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Laparoscopic antrectomy: a safe and definitive treatment in managing type 1 gastric carcinoids

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Abstract

BACKGROUND: Treatment for type 1 gastric carcinoid (T1GC) includes esophagogastroduodenoscopy (EGD), polypectomy, and antrectomy, but few studies compare outcomes. This study assessed risk-benefit ratio to determine the most effective treatment for T1GC.

METHODS: A retrospective review of 52 T1GC patients (ages 30 to 88 years; 77% female) presenting to Mount Sinai Medical Center between 2004 and 2012 was conducted. Patient demographics, procedures, and outcomes were reviewed, and patient satisfaction was assessed using a phone-administered validated questionnaire. Data were analyzed using SPSS version 20 software.

RESULTS: Average EGDs needed per follow-up year was significantly lower for antrectomy than polypectomy or EGD surveillance (.395 vs 1.038 vs 1.380, $P = .002$). Antrectomy patients exhibited decreased recurrence risk than polypectomy patients (11% vs 44%, $P = .049$), despite longer follow-up time (6.10 vs 4.39 years, $P = .023$).

CONCLUSIONS: Antrectomy treats T1GC with lower recurrence risk and less postintervention monitoring, whereas allowing patients to avoid the discomfort of repeated EGD surveillance and anxiety over a lingering condition.

Over 70% of all gastric neuroendocrine tumors (carcinoids) are type 1.[1] Although the mechanism of type 1 gastric carcinoids (T1GC) is unclear, the prevailing theory is that enterochromaffin-like (ECL) cells develop into neoplasms after chronic exposure to high-gastrin levels. The elevated gastrin promotes ECL hyperplasia, which develops into polypoid carcinoid tumors. Typically, T1GCs are associated with chronic atrophic gastritis and pernicious anemia.[2] Metastases are more common in larger tumors and do not frequently occur in T1GC patients with intraepithelial neoplasms less than 2 cm in size.[3] However, size is not the only predictive factor −3.4% to 7.9% of patients with tumors less than 1 cm that invade into the lamina propria or submucosa have metastases.[3,4] The overall frequency of metastasis ranges from 9% to 23%, with the most common metastatic location being lymph nodes. Liver metastases occur in 3% to 5% of patients.[5]

Many treatment options exist for T1GC including surgical (antrectomy) and nonsurgical management

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(polypectomy with esophagogastroduodenoscopy [EGD], EGD surveillance, and observation). Studies comparing outcomes of these treatments have been limited. Current recommendations suggest monitoring and/or serial polypectomies for T1GC smaller than 2 cm.[6] However, with this approach, the source of the problem (elevated gastrin levels and ECL hyperplasia) is not addressed. Therefore, endoscopic surveillance is necessary every 6 months for the first 3 years, then annually if nothing is found. Some patients instead opt for nonoperative pharmaceutical management to reduce gastrin levels, but this method of treatment for T1GC is debated.[5–8] Gastrin levels may or may not respond to treatment, and continued endoscopic surveillance is still necessary. For patients with numerous or large gastric carcinoids, antrectomy is recommended. Although antrectomy may be the most invasive method, it may also be the most effective. Antrectomy reduces gastrin levels by removing gastrin-producing G-cells in the antrum of the stomach, thus addressing the source of the problem. In many cases, this leads to tumor suppression, and previous studies have shown that patients treated with antrectomy have a high probability of remaining tumor-free.[2,6,8] However, antrectomy is not without risks, ranging from acute complications such as anastomotic leaks, to chronic issues such as the development of strictures leading to obstruction, causing bloating, nausea, and vomiting.[9] Postantrectomy monitoring, as with all EGD-monitoring in treatment of T1GC, varies according to clinician, but it is practice in our institution to recommend 3-month and 6-month postsurgery EGDs, then annually. However, surveillance frequency may be decreased depending on individual patient information and tumor characteristics.

This study aims to look at the risk-benefit ratio for different T1GC treatment methods to find the most effective way to manage T1GC, reduce follow-up, and maintain the highest patient quality of life. We measured efficacy of management by postintervention recurrence for antrectomy and polypectomy patients. The number of EGDs needed per follow-up year and patient satisfaction ratings were used to measure monitoring requirements and improvements in quality of life. These findings may help guide patients and physicians when determining what course of treatment is best to pursue for managing T1GC.

Methods

Patient acquisition and data collection

After approval from the Icahn School of Medicine at Mount Sinai Institutional Review Board, a retrospective chart review was performed on 52 patients with T1GC (ages 30 to 88; 77% female). These patients underwent T1GC treatment between 2004 and 2012 at the Mount Sinai Medical Center. Patients were identified from an administrative database and confirmed for T1GC with further medical chart review. Group 1 consists of patients who received an antrectomy, group 2 those who received polypectomy and EGD surveillance, and group 3 those who only received EGD surveillance. Patients were excluded if they had received both polypectomy and antrectomy. Data collected included patient demographics, preoperative and postoperative laboratory results, diagnostic tests, surgical procedures, pathological and radiologic findings, adjuvant treatments and survival. Furthermore, number of EGDs in total, number of EGDs preoperatively and postoperatively, and dates of EGDs were also recorded. Patient satisfaction data were collected through individual telephone interviews using a validated questionnaire, the "Functional Assessment of Chronic Illness Therapy-Treatment Satisfaction, General", and select questions from the "Functional Assessment of Cancer Therapy-General" (Fig. 1). These questionnaires included questions about the patient's expectations of treatment efficacy and side effects, physician involvement in helping them evaluate the effects of treatment, satisfaction with treatment, satisfaction with their ability to cope with the illness, worry that their illness will get worse, and general quality of life.

Statistical analysis

All statistical analyses were performed using SPSS version 20 software. Univariate statistical analyses were performed using 2-tail *t*-tests, analysis of variance, and chi-square analysis. Models were used to estimate associated 95% confidence intervals; P values less than .05 or confidence intervals not including 0 were considered to indicate statistical significance.

Results

There were 20 patients who underwent antrectomy (group 1), 16 who underwent polypectomy (group 2), and 16 who received EGD surveillance only (group 3; Table 1). The average estimated blood loss during antrectomy was 131 mL, and average surgery time was 268 minutes. Average hospital stay for antrectomy patients was 5.8 days. Two antrectomy patients had complications: 1 had the surgery redone after a postoperative surveillance endoscopy revealed a retained antrum; the other patient needed to go to the surgical intensive care unit because of respiratory decompensation requiring intubation, after which she recovered well. The range in total number of EGDs was 0 to 7 for antrectomy patients, 1 to 7 for polypectomy patients, and 1 to 8 for EGD-only patients.

Postintervention carcinoid recurrence was significantly less common among group 1 patients than group 2 patients: 2 (11%) antrectomy patients experienced recurrence postantrectomy compared with 7 (44%) patients postpolypectomy ($P = .049$). Average time to recurrence was 3.62 years for antrectomy patients, compared with 1.92 years for polypectomy patients ($P = .45$, Table 2). It is important to note that recurrence risk was lower for antrectomy patients, despite the fact that their mean follow-up time was statistically