Regurgitant Esophageal Ulcer

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Regurgitant or peptic ulcers of the esophagus almost always occur as lesions that are associated with the short-esophagus type of esophageal hiatal hernia. A small percentage of these lesions [1] are congenital, but most occur as complications of the sliding type of esophageal hiatal hernia or of operations upon the gastric cardia.

CAUSATION

Any state which will allow acid gastric or alkaline duodenal secretions to come into prolonged contact with esophageal mucous membrane may produce this type of ulcer (Fig. 1).

Vomiting may rapidly produce ulcerative esophagitis. If the ulcerative process is not controlled, it eventually may lead to deep ulceration, formation of stricture, and shortening of the esophagus. Some patients who have regurgitant esophageal ulcers give a long history of functional vomiting. They usually have a hypersensitive gag reflex to the extent that they gag or vomit when they brush their teeth. They induce vomiting when they are under nervous tension. Roentgen studies of the esophagus and stomach for some years will disclose nothing abnormal, but finally a short esophagus will be found. Prolonged vomiting secondary to migraine, pregnancy, postoperative states, and obstructing lesions of the gastrointestinal tract also may produce esophageal ulcers. The vomiting of a patient who has an obstructing duodenal ulcer is particularly hazardous, since in such an instance the acid content of the secretions vomited is high and is capable of producing severe chemical esophagitis rapidly (Fig. 2). The necessity for control of the vomiting is urgent.

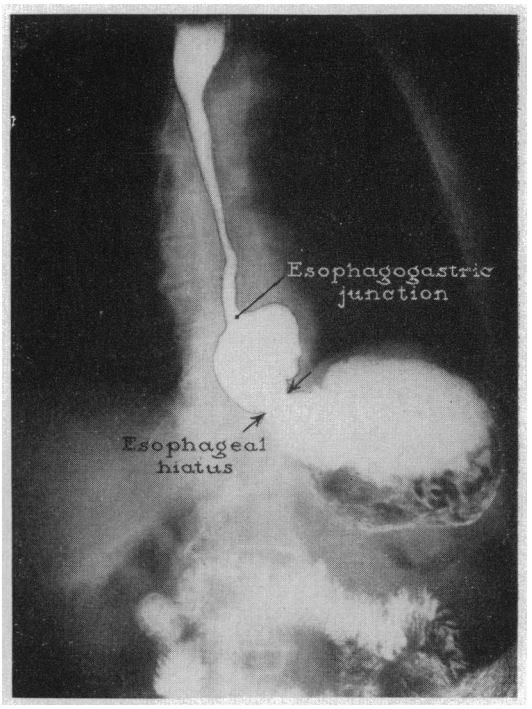

Fig. 1.—The patient was a 75-year-old man who had an obstructing carcinoma of the colon. This caused prolonged vomiting, ulcerative esophagitis, and finally a long stricture of the distal two thirds of the esophagus and a short-esophagus type of diaphragmatic hernia. (Retouched.)

The sliding type of esophageal hiatal hernia is the commonest cause of esophageal ulcers (Fig. 3). When this type of hernia is present, the esophagus has normal length. When the patient is standing, the force of gravity is exerted on the stomach in such a manner that it occupies a normal

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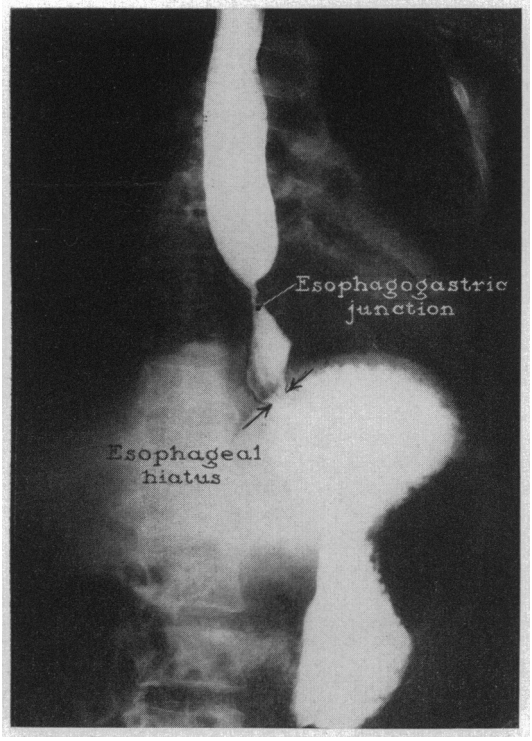


Fig. 2.—This patient had a duodenal ulcer with almost complete obstruction of the duodenum, which caused him to regurgitate into the distal part of the esophagus. The regurgitation produced ulcerative esophagitis, stricture at the esophagogastric junction, and a short esophagus. (Retouched.)

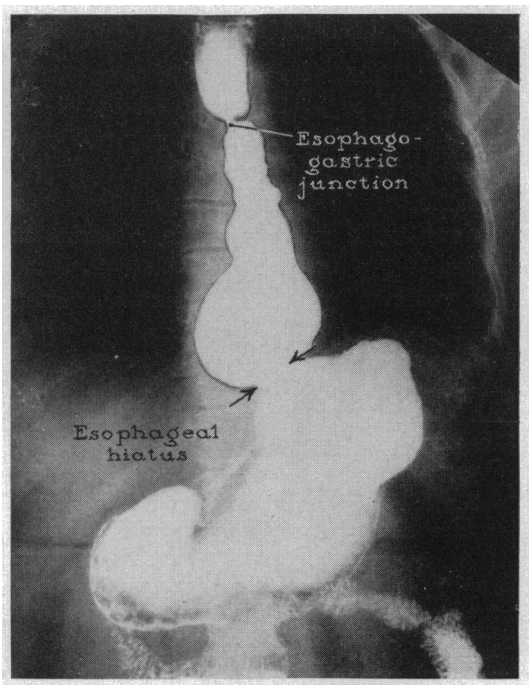
position. During recumbency or during periods when pressure is applied to the anterior abdominal wall, the cardia and variable amounts of stomach will be pushed into the thorax. During esophagoscopic examination done when this condition is present, it is found that the gastric cardia is incompetent, and yellow-tinged gastric juice will be seen to regurgitate freely into the lower part of the esophagus. Even so, ulceration of the esophagus develops in only a small percentage of patients who have the sliding type of esophageal hiatal hernia. It is surprising that such ulceration does not occur more often among patients with this type of esophageal hernia.

It has been reasoned that the most hazardous period, so far as the integrity of the esophagus is concerned, is during sleep. At that time the patient is recumbent and gastric juice regurgitates into the esophagus. Also, during sleep gastric juice is not neutralized by the intake of food for a long period.

Operations on the gastric cardia may produce ulceration of the esophagus. Unfortunately, the hazard of operating on benign lesions, such as cardiospasm and stricture of the distal portion of the esophagus, has not been generally recognized. Various types of plastic operations have been used to treat cardiospasm (Fig. 4). Operations which involve incision into all layers of the esophagus, including the mucous and submucous layers, are followed by the development of esophageal ulcers in a high percentage of cases. Some time may elapse before these ulcers become manifest (Fig. 5). Such surgical procedures should be condemned.

Esophagogastrectomy is an operation that has to be done for carcinoma involving the cardia or lower part of the esophagus. This operation at times is complicated by the formation of regurgitant esophageal ulcers, in spite of the fact that in the presence of

Fig. 3.—The patient was a 63-year-old woman who had a diaphragmatic hernia of many years' standing, with a history of regurgitation into the distal part of the esophagus. The regurgitation eventually caused marked shortening of the esophagus and a stricture at the esophagogastric junction. (Retouched.)



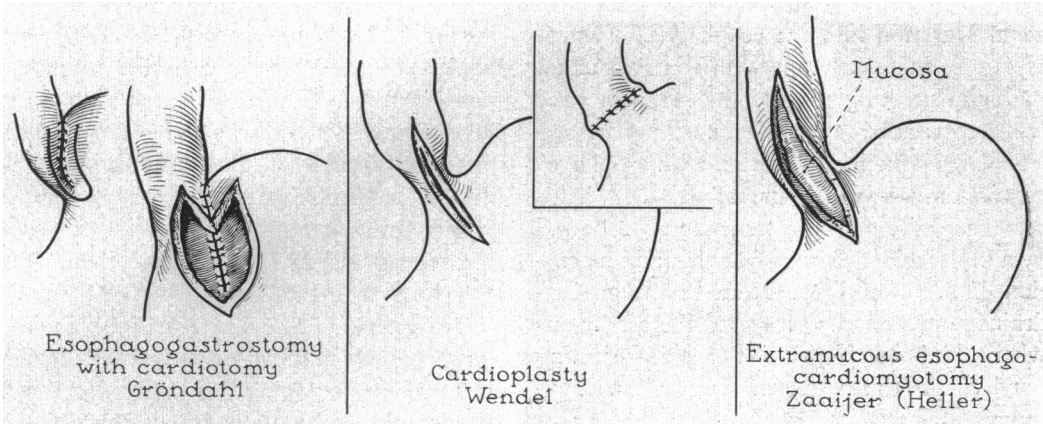


Fig. 4.—Operations that have been done on the cardia for cardiospasm. It is important that esophagogastrostomy or cardioplasty, as illustrated, not be done. If surgical intervention is necessary for this lesion, extramucous esophagocardiomyotomy is the safest operation that can be done. (Reproduced, with permission of the publisher, from Olsen, A. M.; Harrington, S. W.; Moersch, H. J., and Andersen, H. A.: The Treatment of Cardiospasm: Analysis of a 12-Year Experience, *The Journal of Thoracic Surgery,* St. Louis, The C. V. Mosby Company, 1951.)

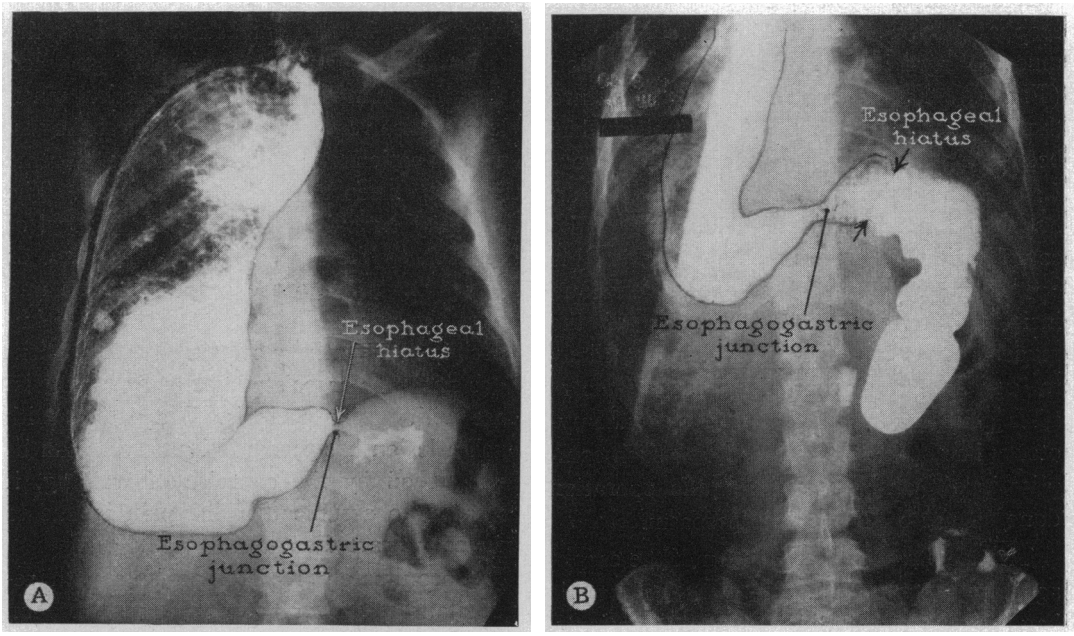


Fig. 5.—The patient was a 45-year-old woman who had marked cardiospasm which could not be successfully treated by dilatation. In October, 1948, she underwent esophagogastrostomy. Ulceration developed at the esophagogastric junction, and the patient eventually suffered a fatal hemorrhage. *A,* preoperative roentgenogram; *B,* postoperative roentgenogram. (Retouched.)

carcinoma of the stomach the acid value of gastric secretions usually is low. Esophagogastrectomy is an operation that should be avoided, in the case of benign lesions, if it is at all possible, since it completely abolishes the sphincter mechanism of the gastric cardia.

Neuman and Ellis [2] have studied the operation of esophagogastrectomy experimentally in dogs with special reference to methods of prevention of the complications of regurgitant esophagitis and esophageal ulcer. Pyloromyotomy, pyloroplasty, and gastrojejunostomy are gastric-drainage procedures which they employed to try to prevent regurgitation of acid gastric or alkaline duo-

denal secretion into the esophagus. Pyloromyotomy in association with removal of all the acid-secreting part of the stomach gave the best results. Gastrojejunostomy or pyloroplasty done in association with esophagogastrectomy, with removal of the acid-secreting part of the stomach, was followed by a high incidence of esophagitis and ulceration of the esophagus. None of the gastric-drainage procedures protected the esophagus when 20% to 30% of the acid-secreting portion of the stomach was allowed to remain.

Esophagocardiomyotomy (modified Heller operation) seems at present to be the safest operation to do for cardiospasm, if surgical treatment is necessary (Fig. 4). This operation cuts the musculature of the cardia as well as that of the adjacent portion of the esophagus and stomach down to the submucosal layer in a longitudinal direction (Fig. 4). No attempt is made to suture these layers. The length of the incision has been variable, depending upon the surgeon. Length of the incision, however, may be an important factor in the development of the complication of esophageal ulcer after this operation. It may be that excessively long incisions or the breaking-through of the mucosal layer are factors which are likely to produce regurgitant esophageal ulcers after this operation. Esophagocardiomyotomy has been followed by fewer such complications than any other plastic operation done on the cardia for cardiospasm.

The results of proper dilation of the esophagus by means of the Plummer hydrostatic bag have been so excellent, for most patients, that esophagocardiomyotomy should be reserved for such patients as do not respond to this type of dilation.

Additional preventive measures will be discussed in the section devoted to treatment.

SYMPTOMS

Dysphagia, retrosternal burning, epigastric pain, pyrosis, vomiting, and hemorrhage are the commonest symptoms of regurgitant ulceration of the esophagus.

Almost all patients with a regurgitant esophageal ulcer have a short-esophagus type of hiatal hernia. The shortening of the esophagus is the result of fibrosis in the muscular layers of the esophagus. The fibrosis, in turn, occurs as a complication of chronic or recurrent esophagitis. At times, esophageal stricture will occur for the same reason.

An incompetent sphincter exists, and the symptoms which it causes are classic. During recumbency, stooping, or straining, sour gastric juice regurgitates into the mouth. In obese patients these symptoms will abate as weight is reduced. Any situation which increases intra-abdominal pressure, such as the wearing of tight clothing around the abdomen, will aggravate these symptoms.

Frequently, a "burning" pain is experienced high in the epigastrium and in the retrosternal region. This pain is worse when the patient is in the recumbent position, when gastric juice regurgitates into the esophagus. In some patients the pain becomes so extreme that they sleep sitting up in a chair. The pain may extend to the back at the level of the 10th to the 12th thoracic vertebrae, or it may extend into the cervical region and down the arms. Fairly frequently it is impossible to be entirely certain that the patient does not have associated coronary heart disease with angina pectoris. If a patient with such a lesion has precordial pain that can be brought on by the exercise of walking, it is safest to assume that the pain is due to coronary heart disease.

Approximately 18% of patients with regurgitant ulcers of the esophagus have an associated duodenal ulcer.[1] In such an instance the symptoms of duodenal ulcer also are present.

Most patients who have diaphragmatic hernias are aerophagic. The symptoms of upper abdominal distention and "fullness" extending up over the left anterior part of the thorax are common. When the stomach is distended with air, exaggerated consciousness of the presence and functioning of the heart becomes common. Patients thus affected come to their physicians worrying

about heart disease. The foregoing symptoms can be abated by belching, which is common.

Dysphagia is the commonest symptom of regurgitant ulceration of the esophagus, and it may occur in two ways: 1. It may be the result of esophageal spasm which comes about secondary to the esophageal ulcer and the diaphragmatic hernia. 2. It may be the result of stricture, which is a relatively frequent complication. If the dysphagia is due to spasm, it is intermittent in character and may be as severe when cold liquids are taken in as it is when solid foods are ingested. If it is the result of esophageal stricture, it is constant and is most marked when solid foods are ingested.

Hemorrhage is rather common. The amounts of blood lost may be microscopic in amount or they may be exsanguinating.

In a series of 170 patients with regurgitant ulceration of the esophagus seen at the Mayo Clinic in a 10-year period,[1] 38 complained of hematemesis, 20 complained of melena, and 16 said they had had hemorrhages of such severity that blood had to be transfused. One patient had received blood by transfusion eight times; three had required blood five times; one had required it four times; another one, three times; two required blood twice, and eight required it once. During this period there were three fatal hemorrhages.

Sometimes the bleeding is slow, and it may be unnoticed until the symptoms of rather marked secondary anemia develop.

Loss of weight may develop if the complication of stricture occurs.

RECOGNITION OF THE LESION

Roentgenologic Findings.—The esophagus will be seen to be shortened and may appear slightly dilated. The esophagogastric junction will be located at variable levels above the diaphragm. It may be anywhere from just above the diaphragm to as high as the level of the aortic arch. The constriction, if pronounced, will extend 1.5 to 2 cm. in length. If the lesion is the result of persistent prolonged vomiting, a short esophagus may be seen, with a diffuse fusiform stricture involving the distal half or more of the esophagus. The gastric folds can be seen extending through the diaphragmatic hiatus into the thorax. The intrathoracic portion of the stomach may be narrowed in such a way that it appears to be part of the esophagus below a stricture. If the patient is examined in the Trendelenburg position, reflux from the stomach can be demonstrated.[3] When minimal changes are present, the roentgenologist may call the esophagus and stomach "normal." If symptoms or roentgenologic findings suggest regurgitant ulceration at the esophagogastric junction, esophagoscopy should always be done to identify the lesion and to rule out carcinoma.

Esophagoscopy.—When a normal person undergoes esophagoscopy, it is usually difficult to introduce the esophagoscope past the final 1.5 to 2 cm. of the esophagus if the procedure is done with the patient under the influence of local anesthesia. The tip of the instrument must be directed to the left and anteriorly. Generally, it is necessary to exert slight pressure and to wait for the musculature of the esophagus and diaphragm to relax. After this occurs, yellow-tinged secretion is seen to gush from the stomach and into the lower part of the esophagus. There is evidence of sphincteric reaction at the cardia. In people who have esophageal hiatal hernias of the short-esophagus or sliding type, this sphincteric action is lacking. It is possible to see yellow-tinged gastric secretion in the middle and lower third parts of the esophagus. It is easy to pass the distal end of the esophagoscope into the upper part of the stomach. The same observations may be made after some of the cardioplastic operations done for cardiospasm or in all patients who have undergone esophagogastrectomy.

Prolonged exposure of the esophagus to gastric juice usually will cause esophagitis. The mucous membrane becomes redder than normal. As the inflammatory reaction becomes severer, linear superficial ulceration will develop between the longitudinal mucosal folds at the esophagogastric junction. If the process is severe, a deep, in-

durated ulcer may be seen on the esophageal side of the esophagogastric junction. It may have a nodular base or be covered with a gray-white exudate. The ulcer will bleed readily when touched, and it is impossible to distinguish it from carcinoma without biopsy. The ulcer, when deep, does not heal readily.

A common complication is formation of stricture. Generally, this stricture is short, unless it has been produced by prolonged vomiting. It is seldom as dense as a lye stricture, and as a rule it is easy to dilate.

TREATMENT

Prevention.—The most important aspect of treatment is the prevention of such a lesion. Some of the preventive aspects relating to prior operative procedures have been discussed under Causation. At present, only a small percentage of diaphragmatic hernias of the sliding type are repaired. Most are small and cause very few symptoms. These symptoms, when present, generally can be eliminated by reduction of weight, if the patient is obese, and by avoiding pressure on the abdomen. If, however, the patient has the classic symptoms of an incompetent cardia and esophagitis, it is best to repair the hernia to restore competency of the cardia and to obviate the risk of the development of regurgitant esophagitis, ulcer, stricture, and short esophagus.

It is best not to treat benign lesions of the lower part of the esophagus surgically until all conservative measures have been tried and found ineffective. Cardiospasm and benign stricture of the esophagus can be treated successfully by proper esophageal dilation in the majority of instances. As a rule, the end-result is better and the risk of development of a regurgitant ulcer is far less than would be the case if any of the presently used operations for these lesions were employed. If an operation must be done, esophagocardiomyotomy (modified Heller) seems to be the safest procedure to use.

For patients who vomit from whatever cause, everything should be done to eliminate the cause of vomiting as rapidly as possible. The patient whose vomiting is on a functional basis should be warned to stop this habit immediately.

Definitive Treatment.—After a regurgitant ulcer has formed, no treatment known at present is altogether satisfactory. In general, most patients can be treated by their following a medical program.

Medical Program.—This consists in the use of an ulcer diet and antacids. Patients should be advised to sleep with the head of the bed elevated 6 to 8 in., so that the force of gravity is utilized to keep acid gastric secretions in the stomach. Two blocks of wood of the desired height can be placed under the legs of the head of the bed to accomplish this elevation.

Patients who have sufficiently troublesome dysphagia should have the benefit of esophageal dilation, performed by the passage of esophageal dilating sounds over a previously swallowed silk thread, used as a guide. Generally, the esophagus can be dilated up to the diameter of a 45 or 50 F. sound, depending on how dense the stricture is. If symptoms warrant, dilation will have to be repeated.

Obese patients should lose weight, should not wear tight undergarments, and should avoid stooping-over positions. These are factors which increase intra-abdominal pressure and force gastric secretions into the esophagus.

Surgical Treatment.—It is beyond the scope of this paper to go into any detail regarding surgical treatment. However, some of the operations which have been used can be mentioned. In instances in which there is only moderate shortening of the esophagus, Harrington [4] has been able to suture the diaphragm above the stomach after the diaphragm has been paralyzed by phrenic-nerve interruption. Wangensteen and Leven [5] have performed subtotal gastric resection in an attempt (1) to reduce acidity and digestive capacity of the stomach and (2) to speed up the emptying time of the stomach. In a review of the records of a group of Mayo Clinic patients over a 10-year period,[1] it was

found that nine patients who had rather severe symptoms underwent this operation. Seventy-five to eighty per cent of the stomach was removed. Five had excellent results; two obtained good results and two were regarded as having poor results.

Allison [6] has performed partial esophagectomy and esophagoenterostomy for patients who have not responded to a conservative program. The rationale for this operation is elimination of the possibility of regurgitation of gastric contents into the lower part of the esophagus. A surgical procedure of this magnitude should be used only if conservative measures have failed and symptoms are severe. At our present stage of knowledge, such an operation would be indicated for any patient who has experienced repeated hemorrhages or who has intractable pain from his esophageal ulcer. It should also be considered for those patients who have had dense strictures of the esophagus and for whom repeated esophageal dilations have been a failure.

SUMMARY

Attention is called to the important lesion known as regurgitant or peptic esophageal ulcer. Most of these lesions occur secondary to esophageal hiatal hernia of the sliding type or to operations on the cardia. The esophagus becomes short and usually strictured as a result of fibrosis in the muscular layers of the esophagus, caused in turn by chronic esophagitis.

The symptoms, roentgenologic findings, esophagoscopic picture, and treatment are discussed.

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