Sphincter of Oddi Dysfunction

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Case Report (1)
- TD 33yr old male
- **Feb – May 2010:** Recurrent episodes of abdominal pain
- **June 2010** 
  - Episode severe abdominal pain
  - Admitted

Case Report (2)
- Acute episode of pancreatitis – Amylase 2000
- Normals LFTs
- Possible aetiology:
  - No alcohol excess
  - No relevant drug history
  - No evidence stones on USS

Case Report (3)
- **Subsequent investigation**
  - MRCP – no pancreatobiliary abnormality
  - EUS no evidence of:
    - Microcalculi
    - Chronic pancreatitis
  - genetic screening negative for:
    - PRSS-1
    - Spink-1
    - Cystic fibrosis

Case Report (4)
- ERCP and sphincter of Oddi manometry
  - Normal anatomy
  - SOM Basal biliary 45-60 mm Hg
    - Basal pancreatic 50-65 mm Hg

Case Report (5)
- Management:
  - Biliary sphincterotomy
  - Pancreatic sphincterotomy + temporary stenting
Case Report (6)

- Progress:
  - Post ERCP pancreatitis – 14 days
  - No recurrence pancreatitis 20 months
  - Gallbladder related RUQ pain. Cholecystectomy 2011

Sphincter of Oddi Dysfunction

- Disorder of SO motility
  - SO Dyskiniesia
  - SO Stenosis

Sphincter of Oddi Dysfunction

Non Invasive Assessment
- Morphine-Prostigmin Provactive test
- Quantitative Hepatobiliary Scintigraphy
- MRCP after secretory stimulation
- (Intra sphincter botulinum toxin injection)

MRCP showing Pancreatic Duct Stricture in patient with suspected SOD
EUS pre-assessment

Sphincter Manometry
- Perfusion catheter.
- Solid state catheter
- Sleeve catheter.
**Sphincter of Oddi Dysfunction**

**Manometric Definition:**

<table>
<thead>
<tr>
<th></th>
<th>Normal Range</th>
<th>Abnormal Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basal Sphincter Pressure</td>
<td>10-20mmHg</td>
<td>&gt;35mmHg</td>
</tr>
<tr>
<td>Phasic Wave Amplitude</td>
<td>100-140mmHg</td>
<td>&gt;220mmHg</td>
</tr>
<tr>
<td>Phasic Wave Frequency</td>
<td>3-6/min</td>
<td>&gt;8/min</td>
</tr>
</tbody>
</table>

**Sphincter of Oddi Dysfunction**

**Sphincter involved**

<table>
<thead>
<tr>
<th></th>
<th>Biliary alone</th>
<th>Pancreatic alone</th>
<th>Both</th>
</tr>
</thead>
<tbody>
<tr>
<td>20%</td>
<td>30%</td>
<td>50%</td>
<td></td>
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</table>

**Rome II Criteria**

- Episodes of severe pain located in the epigastrium and right upper quadrant:
  - Episodes of pain last 30 minutes or more
  - Symptoms have occurred on one or more occasions in the previous 12 months
  - The pain is steady and interrupts daily activities
  - There is no evidence of structural abnormalities

In addition the diagnosis is supported by abnormal liver and pancreatic biochemistry or acute recurrent pancreatitis.

**Milwaukee Classification:**

- **Type 1**
  - Typical biliary-pancreatic pain
  - Liver and/or pancreatic biochemistry > 1.5-2 elevated
  - Dilated common bile duct and/or pancreatic duct
- **Type 2**
  - Typical biliary-pancreatic pain
  - Abnormal biochemistry or dilated duct(s)
- **Type 3**
  - Typical biliary-pancreatic pain only

**Outcome in relation to Milwaukee classification:**

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Probability of pain relief if manometry: abnormal</th>
<th>Probability of pain relief if manometry: normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>75-95%</td>
<td>90-95%</td>
<td>90-95%</td>
</tr>
<tr>
<td>Type 2</td>
<td>55-65%</td>
<td>85%</td>
<td>35%</td>
</tr>
<tr>
<td>Type 3</td>
<td>25-60%</td>
<td>55-65%</td>
<td>&lt;10%</td>
</tr>
</tbody>
</table>
SOD and Response to Sphincterotomy

Imperial /CW Data : 140 patients

<table>
<thead>
<tr>
<th>Type</th>
<th>Frequency abnormal manometry</th>
<th>Probability of pain relief with sphincterotomy, Abnormal pressure.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 2</td>
<td>48%</td>
<td>77%</td>
</tr>
<tr>
<td>Type 3</td>
<td>33%</td>
<td>63%</td>
</tr>
</tbody>
</table>

Complications of Combined Biliary and Pancreatic Sphincterotomy for SOD

Immediate Post Procedure 313 cases

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>47 (15%)</th>
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</thead>
<tbody>
<tr>
<td>Pancreatitis</td>
<td>45</td>
<td>(14.4%)</td>
</tr>
<tr>
<td>Severe</td>
<td>3</td>
<td>(0.9%)</td>
</tr>
<tr>
<td>Bleeding</td>
<td>1</td>
<td>(0.3%)</td>
</tr>
<tr>
<td>Perforation</td>
<td>1</td>
<td>(0.3%)</td>
</tr>
<tr>
<td>Deaths</td>
<td>0</td>
<td></td>
</tr>
</tbody>
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Park et al 2003

Sphincter of Oddi Dysfunction

Technical aspects to reduce complications:

- Continual pancreatic ductular aspiration
- Prophylactic pancreatic stent insertion

Indications for prophylactic PD stenting (supported by expert consensus)

- Ampullectomy
- Pancreatic sphincterotomy (major/minor orifice)
- SOD undergoing sphincterotomy (biliary, pancreatic or dual)
- Suspected SOD with intact papilla and normal manometry

Elta, Gastrointest Endosc, 2008

Prophylactic Pancreatic Stents

Prophylactic Stent Placement
Prophylactic Stent Placement

Pancreatic Sphincter of Oddi Dysfunction

- Pancreatic pain
- Acute recurrent pancreatitis
- Idiopathic chronic pancreatitis

Idiopathic Pancreatitis

90 Cases:
- SOD----------------------28 (31%)
- Pancreatic Divisum------18 (20%)
- Microcalculi--------------18 (20%)
- Tumour-------------------8 (9%)
- Unexplained-------------18 (20%)

From Coyle et al 2002

Endoscopic Intervention for Idiopathic Pancreatitis

Outcome:

Benefit:
- Biliary sphincterotomy alone 5/18 (28%)
- Combined biliary + pancreatic 22/27 (85%)

Guelrud et al. 1995

Overall reported benefits 55-85%

Sphincter of Oddi Dysfunction

Failure to respond to biliary sphincterotomy:
- Inadequate sphincterotomy
- Pancreatic sphincter implicated
- Established chronic pancreatitis
- Other contributing factors

Role of Intraspincteric Botulinum Toxin:

<table>
<thead>
<tr>
<th>Manometry Proven SOD Type 3</th>
<th>Botox: Benefit</th>
<th>Botox: No Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Response to Sphincterotomy</td>
<td>11/12</td>
<td>2/10</td>
</tr>
</tbody>
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Wehrman et al 1998
Sphincter of Oddi Dysfunction

Role of Botulinum Toxin:
- Post Chole Syndrome
  - 58 patients
- Biliary phincterotomy
  - 39 (of 41)

Botox Injection Benefit
- 41 (71%)
- Benefit 36 (92%)

Kong et al. 2007

Botulinum Toxin as a Predictor of Response to Sphincterotomy

Imperial data
- All Type 3 patients.
- 17 patients with botox response.
- 7 with response to sphincterotomy.
- 10 no sustained response.

Sphincter of Oddi Dysfunction

- Accumulated evidence of role in both biliary and pancreatic disease
- Significant benefit for intervention in Type 1 and 2 SOD
- Type 3 patients appear an heterogeneous group with limited evidence of benefit from investigation/manometry
- Intraspincteric bolulinum toxin may offer a less invasive method of patient selection for sphincterotomy