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THE RELATION OF TYPE AND GRADE TO OPERABILITY AND PROGNOSIS IN GASTRIC CARCINOMA *

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The optimum management of carcinoma of the stomach necessitates the recognition and appreciation of all factors related to any phase of the life history of the lesion. Since the first successful resection of a portion of the stomach for cancer half a century ago, the majority of attempts at surgical therapy have brought discouraging results, so much so, in fact, that many clinics regard cure by this means with extreme pessimism. Although statistics vary greatly with the skill of the operators, the pre-operative and post-operative care of the patient and the early recognition of the lesion, it is rare that the percentage of ten-year arrests exceeds that of the operative mortality, figures which are entirely too low in the former and too high in the latter.

This paper deals with the application of factors influencing the arrest of the growth following successful resection. The material is based on the study of 95 resections of the stomach for carcinoma in the Presbyterian Hospital over a period of 24 years.

The classification of carcinomas of the stomach into pathological types is difficult in view of the variety of forms it may assume. Many terms based upon microscopic histology are in common use but are entirely inadequate in conveying to the profession at large a concise interpretation of their meaning. For simplicity in the ensuing discussion these carcinomas are divided into three gross types:

1. The *fungating, vegetative* type which tends to grow into the lumen rather than infiltrate the stomach wall. In this

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series they comprised 23 per cent and were most frequently located in the *pars media.*

2. The *ulcerating* growths which grow both into the wall and the lumen with marked ulceration. Thirty per cent of the tumors were of this type and were most common to the antrum.

3. The *infiltrating* carcinomas which are usually confined to the walls of the viscus grow and invade the different layers diffusely, sometimes producing the entity known as *linitis plastica.* They may or may not ulcerate secondarily. The infiltrating type was most common, occurring in 47 per cent and were most frequent in the pylorus and antrum.

Grading of any malignant growth is at best presumptive and inadequate, but in some instances aids in classification on a comparative basis. The method of grading employed by the authors is purely arbitrary, and it is to be emphasized that these represent only individual conceptions of relative malignancy. The following criteria have been used in grading the tumors of this group.

I. The degree of cell differentiation.

II. Cellular activity as evidenced by the variation in size and shape of cells and in cell types within the same tumor.

III. The invasive power of cells.

IV. Cohesiveness as shown by the tendency of the cells to form conglomerate masses of tumor.

V. The presence and extent of metastases.

Graded on this basis there was found to be a fairly definite relationship between the gross types, and the grades and the results of treatment (see Table I). Thus, fungating tumors most commonly fell into grades II and III. The infiltrating tumors were almost uniformly graded III and IV, while the ulcerating growths were about equally distributed between grades II, III, and IV. Likewise, the prognosis as indicated by the results is progressively worse with the ascending grade of malignancy, is worst in tumors of the infiltrating variety, and best in the fungating neoplasms.

The causal relationship between ulcer and carcinoma is not discussed in detail. There were found in this series, however, six, which according to commonly accepted criteria were thought to have developed on the side of a pre-existing chronic ulcer. It is significant that of these six, all but one had metastasized, none have remained well five years, and

four were graded IV. The majority were of the infiltrating type. This group, although comprising a relatively small percentage of all cases, must therefore be considered as highly malignant and one of the most difficult to deal with.

The question of operability combines several features. First, there is a pre-operative impression which comprises the history and physical findings as given by the physician, the X-ray interpretation of the roentgenologist and the laboratory findings by the pathologist. The pre-operative determination of the type and grade of malignancy in this manner is difficult, but by careful consideration of all factors it is possible to obtain extremely helpful leads for the further treatment of the disease. Thus, pain and bleeding are suggestive of ulcerating growths. Large, palpable, freely movable masses are indicative of fungating tumors. A previous ulcer history of long duration is apt to be the precursor of a very malignant carcinoma. The most decisive evidence of a malignancy is obtained through the X-ray. In the majority, the diagnosis and even the determination of type is possible. Lesions may also be detected before they are clinically manifest. Thus Golden, in the Presbyterian Clinic, suggests as criteria for the early diagnosis of carcinoma three salient points:

1. Interruption of peristalsic waves on the lesser curvature.
2. Obliteration of mucosal folds.
3. The presence of a crater shadow (if ulceration has occurred) which fails to decrease in size over a period of two to three weeks of ulcer diet.

The laboratory finding of achlorhydria, long regarded as a diagnostic point in all carcinomas of the stomach, has been found to occur in only about half of the cases. Of more significance, however, is the fact that it is especially common in fungating carcinomas of the lower grades and is therefore of prognostic importance.

The post-operative impression is formed by the surgeon who sees the growth *in situ* with its complications of ascites, metastases, obstruction, etc., and the pathologist who observes more meticulously the behaviour of the malignant cells. Tumors accompanied by ascites, peritoneal implants or nodules in the liver are obviously inoperable. Involved lymph glands do not necessarily contra-indicate resection but lend

gravity to the prognosis. Glands which appear grossly involved may prove on microscopic examination to be the result of inflammatory hyperplasia. Serosal involvement of the stomach wall likewise does not always mean a hopeless prognosis. Some carcinomas, especially those commonly known as colloid, show a tendency to invade the serosa before extending to the lymphatic system.

In general, proved lymphatic metastasis is a good index to prognosis. In none of the five or ten-year arrests were the glands involved. On the contrary, none of those cases with proved glandular metastases have lived longer than 29 months after resection. The presence of secondary tumor growth in glands is not, however, an accurate index to the grade of malignancy. The lower grades will undoubtedly metastasize if allowed to remain unmolested long enough, while the more malignant tumors can produce the same picture in a much shorter period.

The results achieved by surgery alone in this group of cases, while far from being laudable, are encouraging in showing that cancer of the stomach *can be cured.* Of the 22 cases surviving operation, and upon which ten year follow-ups were available, 31.8 per cent lived ten years or more without sign of recurrence. The operative mortality, however, leaves much to be desired. Thirty-four per cent of all patients subjected to resection died before leaving the hospital.

TABLE I

THE RELATION BETWEEN GRADE, PATHOLOGICAL TYPE AND RESULT IN GASTRIC CARCINOMA

Grade	Fungating	Pathological Type		Presumably well*	Result	Dead* Recurrence **	Total
		Ulcerating	Infiltrating		Dead, P. O.		
I.....	2	1	0	3	0	0	3.
II.....	7	7	0	7	5	2	14
III.....	10	12	14	9	12	15	36
IV.....	3	11	28	1	14	27	42
Total....	22	31	42	20	31	44	95

* Under this classification are included all those cases living after resection without signs of recurrence and without lymph node involvement. Of these twenty, 13 have lived three years, 10 have lived five years and 8 have lived ten years.

** In this group are included all cases which have died from a recurrent growth and those in which glandular involvement jeopardized the complete removal of all malignant tissue. Of these 44 cases, 33 have died from recurrence; 11 with metastases are living less than one year, some of which have shown symptoms of returning malignant disease.

DISCUSSION

Classification of gastric carcinomas into pathological types and grades is at best inexact. When combined with preoperative and operative findings, however, and studied from a critical standpoint, they should be helpful to the surgeon in determining the operability and operative procedure and to both the pathologist and surgeon in predicting the ultimate result.

There are two groups of carcinomas in which early diagnosis is especially difficult. One is the infiltrating type of growth appearing in a patient without previous gastro-intestinal symptoms, the first manifestation of illness being vague constitutional disorders. The second group includes those patients with a history and positive diagnosis of chronic gastric ulcer, in which the insidious advent of malignant manifestations comes all too late to allow the satisfactory control of a highly malignant lesion.

It is the opinion of the authors that the best management of a disease with such disastrous consequences can be secured only through the medium of a combined clinic in which the physician, surgeon, roentgenologist and pathologist coöperate in establishing the diagnosis at the earliest possible stage of the disease. To do this they must become familiar with the life history of the lesion, disregarding no salient feature from the first appearance of any untoward symptom until the resected growth has reached the pathologist.