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# CARCINOMA OF THE ESOPHAGUS*

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The death rate from cancer increased from sixty-three per hundred thousand in 1900 to ninety-one and nine-tenths per hundred thousand in 1924, making an increase of nearly forty-six per cent in twenty-four years. This is probably partly due to better diagnosis and partly to a higher percentage of postmortem examinations. Yet this does not account for all. There has been an absolute increase in the number of deaths from cancer.

Whenever there is a persistent endeavor on the part of the profession to discover a method of controlling a disease, results are always obtained. Sometimes the result comes quickly, and in other instances it comes after long and laborious study has been made. The exact cause of a malady need not necessarily be known in order to control it. Smallpox is an absolutely preventable disease and has been since the days of Jenner, although its cause is not known even at the present day.

Because we do not know the exact cause of cancer is no reason why physicians should sit idly by, while the research men are searching for it. We know that chronic irritation of epithelial structures

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leads to cancer. We know that radical removal of a primary growth before metastasis has occurred results in a cure. In the light of our present knowledge the prevention and control of cancer consists, first, in a removal of all irritating processes which may lead to its developument and, second, the early removal of malignant growth. To accomplish this requires education of both the profession and the layman, as to the importance of early examination and early radical irradication of the malignant process.

A report of the Pennsylvania cancer commission shows the need and value of such education. In 1910 the average time elapsing between the first symptom and the operation in superficial cancer was eighteen months. In 1923 this had been reduced to fourteen and six-tenths months. In 1910 the average time elapsing in superficial cancer, between the first consulting of a physician and the operation, was thirteen months. In 1923 this had been reduced to four and a half months. For deep cancer the average time between the first symptom and the operation in 1910 was fourteen months. In 1923 this had been reduced to eight months. The average time between first consulting a physician and the operation in 1910 was twelve months, and in 1923 was three and nine-tenths months. This improvement has come as a result of education, but it still shows a need of further education, for the average time between the consultation of a physician and the proper treatment of a superficial cancer was still four and one-half months in 1923, and for deep cancer was three and nine-tenths months. This gives entirely too much time for metastasis to occur.



I have chosen to discuss carcinoma of the esophagus as it is generally looked upon as one of the hopeless carcinomas, and the patients are often advised, when the diagnosis is made, that there is nothing to do but wait for the termination. While it is true that in a considerable proportion cure is impossible, yet there is much to be done to relieve the patient of suffering and to prolong life, and make it more endurable. There are some that can be cured. I believe also that there is much that can be done in the prevention of cancer of the esophagus.

Statistics from various authorities show that carcinoma of the esophagus occurs in from four and a half to twelve per cent of all carcinomas. Eighty-two per cent occurs in men, while eighteen occurs in women. This great preponderance in men means that there is something that exists in them and not in women that serves as an important etiologic factor.

In going over clinical records it is found that the esophagus of men is subject to two irritating substances more frequently than that of women, viz., alcohol and tobacco. Regardless of what one would like to believe, facts must be taken. The use of these two irritants is the only striking difference and possible etiologic factor existing between men and women. Therefore, in the light of our present knowledge, I cannot see how any other conclusion can be made than that these two irritants are responsible for a considerable proportion of the additional sixty-four per cent of cancer found in the esophagus of men. So long as men will disregard that which they know to be for the

best interest of health and continue to use two irritant substances because of a transitory, pleasurable sensation produced by the effect of these powerful drugs, cancer of the esophagus is going to be far more prevalent in them than in women, unless modern women assume to an equal degree these detrimental habits of men.

Of the carcinomas of the esophagus, twelve and three-tenths per cent is found in the upper third, sixty and eight-tenths at the bifurcation of the trachea and twenty and nine-tenths per cent in the lower third, eighteen per cent of which are at the cardia. The cancer is usually of the squamous cell type, but adenocarcinoma also occurs, in which case it resembles that of the stomach in appearance. It usually presents a flat infiltrating ulcer, but not infrequently there is a bulky, projecting mass. This latter type is usually of the adenocarcinomatous variety. The diffuse infiltrating type occurs occasionally. In some there is marked proliferation of the interstitial connective tissue, giving a typical appearance of scirrhous carcinoma.

The earliest symptom is that of dysphagia, beginning with solid foods and finally liquids. With the development of the obstruction, there is a dilatation of the esophagus above and a regurgitation of the food following eating. Early the obstruction is sufficient to prevent passage of only coarser foods. The patient feels a sense of pressure pains as the larger portions of the food are swallowed. With the extension of the process the pain becomes more constant. The regurgitated food may contain mucus, some blood if there has been bleeding, and with



ulceration of the growth a foul odor, due to necrosis of the tumor.

A diagnosis is made from the history of the symptoms as outlined. An x-ray study shows encroachment upon the lumen of the esophagus of an irregular type. Esophagoscopy reveals a growth from which a piece of tissue may be removed. Sounds may be passed for diagnostic purposes and later for treatment. Personally I believe this process is not surgically sound. While it is true there is no harm for a time, it is also true that the continual passing of sounds eventually results in a rupture of the esophagus.

Treatment that has been used consists of dilatation, radiation, esophogostomy, gastrostomy and resection. Dilatation is mentioned for the purpose of its condemnation. It is a blind method and a dangerous one, although the danger is minimized by giving a thread which is allowed to pass out into the intestinal tract and used for a guide.

The use of radium is not giving the result that was hoped for when it was first introduced. Esophagostomy has proved of value only as a part of the radical operation. Gastrostomy is a procedure that has given the greatest relief, although it never gives a cure. By feeding through the gastrostomy wound and giving the esophagus a complete rest the secondary inflammatory infiltration is absorbed so that the stricture often opens, enabling the patient to eat food normally.

Following gastrostomy these patients often gain in weight, and can go about their work for some months. I had one patient who, though much emaciated at the time of the operation, regained his

normal weight, and was again able to eat normally without any apparent difficulty, and carry on his work on a small farm as well as formerly. He considered suing me for malpractice because his apparent recovery was so complete that he thought it impossible for him to have had a cancer. He lived over eighteen months following the gastrostomy.

Resection offers the only opportunity for a cure. When the carcinoma occurs in the upper portion, its removal is not so difficult, and although mortality runs close to twenty per cent, it is justifiable because it offers the only chance of cure and adds to the life and comfort of the majority that are operated upon. Even in the extensive carcinomato involving the larynx and surrounding structures the patients will often live with a fair degree of comfort for a year to a year and a half after the operation. One of our patients, in whom an emergency operation was necessary to prevent strangulation, had more than an additional year of life, went out on a small farm, where she assumed charge of the chickens and learned to speak so that she could go shopping. She felt happy and contented for approximately a year.

The operation for radical removal of carcinoma of the esophagus within the chest may be divided into four different types: (1) radical removal with an esophagostomy above and a gastrostomy below, connected by a rubber tube, (2) the radical removal with a formation of a subcutaneous epithelial-lined tube as an artificial esophagus, (3) radical removal with reconstruction of the esophagus from a transplant skin flap, (4) reconstruction of the esophagus by use of a portion of the intestine or the stomach,



(5) transplantation of the stomach or a portion of it upward, (6) transplantation of the diaphragm upward, so that the lower end of the esophagus becomes an abdominal organ.

The most striking illustration of esophagostomy and gastrostomy connected by a tube was in Torek's case, in which the patient lived for about thirteen years, and died from pneumonia. Lilienthall successfully reconstructed the esophagus after removal of a portion by transplanting a skin tube. The patient lived about eight months and died of recurrence.

Leeding suggested the abdominal method, bringing the esophagus down, closing the cardia, and then anastomosing the esophagus to the fundus. Mickulicz improved this by first obtaining better exposure through the turning up of the costal arch on the left side and, second, transplanting of the diaphragm upward. Heuer has recently elaborated a method of securing greater transplantation of the diaphragm. Volker, Kuffell and Burcher have each had successful cases operated on by this method. Zaaiger and Hedbloom have had operative successes by the combined abdominal and thoracic method.

In the department of surgery at the University of Oregon we have been working on an operation for carcinoma both at the lower end of the esophagus and the middle third. Our work has been upon dogs and up to the present time our chief difficulty has been with anesthesia, as the dog's mediastimum is so thin that collapse of the right lung occurs if positive pressure is not employed. We have been using the transpleural method of approach, making an incision in the eighth intercostal and resection

of the fifth, sixth and seventh ribs posteriorly so that they can be retracted upward. The opening in the diaphragm is stretched and the stomach transplanted upward.

After walling off the mediastinum with gauze the esophagus is picked up, freed, and the phrenic nerves separated from the esophagus. The esophagus then is clamped at the cardia and at a point about 7 cm. higher and the intervening portion removed. A silk suture is inserted into the anterior wall of the stomach about 2 cm. below the orifice of the cardia, and brought through the orifice, catching the esophagus about 1 cm. above the cut end. The needle does not go through the mucosa because of danger of infection. It is then carried down through the cardia and run out through the stomach at a point about 1 cm. from where it entered. Similar sutures are inserted in the posterior wall and in the lesser and greater curvature. These are drawn taut, bringing the esophagus down through the cardiac opening of the stomach and tied.

A continuous suture is then inserted, uniting the serous surface of the cardia to the esophagus, thus producing a complete closure. The stomach is then pleated so as to make it tubular in order that the portion above the diaphragm will not dilate and pull the entire stomach into the thorax. Next the opening of the diaphragm is sutured to the stomach. This is very important, as in a successful operation upon one dog we had perfect healing of the anastomosis but the dog later died from intestinal obstruction, due to a loop of jejunum passing up by the stomach into the thorax.



The operation of carcinoma in the middle third is done in three stages. At the first operation an incision is made in the stomach after putting on clamps parallel to the greater curvature, beginning on the lesser curvature at a point one and a half cm. from the cardia, and extending down for nearly half the length of the stomach. The margins are then sutured, thus making a tube continuous with the esophagus, extending down to about the middle of the greater curvature and a more or less triangular pouch which is brought through the abdominal wall for a gastrostomy.

At the second stage the chest is opened. The incision is made in the eighth interspace and the fifth, sixth and seventh ribs resected posteriorly. The esophagus is freed and the gastric tube brought into the thorax until the stomach rests against the diaphragm. The diaphragm is then sutured at the base of the tube. Gauze is packed about the esophagus in order to produce a walling off sufficient to prevent infection of the mediastinum, and the tract closed without drainage. After five days the chest is again opened and a portion of the esophagus is resected.

Our work for carcinoma of the esophagus is in a purely experimental state. We are not ready at this time to do any work for patients at all, but I believe as a result of experimental work being carried on here and elsewhere, a fairly safe approach for the treatment of a malady, that until the present time is otherwise always fatal, will be developed.

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