CANCER OF THE OPERATED STOMACH

FATMA A. TATAR*
EROL KAYMAK*
ALI G. DENEÇLI*
MUSTAFA ÖZER*
GÜVEN ATASOY*

SUMMARY: Between 1970-1989 in Izmir State Hospital third Surgical Clinic, 19 out of 587 gastric cancers were found to be operated previously for benign ulcer disease. The cases were evaluated for prior history of gastric surgery, age, sex, interval between surgery and diagnosis, treatment, prognosis and compared with prior reports in the literature. It is mostly believed that previous gastric surgery is a risk factor for gastric cancer development. The etiopathogenesis is still questinable although duodenogastric reflux, an/hipoaciditiy are accused. Early diagnosis is important for the prognosis is generally poor. We recommend endoscopic examination starting in the fifth postoperative year.

Key Words : Gastric stump carcinoma, stomach cancer, gastric remnant carcinoma, gastric surgery.

INTRODUCTION

The frequency of gastric carcinoma following surgery for benign gastric or duodenal ulcer is not a rare entity. The risk of developing cancer in a remnant increases with time following the initial operation (16). Since Balfour first described in 1922 (10), the incidence is presented as 0.4 -12.2 % (4, 11). It has been reported after a Billroth I type of reconstruction, gastrojejunostomy, more common after a Billroth II procedure (as it is mostly performed) and even after gastric operations other than benign ulcer disease (6, 8, 14, 21). In etiology, it is implicated that duodenogastric reflux plays an important role (13). We have reviewed 19 cases of cancer of the operated stomach re-operated in our clinic.

MATERIALS AND METHODS

During the years 1970-1989, 587 operations were performed for gastric cancer. Nineteen patients who had undergone gastric operations for benign ulcer disease were diagnosed as gastric cancer by gastroenterology and medicine services and re-operated by us. They were evaluated for prior history of gastric surgery, age, sex, interval between surgery and diagnosis of cancer, treatment and survival following the second operation.

*From Izmir State Hospital, 3rd Surgical Clinic, Izmir, Türkiye.

RESULTS

Of the 19 patients, 13 were male and 6 were female. The mean age at the time of diagnosis of carcinoma for males was 59.6 and 58.3 for females (Figure 1). In 9 patients a former operation was performed, Billroth II in 6 and gastrojejunostomy in 10 patients (Figure 2). The mean interval after resection for duodenal ulcer was 18 years and 14.5 years after gastrojejunostomy. Gastric cancer developed an average of 9.7 years after gastric resection for gastric ulcer (Figure 3). At the time of the second operation, 11 of the patients were found to be inoperable while radically extended resection was applied to the remaining 8 patients. The average survival was found to be 15 months.

Among 19 patients there were two brothers 58 and 60 years of age operated for gastric ulcer 7 and 9 years ago, despite radical interventions both died 19th and 21st months respectively.

Table 1 summaries our data of 19 cases of cancer of the operated stomach.

DISCUSSION

Gastric remnant carcinoma develops later than 5 years after operation for benign ulcer disease (16). Although some authors suggest, the risk of cancer in the gastric stump is not significantly increased as compared

Figure 1: Age and sex distribution of patients with cancer of the operated stomach.

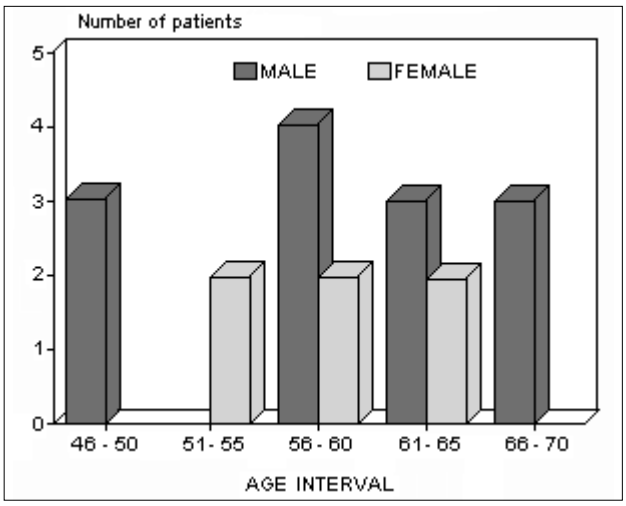
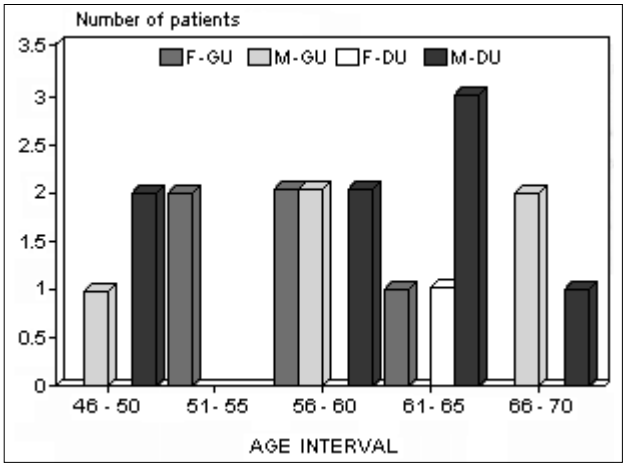


Figure 2: Histogram showing distribution of gastric ulcer (GU) and duodenal ulcer (DU) patients with respect interval and sex. F: Female, M: Male.



to the normal un-operated population (1, 11, 19, 20), and even do not recommend endoscopic surveillance in asymptomatic patients with previous gastric surgery for benign ulcer disease (11, 20), lots of series state the contrary (5, 6, 10, 13).

Table 1: Data of 19 cases of cancer of the operated stomach.

No.	Sex	Age (year)	Original Pathology	Operation Interval	Time (year)	Treat.	Prognosis
1	M	60	GU	B II	7	Rad.	21 month
2	F	60	GU	B II	14	Inop.	11 month
3	M	47	DU	GJ	14	Inop.	?
4	M	64	DU	GJ	6	Rad.	18 month
5	F	62	GU	B II	10	Inop.	5 month
6	M	58	GU	B II	9	Rad.	19 month
7	F	54	GU	B II	5	Inop.	9 month
8	M	70	DU	B II	22	Inop.	3 month
9	M	59	DU	B II	13	Inop.	?
10	M	67	GU	B II	13	Inop.	PO Dead
11	F	61	DU	GJ	24	Rad.	36 month
12	F	53	GU	B II	9	Rad.	42 month
13	M	63	DU	B II	19	Inop.	?
14	M	68	GU	B II	12	Rad.	PO Dead
15	M	49	GU	B II	8	Inop.	?
16	M	48	DU	B II	16	Inop.	8 month
17	F	60	GU	B II	10	Rad.	22 month
18	M	59	DU	B II	18	Inop.	6 month
19	M	63	DU	B II	20	Rad.	24 month

GU: Gastric Ulcer, DU: Duodenal Ulcer, Rad.: Radical,
PO Dead: Postoperation Dead, B II: Billroth II,
GJ: Gastrojejunostomy, Inop.: Inoperable

Kuhlmayer *et al.*, Helsingen *et al.*, Romcke *et al.* depending principally on necropsy materials, recorded that gastric carcinoma is more frequent in patients with previous gastrectomy for benign ulcer disease than the normal population (3, 7, 9).

Independent of the type of the operation, every intervention to the stomach causes later risk of carcinoma development (13,14,16, 21). Domellof *et al.* reported possible pre-cancerous changes after Billroth I resection (4), and Pointner *et al.* observed and increase in stump carcinomas after Billroth I procedures (17). The preponderance of Billroth II operations may simply be due to the popularity of the operation (6, 19). After vagotomy and antrectomy or pyloroplasty, achlorhydria or hypochlorhydria is observed in most of the patients, which may be a factor in development of gastric cancer (6, 8, 9).

Duodenogastric reflux seen approximately 23% of patients after Billroth I procedure an 75% of patients after Billroth II procedure (10) may cause acute and chronic damage of the gastric mucosa (2,10,13). Mucosal changes such as atrophic gastritis and intestinal metaplasia are thought to be pre-cancerous (10,11,18, 21). They occur early in the postoperative time with mucosal atrophy being seen as early as three months and present a significant degree in the first year (10). Reflux gastritis resulting in de-conjugation of bile salts has been suggested as a possible cause. Vagotomy also has been implicated along with bacterial reduction of nitrates to nitrosamines (14). Margenstern suggested that gastrojejunostomy facilitates induction of experimental gastric tumors in rodents. Dahm *et al.* demonstrated experimentally the resected gastric mucosa is more prone to the

effect of carcinogens (9). Oral administration of carcinogens in rats previously subjected to vagotomy and gastroenterostomy also induces cystic formations (12).

The frequency is higher, as the interval between the initial operation and diagnosis of cancer increase (19, 21). The median time is about 10-15 years (7,10,20). Although the number of patients is not big enough for statistical analysis, in our study the interval was found to be 18 years for resected duodenal ulcers, 14.5 years for gastrojejunostomies and 9.7 years for resected gastric ulcers. We may say the interval is shorter with gastric ulcers and resection (Figure 3).

The existence of gastric cancer does not depend on the previous benign pathology, either gastric or duodenal ulcer (3, 7,16, 20, 21). We reported 9 duodenal and 10 gastric ulcer patients that have had gastric cancer development. Some authors suggest that gastric ulcer have a slightly higher risk for development of gastric stump carcinoma (8, 15).

We found no significant difference in the mean age of the both previously operated and un-operated gastric cancer groups. Domellof *et al.* also observed the similar results (3).

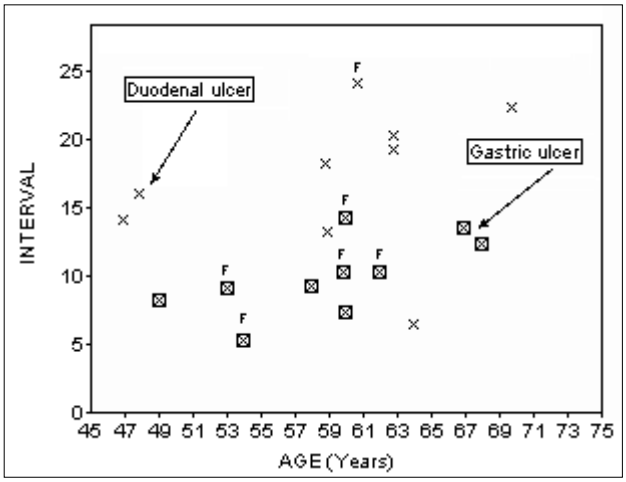
In some of the series no difference is found in relative risk of stump cancer between men and women (16, 21). In our study, males were effected mostly. This higher frequency in male sex is in agreement with other authors (3, 5, 18). A sex linked difference in the potential of carcinogen-metabolizing enzymes however may exist. Tobacco or alcohol consumption may also be a responsible factor in aetiology of higher frequency of gastric stump carcinoma in male population (3). Caygill *et al.* however reported an increased risk in women (16).

Hereditary factors may be also important in pathogenesis. We reported two brothers with gastric remnant carcinoma developed after gastric ulcer. Dubarry implied genetic factors in gastric cancer (9).

The area around the gastrojejunal anastomosis was found to more be vulnerable to the development of gastric cancer (4, 16). In most of the cases to localize the site of tumor seems impossible (15). Eleven out of 19 of our patients were found inoperable at the time of the second operation. Radical resection was performed on 8 patients. The prognosis is generally poorer than the previously un-operated gastric cancers (12). Most of the patients die with one year (10). The average survival is 15 months in our study.

Early diagnosis of cancer of the operated stomach is important to improved prognosis (15). Symptoms may be attributed to anastomotic ulceration (6). Symptomatic

Figure 3: Scatter diagram with the total material of patients with cancer of the operated stomach according to the age and time interval between the initial operation and diagnosis of carcinoma.



patients, especially older than 50 years should be endoscoped at early intervals thoroughly as gastric carcinomas can be multicentric. Although most of the authors suggest endoscopic follow up for all patients 10-15 years after the initial operation (4, 5,10,16,19), there are reports announcing cancer of the operated stomach earlier than tenth post-operative year (1, 8,10,12,15,16,18,19). As gastric cancer is seen earlier than 10 even 5 years (5 through 9 years in our study), we do advise starting endoscopic examination beginning in the fifth postoperative year and even earlier for symptomatic cases, since cancer of the operated stomach has been reported as early as two years (12,15).

REFERENCES

1. Cote R, Pockerty MB, Cavi JC : Cancer of the stomach after gastric resection for peptic ulcer. SGO, 107:200-204, 1958.

2. Domellof L, Erikkson S, Janunger KG : Late occurrence of pre-cancerous changes and carcinoma of the gastric stump after Billroth II resection. Acta Chir Scand, 141:292-297, 1975.

3. Domellof L, Erikkson S, Janunger KG : Carcinoma and possible pre-cancerous changes of the gastric stump after Bilroth II resection. Gastroent, 73:462-468, 1977.

4. Domellof L, Erikkson S, Janunger KG : Late pre-cancerous changes and carcinoma of the gastric stump after Billroth I resection. A J Surg, 132:26-31, 1976.

5. Domellof L, Janunger KG : The risk for gastric carcinoma after partial gastrectomy. Am J Surg, 134:581-584, 1977.

6. Eberlein TJ, Lorenzo FV, Webster MW : Gastric carcinoma following operation for peptic ulcer disease. Ann Surg, 187:251-256, 1978.

7. Havaag K : Cancer development in gastric stump after partial gastrectomy for peptic ulcer. Ann Surg, 155:103-106, 1962.

8. Helsingen N, Hilestad L : Cancer development in the gastric stump after partial gastrectomy for ulcer. Ann Surg, 143:173-179, 1956.

9. Kaymak E, Aksoy O, Baysun O, Uarci H, Sabar E : Ameliyatlıý midede kanser olusumu.ÝIzmir Devlet Hastanesi Mec, 14:245-250, 1976.

10. Kralfeld J, Resnick G : Gastric remnant carcinoma. Cancer, 44:1129-1133, 1979.

11. Kivilaako E, Hakkiluoto A, Kalima TV, Sipponen P : Relative risk of stump cancer following partial gastrectomy. Br J Surg, 64:336-338, 1977.

12. Margenstern L, Yamakawa T, Seltzer D : Carcinoma of the gastric stump. Am J Surg, 125:29-37, 1973.

13. Mason RC, Taylor PR, Rowe PH, Aston NO, Filipe MI, Owen WS : Genesis of gastric stump carcinoma. Lancet, i:1381, 1986.

14. Nhyus LM, Wastell C : Surgery of the stomach and duodenum, Fourth edition. Little, Brown and Company, Boston/Toronto, 1986.

15. Nicholls J : Carcinoma of the stomach following partial gastrectomy for being gastro duodenal lesions. Br J Surg, 61:244-249, 1974.

16. Papachristou DN, Agnanti N, Fortner JG : Gastric carcinoma after treatment of ulcer. Am J Surg, 139:193-196, 1980.

17. Pointner R, Foltin E, Konigsrainer A, Bodner E : Stump carcinoma after Billroth I resections. Lancet, 2:1533, 1987.

18. Saegesser F, James D : Cancer of the gastric stump after partial gastrectomy (Billroth II principle) for ulcer. Cancer, 29:1150-1159, 1972.

19. Sandler RS, Johnson MD, Holland KL : Risk of stomach cancer after gastric surgery for benign conditions a case control study Dig Dis Sci, 29:703-708, 1984.

20. Schaffer LW, Larson DE, Melton J, Higgins JA, IIstrup DM : The risk of gastric carcinoma after surgical treatment for benign ulcer disease. N Engl J Med, 309:1210-1213, 1983.

21. Viste A, Opheim P, Thunold J, Eide GE, Bjornestad E, Skarstein A, Hartveit F, Eide TJ, Soreide O : Risk of carcinoma following gastric operations for benign disease. A historical cohort study of 3470 patients. Lancet, ii:502-505, 1986.

Correspondence:
Fatma A. Tatar
Izmir Devlet Hastanesi,
3rd Cerrahi Klinigi,
Izmir, TÜRKIYE.