<th>Terminology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mucin without epithelial cells</td>
<td>Acellular mucin (A descriptive diagnosis followed by a comment is likely to be appropriate, depending on the overall clinical picture. It should be stated whether the mucin is confined to the vicinity of the organ of origin or distant from it, i.e., beyond the right lower quadrant in the case of the appendix. The term PMP should normally be avoided unless the clinical picture is characteristic.)</td>
</tr>
<tr>
<td>2. PMP with low-grade histologic features*</td>
<td>Low-grade mucinous carcinoma peritonei OR Disseminated peritoneal adenomucinosis (DPAM)</td>
</tr>
<tr>
<td>3. PMP with high-grade histologic features*</td>
<td>High-grade mucinous carcinoma peritonei OR Peritoneal mucinous carcinomatosis (PMCA)</td>
</tr>
<tr>
<td>4. PMP with signet ring cells</td>
<td>High-grade mucinous carcinoma peritonei with signet ring cells OR Peritoneal mucinous carcinomatosis with signet ring cells (PMCA-S)</td>
</tr>
</tbody>
</table>

*Omental cake and ovarian involvement can be consistent with a diagnosis of either low-grade or high-grade disease.
FIGURE 7

<table>
<thead>
<tr>
<th>Reporting Checklist for Appendiceal Mucinous Neoplasia and/or Pseudomyxoma Peritonei</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material in <em>italics</em> is optional and may be more relevant to research rather than routine reporting. Note that the primary neoplasm and the peritoneal metastases are assessed separately.</td>
</tr>
</tbody>
</table>

### Patient Details

<table>
<thead>
<tr>
<th>Hospital Number</th>
<th>Name</th>
<th>DoB</th>
<th>Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinician</td>
<td>Sample Date</td>
<td>Consent form</td>
<td></td>
</tr>
</tbody>
</table>

### Clinical Details

**Primary site**
- ☐ Appendix
- ☐ Other (state) □ Unknown

**Previous appendectomy?**
- ☐ Yes: Date: ______ Diagnosis ______
- ☐ Appendix entirely sampled? ☐ Yes ☐ No ☐ Not known
- ☐ No
- ☐ Not known

**Previous mucinous tumor (other than in appendix)?**
- ☐ Yes: Site: ______ Date: ______ Diagnosis ______
- ☐ No
- ☐ Not known

**Previous cytoreductions?**
- ☐ Yes: Number of operations: ______
- ☐ No
- ☐ Not known

**Neoadjuvant therapy?**
- ☐ Yes Type ______
- ☐ No

**Clinical history and operative findings:**

**Cytoreduction:**
- ☐ CC-0 (no visible disease)
- ☐ CC-1 (nodules <2.5 mm)
- ☐ CC-2 (nodules 2.5 mm - 25 mm)
- ☐ CC-3 (nodules >25 mm)

**Peritoneal cancer index (PCI) ______**

**Confirmed to one quadrant?**
- ☐ Yes (state which ______)
- ☐ No
- ☐ Not known / Not applicable

**Organs submitted:**
- ☐ Appendix
- ☐ Greater Omentum
- ☐ Lesser Omentum
- ☐ Right Colon
- ☐ Transverse colon
- ☐ Left Colon
- ☐ Sigmoid
- ☐ Rectum
- ☐ Anus
- ☐ Subtotal colon
- ☐ Other: ______

- ☐ Small bowel
- ☐ Gallbladder
- ☐ Liver segment
- ☐ Stomach (partial)
- ☐ Stomach (total)
- ☐ Spleen
- ☐ Right Ovary
- ☐ Left Ovary
- ☐ Uterus
- ☐ Umbilicus

**Peritonealmetastases:**
- ☐ Right Parietal
- ☐ Left Parietal
- ☐ Pelvic
- ☐ Right Diaphragmatic
- ☐ Left Diaphragmatic
- ☐ Liver Capsule
- ☐ Fallopian ligament
- ☐ Omental bursa

**Tumor bank:**
- ☐ Yes: ______
- ☐ No: ______
- ☐ Not known: ______
THANK YOU FOR YOUR ATTENTION
ANY QUESTIONS?