



# **GIST:** Role of Interventional Radiology in the Treatment of Localized and Metastatic Disease

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GIST Day of Learning  
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- Multidisciplinary approach
- Interventional radiology (IR) serves many roles
- Usually after or with surgical and medical treatment

- Patients referred to IR mostly from the Oncologists and surgeons
- Patient's are seen in the IR clinic prior to ablations, embolizations, and blocks, or if questions, even about minor procedures

# Where does IR come in?

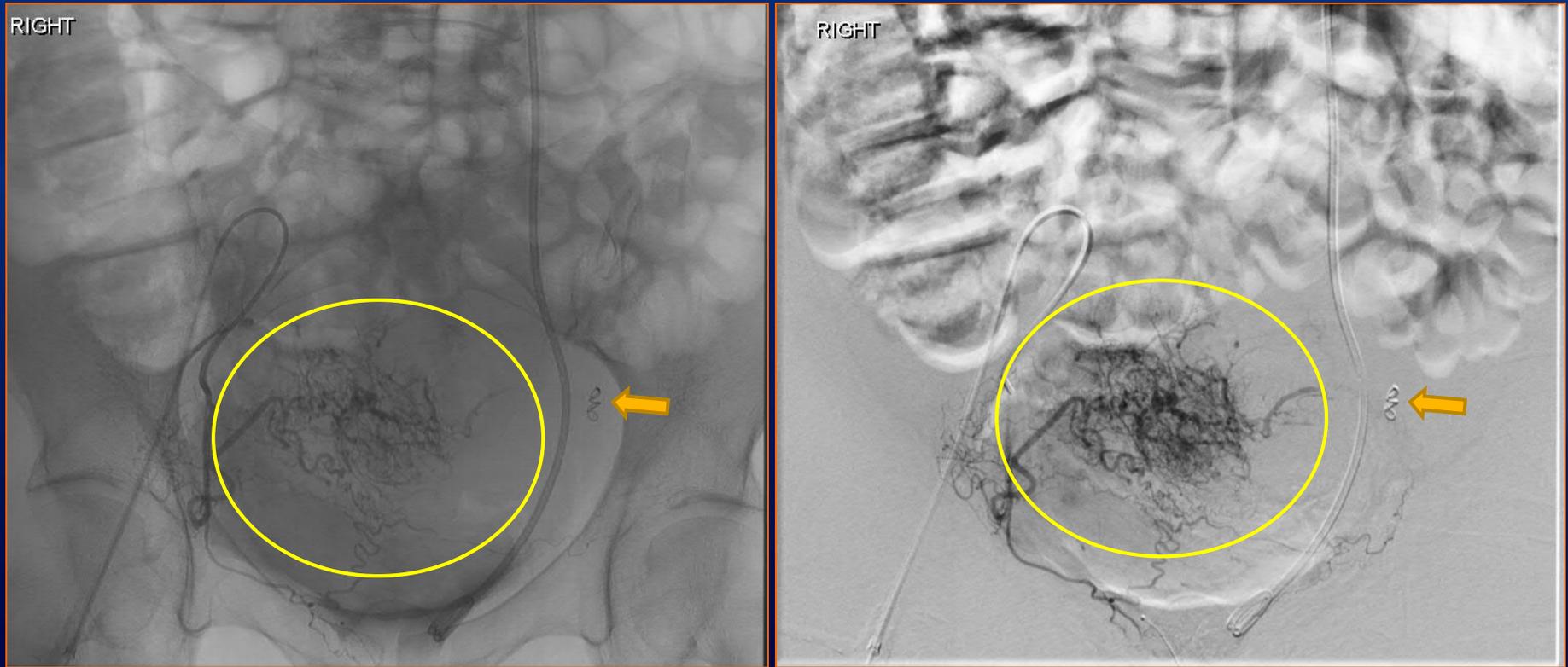
- **Before surgery and/or medical Rx**
- **During/after surgery and/or medical Rx**
- **Palliation/comfort**

# Before surgery and/or medical Rx:

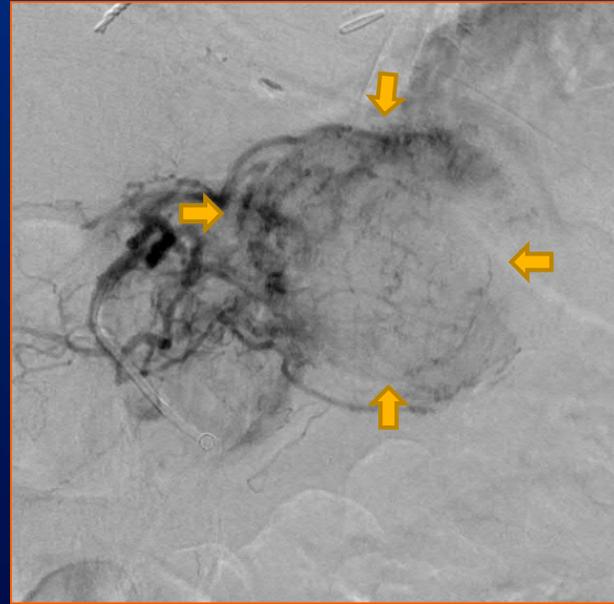
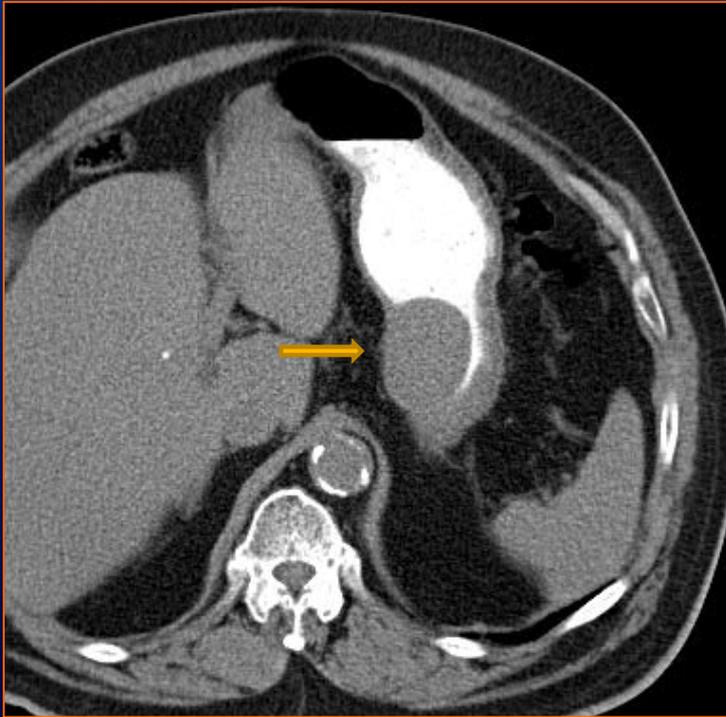
- Biopsy if needed
- Embolization to stop bleeding
- Embolization to decrease bleeding risk at surgery
- Portal vein embolization preoperatively for liver metastases



# Embolization for bleeding- pelvic GIST



# Embolization for bleeding



# PV Embolization prior to liver resection

- 55 yo male w/ 14 yr hx GIST
- 2014 Large solitary right lobe GIST met responding to imatinib; recommend resection
- Pre-MRI 11/12/2014; small left lobe
- PVE 12/11/2014
- Post\_MRI 1/12/2015; total 1674 mL; Lt 706 mL (42%)

# PV Embolization

- Moderate procedural sedation in most cases (in AZ)
- Use ultrasound to access the portal venous system
- Occlude either the right or left PV system to cause atrophy of that lobe and hypertrophy of the other lobe, prior to planned resection.
- Usually admitted overnight after procedure.

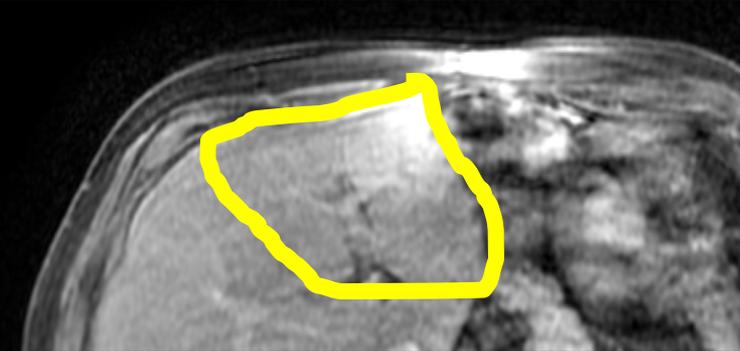
# PV anatomy



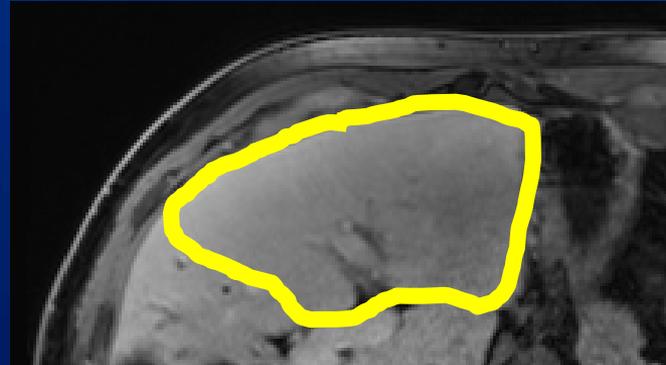
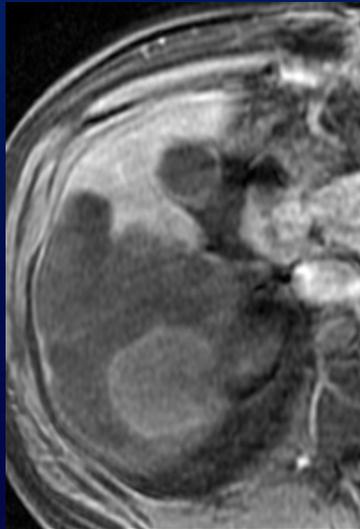
# Balloon occluded; embo w/ glue mixture



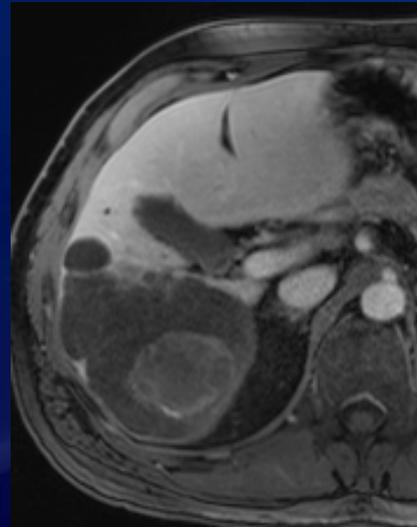
# Left lobe volume increased after PVE



Pre-PVE



Post-PVE



# During/after surgery and/or medical Rx:

- Intraoperative liver mass ablation
- Percutaneous ablation of resistant/recurrent liver lesions
- Intra-arterial therapy of resistant/recurrent liver lesions (especially multiple)

## Ablation:

“One advantage that RF ablation has over catheter-based intra-arterial therapy is that it allows for minimal interruption of systemic treatment ... RF ablation has a particular role in patients who have a solitary area of disease progression, in the context of metastatic disease that is otherwise effectively controlled by tyrosine kinase therapy. RF ablation can delay a change in systemic therapy by achieving local control at the site of solitary progression.”

Pollack, S. M., et al. "The Use of Radiofrequency Ablation in Gastrointestinal Stromal Tumor." [Journal of Vascular and Interventional Radiology](#) **24**(5): 751.

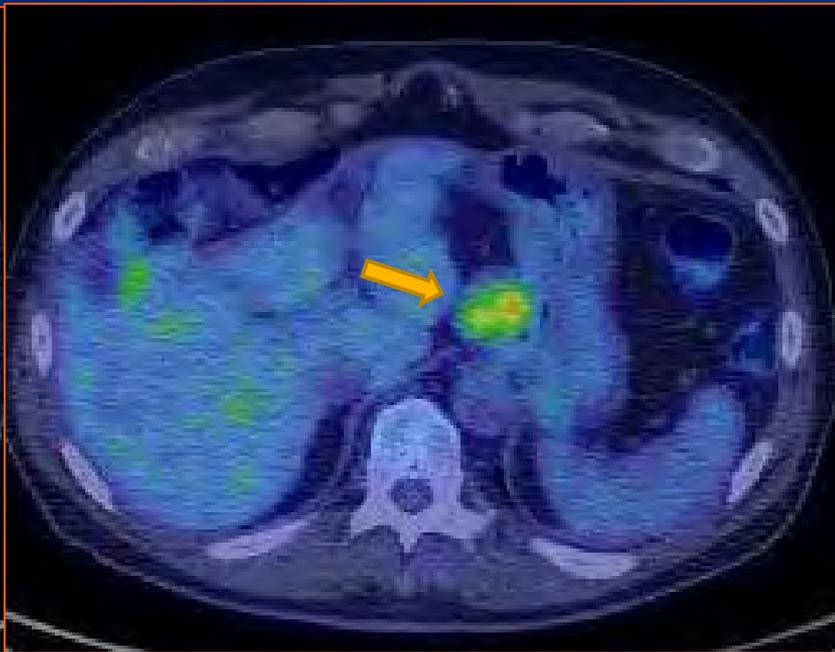
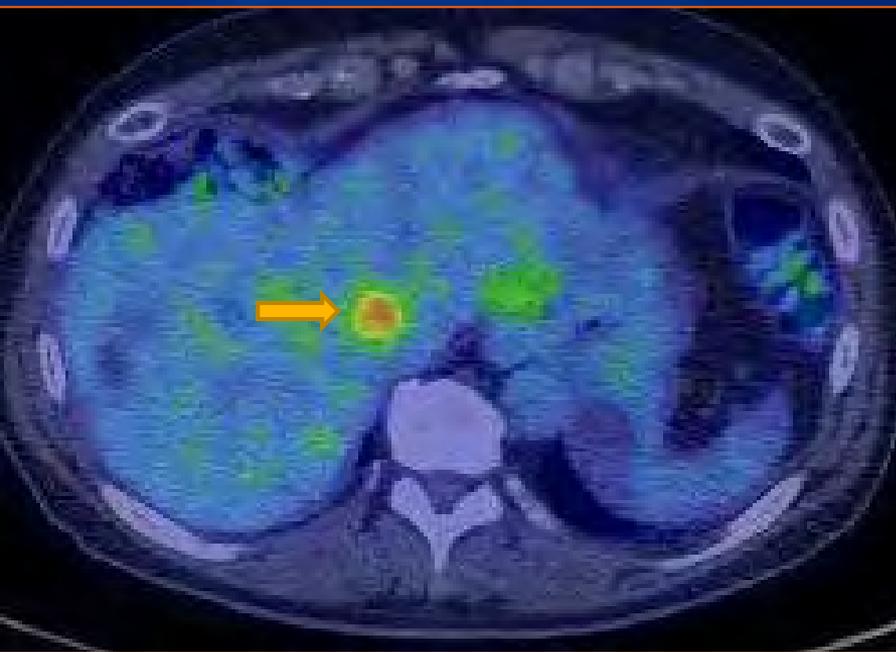
# Ablation:

- Historically, used radiofrequency (RF) or cryoablation (freezing)
- In the liver, we now use microwave ablation (better control).
- May be performed intraoperatively, at the same time as a resection (e.g. right lobectomy and solitary left lobe ablation)
- May be done in the CT suite with CT and ultrasound.
- Use general anesthesia because of pain and to control breathing motion.
- Admit at least overnight after percutaneous ablation.

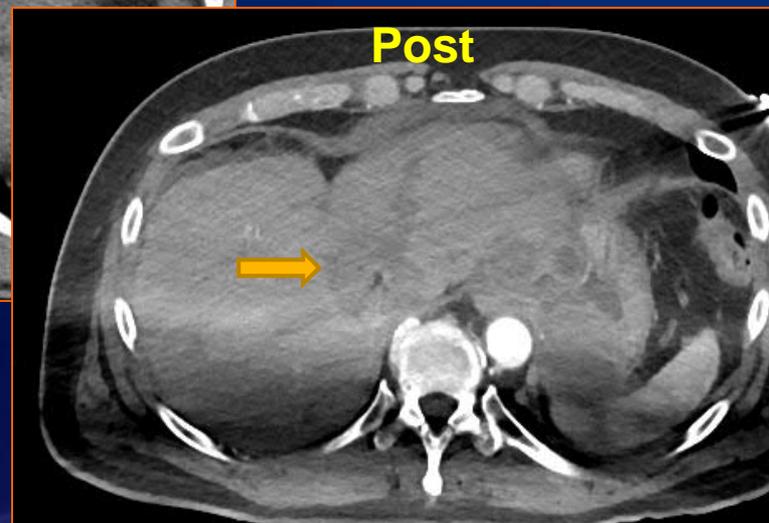
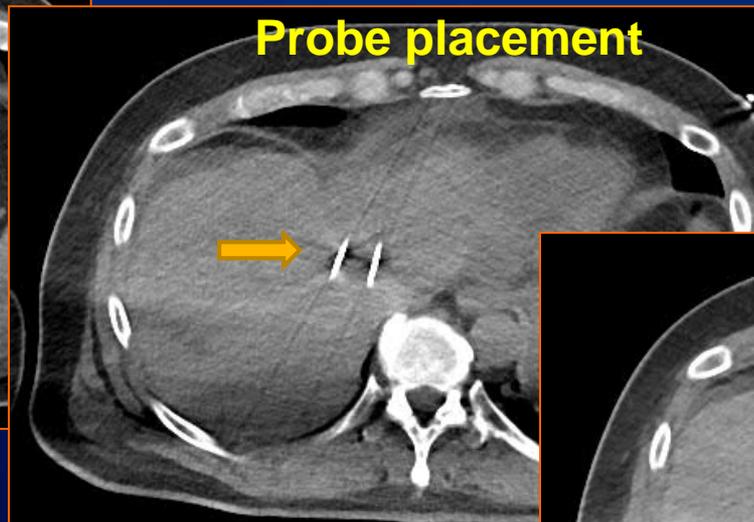
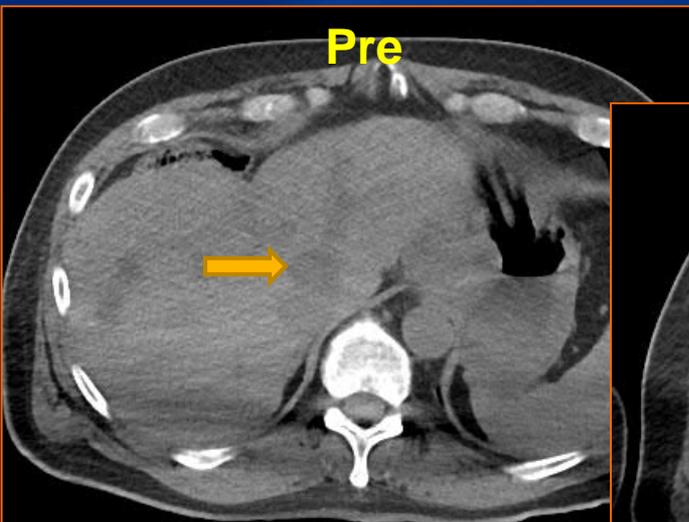
# Ablation complications:

- Pain
- Abscess and sepsis (1-2 weeks)
- Post-ablation syndrome (esp. if large area ablated)
  - flu-like symptoms
  - pain
- Liver failure (if large area or previous/concurrent resection)
- Other organ injury (gallbladder, stomach, bowel)
- Pneumothorax (if high in liver)

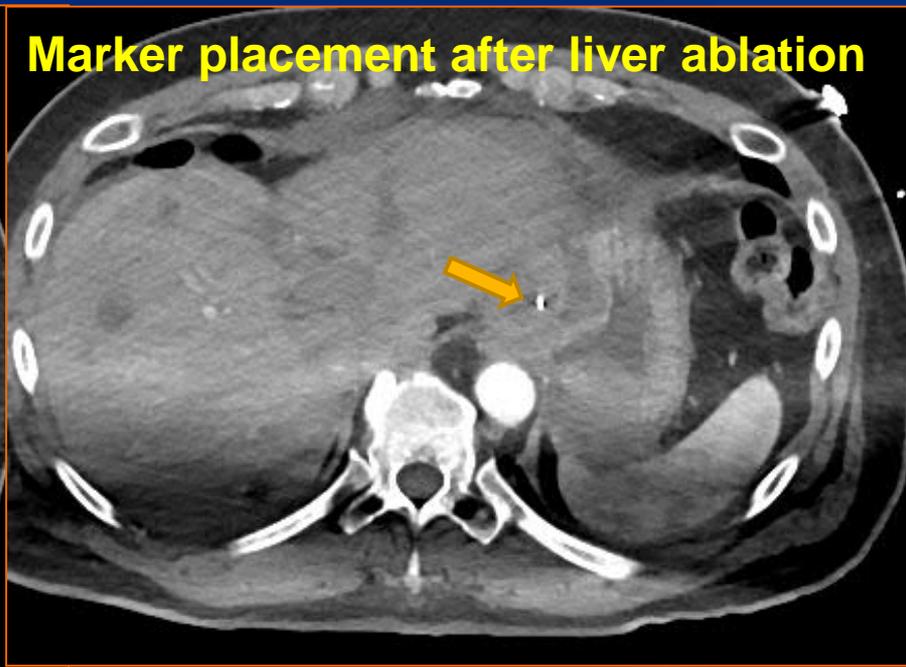
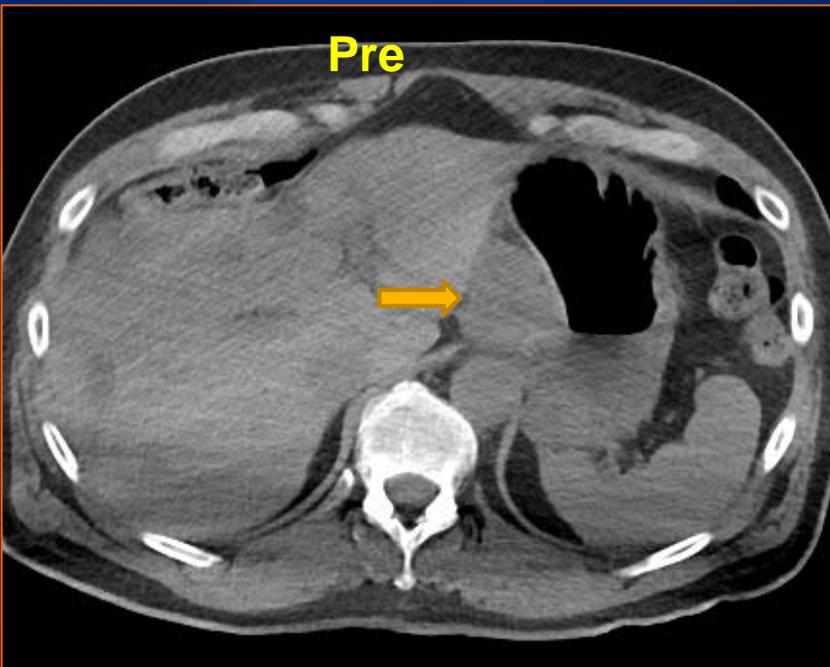
# PET/CT GIST perigastric mass and liver met



# GIST liver met ablation



# GIST perigastric mass fiducial marker



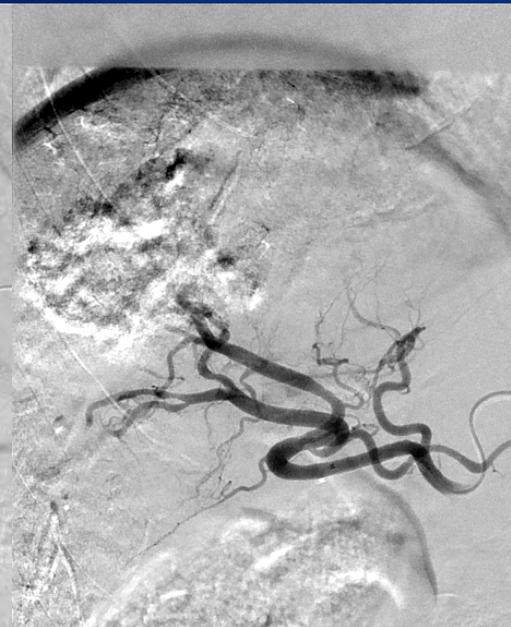
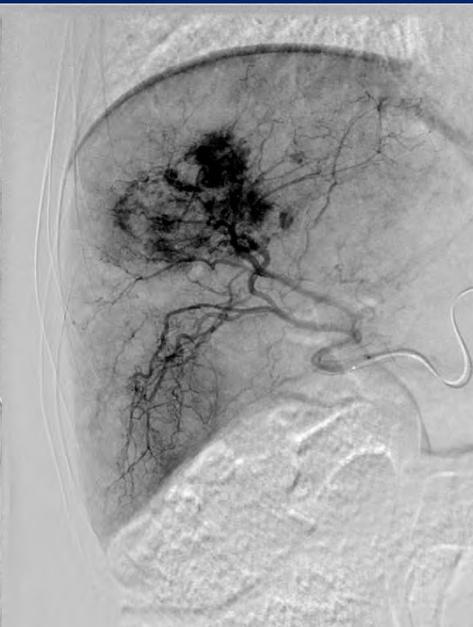
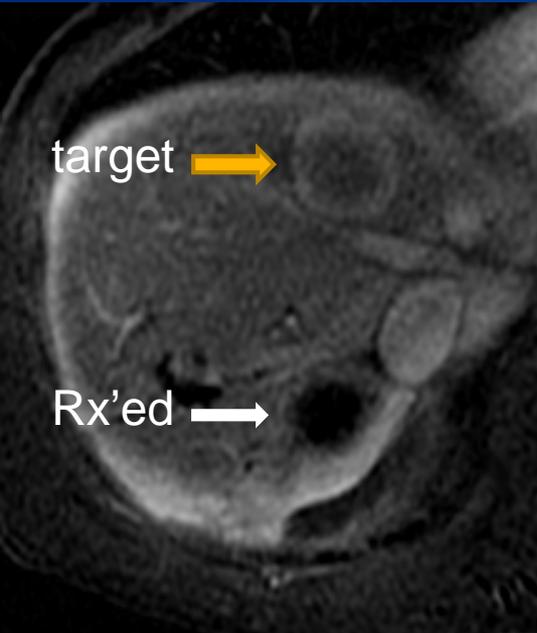
# Arterial therapies

- Bland embolization
- TACE
- DEB-TACE
- Y-90 (radioembolization)

# Arterial therapies

- Moderate sedation and overnight observation
- Premedicated, including antibiotics and anti-nausea
- Post-embolization syndrome can occur
  - Fever, RUQ pain, N/V
  - Treat with intra-arterial lidocaine, ondansetron (anti-nausea), analgesics (pain meds)
- Other complications include groin hematoma, and (rarely) liver failure

# Segment IV mass TACE

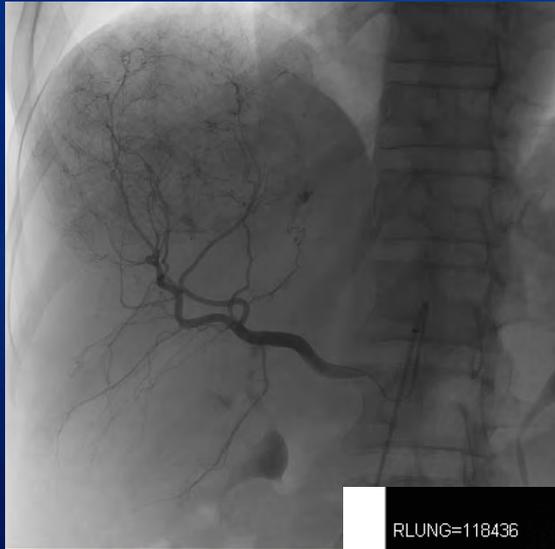


# Yttrium-90 (Y-90)

- Radioactive embolic particles used, trapped in liver
- Requires arterial and NM procedures to plan
  - Embolizing small vessels sometimes needed to avoid non-target embolization
  - Shunting percentage (portosystemic) calculated
- Usually entire lobe treated

# Intra-arterial Technetium 99m MAA

Shunt fraction to lungs (c/w liver) = 26% anteriorly and 32% posteriorly, precluding y-90 procedure.

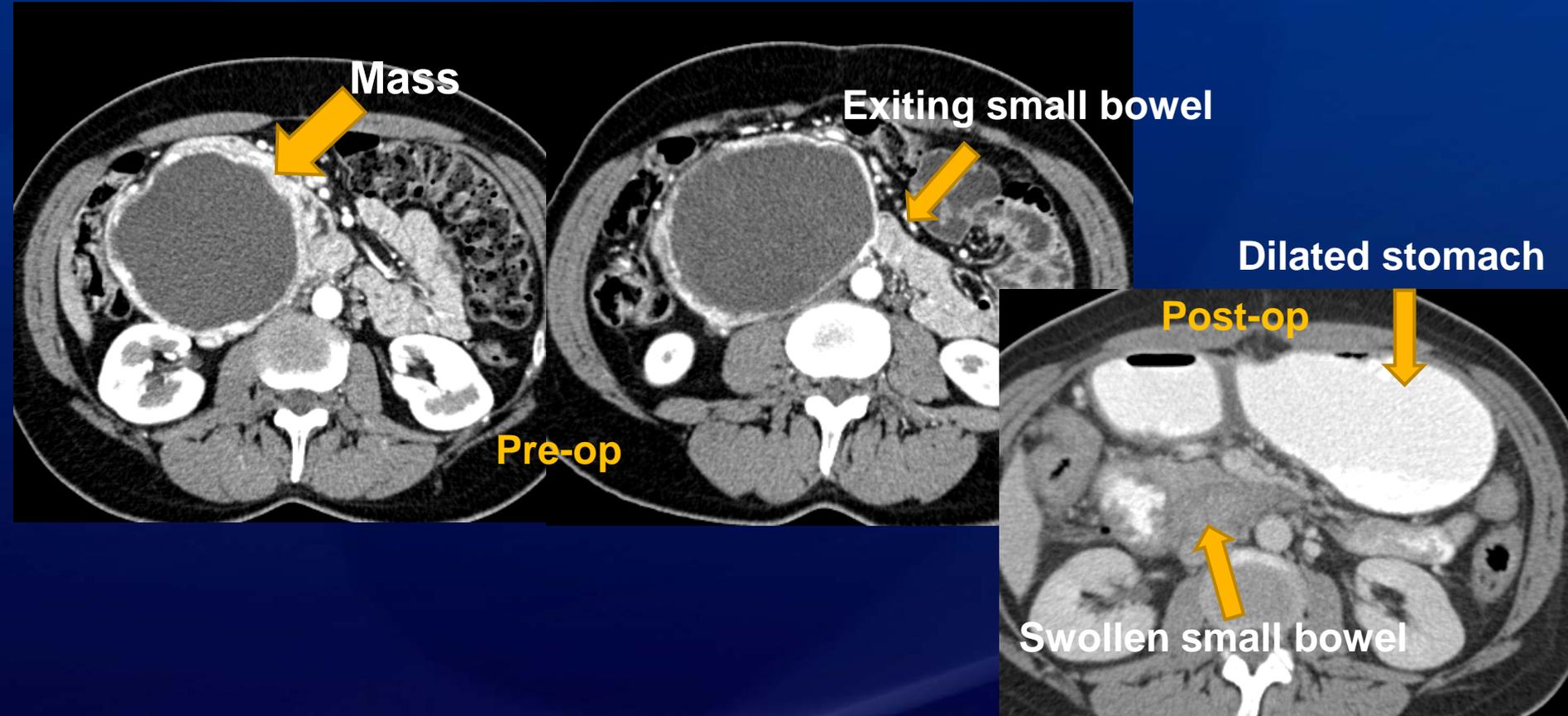


# Palliation/comfort (relief of symptoms):

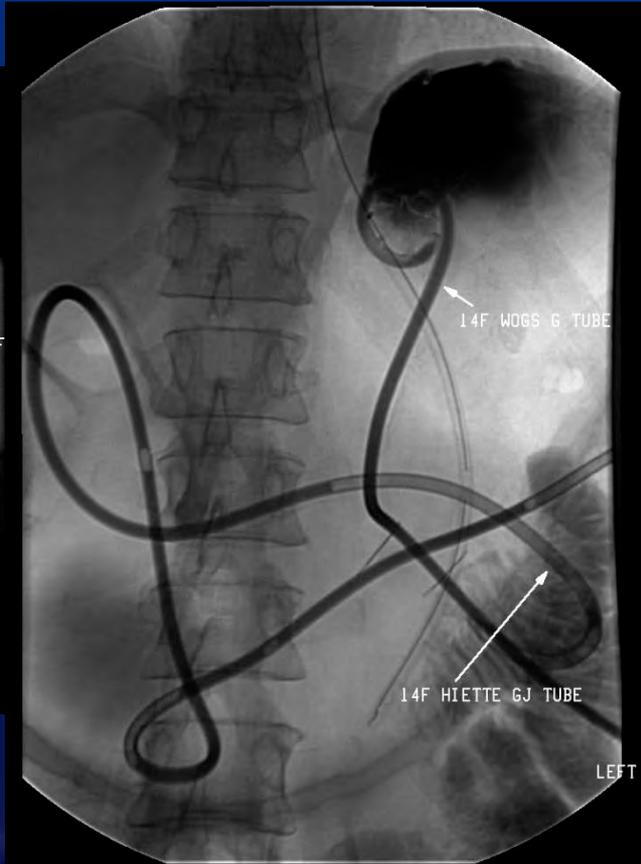
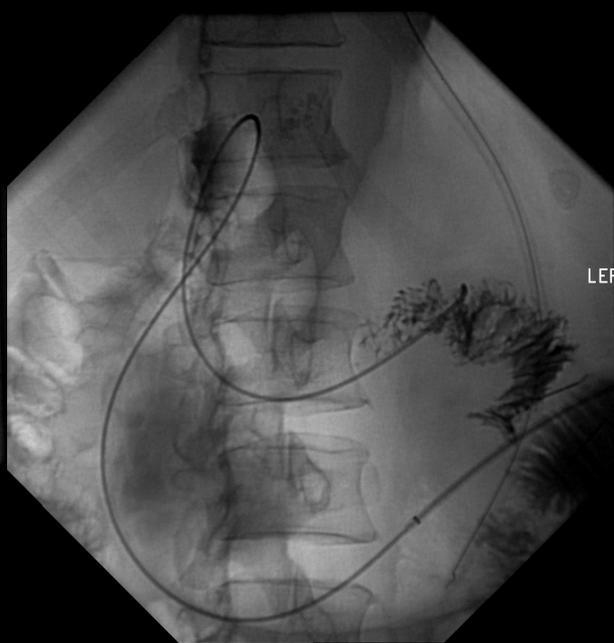
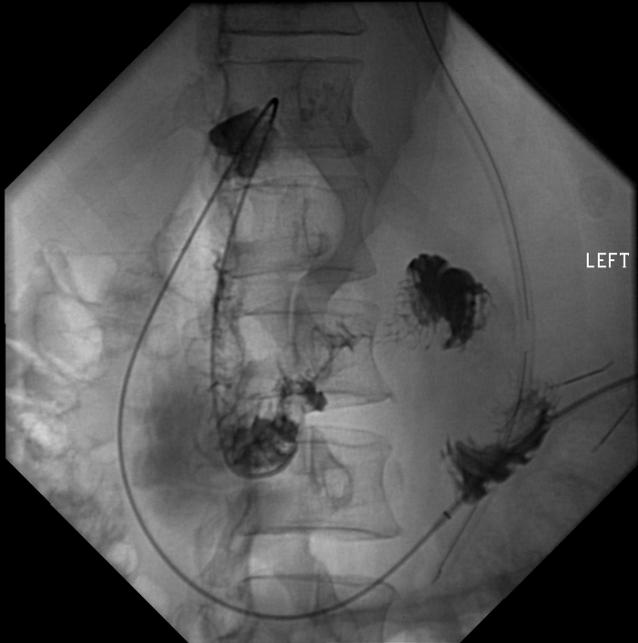
- Drain fluid (paracentesis, thoracentesis, abscess)
- Gastrostomy tube placement
  - Percutaneous transgastric
  - Transesophageal (PTEG)
- Nerve blockade

- 10 cm duodenal (proximal small intestine) GIST
- After resection, food and fluid would not easily pass through causing N/V and distention
- Needed feeding tube beyond the surgical site
- Needed to vent the stomach

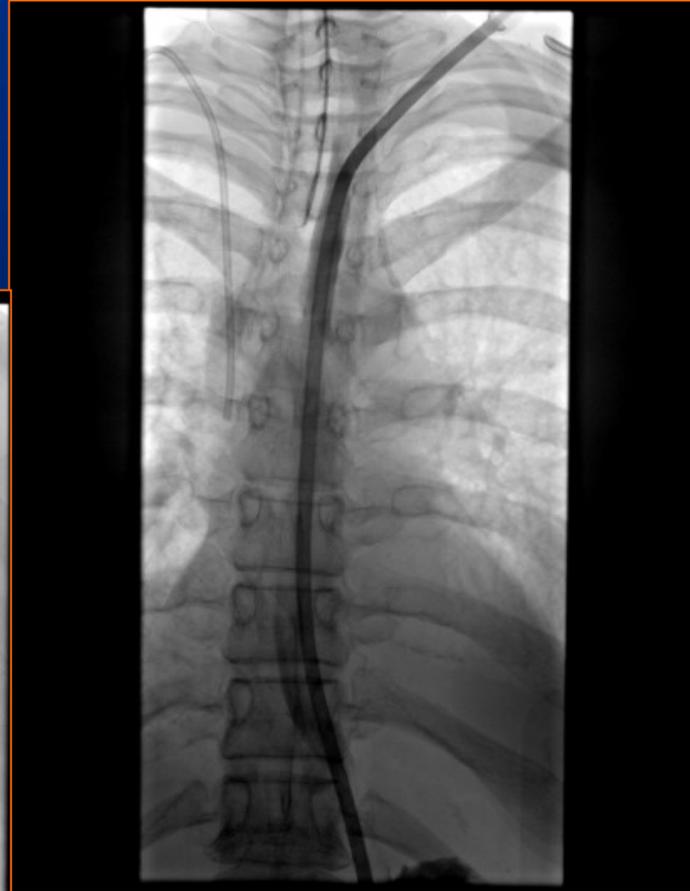
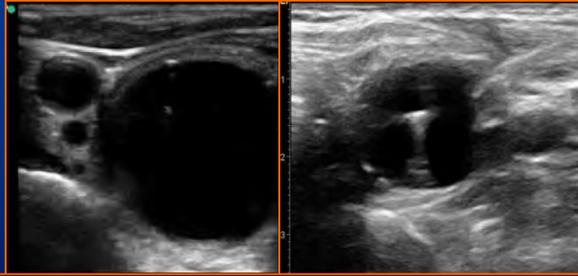
# Large GIST duodenal wall



# Percutaneous gastrostomy and gastrojejunostomy



# PTEG (percutaneous transesophageal gastrostomy)



# Celiac plexus block (neurolysis)



# Summary

- Multidisciplinary approach
- IR serves many roles
  - Biopsy
  - Embolization
    - Bland
    - PVE
    - Intra-arterial therapies
  - Ablations
    - Percutaneous
    - Intraoperative
  - Symptom relief/palliation

