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Management of Gastrinoma

Gerard M. Doherty

N.W. Thompson Professor of Surgery

University of Michigan

IAES at International Surgical Week
August 26 – 30, 2007

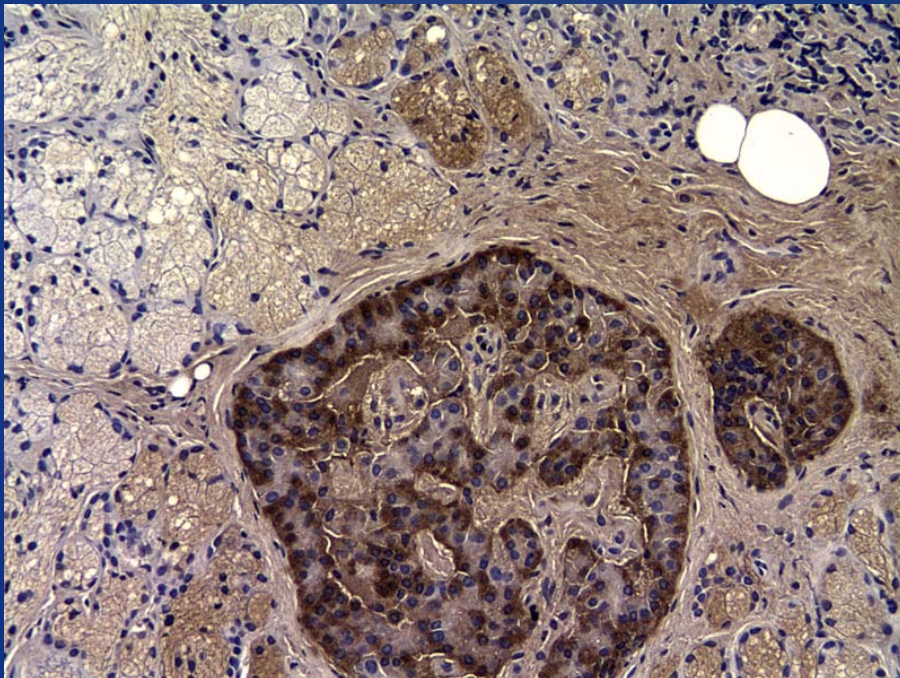
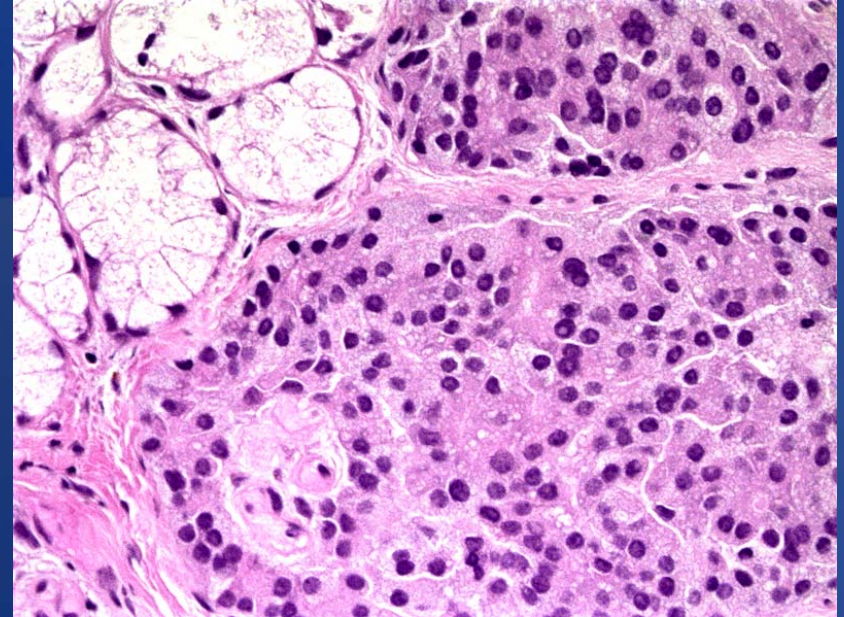
- Abstracts Due January 5, 2007
- Local Organizer – Janice Pasioka
- IAES hotel: Hotel Place d'Arms
- Banquet: Montreal Museum of Fine Arts



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- General approach
- Sporadic Gastrinoma
- MEN-1

Gastrinoma



General Principles for Pancreatic Neuroendocrine Tumor Management

- Biochemistry before radiology or surgery
- Separate control of syndrome from control of malignancy as much as possible
- Tailor the risk of the operative approach to the severity of the disease



Step 1: Establish diagnosis biochemically

- Gastrinoma
 - Elevated fasting gastrin with measurable acid in the stomach
 - >1000 pg/mL diagnostic
 - secretin test for elevated levels < 1000
 - When should we test for this?

Presentation of Gastrinoma

| Patients and Symptoms | Ellison and Wilson 1964 (n=260) No. (%) | Mignon et al. 1986 (n=144) No. (%) | Mignon and Cadiot 1998 (n=127) | Roy et al 2000 (n=203) No. (%) |
|-----------------------|-----------------------------------------|------------------------------------|--------------------------------|---------------------------------------|
| % with MEN | 54 (21%) | 34 (24%) | 0 (0%) | 0 (0%) |
| Pain | 241 (93%) | 37 (26%) | | 159 (78%) |
| Diarrhea | 18 (7%) | 21 (15%) | 67 (53.4%) | 146 (72%) |
| Heartburn | | | | 85 (42%) |
| Nausea | | | | 57 (28%) |
| Vomiting | | | | 52 (26%) |
| Weight Loss | | | | 37 (18%) |
| Bleeding | | | | 55 (27%) |



Features Suggesting Gastrinoma

| Differential Diagnosis | Signs/Symptoms Suggestive of Gastrinoma |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Idiopathic Peptic Ulcer Disease | <ul style="list-style-type: none">DiarrheaNegative H. PyloriChronic Diarrhea During FastingWeight LossLong History of Persistent Symptoms |
| Idiopathic Gastroesophageal Reflux Disease | <ul style="list-style-type: none">Complications (e.g. perforation)Refractory to TreatmentPositive Family History of PUD or GERDProminent Gastric FoldsMultiple Peptic UlcersUlcers in Uncommon LocationsEsophageal StrictureGastric Outlet Obstruction |



Step 2: Familial versus Sporadic

- Careful family history with specific attention to evidence for MEN-1
- Check serum levels of calcium and prolactin to screen for MEN-1
- If in doubt, may investigate suspicious first degree relatives
- Reserve direct genetic testing for high risk cases

Step 3: Treat symptoms of hormone excess

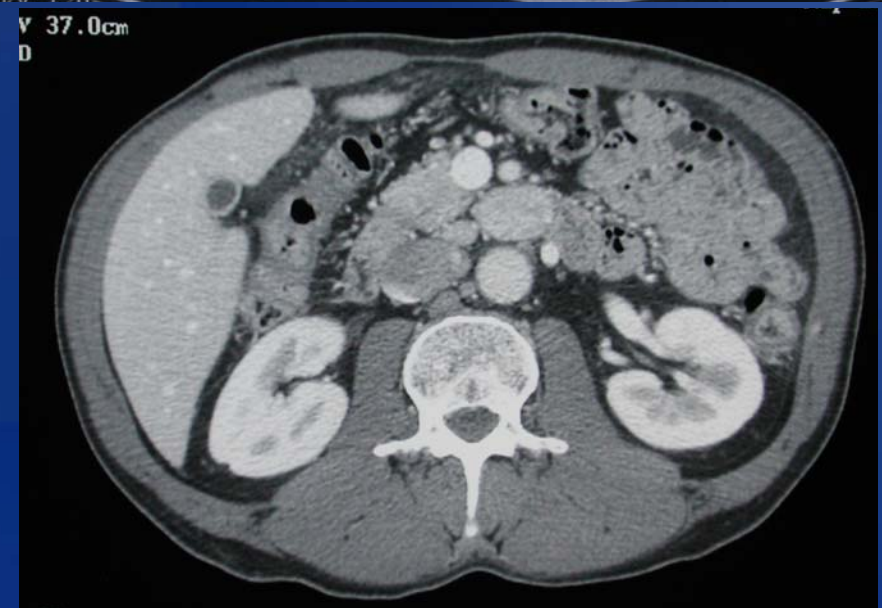
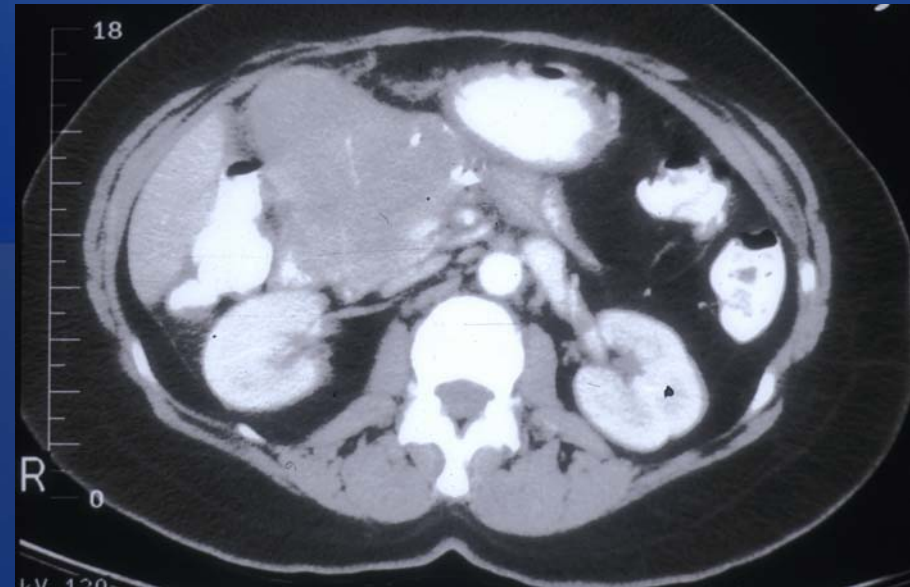
- H₂-blockers or proton pump inhibitors
 - Completely effective at suppression of acid production.
 - NO current indication for total gastrectomy to control acid output
 - Titrate drug dose/schedule to suppress gastric acid output

Step 4: Imaging studies

- **Gastrinoma**
 - Preoperative CT and octreoscan; rarely secretin angiogram
 - ? endoscopic ultrasound
- Occasionally use MR scan to characterize liver lesions

CT scan for Gastrinoma

- Clear cross-sectional imaging
- Good anatomic definition to correlate with octreoscan
- Survey of remainder of abdomen

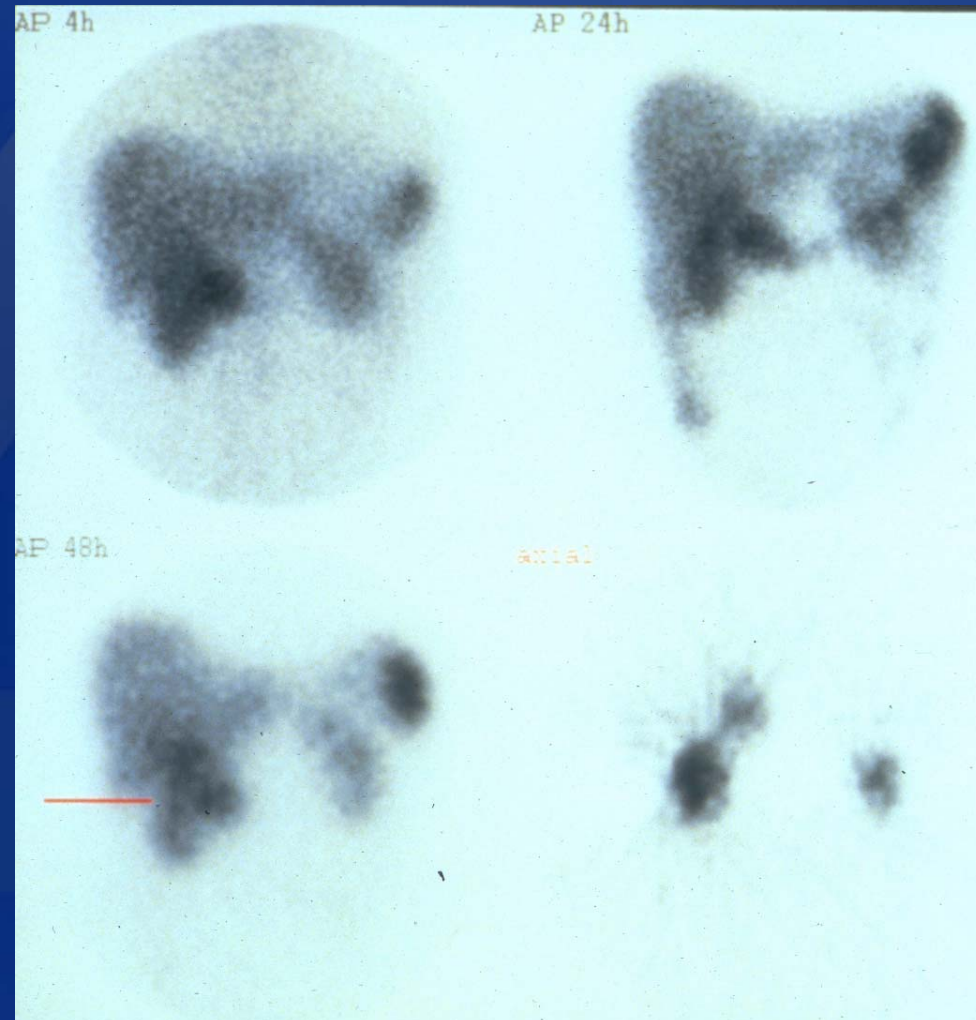




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SRS (Octreoscan) for Gastrinoma

- Functional correlate to cross-sectional imaging
- Identifies active tumor in primary and metastatic sites
- In MEN-1 allows surveillance for other tumors

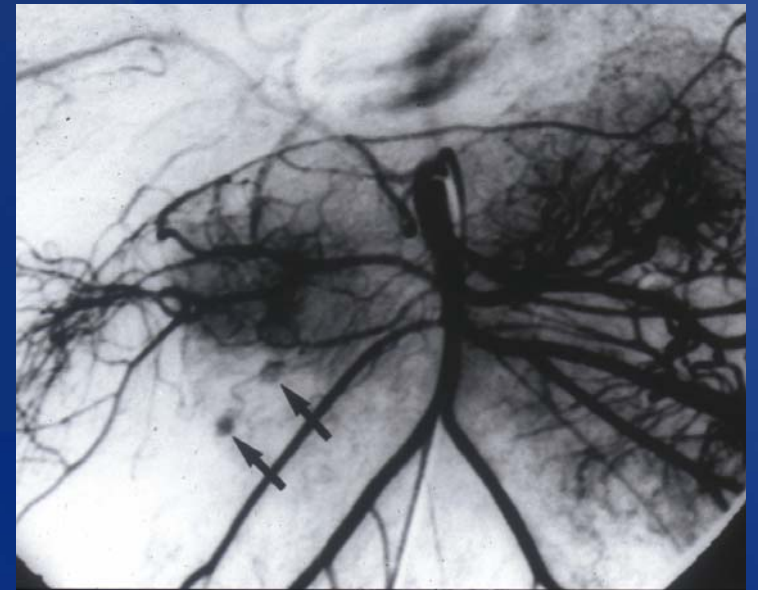




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Arteriogram for Gastrinoma

- Not often necessary now
- Can show duodenal and nodal disease
- Can use secretin stimulation to regionalize tumor, but not usually necessary



Step 5: Immediate preoperative preparation

- Preoperative vaccinations
- Admit for IV acid-blockade preoperatively and continue through operation and postoperative period
- Antibiotics beginning immediately preoperatively

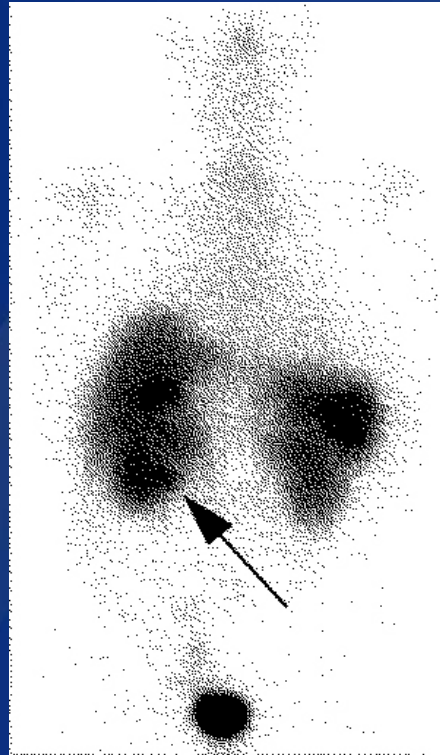
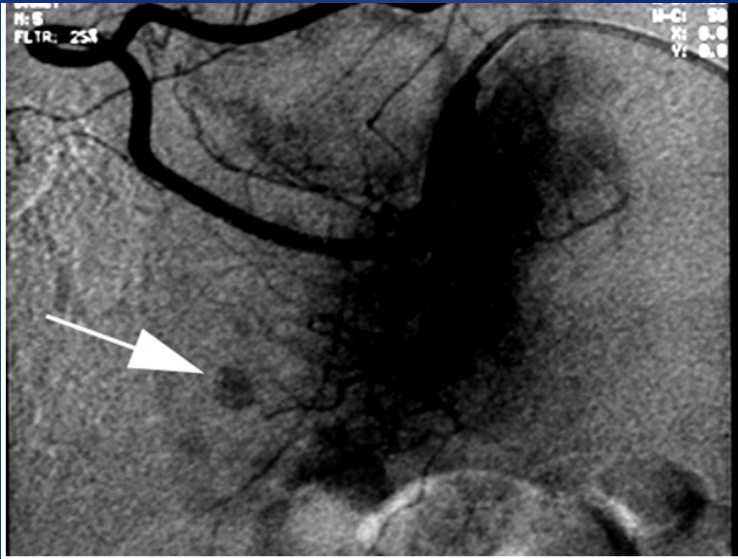
Gastrinoma

- Tenacious though indolent malignancy for most
- Symptom management excellent
- Aggressive, but low-morbidity resection warranted, to include nodal dissection
- Must always evaluate duodenum (esp in MEN-1 patients)



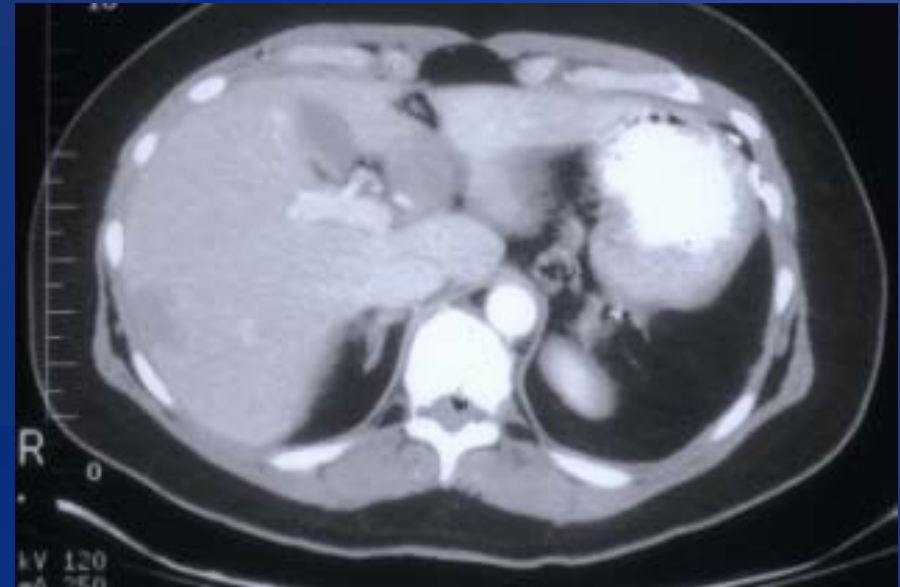
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Duodenal gastrinoma



Gastrinoma Systemic Therapy

- Somatostatin receptor (+) tumors treated with octreotide
- Streptozotocin/5-FU
- 50% objective responses that are mainly symptomatic improvement or biochemical improvement in gastrin levels





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MEN-1 Gastrinoma

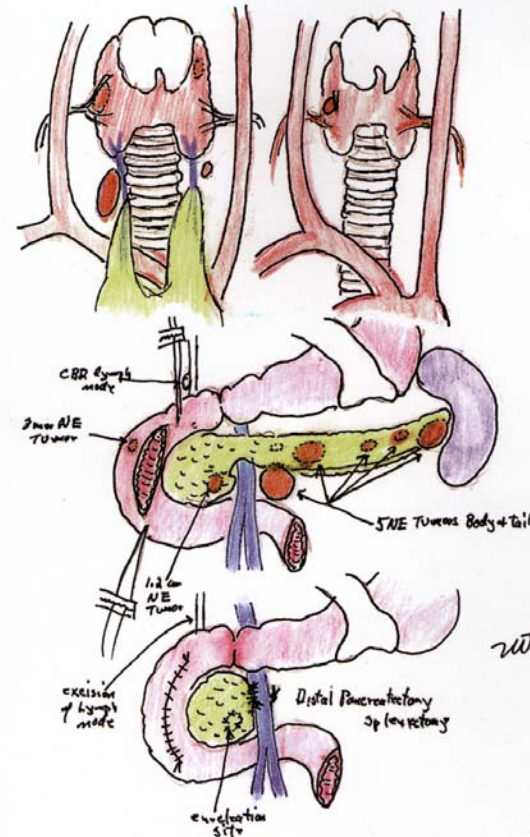
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Endocrinology

April 1997 · Volume 138 · Number 4

Endocrinology

MEN I Insulinomas and ZES & HPT and Prolactinoma



2/2/1996

Operation Oct 14, 1996

Subtotal Parathyroidectomy

Gomy Rt sup. remnant

Thyroidectomy

Distal Pancreatectomy

Splenectomy

Excision of

Uncinate NE Tumor

Duodenotomy

excision of 3mm NE

Tumor in D-2

Local Lymph node

excision.

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PUBLISHED MONTHLY BY
THE ENDOCRINE SOCIETY

ENDOSM 197 Registration &
Housing Forms Inside
Register by April 16 & Save

Combined Causes of Death

- 64 MEN-1 related deaths
 - 43 Neoplasms
 - 25 Metastatic islet cell tumor (39%)
 - 13 Carcinoid (20%)
 - 3 Pituitary
 - 2 Adrenal
 - 10 Hypercalcemia/uremia
 - 9 Peptic Ulcer Disease

MEN-1 pancreatic lesions

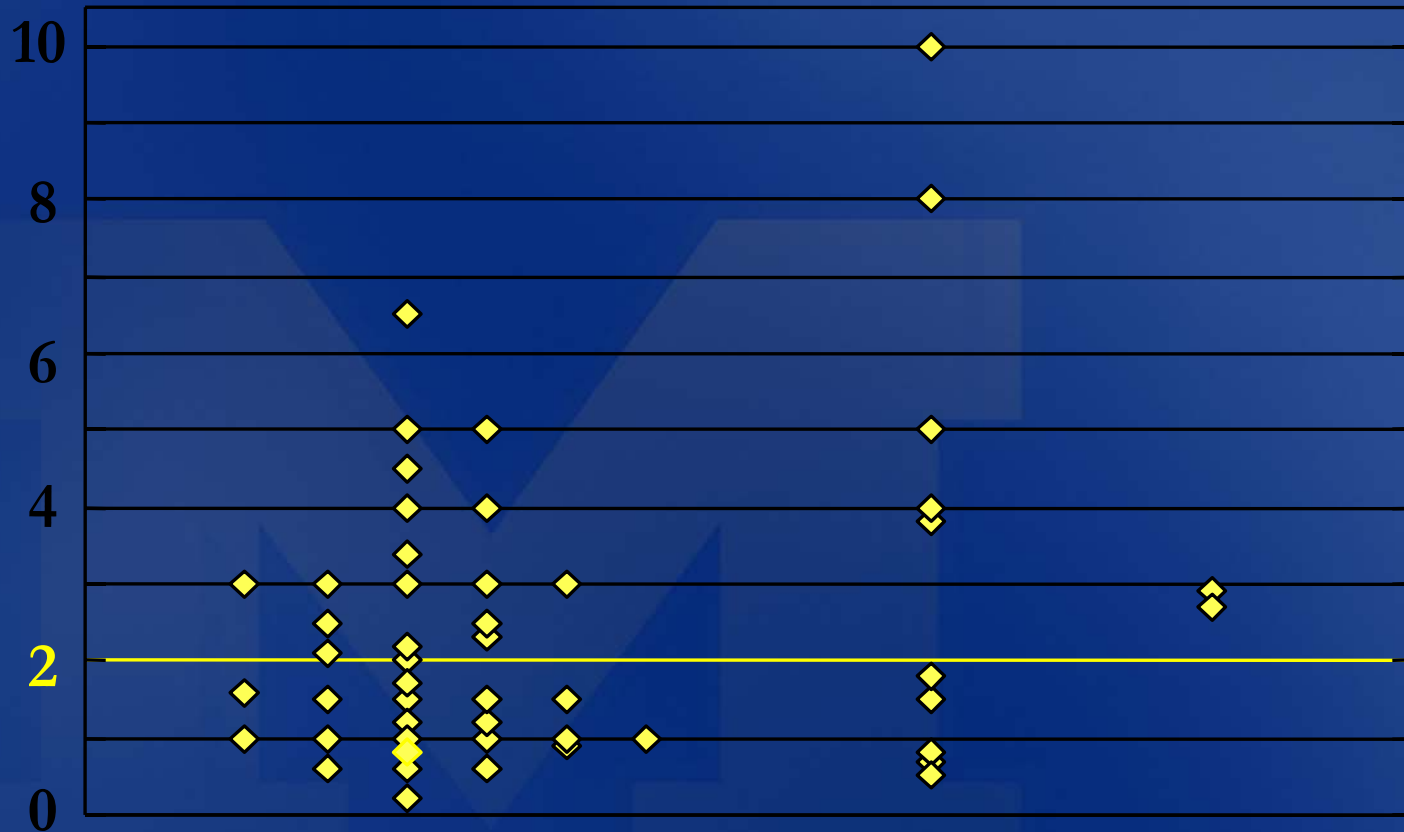
- Multiple lesions
- Variable hormonal function
- Hypergastrinemia may be “incurable”
- Typically malignancy has an indolent course, but can be lethal
- Whom to operate upon and when?
- Can we change the natural history?



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Tumor size versus metastasis

Primary
Tumor
Size
(cm)



No Mets

Lymph
Node
Mets

Liver
Mets

Lowney JL, Surgery, 1999

Current practice for MEN-1

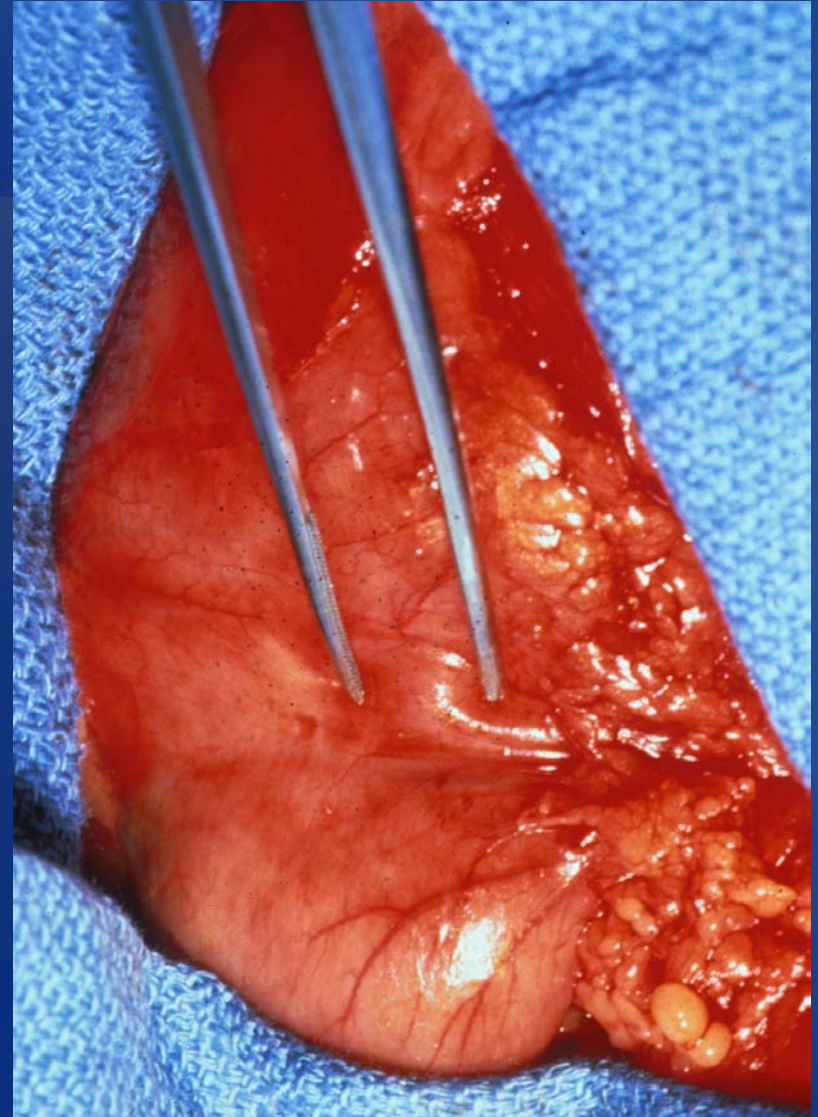
- Duodenopancreatic exploration for
 - Imageable tumor
 - Insulinoma syndrome
- Preoperative studies to evaluate for metastatic or multifocal disease (octreoscan)
- IOUS to define disease in OR
- Duodenotomy for gastrinoma patients
- Tailor operation to extent and location of disease—
 - **Resect all tumor and leave the maximum amount of normal pancreas in place**



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