Benign Tumor of the Stomach

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Incidence

Until recently benign tumors of the stomach were thought to be rather rare. Prior to 1913 the incidence of benign tumor of the stomach at necropsy in various European hospitals ranged from 0.0053 to 0.04 percent. Tilger and Eliason and Wright found an incidence of 3.3 percent. In 1930 Hillstrom found that about 5 percent of all gastric tumors found at autopsy or operation were benign. Nadéau and McCarty stated that 1.2 percent of all gastric tumors are benign. Lockwood in a small series of cases, observed about 5 percent of all gastric tumors found at necropsy or removed at operation were benign. Rieniets, more recently, found an incidence of benign tumor of 16.0 percent out of 200 stomachs autopsied. On direct comparison with malignant tumors found in autopsy material, the incidence of benign tumors increases. Thus, in 4,413 autopsies at Bellevue Hospital Dupley et al. reported a benign tumor incidence of 22.0 percent. Stewart, on comparing 78 benign tumors with 23 malignant tumors occurring in 11,000 autopsies, found an incidence of 22.2 percent. On the same basis Rigler and Erickson found an incidence of 23.2 percent.

From the viewpoint of gastric surgery, a different incidence is reported. Eusterman and Senty reported 27 benign tumors or an incidence of 1.3 percent on 2,168 operations. Dudley and Morse and Miscall also found an incidence of benign tumors of 1.3 percent in surgical pathological material.

On the basis of roentgen examination in a large number of cases, Kirklin and Weber stated that less than 2 percent of all gastric tumors were benign. Rigler and Erickson reported an incidence of 11 percent on 4,236 x-ray examinations. Finesilver in an estimated 43,200 examinations found a ratio of malignant to benign tumors of 66 to 1.

Schindler reported an incidence of 1.5 to 2 percent of all patients examined by gastroscope.

Pathology

Benign tumors of the stomach are rounded, nodular, lobulated or mushroom-shaped and usually of smooth contour. The growth may arise in the mucosa, extra-mucosa, submucosa, or serosa of the stomach. It presents endogastric or exogastric tumors. The mucosa
over the tumor is thinned out, smooth and its folds are effaced. These tumors often ulcerate. The size of the tumor varies from a millet seed to one filling the entire stomach. Chaput reported a tumor as large as a fetal head. They are sessile or more often pedunculated. Eliason found that 20 percent are pedunculated.

There is scant agreement among pathologists regarding the classification of benign tumors of the stomach. It appears that the classification by Thompson and Oyster, based on pure histologic types, is adequate and the mixed varieties are classed as sub-groups of the pure forms of benign tumors. The frequency of occurrence of benign tumors of the stomach under the classification by Thompson and Oyster is indicated by tabulations of collected cases. Eliason, Wright, Geschickter and Minness have collected groups of 560 cases and 931 cases respectively.

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<th>Type of Tumor</th>
<th>Minnes &amp; Geschickter</th>
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** In this group authors include fibromyoma, fibroleiomyoma, adenomyoma, myoma and adenoleiomyoma.

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Case Presentations

Case No. I

A 63 year old white female entered the hospital on March 27th 1954 complaining of vague pain in the right upper quadrant, often radiating sharply around the right costal margin to back, occasional flatulence and bloating after meals of two years duration. The patient has been rather constipated but no bloody stools.

The physical examination showed nothing remarkable. The blood cell count showed RBC 4,400,000, WBC 4,900, which was consisted of neutrophil 64, lymphocyte 33, monocyte 2, and eosinophil 1. The gastric analysis showed occult blood in two specimens but otherwise was normal; free HCl 7.19 and total acidity 19.32 in two specimens respectively. Duodenal drainage revealed yellow-green mucoid and turbid gross blood was present, a few epithelial bile cells and many fungus and mycelia spores. Smears of gastric fluid demonstrated epithelial cells and leucocytes but no tumor cells were found. Bromsulphalein excretion and cephalin flocculation were within normal limits.

[X-ray findings(Fig. 1)] An upper gastro-intestinal tract study done on March 29, 1954 showed an oval intramural tumor on the anterolateral border of the stomach in the upper portion of the body of the stomach, which measured approximately two by three centimeter. The mucosal pattern did appear to be slightly distorted but it is not thought that there is any infiltration type of disturbance to the mucosal pattern. The patient was not tender in this region to
palpation, and the mass could not be felt through the abdominal wall. It was constantly present and did not move about. The mass presented no stalk or pedicle. This finding was thought to represent a benign tumor. Three days later the examination was repeated and the presence of a tumor on the greater curvature of the stomach was reconfirmed and the duodenal bulb and visualized small intestines were normal.

Surgery done on April 5, 1954 revealed a mass measuring about one inch by two centimeters in diameter, ovoid and firm, well encapsulated and located along the greater curvature. It cut with resistance and bulged on division by a knife. There appeared to be several consecutive layers to the tumor mass. It appeared to be probably a leiomyoma on the stomach wall itself, intramural in position. It lies between the muscle fibers and the mucosa of the stomach wall, located along the greater curvature. The tumor mass was dissected sharply and the mucosa was not entered. The incision was closed.

[Fig. 2]

The tissue examination showed (Fig. 2) (1) Grossly a firm tan-brown to white mass measuring approximately 3 by 1.5 by 1.5 cms; (2) Microscopically a leiomyoma with rather extensive fibroblastic proliferation and hyaline fibrosis; slight focal calcification but no histologic proof of malignancy present.

**Final diagnosis:** Leiomyoma in gastric wall.

**Progress:** Patient was discharged on April 11, 1954 in improved condition.

**Comment on myoma:** Myomata includes fibromyoma, fibroleiomyoma, adenomyoma, leiomyoma and adenoleiomyoma. According to Eliason and Wright, of all benign tumors of the stomach the incidence of myomata is 60 percent. Minnes and Geschickter found leiomyomata occur in 36.6 percent of all benign tumors of the stomach. Rieniets studied 200 autopsies, found 43 leiomyomas varying from 0.1 to 0.9 centimeters in diameter. They occur as hard, round, smooth, sessile or pedunculated tumors which originate in the stomach wall, project into the lumen of the stomach as intragastric tumor, but may grow within the wall and become exogastric. Most often they occur near the pylorus as either single or multiple tumors. All of the Rieniets' tumors were quite small but some unusually large myomatous tumors have been reported. Eiselberg and Blaxland each reported a case the size of a head. About 85 percent arise in the muscularis of the submucous layer and project into the stomach. Nassetti noted the site in 106 cases as follows: 14 on the anterior wall, 15 on the posterior wall, 30 on the greater and 12 on the lesser curvature, 23 on the pylorus, 7 near the cardia and 5 in the fundus. Associated pathologic changes range from ulceration or cystic formation to malignant sarcomatous degeneration. After reviewing 310 cases, Eliason and Wright were of the opinion that they are far from being as benign as their classification suggests. Lahey and Colcock concur in this view. One of the most striking clinical features of leiomyomata is their tendency to ulcerate and to bleed massively or ooze blood continuously. In the case presented above, the patient had occult blood in two specimens of gastric analysis. Rieniets pointed out that they show little evidence of becoming malignant. Nassetti found that 27 percent undergo malignant degeneration. Blood is encountered in over 50 percent of cases. Pyloric obstruction occurs in about 20 percent of cases. Myomata found most often between the ages of 30 and 70 years. Outland and Clendenning report a case in a boy aged 7.

**Case No:** 1

A 56 year old male, apparently in good health, had severe gastro-intestinal upsets consisting of vomiting and diarrhea, ranging upwards of stools 20 per day about one year ago. The last episode in February lasted about one week and patient had small amount of blood in bowel movement. Since then has had no distress of stomach and bowel movement has been regular up to the date of admission to the hospital on March 23, 1954.
The physical examination was not remarkable. The abdomen was soft and no mass nor tenderness were elicited. The blood count showed RBC 5,260,000, Hemoglobin 91 percent, WBC 9,800, which were consisted of neutrophil 72, lymphocyte 23, monocyte 3, and eosinophil 2.

The stomach was opened with a longitudinal incision on its anterior wall. The polyp was readily excised including its base and the wound was closed.

The tissue examination revealed (Fig 4) (1) Grossly soft to firm, tan-pink to purple piece, the largest 10 by 9 by 3 mm and the smallest 3 by 3 by 2 mm; (2) Microscopically adenomatous polyp of the stomach, low grade inflammation, no infiltrative growth was found.

Progress: The patient was discharged in improved condition on March 3, 1954.

Comment on polyps: Benign adenomas of the stomach also are referred to as polyps, polyposis and adenopapillomas. The term “polyp” refers to the gross appearance of the tumor, not its histologic structure. They occur as round, sessile or pedunculated, single or multiple projections into the lumen of the stomach. In one-half the cases of polypoid adenoma, the tumor is single and in most of the remaining cases only few of the small tumors are present. Diffuse gastric polyposis is considered a rare disease. The autopsy incidence of polyposis is about 1.7 to 1.9 percent of all benign tumors of the stomach. Polyps occur in about 15 percent. Among polyps, about 80 percent are sessile, 10 percent pedunculated, about 65 percent are single and 35 percent are multiple. The most common site of gastric polyps is on the posterior wall in the region of the pylorus. Single polyps are most common near the pylorus; and according to Johnson, Basch and Higgins, multiple polyposis are more common in the mid portion of the stomach. Polyposis of the stomach may be associated with polyposis of the intestinal tract.
Brunn and Pearl noted a generalized polyposis in 7 percent of cases.

The most important clinical aspect of adenoma is its tendency to undergo malignant change. Diffuse polyposis of the stomach is not commonly associated with carcinoma. According to Walters, multiple gastric polyposis are rarely malignant, whereas single gastric polyps are frequently malignant. Miller, Eliason and Wright reported malignancy in 35 percent of 23 cases of gastric polyps. Brunn and Pearl reported 12 percent and McRoberts revealed a grade one malignancy in 4 of gastric polyps. Brunn and Pearl reported 12 percent and McRoberts revealed a grade one malignancy in 4 cases out of five. According to Bockus, the cauliflower-like papilloma is comparatively rare but transformation into malignant tumor probably occurs frequently, and some fungating cauliflower-like carcinoma may originate as benign papillomas. The diffuse type of polyposis may show a familial tendency. Schindler and Mac Glone reported cases of hyperplastic diffuse polyposis occurring in the same family. The majority occur above the age of 40 with males predominating. According to Schindler, adenomatous polyps are more prone to develop in cases of atrophic gastritis rather than in a normal mucosa.

Case No. II

A 68 year old white female, obese and chronically ill with diabetes and rheumatoid arthritis gave a history of duodenal ulcer which had been asymptomatic. For the past six years the patient has been complaining of heat intolerance, nervousness, palpitation, sweating palms and a lump in the midline of the neck. She was admitted to the hospital on March 27, 1954 for further medical observation.

Physical examination (Fig. 5) showed no exophthalmus but the thyroid was diffusely enlarged in the midline of the neck. looked abdomen was obese but not tender and no mass was palpated. Her blood count showed RBC 4,870,000, Hemoglobin 97 percent, WBC 9,200 consisting of neutrophil 75, lymphocyte 15, monocyte 5, eosinophile 5, fasting blood sugar ranged from 120 to 175mg/100ml at different examinations, and the Kahn was negative.

The x-ray examination done on March 29, 1954 revealed a well defined smooth tumor on the anterolateral aspect of the greater curvature in the mid portion of the body of the stomach measuring approximately 1 by 1.5 by 4 centimeters and was located more anteriorly than laterally. It is thought to be intramurally located and to distort the mucosal pattern slightly but not to invade or ulcerate the mucosa. The patient was not locally tender in this region and the tumor mass could not be palpated through the abdominal wall. The peristalsis was not seen to pass through this region. The tumor was rather firm, but the surrounding gastric wall did not appear to be infiltrated or fixed. This finding probably represents a benign tumor, such as myoma, fibroma, adenoma or lipoma. This study does show a deformity of the distal third of the duodenal cap evidently the residual of an old healed duodenal ulcer. Three days later examination was repeated and a benign tumor on the greater curvature of the stomach was reconfirmed, and it is doubtful that the tumor is accounting for this patient's symptoms.

The operation performed on April 12, 1954, on the greater curvature of the stomach and on the posterior wall, revealed a nodule measuring about one inch in diameter. It was between the serosa and mucosa and it consisted of grossly fatty tissue. Otherwise, the stomach was normal to palpation. The pancreas was movable, and the gallbladder was thin walled and contained no stones and the liver was normal. A vertical incision was made in the posterior serosa of the stomach over the tumor and the tumor was shelled out by resection.

The tissue examination revealed (1) Grossly flat, round, yellow, fatty mass measuring 2.5 by 1 centimeters in size; (2) Microscopically adipose tissue with relatively large cells and very few septa. No malignancy was present.

(Fig. 5)
Final diagnosis: Lipoma of the stomach.

Progress: Patient was discharged on April 17, 1954 in improved condition.

Comment on lipoma: Lipomata are among the least common of benign gastric neoplasms. Kirshbaum found the autopsy incidence of lipoma of the stomach is about 0.018 percent. Approximately 5 percent of lipomata of the gastro-intestinal tract occur in the stomach. In 1,125 gastric tumors Hunermann found 4 lipomas or approximately 0.36 percent. In a series of 1,81 cases of gastrointestinal lipomatas collected by Comfort in 1931, there were 22 cases of gastric lipoma but only five of the latter caused symptoms. Four cases of gastric lipoma were encountered in 3,924 necropsies reported by Eliason and Wright. Badner and Caplan reported a case of lipoma of the stomach in 1952 and claimed his case to be the fifty-fifth reported case. They are usually sessile pedunculated, single or multiple tumors ranging from hazelnut to walnut size. The majority of gastric lipomas originate in the submucosa. In 9 cases observed by Kirshbaum, 8 cases were located in the submucosa. Spitzmuller reported a case of submucous lipoma measuring 20 by 27 centimeters. It is generally located in the body and pyloric antrum of the stomach. It is usually noted in individuals over 40 years. The sex incidence is about equal with perhaps a slightly greater frequency in males. Malignant change from lipomata is very rare.

Clinical Symptoms

Unfortunately benign tumor of the stomach does not induce symptoms which are pathognomonic. The clinical behavior of benign tumors depends on such factors as size, intragastric or extragastric protrusion and whether they are located near of far from the gastric orifices. The intragastric tumors are likely to cause more symptoms than extragastric growths. If they are situated at or near the cardiac orifice, they may cause dysphagia; in the region of the pyloric orifice, they may cause intermittent or persistent pyloric obstruction. Only 15 percent of the benign tumors of the stomach reported in the literature were associated with the symptoms of pyloric obstruction. A pedunculated tumor situated near the outlet of the stomach may cause obstruction of the intermittent ball-valve type, or it may pass into the duodenum and induce gastric intussusception. Thus, pedunculated tumor of the pyloric antrum may cause intermittent pain, vomiting and retention followed by a quiet interval as the tumor recedes into the more proximal stomach. In Eusterman and Senty’s cases, obstruction occurred in 25 percent; in Kiefer’s series and Judd and Hoerner’s cases, vomiting occurred in 33 percent and 34 percent respectively.

Tendency to bleed is one of the remarkable features. Ulceration of the mucosa over the tumor is the source of the hemorrhage. Bleeding may range from oozing resulting in anemia to massive hemorrhage which, while grave, usually is not fatal. In Eusterman and Senty’s cases, recurring hemorrhage was present 37 percent in Judd and Joerner’s series, 22 percent. In Brunn and Pear’s series of diffuse polyposis, by contrast, hema­mesis occurred in only 8 percent of the cases. Haring collected 41 cases of gastric polyp having the blood picture of primary pernicious anemia. This association has led to the hypothesis of the sequence of atrophic gastritis, gastric polyp and gastric cancer. Gastric analysis frequently shows an achylia.

Diagnosis

In most cases, physical examination is of no help. If the tumor is large enough, it may be palpated, but that is extremely rare. The most significant step toward diagnosis is x-ray examination. A very small benign tumor is difficult and sometimes impossible to visualize, however, even a very small tumor near the pylorus will usually produce a definite filling defect, Schlesinger says benign tumors can only be diagnosed as such when the contour shows smooth round lines. The criteria for roentgen diagnosis of benign tumor at

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enunciated in 1924 by Moore have been quoted extensively.

These criteria are: (1) Filling defect which is circumscribed or punched out. (2) Filling defect on the gastric wall leaving curvatures regular and pliant. (3) Rugae surrounding the tumor which are more nearly normal in arrangement and distribution than in inflammatory or malignant lesions. (4) Minimal disturbance in peristalsis but with retention rather common. (5) Absence of niche, incisura or other evidence of spasm. (6) Rarely a tumor sufficiently large to be palpated. (7) Splitting of barium as it passes over the wall. (8) Gastric polyposis presents a typical mottled appearance but must be differentiated from particles of food in a stomach filled with secretion. (9) Close and complete approximation of the walls of the barium filled stomach. He stated that if these signs are not characteristic, they are at least suggestive.

However, the differentiation between benign and malignant tumors on the basis of the roentgen defect is not always possible. Often leiomyomas and intramural adenocarcinoma cause identical roentgen findings.

Gastroscopic examination furnishes an essential adjunct to x-ray and gives complementary information, as to the nature and extent, and superficial appearance. But gastroscopy does not differentiate between benign and malignant intramural tumors, but is of some assistance in the differential diagnosis of mucosal polyp-like growths.

Since the potentiality of benign tumor of the stomach to become malignant is great as previously stated, the final diagnosis of the benign tumor of the stomach must be relied on microscopic examination in addition to roentgen examination and gastroscopic findings.

**Treatment**

Once the diagnosis of gastric tumor has been established, the treatment is primarily surgical. The only divergence of opinion which exists with reference to surgical treatment relates to the type of operation employed. Bockus qualified his recommendation of surgery by saying that if x-ray and gastroscopic evidence of benign tumor is found, occasionally operation may be postponed but frequent re-examinations should be carried out. Furthermore, he stated that it is impossible for the surgeon to determine by inspection and palpation whether the tumor is malignant or not, so that gastric resection is the operation of choice. Balfour and Henderson remarked that while the possibility of malignant degeneration makes partial gastrectomy advisable, when the tumor is the only lesion, transgastric local excision may be utilized. Judd and Hoerner recommended that local excision be applied when the tumor is small, simple, uncomplicated and of no apparent clinical significance or when the lesion is near the cardia or is inaccessible. Subtotal gastric resection has been advised by Dudley, Miscall and Morse because of the high incidence of malignant degeneration. Hunt reported that about sixty percent of the tumors, mostly pyloric, have been removed by partial gastrectomy and that sleeve resection had been used in a small proportion of cases. Kiefer concluded that the type of operation to choose is wide excision or resection, Bockus, Lahey, and Colcock noted that total gastrectomy may be necessary in a few cases.

Kiefer pointed out that malignancy always is a possibility and that the demarkation of benign leiomyoma, and fibromas from the malignant leiomyosarcomas and fibrosarcomas is indistinct. Bockus stated that simple excision has been followed in a number of instances by the occurrence of a malignant lesion at the site of the original growth. Rigler and Erickson reported two samples of malignant degeneration—one followed a local excision four years later and the other one presented an autopsy specimen of a benign lesion situated immediately adjacent to a malignant lesion.

**Summary**

A review of the literature of benign gastric tumors has been presented along with three cases of benign gastric tumors, that is, leiomyoma, polyp and lipoma. The x-ray findings were suggestive of typical benign tumors of the stomach in all three cases, in which the clinical findings were vague digestive complaints.

**References**

3) Comfort, M. W.: Submucous Lipomata of the Gas