

Clinical Science

Gastric stump carcinoma after distal subtotal gastrectomy for early gastric cancer: experience of 541 patients with long-term follow-up



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Abstract

BACKGROUND: Gastric stump carcinoma (GSC) has been studied after primary gastrectomy for benign disease but few studies have evaluated its correlation with gastric cancer.

PATIENTS: We assessed 541 patients submitted to subtotal gastrectomy for early gastric cancer at least 15 years ago.

RESULTS: GSC was diagnosed in 16 (2.9%) patients, giving a 4% cumulative risk of GSC 20 years after surgery. Diagnosis was made within 5 years of surgery in 10 patients and after 8 years in 6 cases. GSC occurred in 13/470 (2.8%) patients submitted to Billroth 2 reconstruction, 2/30 (6.7%) patients who underwent Billroth 1, and 1/41 (2.4%) patients after Roux-en-Y reconstruction. Significant risk factors observed for GSC were histologic type and sex. Other synchronous or metachronous extragastric tumors were registered in 56 (11.2%) patients.

CONCLUSIONS: The risk of GSC was low, even 20 years after subtotal gastrectomy for early gastric cancer. Lauren intestinal histotype and male sex were frequently associated with GSC. No correlation was observed between GSC and reconstruction technique or multifocality. Clinically speaking, GSC could be considered a subset of gastric cancer.

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Gastric stump carcinoma (GSC) has recently been re-evaluated as a separate cancer when diagnosed after subtotal gastrectomy performed not only for benign lesions but also for neoplastic disease.¹⁻³ Numerous studies have been published on patients treated for benign gastric disease, and gastric resection is considered to be a risk factor for GSC even 15 to 20 years

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after surgical treatment, especially when Billroth 2 (B2) reconstruction is performed.^{1,4} However, for patients operated on initially for gastric cancer, it is still not clear when GSC should be considered a recurrence or a new carcinoma arising on the stump. Recurrence after early gastric cancer (EGC) varies between 1.4% and 24%⁵⁻⁷ and generally occurs within 2 years of surgery. It has also been observed up to 5 years after surgery but rarely after that. Few patients who relapse have stump recurrence. Some authors have arbitrarily defined GSC as metachronous cancer arising 5⁸ or 10³ years after the first malignancy, while others also consider metachronous cancer as tumors detected after 1 year if followed up with accurate endoscopy.⁹ However, no clear guidelines exist as yet.

The aim of this study was to present our experience of GSC in radically resected EGC patients surgically treated with different types of anastomosis. We also calculated the risk of GSC in our patients operated on at least 15 years ago and confirmed the difficulty in identifying whether gastric stump cancer is a relapse, missed lesion, or new tumor.

Patients and Methods

Six hundred and fifty-seven patients who represent the whole population registered in our database because submitted to surgical resection for EGC between 1976 and 1994 were considered for this study. Surgical treatment was performed in four Italian Surgical Units: Department of General Surgery, Morgagni-Pierantoni Hospital, Forlì; Surgical Oncology Unit of Siena University; Second Surgical Clinic of Padua University; and First Surgical Clinic of Verona University. A total of 541 patients submitted to subtotal gastrectomy were included in this study. The recruitment period did not extend beyond 1994 to obtain long-term patient follow-up.

Patients were classified at the time of the first diagnosis on the basis of sex, age, tumor site, tumor size, macroscopic type,¹⁰ Lauren's histologic type,¹¹ differentiation, TNM staging,¹² lymphadenectomy, multifocality when detected by pathologist, and reconstruction type. Subsequently, patients with GSC were classified in relation to the time interval after first surgical treatment and the site of the neoplastic lesion on the stump. Anamnestic data on synchronous or metachronous nongastric tumors were retrieved and information on death from recurrence, other tumors, or noncancer causes was collected. Clinicopathologic characteristics were compared with risk factors for both GSC and recurrence. D1 lymph node dissection was performed during the first period of this study (until 1990) and thereafter only in elderly or critical patients. En bloc D2 lymphadenectomy was performed in all other patients, in accordance with Japanese Gastric Cancer Association recommendations.¹⁰ The greater and lesser omentum was removed and surgical reconstruction consisted of gastroduodenal Billroth 1 (B1), B2, or Roux-en-Y anastomosis.

Death from postoperative complications was considered as a variable if it occurred during hospitalization or within

30 days of surgical treatment. Follow-up examinations for the first 5 years comprised clinical evaluation, ultrasound scan, and serum markers every 6 months, and annual endoscopy. Thereafter patients were monitored once a year.

Statistical analysis was carried out using SPSS software (version 8.0, SPSS Inc, Chicago, IL) and all *P* values were based on 2-sided testing (threshold value = .05). Survival curves and the cumulative risk of recurrence were calculated according to the Kaplan–Meier method.¹³

Results

Five hundred and forty-one patients were submitted to subtotal gastrectomy for lesions sited at the lower or middle gastric third. Full patient characteristics are reported in [Table 1](#). Distal third location, small size, depressed or ulcerated macroscopic type, and well-differentiated intestinal histotype were the most frequently observed characteristics. D1 lymph node dissection was performed in 347 patients with a median of 9.4 lymph nodes removed (range 1 to 21), whereas 194 patients underwent D2 lymphadenectomy with a median of 18.8 nodes removed (range 15 to 55). B2 anastomosis was performed in the majority of patients (470), B1 in 30 patients, and Roux-en-Y in 41 cases. Five patients died for postoperative complications (.9%) and were not considered for follow-up. The median follow-up period was 150 months (range 2 to 356). Two patients were lost to follow-up and thus excluded from the survival analysis.

The cumulative risk of recurrence was calculated according to the Kaplan–Meier method (one minus survival) on 534 patients with EGC treated with subtotal gastrectomy; a risk of 13.5% at 20 years was estimated ([Fig. 1](#)). The recurrence pattern is described in [Table 2](#).

Sixteen of the 534 patients (3 %) were diagnosed with GSC at different times after the first treatment (range 1 to 21 years); in 10 cases it occurred within 5 years of surgery, while in 6 it was detected after 8 years ([Fig. 2](#)). The cumulative risk of GSC was 2.6% at 10 years, 3.2% at 15 years, and 4% at 20 years ([Fig. 3](#)). GSC occurred in 13 of 470 patients submitted to B2 reconstruction (2.8%), in 2 patients after B1 reconstruction (6.7%), and in 1 patient after Roux-en-Y anastomosis (2.4%). The 20-year risk of relapse (in any site) and the risk of GSC were stratified according to several clinical and pathologic variables ([Table 1](#)).

Lymph node status ($P < .001$), depth of invasion ($P < .001$), male sex ($P = .016$), and tumor differentiation ($P = .028$) were significantly associated with the risk of relapse. Intestinal histotype ($P = .002$) and male sex ($P = .015$) were significant predictors of GSC. Interestingly, all GSCs occurred in patients previously resected for intestinal-type tumors; only 2 GSC occurred in women (one 24 years after the primary resection).

Multivariate analysis (Cox proportional hazard model) confirmed nodal status, depth of invasion, and male sex as independent predictors of overall risk of recurrence, while Lauren's intestinal histotype was revealed as the only

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