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Heterotopic pancreas in the Esophagus: What do we know? - A review of the literature

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Abstract:
Heterotopic pancreatic tissue is a rare phenomenon which may occur in locations outside of the pancreas within the gastrointestinal tract. Of these locations, involvement in the esophagus is quite rare. It is paramount to improve our understanding regarding heterotopic pancreas as some lesions may carry malignant potential. With this article we present a case of heterotopic pancreas in the distal esophagus and review the current literature.

Introduction:
Heterotopic pancreas is a rare congenital malformation which is usually discovered incidentally. It has been previously noted in various parts of the gastrointestinal tract, however, involvement in the esophagus is rare.

Case Report: Patient is a 59-year-old female with a past medical history of asthma, narcolepsy, prediabetes, pancreatitis who presented with right upper quadrant pain radiating to the shoulder and nausea. Patient denied any hematemesis, melena, dysphagia or odynophagia, change in bowel movements, or weight loss. She denied any NSAID or blood thinner use. Routine blood work was unremarkable. EGD was performed which revealed grade A esophagitis (Figure 1).

Figure 1: EGD showing area of distal esophagus with visible evidence of inflammation and grade A esophagitis.

Subsequent tissue biopsy revealed evidence of active reflux esophagitis and granulation tissue consistent with focal pancreatic heterotopia (Figure 2).

Figure 2: Histopathology demonstrating foci of acinar pancreatic tissue with surrounding inflammatory cells in the background of distal esophageal squamocolumnar epithelium

Given the patient’s active inflammation, she was treated with PPI with improvement in symptoms. Patient was told to continue routine surveillance of her esophagitis.

Discussion: Heterotopic pancreas (HP) is a congenital malformation defined as pancreatic tissue that is not anatomically or vascularly connected to the normal pancreatic body (1). HP can occur in any part of the digestive tract, but it is most commonly found in the stomach (30%), the duodenum (17%-36%), and the jejunum (15%-21%) (1). It is most often diagnosed incidentally on autopsies with a prevalence between 0.5% to 13% and is more commonly found in males (2).
There are several theories proposed regarding the pathogenesis of heterotopic pancreas including the totipotent cell theory, the pancreatic metaplasia theory, and misplacement theory. The totipotent cell theory assumes that the endodermal cells of the bowel wall have the potential to differentiate into pancreatic tissue. The pancreatic metaplasia theory stipulates that during embryogenesis, pancreatic tissue migrates to intestinal submucosa. The misplacement theory assumes that pancreatic tissue is randomly lost throughout the developing primitive foregut (2).

Although heterotopic pancreatic tissue may not be in close proximity to the pancreas, it is susceptible to similar pathology such as acute or chronic inflammation (3). Several reports have demonstrated pseudocyst and fibrotic features of heterotopic pancreatic tissue. Furthermore, evidence of pre-malignant lesions has and adenocarcinoma have also been identified, although the majority of cases were from stomach and duodenum (3).

HP in the esophagus is a rare entity. It has previously been reported only 17 times in the medical literature (4-20) (Table 1).

Table 1: Review of cases of heterotopic pancreas in the esophagus including patient symptomatology, location of lesion, management of lesion (if provided) and malignant potential

Of the 17 cases reported, 16 of them were found in the distal esophagus/gastroesophageal junction. Although the condition is typically asymptomatic, it can cause epigastric pain, dysphagia, and upper gastrointestinal bleeding. Based on previous reports that have suggested the presence of malignancy in some of these lesions, adequate stratification of patients into those who are surgical candidates vs those who could have active surveillance is necessary. Furthermore, given that most of the previous cases underwent surgical or endoscopic intervention, there are no clear guidelines on management of patients with asymptomatic and benign cases such as our case. Should these patients receive antireflux therapy? Should they undergo surveillance endoscopy every 1-3 years? Should the lesion be pre-emptively excised given potential for pre-malignancy? These questions will need to be answered eventually in order to better serve patients with pancreatic heterotypia.

<table>
<thead>
<tr>
<th>Case</th>
<th>Age</th>
<th>Sex</th>
<th>Symptoms</th>
<th>Location</th>
<th>Management</th>
<th>Malignancy</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>24</td>
<td>F</td>
<td>chest pain, vomiting, shortness of breath</td>
<td>Distal esophagus</td>
<td>Esophageal enucleation procedure</td>
<td>None</td>
<td>R.T.Temes et al</td>
</tr>
<tr>
<td>2</td>
<td>25</td>
<td>M</td>
<td>RUQ abdominal pain</td>
<td>Distal esophagus</td>
<td>VATS</td>
<td>None</td>
<td>D.M.Lowry et al</td>
</tr>
<tr>
<td>3</td>
<td>38</td>
<td>F</td>
<td>Worsening dysphagia</td>
<td>Distal esophagus</td>
<td>Thoracoscopic ILR</td>
<td>IPMN</td>
<td>E.Crighton et al</td>
</tr>
<tr>
<td>4</td>
<td>47</td>
<td>F</td>
<td>Vomiting, epigastric pain</td>
<td>Distal esophagus</td>
<td>Bili-laparoscopic jejunostomy with pyloroplasty</td>
<td>None</td>
<td>A.T.Noffinger et al</td>
</tr>
<tr>
<td>5</td>
<td>63</td>
<td>M</td>
<td>Asymptomatic</td>
<td>Middle esophagus</td>
<td>No surgical intervention, conservative</td>
<td>None</td>
<td>J.Goto et al</td>
</tr>
<tr>
<td>6</td>
<td>34</td>
<td>M</td>
<td>Worsening dysphagia and dysphagia</td>
<td>Distal esophagus</td>
<td>Partial fundoplication</td>
<td>None</td>
<td>J.Lynch et al</td>
</tr>
<tr>
<td>7</td>
<td>26</td>
<td>F</td>
<td>Nausea and epigastric pain</td>
<td>Distal esophagus</td>
<td>Laparoscopic excision followed by Partial Dor fundoplication</td>
<td>None</td>
<td>S.Gananadha and D.R.Hunt et al</td>
</tr>
<tr>
<td>8</td>
<td>25</td>
<td>M</td>
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<td>Distal esophagus</td>
<td>Exision via right thoracotomy</td>
<td>None</td>
<td>J.A.Sato et al</td>
</tr>
<tr>
<td>9</td>
<td>45</td>
<td>M</td>
<td>Progressive dysphagia</td>
<td>Distal esophagus</td>
<td>Thoracosubxiphoid esophagegastrectomy</td>
<td>Anaplastic cancer</td>
<td>J.Rohe et al</td>
</tr>
<tr>
<td>10</td>
<td>43</td>
<td>M</td>
<td>Upper GI bleeding</td>
<td>Distal esophagus/lesser curvature of stomach</td>
<td>Enucleation of tumor from esophagus</td>
<td>None</td>
<td>M.O.Ras et al</td>
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<tr>
<td>11</td>
<td>52</td>
<td>M</td>
<td>Intermittent Dysphagia</td>
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<td>No surgical intervention, conservative</td>
<td>None</td>
<td>M.Shah et al</td>
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<td>Distal esophagus</td>
<td>Tumor resection with proximal stomach resection</td>
<td>Adenocarcinoma</td>
<td>L.Guillou et al</td>
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<td>38</td>
<td>F</td>
<td>Heartburn and Nausea</td>
<td>Distal esophagus</td>
<td>Endoscopically assisted laparoscopic resection of tumor</td>
<td>None</td>
<td>T.Garn et al</td>
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<td>14</td>
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<td>M</td>
<td>Dysphagia and epigastric pain</td>
<td>Distal esophagus</td>
<td>No treatment mentioned</td>
<td>None</td>
<td>S.T.Gail et al</td>
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<tr>
<td>15</td>
<td>41</td>
<td>F</td>
<td>Dysphagia and epigastric pain</td>
<td>Distal esophagus/lesser curvature of stomach</td>
<td>No treatment mentioned</td>
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<td>J.J.Rodrique et al</td>
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<td>16</td>
<td>70</td>
<td>M</td>
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<td>Distal esophagus</td>
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<td>A.Sharmon et al</td>
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<td>Distal esophagus</td>
<td>Endoscopic resection</td>
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<td>R.Filip et al</td>
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</tbody>
</table>