A Case of Delayed Diagnosis of Gastric Ulcerations Due to Non-target Yttrium 90 Radioembolization

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Introduction

•**Y-90 radioembolization** is generally well tolerated, with elective hepatic-artery delivery of 15–35 µm microspheres for liver tumors. Prior to treatment, delivery is mapped with angiography + 99mTc-MAA/SPECT
•**Non-target embolization** is the unintended delivery of therapy to vessels supplying normal tissue rather than the target lesion; to minimize it, use meticulous angiographic mapping with 99mTc-MAA/SPECT, prophylactically coil/plug gastric-duodenal branches and risky collaterals.

Case Presentation (1)

•70-year-old woman with metastatic intrahepatic cholangiocarcinoma, treated with palliative chemotherapy and Y90 treatment.
•During the patient's mapping procedure:
  •Variant anatomy: RHA from celiac; gastrohepatic trunk → LGA & LHA; RGA ↔ LGA collateral to LHA
  •LHA embolized proximal to gastric branches
  • Target artery = segment 4 branch from RHA
•Mapping: 99mTc-MAA in segment 4; lung shunt 0.9%; no extrahepatic uptake
•Treatment day: patient experienced nausea/vomiting during delivery of Y90 beads. >90% dose delivered, and stasis achieved.

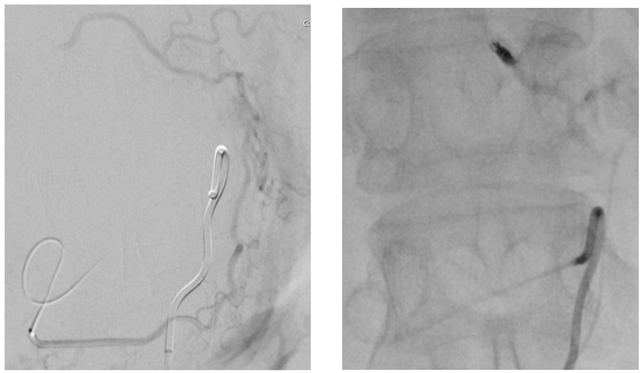


Figure 1: Angiogram from Y90 mapping procedure.

Selective catheterization of the right gastric artery and advancement of the catheter into the left gastric artery demonstrated collateralization with the left hepatic artery. As such, the left hepatic artery was embolized with a coil at a site proximal to branches supplying the stomach.

Case Presentation (2)

Post Treatment Course:

- Persistent nausea/vomiting, anorexia, fatigue >1-year post-treatment
- Early EGD: distal esophageal ulcer (non-bleeding) → PPI started
- 8-week EGD: persistent esophageal ulcer; diffuse gastritis; H. pylori negative
- 4-month imaging: favorable hepatic response with residual disease
- Ongoing course: esophageal stricture and cratered ulcer; biopsies initially non-diagnostic
- 16-month EGD: gastric biopsies with intravascular beads → confirmed delayed non-target 90Y embolization

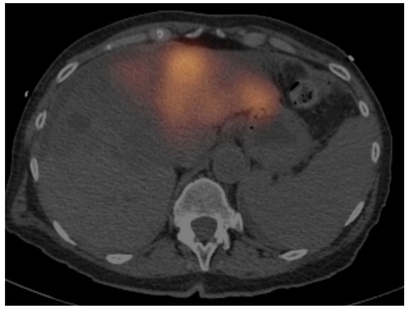
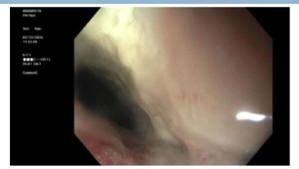


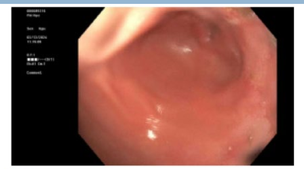
Figure 2: NM SPECT study.

- MAA administration during the mapping procedure and following NM SPECT Study demonstrated diffuse radiotracer uptake involving the left hepatic lobe and segment 4 of the right hepatic lobe. There was no extrahepatic uptake seen stomach, bowel or pancreas.

Follow-up EGD



Lower Third of the Esophagus



Gastric Body

Figure 3: EGD 2 months s/p Y-90.

(A): Lower esophageal cratered ulcer with stigmata of recent bleeding.

(B): Gastric antrum with diffuse erythema/nodularity (moderate gastritis).

Discussion

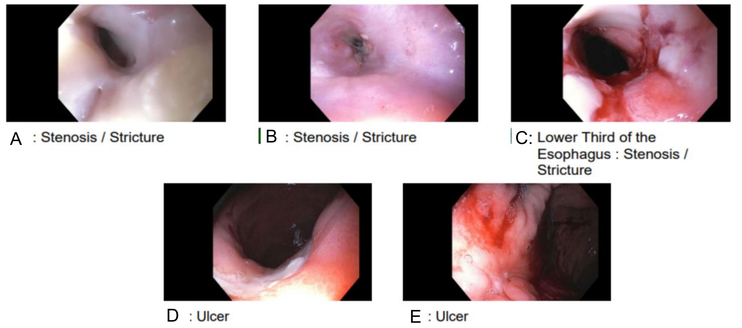


Figure 3: EGD findings 16 months post-Y90.

(A-C): Demonstrate severe ulcerative esophageal stenosis, initially preventing scope passage. This was traversed after balloon dilation to 10 mm (6–7–8 and 10–11–12 mm). **(D-E):** Cratered gastric ulcer (9 mm) on posterior gastric body; biopsied.

• Patient's gastritis occurred despite **negative MAA** and prophylactic LHA embolization → mapping is an **imperfect surrogate** for treatment-day flow.
•**Variant collaterals** (RGA ↔ LGA ↔ LHA), microcatheter position shifts, and near-**stasis** likely enabled reflux/non-target deposition.
•Management: **PPI early**, **serial EGD/biopsies**, treat strictures; reduce risk with **super-selective** delivery, **anti-reflux/balloon** microcatheters, prophylactic gastric/duodenal coiling, and **avoid deep stasis** (consider remapping if delays).

Conclusion

- **Non-target GI injury can occur** and present **>1 year** post–Y-90, even with standard precautions.
- The risk of non-target embolization increases with variant/collateral anatomy
  - MAA is an imperfect surrogate for treatment-day flow.
- This case emphasizes the need for meticulous technique + anti-reflux strategies, as well as **long-term surveillance**
- Patients should be counselled to report persistent GI symptoms.