

Gastric Ulcers Related to The Transarterial Radioembolization of Yttrium-90 in A Patient with Paraganglioma

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To the Editor,

Paragangliomas (PGLs) are neuroendocrine tumors that arise from extra-adrenal neuroendocrine cells. Liver metastases of PGL which are not candidates for surgical resection can be treated by transarterial chemoembolization (TACE) when it is technically feasible (1). Selective internal radiation therapy (SIRT), in other words, radioembolization (RE) with biocompatible resin-based yttrium 90 (Y^{90})-labeled microspheres, administered via hepatic artery branches, is a method used to selectively deliver internal radiation therapy to liver metastases (2). However RE, has the potential to cause extrahepatic adverse effects if the microspheres are incorrectly delivered to arteries supplying the stomach, duodenum, or pancreas, as well as other organs. We present here a case of metastatic PGL with gastroduodenal ulcerations related to Y^{90} RE.

A 57-year-old man was admitted to our hospital with epigastric discomfort. The computed tomography (CT) scan revealed a 13 cm retroperitoneal mass. The tumor was resected and histopathological examination was consistent with a PGL. Two years after resection of the retroperitoneal mass, multiple liver masses were detected on follow-up computed tomography examination and he was admitted to our hospital for further evaluation. In order to establish the diagnosis, a thin needle aspiration biopsy of the mass at the segment 2 of the liver was performed under US guidance. Histology of the tumor was consistent with a PGL. Because of the potential side effects and lack of sufficient response to the systemic chemotherapy, RE treatment was considered. A week before the procedure, hepatic angiogram demonstrated a single hepatic artery with no aberrant vasculature. Then all tumors were embolized using Y^{90} emulsion and multiparous gelatin particles. The patient had epigastric pain, severe nausea, and loss of appetite after the procedure. These symptoms were not alleviated by conventional medications. Amylase concentration and abdominal ultrasonography were normal. Gastroscopy showed mucosal hyperemia, edema, and multiple moderate to severe ulcers with different sizes and depths on the antrum and corpus of the stomach (Fig. 1). Endoscopic biopsy specimen revealed Y^{90} microspheres

in the small vessels of the lamina propria (Fig. 2). Thus, gastric ulcers were considered as a complication of RE. The patient was given pantoprazole and sucralfate for 4 weeks which resulted in resolution of the symptoms of the patient. Follow-up gastroscopy showed complete mucosal healing. The patient was discharged and was doing well in the follow-up visit which took place 3 months later.

Radioembolization is a new and effective technique in which we can deliver radiation directly to the tumour with the injection of biocompatible microspheres. Because of the irregular migration of microspheres, 0 to 12% of the patients experience adverse events in the first two months following the RE treatment (3). Gastrointestinal system ulceration is due to arterio-arterial non-target flow of the radioisotopes in an aberrant hepatic arterial vasculature supplying the stomach and duodenum with resultant radiation injury in the affected mucosa (4). In our patient, there was histological evidence of gastric deposition of the microspheres, probably due to undetected collateral vessels which caused an irregular deposition of the particles in gastric vessels causing radiation gastritis and ulceration.

To prevent this complication, the interventional radiologist who perform the RE has to evaluate the patients very carefully and should avoid embolizing the gastroduodenal artery, cystic artery, right gastric artery and any other unusual arteries arising from the right or left hepatic artery to avoid extrahepatic migration of the microspheres. This is very important because ectopic migration of the microspheres cannot be immediately recognized despite sensitive radionuclide imaging looking for extrahepatic deployment (5).

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Submission date : 19/02/2016
Acceptance date : 13/07/2016

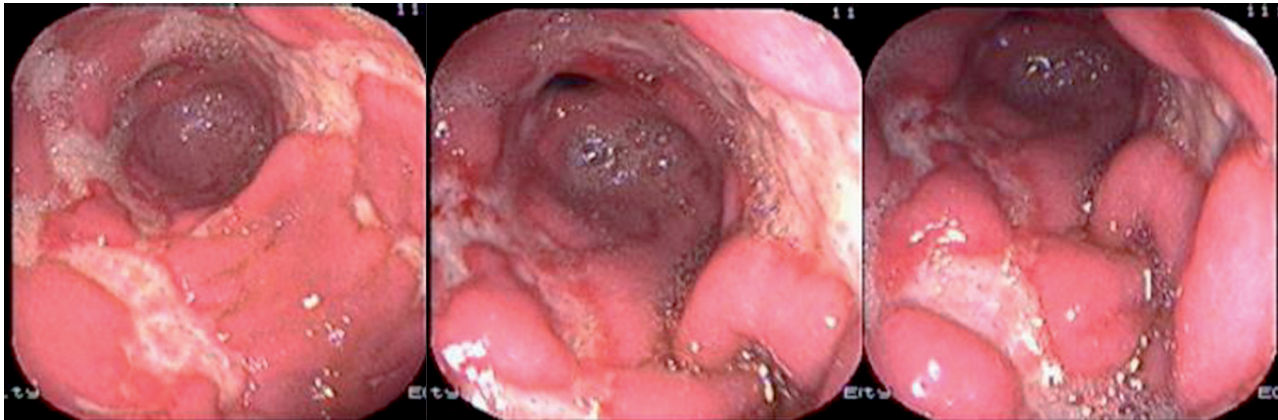


Fig. 1. — Several ulcerations at the antrum and body of the stomach with different size and depth

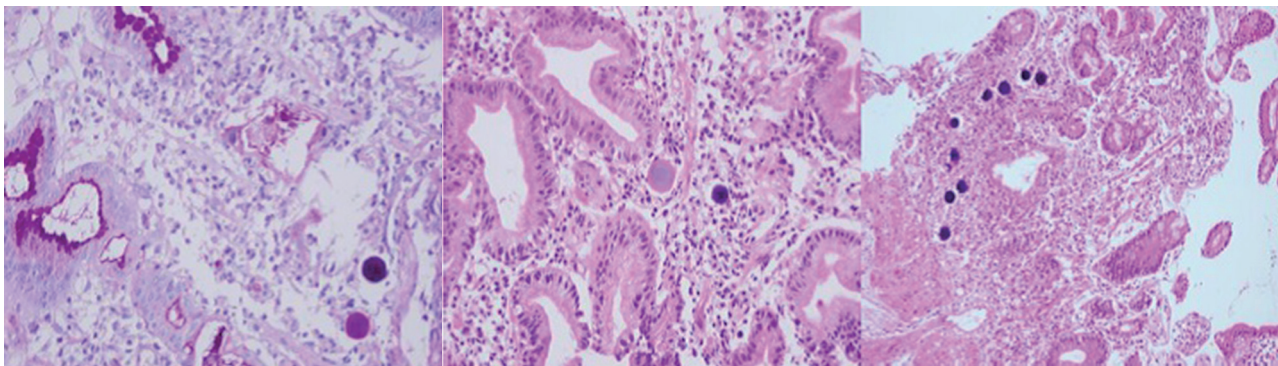


Fig. 2. — Histopathological view of Yttrium-90 spherules in the lamina propria

In conclusion, because of the increased use of RE in hepatic malignancies, adverse effects such as gastric and/or duodenal ulceration secondary to misplacement of RE microspheres may be seen in the clinical practice of a gastroenterologist. Awareness of this complication is important to manage these patients appropriately. Obtaining biopsies is essential to exclude other causes in the differential diagnosis such as metastases. Detection of the characteristic microspheres at the histopathology aids in the diagnosis. Management is non-specific and it is recommended in the product monograph that the patients should be on prophylactic gastric acid suppression treatment before the procedure and that they should continue proton pump inhibitor for a month afterwards (6).

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