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THE CARCINOMATOUS GASTRIC ULCER

CLINICAL AND PATHOLOGIC CONSIDERATIONS *

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Medical literature has until recent years laid considerable emphasis upon the moderately advanced and late clinical signs and symptoms of many of our more common disease syndromes. The early symptomatology was often overlooked, misinterpreted and disassociated from the more apparent and often hopeless condition which received most of the emphasis. Fortunately for our conception of disease, clinical research in the past two to three decades has been towards early diagnosis and recognition of incipient disease. This trend in medical procedure is of greatest importance in diseases where malignancy is the causative agent, since here prevention is synonymous with an early recognition of its presence and with adequate measures being instituted for its control and attempted cure.

The interest of the medical profession in the early diagnosis and management of cancer of the stomach is not without justification, when we consider that it is the most common of all forms of cancer and is responsible for approximately thirty-eight per cent of all deaths from malignant disease in the United States. With the incidence of deaths from gastric cancer increasing, as it has from 212 per hundred thousand in 1900 to 311 per hundred thousand in 1920, there can be no question about the challenge to the profession for early recognition

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of its presence. Pessimism in the surgical management of gastric malignancy has been well founded, due to the late stages in which the disease is seen by the surgeon. About 51 per cent of the cases of carcinoma of the stomach coming for diagnosis are clinically operable and in only about 32 per cent of the total number is some form of surgical removal of the lesion justifiable. These are surely figures which demand that we focus more attention upon the early stages of a disease as insidious and destructively progressive as gastric carcinoma.

It was this interest which led to an investigation of the early stages of gastric cancer while a Fellow in Surgery under the Mayo Foundation, and we are indebted to the Mayo Clinic for the privilege of reviewing the case histories and pathologic material which form the basis of this investigation. Lack of time makes possible only a cursory report of this study.

A series of 1142 consecutive cases of gastric cancer were studied, representing cases operated upon at the Mayo Clinic during a five-year period, 1920-1924. In order to segregate the smaller circumscribed carcinomatous lesions from the larger ulcerating cancers an arbitrary grouping was adopted. In group I were placed all ulcers less than 4 cm. in diameter. Group II represented all lesions called carcinomatous ulcers by surgeon or pathologist which measured larger than 4 cm. in diameter. In Group III were placed cases of carcinomatous ulcers, so diagnosed by the surgeon at the time of operation but in which the perforation of the lesion and perigastric involvement prohibited resection, but permitted gastroenterostomy. Gland biopsy and the subsequent death of the patients

from cancer confirmed the original diagnosis of this group.

The histories of the cases in groups I, II and III were then reviewed and classified according to the type of history presented and the duration of symptoms. The gastric chemistry, roentgen findings, medical and surgical diagnoses were likewise classified for each group.

A review of the literature brought to light a rather confused conception of the carcinomatous ulcer problem. Some have described this lesion as a carcinoma-on-ulcer, presupposing a benign ulcer base but with no proof justifying such a sequence. Others have called this a gastric ulcer undergoing carcinomatous change, as an ulcer associated with carcinoma and as a primary ulcerating cancer.

There is need for a clarity of terms before submitting a discussion of the problem, and for this paper the following three terms shall apply. The term carcinoma-on-ulcer may be applied only to a relatively small group of circumscribed malignant ulcers of the stomach and only after a careful clinical pathologic study has revealed evidence of a preexisting benign gastric ulcer with carcinomatous change superimposed. Criteria for such an investigation have been established by Hauser, Anschutz and Konjetzny, Stromeyer, Ewing, Spillsbury, Warthin, Dible and M. J. Stewart but will not come under the scope of this paper.

The term, carcinomatous ulcer, may be applied after clinical and pathologic study has convinced the pathologist that the lesion is a primary carcinoma of the stomach, which during its early stages is assuming the morphologic characteristics of a benign chronic gastric ulcer. In this paper the group I

lesions, less than 4 cm. in diameter, will be considered as carcinomatous ulcers.

The term ulcerating carcinoma will be applied to a primary carcinoma of the stomach with diffuse ulceration of the gastric wall, but without perforative phenomena and without the morphology characteristic of benign chronic gastric ulcer. The lesions of group II, larger than 4 cm. in diameter, come under this classification.

It may be of interest to note that in the series of 1142 clinically operable gastric carcinomata, the rate of carcinomatous ulcers to ulcerating carcinomata was 1:16, but of the resectable cancers of the stomach, one in every five cases was a carcinomatous ulcer. During this same period, 1920-1924, there were five benign ulcers operated on to one carcinomatous ulcer of group I.

It thus becomes apparent that the carcinomatous ulcer represents the stage in the development of gastric cancer when the disease is circumscribed, clinically symptomatic and surgically amenable to a five year cure in many instances. It is also the stage during which a small carcinomatous ulcer may be confused clinically, roentgenologically and at operation with that of benign chronic gastric ulcer. To date we have no accurate clinical data which will differentiate in every instance a benign chronic gastric ulcer from the early carcinomatous gastric ulcer. It is true that as the lesion increases in size the roentgenologist will become more positive in his belief that the ulcer is malignant. However, the more positive the roentgen findings are the less positive does the surgeon become that the lesion is curable.

With the ulcerating carcinomata of group II, sur-

gical intervention is more often palliative than curative.

The common clinical conception of gastric carcinoma in the minds of many laymen and physicians is still that of the medical textbooks of the last decade and represents the rather hopeless clinical picture of advanced cancer, with its pallor, weight loss, anorexia, palpable epigastric mass, progressive weakness and cachexia. Too often the diffuse ulcerating carcinomata give this picture before gastric symptoms bring the patient to the physician. Often the first symptoms to appear, following the latent stage of carcinoma, may be those of a mild dyspepsia in a person over thirty-five years of age, previously free from gastric symptoms. These may be treated by home remedies for a period of time, but in this cancer-conscious age we hope that such a symptom-complex will not be so lightly treated by the family physician first seeing the patient without submitting his patient to a careful clinical analysis, supported by roentgenography, to determine the cause of such apparently mild and innocuous symptoms. Diffuse ulcerating cancer of the stomach may present a bizarre type of early symptoms, which do not become characteristic until a later stage is reached. Many of these lesions do not produce pain until the later stages of cancer invasion have been well established.

There is, however, another clinical picture which also represents the early stage of gastric cancer but in which periodic pain, related to food intake, brings the patient to the physician at a much earlier stage in the development of the malignancy. The clinical history may sound as relatively benign as that of the previous group during its initial stages.

The symptoms may date from several months to several years, with all of the features of a peptic ulcer syndrome. There may be epigastric pain and distress, occurring from one to three hours after a meal with food and soda relief and frequently relief by vomiting. Periodicity of symptoms may be noticed with periods of symptomless remission. Under ulcer management some of these patients may even show a temporary gain in weight. The gastric chemistry may be normal or show a hyperacidity and the roentgen findings that of a penetrating gastric ulcer.

At operation, however, if these patients be fortunate enough to come to early operation, both surgeon and pathologist find themselves confronted with carcinoma, masking under the morphology commonly ascribed to a benign chronic gastric ulcer. The ulcer crater is there as represented by the roentgenogram, but either malignancy has developed upon a long standing chronic gastric ulcer, or the neoplasm developing in the gastric lumen of normal or increased acidity has undergone the same ulcer formation in the poorly nourished center of the neoplasm that is found in the development of a benign gastric ulcer. The morphology is similar, the etiology and pathology different. The correct diagnosis of such a lesion, based upon morphology and its effect upon gastric physiology, may be misleading, and the clinician's possibility for error greatly increased. Diagnosis based upon pathology and actual visualization of the lesion must of necessity be more accurate. Hence the surgeon and pathologist must be the final arbiters in such cases of penetrating gastric lesions, in which benignancy cannot be definitely established.

The problem of the gastric ulcer is, then, not such that it is submitted to surgery because of the fear that it might become malignant but because of a well grounded suspicion that it may at the time be a carcinomatous ulcer morphologically and clinically indistinguishable from a benign chronic gastric ulcer.

From the table which I show you (table I) it will be seen that there is a difference in the duration of symptoms, depending upon the morphologic appearance and gross pathology of the lesion. Plaut,[1] in 1924, was among the first to present a series of cases which demonstrate that a primary carcinomatous ulcer with an ulcer-type of history may exist for from three to five years as a primary carcinoma. Anschutz and Konjetzny[2] have expressed the opinion that carcinoma of the stomach may be a slow-growing neoplasm. Many of the Continental surgeons feel that under two years duration one must consider a carcinomatous ulcer a primary cancer. We have no accurate statistics based upon the so-called "silent or symptomless period" of gastric carcinoma. Diffuse gastric cancer may be present and growing for a much longer period than the short average duration of symptoms would seem to indicate. The onset of symptoms usually dates from gross hemorrhage, from the time the size of the neoplasm causes disturbance with the motor mechanics of the stomach, or when perigastric invasion occurs. The growth up to this period may be symptomless and may even present a palpable epigastric mass as first evidence of its presence.

There is, on the other hand, the penetrating type of lesion represented by the carcinomatous ulcer. This type penetrates the submucosa and muscularis

TABLE I

Type of Gastric Lesion	Total Number Cases	Ulcer-type of History 5 Years or More: Cases	Per Cent	Average Duration of Symptoms	Average Duration Symptoms; in Total Number of Cases
A. Carcinomatous Ulcers					
Group I	139	26	18.7	14.4 years	4.59 years
Group II	56	3	5.3	8.0 years	2.92 years
Group III	24	4	16.6	9.0 years	2.80 years
B. Gastric Cancers—excluding Carcinomatous Ulcers	913	14	1.5	17.5 years	11.26 months
C. Gastric Cancers—including Carcinomatous Ulcers	1142	44	3.8	10.34 years	2.07 years
D. Benign Gastric Ulcers surgically proven	556	300	53.9	13.4 years	8.02 years

TABLE II

Gross Pathology	Group I			Group II		
	Free HCL Per Cent	Achlorhydria Per Cent	Average Size Ulcer, cm.	Free HCL Per Cent	Achlorhydria Per Cent	Average Size Ulcer, cm.
Ulcerating Carcinoma Type of Lesion	70.58	29.41	3.12	46.80	53.19	6.25
Chronic Gastric Ulcer Type of Lesion	95.00	5.00	2.34	66.66	33.33	5.00
Total Number of Carcinomatous Ulcers	79.85	20.15	2.79	53.06	46.93	5.20

and differs in this respect from the diffuse gastric carcinoma which grows into the gastric lumen by an overgrowth of neoplastic tissue usually in the presence of a lowered gastric acidity. The carcinomatous ulcer is practically always centered in a mass of growing carcinoma with a tendency to destroy the neoplastic tissue as it pushes into the ulcer crater. Peptic activity and gastric acidity are higher in this group than in the diffuse carcinomata, and to a certain extent the cancer growth keeps pace with cancer destruction by peptic activity (table II).

A point worthy of clinical notice may be emphasized here. The penetrating carcinomatous ulcer simulates the benign ulcer by giving symptoms from the onset. This is not the case with most diffuse, late-ulcerating cancers. The carcinomatous ulcer base is formed by and penetrates the muscularis. The gastric secretion is permitted to produce irritation reflexes in the neuromuscular structure of Meissner's and Auerbach's plexus. It is these reflex changes in the motor function of the stomach which in turn are translated into the clinical symptoms of dyspepsia of organic origin.

Here, then, lies the most important problem of the clinician in dealing with carcinoma of the stomach, to recognize and establish the doubtful nature of the carcinomatous lesion in the ulcer stage, the stage in which the symptoms produced are due to the local effects of implantation of the cancer in the stomach wall. Appreciation of this fact will aid in bringing carcinoma of the stomach for surgical treatment at an earlier stage than has heretofore been done.

Should the implantation of carcinoma in the stomach wall, however, assume the characteristics of a diffuse, progressive involvement without penetration or ulceration of the deeper layers of the gastric wall, we may expect an absence of early symptoms and a latent period in the cancer development. This latent period gradually blends into one of vague local gastric symptoms, upon which is almost simultaneously superimposed the well known systemic signs and symptoms of advanced gastric cancer. This group, with its insidious onset, offers a diagnostic menace which only frequent medical examination can combat. It is the carcinomatous ulcer group, then, which offers a challenge to the clinician for the early diagnosis and treatment of gastric cancer, because here are symptoms and signs pointing to organic disease of the stomach long before systemic evidence of malignancy is present.

From a study of glandular involvement it was found that approximately one-third of the group I carcinomatous ulcers showed no involvement of regional lymph nodes or extension of the malignancy to the serosa. Only one-fifth of the ulcerating carcinomata gave such favorable surgical possibilities. The smaller the carcinomatous ulcer the more favorable the chance for a surgical cure of the cancer. It may be also aptly stated that the longer the supposedly benign but carcinomatous gastric ulcer is treated medically, the shorter the patient's postoperative life. Even though morphologically there is very little increase in the size of the carcinomatous ulcer under treatment, there is a constant, progressive spread of cancer in the regional lymphatics.

CONCLUSIONS

Briefly, in conclusion, the carcinomatous ulcer in its early stages represents the only curable stage of gastric carcinoma. It is unfortunate for the patient that this lesion should mimic ulcer so closely in many instances.

Diffuse gastric cancer with extensive shallow ulceration may have its initial onset as a latent period and hence is one of the most insidious types of carcinoma to apprehend in its early stages.

A closer cooperation is urged between clinician, roentgenologist, surgeon and pathologist in the early diagnosis and surgical treatment of the ulcer stage of gastric cancer, the carcinomatous gastric ulcer.

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