CANCER OF THE STOMACH IN YOUNG PATIENTS

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Cancer of the stomach occurring in the young is frequently overlooked solely because of the age of the patient. While it is true that cancer of the stomach is generally regarded as a disease of elderly persons, the possibility of its presence should not be overlooked in obscure gastric conditions in the young. In the first decade of life it is a curiosity, but between the ages of ten and twenty it occurs as a small but definite percentage of all cases. Osler and McCrae (1) report 13 cases in the second and third decades, the ages of the patients being thirteen, fourteen, fifteen, sixteen, seventeen (4 cases), nineteen (2 cases), and twenty (3 cases). Smithies (2) reported one case in a patient aged eighteen. Marble (3) has recorded a case in a seventeen-year-old girl. Morian (5) reported from Payr's Clinic an instance of the disease in a patient aged nineteen.

It is said that the symptoms of gastric cancer in the young are similar to those of elderly patients. In the case here reported there were no gastric symptoms and the tumor was discovered only at autopsy.

In the cases reported by Smithies (2) gastric symptoms were present very late in the disease and vomiting was mostly terminal. Marked obstruction and dilatation of the stomach are not described in the cases reported, nor is hemorrhage, although occult blood and tarry stools are mentioned in a few instances. Other diagnostic and clinical evidence of gastric disease is incompletely reported in many instances. Gastric analyses, reported in a few cases, showed a fairly wide range of acidity, the highest figures being obtained in the large carcinomatous ulcers. Lactic acid was reported by Smithies (2) in six cases. The apparent deficiency and, in many cases, complete lack of laboratory data, may be attributed to the fact that many of the cases presented no symptoms pointing to the stomach as the seat of disease. In some cases in which x-ray examination was made, the stomach showed evidence of malignancy, but many cases were reported or seen before this method of examination and diagnosis became universal. Morian (5), who found x-ray examination of special value, believes that this method will lead to the more frequent diagnosis of gastric carcinoma in young patients in the future.

The duration of the disease in the young may be figured in months rather than years, despite the statement of Dock (6) that gastric carcinoma runs a slow course even in early life. While there are reports of patients suffering from obscure gastric disturbances, "dyspepsia," etc., over a considerable period of time, in most cases the onset is fairly sudden and the patient succumbs in a few months. On the other hand,
some of Smithies' patients lived nearly five years and Marble's patient (3) lived nearly three years. Our patient lived only two months from the onset of the first symptom, which was weakness. A low fever was also present in this case. In 70 per cent of Morian's patients (5) cachexia was marked, but fever slight.

Gastric tumors occurring in young subjects show essentially the same gross and microscopic features as these tumors occurring in older patients. Bulky adenocarcinoma, gelatinous carcinoma, infiltrating carcinoma, carcinomatous ulcers, both large and small, and linitis plastica are observed. Fibrocarcinoma of the pylorus with obstruction seems to be unusual in young patients, no record of this type being found.

Most of the cases reported have been inoperable on account of the early and widespread metastases. The case here reported showed definite metastases to both the cervical and axillary nodes, as well as the deeper chains, the peritoneum, cecum, appendix, and both ovaries.

The occurrence of metastases to the ovaries from gastro-intestinal carcinoma is of special interest. It is almost universally agreed that the "Krukenberg" tumor of the ovary is secondary to a tumor of the gastro-intestinal tract, usually the stomach. The few cases reported as primary Krukenberg tumors of the ovary must be looked upon with suspicion. In such cases a small gastric tumor was undoubtedly overlooked at operation, or there was no autopsy to rule out definitely a primary tumor of the gastro-intestinal tract. In our case, bilateral tumors of the ovary were noticed immediately upon opening the abdomen and the stomach was at once investigated. The tumor was invisible on its outer surface but was easily felt through the stomach wall.

The structure of the ovarian metastases is quite striking, the characteristic feature being the large "signet-ring" cells, due to compression of the nucleus to one side of the cell by the mucus within the cell. These cells, which may be quite numerous, lie in a fibrocellular, edematous stroma which in itself is frequently suggestive of sarcoma, and which accounts for the original designation of these tumors as fibrosarcoma mucocellulare carcinomatodes. In the case reported, similar cells were found in the abdominal lymph nodes, but the neoplastic cells in distant metastases showed no "signet" appearance, being of a more rounded and embryonal type.

**Case Report**

J. W., a white, unmarried female, aged sixteen, was admitted to a hospital in another city April 6, 1931. Her father, three brothers, and one sister were living, her mother having died of what was said to have been "tuberculosis of the cervical lymph nodes." The personal history was negative except for the usual diseases of childhood. The chief complaint was a general malaise and dizziness of one month's duration. The patient had been confined to bed for one week previous to admission. She had no digestive disturbance but her appetite was poor. Her menstrual history was normal up to two months ago; since then she had not menstruated. The patient was well developed but very pale and undernourished. She weighed 110 pounds, stating that there had been
little or no change in weight. Anemia was marked. The heart was rather rapid, but
the chest was otherwise negative. Physical examination revealed no palpable mass in
the abdomen, but the cervical lymph nodes were moderately enlarged. The blood
Wassermann and Kahn reactions were negative. The blood count was as follows:
2,300,000 red cells, 29 per cent hemoglobin, 4,600 white cells with a normal differential
count. The blood was negative for malarial parasites and the stool negative for intestinal
parasites. A node from the neck was removed the day of admission and sent to a private
laboratory, which returned a diagnosis of Hodgkin's disease.

The patient was referred to the Steiner Clinic for x-ray therapy, and, on the basis
of the above diagnosis, and as no section could be obtained for examination, she was given
three treatments on April 14, 17 and 22 to the posterior neck, right and left supra-
clavicular regions, and neck (70 minutes, 4 ma., 0.5 mm. Cu and 1 mm. Al filter, 15 inch
gap, 50 cm. distance, 10 × 10 cm. port). Blood examination on April 14 showed
3,180,000 red cells with 41 per cent hemoglobin, the white count being normal.

The patient left the hospital after these treatments and returned home, where she
became progressively worse. She lost weight rapidly, and all the superficial lymph nodes
became considerably enlarged. Death occurred on May 20, 1931, about two months after
the appearance of the first symptoms, weakness and dizziness.

Fig. 1. Primary Carcinoma of Stomach

Autopsy: Autopsy was done three and a half hours post mortem. The report, with
the omission of unimportant details, was as follows:

The body is that of a young female, well developed and moderately well nourished.
The head is negative. On the left side of the neck is a recently healed incision, be-
neath which can be felt several moderately enlarged and firm lymph nodes. There are
several larger nodes of the same consistency in the left axilla. No nodes are palpable in
the right side of the neck and none in the right axilla.
The outer chest wall presents no abnormality. There are no palpable masses in the
abdomen, and no inguinal nodes are felt.
The body is opened by the usual midline incision. There is a moderate amount of
subcutaneous fatty tissue, more orange than yellow in color. The cervical and axillary
nodes, removed by subcutaneous dissection, are well encapsulated, firm and cellular, with
small areas of necrosis. There is little connective tissue production apparent.
On the posterior surface of the sternum, a few small lymph nodes are found in the
fatty tissue, extending downward to the ensiform.
The lungs are voluminous and fill the chest cavities. They are pale, and no nodules
are felt or seen. No adhesions are found on either side and there is no fluid. The per-
ocardium is normal and without nodules. The heart seems slightly hypertrophied and
there is slight dilatation of the right side. There are many large bronchial nodes, some
measuring 3 cm. in diameter and containing some anthracotic pigment. The pleura is smooth.

The peritoneum is smooth with the exception of an occasional firm and rounded nodule. The liver is of normal size, slightly paler than normal and without nodules. The gallbladder is small and practically empty. The pancreas is apparently normal.

The stomach is small and collapsed. Through the wall an indefinite mass is felt on the greater curvature. This proves to be a rounded, depressed ulcer, 1 cm. in diameter and very hard, surrounded by a hyperemic zone, 4 cm. on either side, slightly elevated and indurated throughout. A few small nodes are found along the greater curvature. The tumor mass apparently infiltrates through the stomach wall (Fig. 1).

The small intestines are negative except for the last twelve inches or so, where there are numerous kinks bound down by adhesions, apparently of some standing, and with hemorrhagic nodules in the immediately adjacent mesentery. At the ileocecal juncture is a large firm mass, with considerable constriction of the lumen. The appendix is swollen and bound down to the head of the cecum, being sharply kinked in the middle portion.

In the mesentery are many enlarged, firm lymph nodes, of various sizes. In cross-section the appearance is similar to that of the cervical and axillary nodes.

The spleen is enlarged and engorged, but otherwise negative.

The kidneys are of normal size and shape, with some fetal lobulation present in both. The capsules strip easily without tearing. The cortex is normal in thickness. There is no dilatation of the pelves or other evidence of disease.

The uterus is small, firm, and of normal appearance. The tubes are normal. Both ovaries are greatly enlarged, measuring about 7 cm. in cross diameter. They are white, partly cystic, and of a gelatinous appearance (Fig. 2). Cross-section reveals no gross ovarian structure. The capsules are intact, and there are only a few adhesions about the ovaries.

The bladder is negative.

**Anatomical Diagnosis:** Carcinoma of the stomach with generalized lymphatic metastases (cervical, axillary, bronchial, mesenteric); metastases to both ovaries, "Krukenberg tumor"; metastases to appendix, cecum, and peritoneum; slight dilatation of right heart.

**Microscopic Examination:** Sections of the tumor of the stomach show a widespread infiltrating tumor composed of bulky strands and sheets of hyperchromatic epithelial cells, with almost no tendency toward glandular formation (Fig. 3). Many cells filled with mucus are found, and in other areas there are large sheets of mucus with only a few cells (Fig. 4). The tumor has infiltrated through the stomach wall, fine strands of neoplastic cells being traced between muscle fibers.

Sections of the ovary show a considerable connective tissue stroma in which are large numbers of large mucoid or edematous cells of typical signet ring type (Fig. 5).

In the cecum and appendix there is a marked replacement by the same type of cells seen in the stomach, infiltrating strands being found between the muscle fibers.
In the lymph nodes, the structure of the tumor is even more anaplastic. The cells are more or less rounded or polyhedral with a few fusing in masses. Mucoid cells are found only in the mesenteric nodes (Fig. 6), those of the cervical and axillary regions showing none of this type. Only a small portion of lymphoid structure remains in any of the nodes examined. Necrosis is more marked in the lymph nodes than in any other structures.

Microscopic metastases are found in the lungs.

Diagnosis: Gelatinous adenocarcinoma of the stomach; generalized metastases to lymph nodes, ovaries, peritoneum, lungs, cecum, and appendix; ("Krukenberg tumor" of ovaries).

Conclusions

1. Cancer of the stomach in young patients is a comparatively rare disease, but its frequency increases with age.
2. Symptoms of the disease in young patients may be the same as or similar to those in older patients, or gastric symptoms may be lacking entirely.

3. The course of the disease is much more rapid in young patients, and may be estimated in months or weeks.

4. The gross and microscopic features of gastric cancer in young patients are identical with those of later life.

5. Metastases are frequently limited to the lymphatic system, more commonly the deep nodes of the abdomen and mediastinum, rarely the superficial chains.

References