

GENERAL STAFF MEETING
MINNESOTA GENERAL HOSPITAL
UNIVERSITY OF MINNESOTA

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I. ANNOUNCEMENTS:

1. Fall meeting of Medical Six O'clock Club, Shevlin Hall, Tuesday, December 6, 1932, 6 P.M. Dinner 75 cents. Program: Dean Elias Potter Lyon, Dean Richard Everingham Scammon, Director Halbert Louis Dunn. Professorial lecturer - Arnold Schwyzer. You are cordially invited.

2. Minneapolis Community Fund Undersubscribed, but University quota met. Our appreciation to all. Many who failed to give still have an opportunity to do so. Give to Miss Miller in Director Dunn's office. Thank you!

3. Professor W. R. Bloor, who is to be a guest speaker at the joint meeting of the Hennepin County Medical Society and the Northwestern Pediatric Society on December 5, is at the present time Professor of Physiological Chemistry and Pharmacology at the University of Rochester Medical School, Rochester, N.Y. He took his doctor's degree under Folin at Harvard University in 1911, and since that time has held professorial positions at Washington University, St. Louis, Harvard, and at the University of California. He is looked upon by most medical men as the most eminent authority in America on the chemistry of fat metabolism. His methods for determining cholesterol lecithin and total fat in the blood and tissues are widely used.

His subject on December 5th will be "The Clinical Significance of Recent Studies in Lipid Metabolism." He will probably consider such diseases as nephrosis, malignant tumors, multiple xanthomatosis, anemia and rickets.

Irvine McQuarrie, M.D.

4. D. _____ M. _____ diagnosis: Probable pituitary basophilism, Bulletin General Staff Meeting, Minnesota General Hospital 4, 48-50, (Nov. 10) reports by mail that she is feeling about the same. Because of continued back pain (see history), consulted chiropractor who found "vertebrae pulled apart." "Now back in place", she feels much better. This should be final answer to question what has happened D.M.?

5. Minnesota State Medical Association plans to hold next annual meeting at St. Mary's Hospital, Rochester, Minnesota, May 22, 23 and 24 (Monday, Tuesday and Wednesday). Reserve these dates on your calendar and plan to be present. Because of unusual success of 1931 meeting in St. Paul, plans for greater program are under way.

II. CASE REPORT

CARCINOMA OF STOMACH;
SPONTANEOUS PERFORATION
PERITONITIS.

Path. Koucky.

Note: Age, sex. Abrupt onset (70% type). Usual average delay (7 months). Usual story (pain, vomiting, weight loss). Prompt diagnosis when first seen (usual story of successful x-ray study is just before we see them). Exploration. Delayed perforation - peritonitis. Other lesions present.

The case is white male, 73 years of age, admitted to University Hospitals 10-9-32 and expired 11-2-32 (24 days).

Pain - abrupt

3- -32 - Developed soreness in epigastrium. Made worse by dietary indiscretion.

More pain

8- -32 - Pain again developed in epigastrium, associated with nausea but no vomiting. Pain not constant. Soreness and tenderness also present. Slight constipation.

Jaundice

10- -32 - Observed slight jaundice, accompanied by gastric upset. More severe than previous symptoms. Lost a considerable amount of weight. Indigestion gradually more severe.

7 Month's delay

10-5-32 - Consulted physician. Complete examination, including x-ray studies done. X-ray report by physician: large carcinoma involving lower third of the stomach.

10-9-32 - Referred to University Hospitals, for exploratory operation. Physical Examination: Blood pressure 130/90.

Abdomen - slightly distended; hard mass is palpated in left upper quadrant somewhat tender on pressure. Heart - blowing systolic murmur over apex. Extremities - slight pitting edema of feet and ankles. Rectal - slightly enlarged prostate.

Laboratory: Blood - Hb. 58%, rbc's 2,800,000, wbc's 10,800. B.U.N. - 20.4. Gastric expression - no free hydrochloric acid, total 97°. P.S.P. - total 40%. 6 Ft. Heart plate - Heart is within normal limits. Some prominence of left ventricle and some lengthening and tortuosity of thoracic aorta. There is also some diaphragmatic pleurisy on the left. Electrocardiogram - left ventricular preponderance, arborization block, prolonged R-T interval.

10-13-32 - Operation - under spinal anesthesia, abdomen opened. Extensive infiltrating carcinoma extending into pancreas. Liver felt nodular and was thought to contain metastases. Abdomen closed after taking biopsies of omentum and peritoneum. Microscopic examination shows marked leucocytic infiltration with some exudate. Diagnosis - Peritonitis. Postoperative course immediately after operation was uneventful. Given paraoral fluids. Nasal suction started. Temperature and pulse - within normal limits.

10-17-32 - Slight rise in temperature. Quite comfortable.

Wound Breaks

10-21-32 - No complaints. Suction discontinued. The wound broke down. Dichloramine-T packs inserted.

10-23-32 - Necrotic tissue removed from wound.

Urinary difficulty

10-27-32 - Temperature 101.3. Permanent catheter inserted into bladder because patient is having some difficulty in voiding.

10-29-32 - Great deal of distention. Complains of gas pains. Surgical pituitrin and Noble's enema given.

Sudden change (17th day)

10-30-32 - Restless. Perspires profusely. Skin cold. Complains of pain in

left chest. Abdomen is distended. Blood pressure 80/42. Pulse 84. Temperature 101. Following this rather sudden change, temperature dropped to 96 and remained subnormal all day. Systolic blood pressure ranged all day from 65 to 100. Peculiar collapse-like condition caused by?

11-1-32 - Temperature rising, at end of day 104°. Perspiring profusely. Pulse very weak and thready. Drowsy and semi-comatose during latter part of day.

Exitus

11-2-32 - Condition much worse. Blood pressure 78/54. Pulse 158. Temperature 104.4. 8:45 A.M. expired.

AUTOPSY

Operation wound

Body is well-developed and fairly well-nourished, white male, about 73 years of age, measuring 167 cm. in length and weighing approximately 185 lbs. Rigor just beginning. 1+ edema of ankles. No cyanosis. Slight icteric tinge of skin. Recent incision in left upper quadrant, measuring 11 cm. in length, suppuration in its lower portion.

Perforation - peritonitis

Peritoneal Cavity. Extensive peritonitis of about 3 or 4 days duration? Several hundred c.c. of thin, yellowish pus spread regularly throughout abdomen. Considerable collection of thin pus in pelvis. Under dome of diaphragm and between liver and stomach, particularly in lesser omental cavity, (in bottom of Morrison's pouch) inflammation appears to be more than 3 or 4 days duration. Exudate more organized and heavy in this area. Appendix is present and shows no particular change.

Fluid

Pleural Cavities show slight excess of clear fluid on both sides. Pericardial Sac contains no excess fluid.

Aortic and Coronary Sclerosis

The Heart 425 grams. Musculature heavy and hypertrophied. The mitral and pulmonary valves are quite normal. Aortic leaflets at base (junction of

leaflet and aorta) show moderate degree of sclerosis. Edges of valves are free. Finger can be easily passed through orifice but aortic ring cannot be stretched because of the calcification. Commissures of valves not separated. Root of the Aorta shows rather extensive calcification behind the pulmonary valve and moderate amount of atheromatous change at the root of the aorta near the arch. Coronaries: Left main branch shows about 3+ sclerosis. Lumen of vessels considerably decreased. On right side in main branch of the vessel, there is about 1 to 2+ sclerosis. No areas of thrombosis, or infarction or areas of fibrosis can be found in the heart muscle.

Atelectasis

Lungs show considerable degree of atelectasis on both sides. On left side there is almost complete collapse of lower lobe. On right side, lower lobe is slightly more than half collapsed. There are no areas suggesting pneumonia in either lobe. Left weight 500 grams, Right 550 grams.

Soft

Spleen weighs 210 grams. It is soft and flabby. A large amount of pulp comes away with scraping knife. Capsule is involved by peritonitis noted above.

Cirrhosis

Liver 1575 grams. Capsule considerably thickened and shaggy (exudate). Contour of liver irregular. Several large, bulky lumps can be palpated within liver and surface is finely granular. On cross section, bulky areas within liver are not metastases but are septae and fibrous tissue bands running across liver giving appearance of false lobes. In addition to this change, there are throughout liver substance small, roundlike masses of liver tissue without normal liver markings giving cut surface of liver a granular appearance (regeneration adenomas?).

Gall-Bladder is involved in the peritonitis. Wall thickened by edema and exudate. Bile ducts not compressed. No lymph nodes at hilum of liver.
enlarged

Carcinoma

Gastro-Intestinal tract. Esophagus shows only postmortem change. Upper part

of stomach is dilated and contains considerable amount of semi-digested blood. There is a bulky, extensive, cauliflower carcinoma involving lesser curvature, part of posterior wall and all of anterior wall down to greater curvature. Carcinoma is ulcerated and ulceration has extended through entire thickness of stomach wall and is source of the peritonitis. Opening through carcinoma at lesser curvature is about 2 or 3 cm. in diameter. Carcinoma is closely attached to capsule of liver but has not invaded liver substance. Small bowel and colon show no changes other than those secondary to generalized peritonitis, i.e., distention, shaggy exudate, redness, edema (particularly of mesentery). Large omentum has been fused into carcinoma. Numerous lymph nodes which are hard and white and suggest malignant involvement.

Invaded

Pancreas is intimately fused with carcinoma at lesser curvature of stomach. Metastatic lymph nodes and direct extension into substance of the pancreas cannot be differentiated within this mass.

Adrenals are uninvolved and show no atrophy or hemorrhage.

Fine Pits

Right Kidney 150 grams, Left 125 grams. Capsule intimately adherent. Surface finely granular, pitting is regular and small. Pelvic fat markedly increased in amount. Cortex, particularly, is thin. Cut surface granular. The appearance is that of a hypertensive arteriolar sclerosis.

Prostatic hypertrophy

Bladder has remarkably thick wall. Hypertrophy of muscle has occurred. In addition, in mucosa, there are many hemorrhagic spots and edematous cystitis.

Prostate shows definite increase in size. Projection into posterior part of urethra and into the bladder immediately behind the opening of urethra.

Sclerosis

Definite ectasia of arch of Aorta, arteriosclerotic basis. No evidence

of syphilis. The arteriosclerotic process is more pronounced in lower part of thoracic and lumbar aorta.

Metastasis

There are many Lymph Nodes along the aorta, renal vessels and celiac axis artery. About 7 or 8 of these are dissected and many are grossly involved by carcinoma. No carcinoma is found in mediastinal or thoracic nodes or in the left subclavian region.

Neck. Thyroid is dissected and shows no adenomas or other gross changes.

Head. Not examined.

DIAGNOSIS:

1. Carcinoma of Stomach.
2. Spontaneous perforation.
3. Generalized peritonitis.
4. Metastases to regional lymph nodes.
5. Infiltration of pancreas.
6. Separation of operative wound.
7. Hypertrophy of heart.
8. Early aortic stenosis.
9. Marked coronary disease.
10. Ectasia of aorta.
11. Arteriosclerosis.
12. Hypertensive kidney.
13. Benign hyperplasia of prostate.
14. Hemorrhagic and edematous cystitis.
15. Splenitis.
16. Bilateral pulmonary atelectasis.

III. CASE REPORT

CARCINOMA OF STOMACH; RESECTION OF RECURRENCE, ACUTE PERITONITIS, PNEUMONIA, LUNG ABSCESS.

Path. Mead.

Note: Age, Sex. Story of injury (probably no connection). Abrupt onset. Short history (70% type). Usual average delay (6 month). Usual story (pain, vomiting, weight loss). Successful resection. Recurrence. Unsuccessful resection. Cause of death (which one responsible?).

Case is white male, 65 years old, admitted to University Hospitals 7-29-29, discharged 8-27-29; readmitted 10-14-30, expired 10-30-30. (46 days).

Injury

1926 - Injury to left chest. Struck by cable on left side, knocking him to ground. Unconscious for 1/2 hr. Thereafter, considerable pain in left side and shoulder. Unable to work for 4 months.

Pain (Abrupt).

2-1-29 - Developed localized burning in epigastrium. Comes on about 1/2 hr. after meals, lasts about 15 minutes, partially relieved by coffee and milk.

3--29 - Emesis developed after eating, consisting mostly of water, with bitter taste. Dark stools occasionally. Weight loss approximately 40 lbs. in past year.

Admitted - 6th month

7-29-29. Complaints: No great change from above. Physical examination: Essentially negative except for emaciation and abdomen - mass present below left costal margin, tenderness on pressure, no rigidity or evidence of metastatic nodes.

Laboratory

Urine - trace albumin, numerous wbc's. Hb. 98%, wbc's 7,000. Gastric analysis - after test meal - no free Hcl, combined acidity 30 cc., lactic acid present, benzidine test negative. Stool - benzidine test + (2 examinations). X-ray: Gastrointestinal - little retention of barium in stomach at end of 6 hrs. Normal peristalsis up to distal third where it is lost on lesser and greater curvatures. Stomach emptied rapidly. Large filling defect made out in this region. No perigastric mass made out. Probably represents operable carcinoma. Chest - pleural adhesions. Spine - chronic hypertrophic arthritis, spondylolisthesis of 4th lumbar vertebra.

Operation. Subtotal gastrectomy.

8-7-29 - Anesthesia-spinocain, reinforced later by ethylene. Findings - Carcinoma in pyloric end of stomach and few small carcinomatous metastases in peritoneum of stomach just over tumor. Culdesac, liver and remainder of peritoneal cavity free of metastases.

Lymph nodes at pyloric end of stomach show few nodes rather suspicious of tumor.

Subtotal gastrectomy with anterior Polya anastomosis done. Microscopic examination shows gelatinous type of carcinoma. Ulcer 3 x 4 cm. with indurated edges. No metastases to nodes. Postoperative course - complicated by development of parotid swelling which subsided under treatment. Discharged - 8-27-30.

Interval history

Completely free of all symptoms until Dec. 1929, when sharp intermittent pain was noted. Pain worse and in morning with intake of food. Good appetite. No vomiting. No tarry stools or weight loss. Pain getting progressively worse.

4- -30 - Developed small sinus at site of scar (previous operation).

Admitted - 10-14-30 (15 months post-operative)

Physical examination - negative except for tenderness in region of epigastrium.

Laboratory: Urine - negative. Hb. 80%.

X-ray

Gastro-intestinal study - Gastric resection with anastomosis is shown in about middle third of stomach. Proximal portion of stomach fills out quite well and appears normal. There is considerable irregularity and thinning out at anastomosis which is very suggestive of recurrence of carcinoma. Marked tenderness on palpation in this region. At end of 6 hours, stomach empty and head of meal in cecum. Conclusions - Well functioning anastomosis. Recurrence of carcinoma of stomach.

10-24-32 - Operation:

Findings - on opening abdomen, small, hard, infiltrated mass found in greater curvature. Sutures which had been placed in seromuscular layer at previous operation still visible. One very large, hard gland at mesentery of small intestine near anastomosis. Small intestine, distal to anastomosis, somewhat brownish in color. Few white spots on mesentery like those seen in tuberculous peritonitis (tumor?). Liver and culdesac free. No evidence of tumor elsewhere. Subtotal gastrectomy done after cutting left ligament of liver freeing left lobe. Stomach then freed on all sides as well as jejunum and a Polya anastomosis made between jejunum and stomach.

Pathological examination

Shows section of small intestine, 22 cm. in length, with attached anastomosed small area of stomach. Stomach is hard, white fibrous and grossly appeared involved with carcinoma. Hard area extended to line of anastomosis of bowel. Microscopic examination - diffuse infiltration with replacement of normal structures by small gland-like formations of large clear cells suggesting appearance of original carcinoma.

Post-operative course - Condition throughout first day fair.

Complication 2nd day.

10-26-30 - Slight rise of temperature. Chest - rales in both bases, more on right side.

X-ray - bilateral pneumonia shown.

10-27-30 - Many rales in both sides of chest. Placed in oxygen tent. Quite dyspneic.

10-28-30 - Chest remains same.

10-29-30 - Temperature climbing. Elevated pulse.

Exitus 6th day.

10-30-30 - Expired of symptoms of so-called pneumonia.

AUTOPSY:

Operation wound

Body white male, 77 cm. in length, weighing about 150 lbs. Good development and nourishment. Cyanosis of finger nails. No edema or jaundice. Left rectus, supraumbilical, unhealed incision, 18 cm. in length. Bony protuberance attached to 8th rib in anterior axillary line, apparently an exostosis. Mild abdominal distension.

Peritonitis

Peritoneal Cavity severe peritonitis involving left upper portion of abdomen. Appendix retrocecal and bound down.

Adhesions

Pleural Cavities generalized adhesions on both sides. Pericardial Sac a yellowish-white plaque on anterior surface of heart.

Heart 360 grams. No evidence of valvular disease or myocardial fibrosis. Root of Aorta and coronaries

normal.

Pneumonia, abscess

Left Lung 950 grams, Right 1750 grams.

Both present definite lobar consolidation with marked purulent exudate. In lower posterior portion of right lower lobe is definite abscess measuring 2 cm. in diameter and containing necrotic purulent material.

Spleen 180 grams. Soft.

Liver 1900 grams appears normal.

Gall-bladder contains viscous dark green bile. Normal mucosa. No stones.

Anastomosis

Gastro-intestinal Tract shows an end to side anastomosis of duodenum to jejunum and an anastomosis of jejunum to stomach with only a very small portion of stomach remaining. Anastomosis between stomach and jejunum is intact. No evidence of leakage. Anastomosis between duodenum and jejunum present area of leakage with brown material about anastomosis and considerable acute peritonitis throughout left upper part of abdomen. Examination of anastomosis and surrounding area including lymph nodes shows no evidence of carcinoma.

Pancreas normal. Adrenals normal.

Right Kidney 165 grams, Left 200 grams. Both present fine cortical pitting. Urinary bladder and Genital Organs normal. Organs of Head and Neck - not examined.

Diagnoses:

1. Carcinoma of stomach (clinical).
2. Operative incision.
3. Partial gastrectomy.
4. Anastomosis duodenum to jejunum, jejunum to stomach.
5. Localized peritonitis.
6. Bilateral lobar pneumonia.
7. Lung abscess.
8. Bilateral pleural adhesions.
9. Exostosis of old rib (fracture).

IV. ABSTRACT:

CARCINOMA OF STOMACH.

Ref.:

1. Rigler, L. "The Early Diagnosis of Carcinoma of Stomach", Minn. Med. 13: 784, (Nov.) '30.
2. Sagel, J. Factors in Delay in Diagnosis of Carcinoma of Stomach. To be

published.

3. Files of Cancer Institute, University of Minnesota Hospital.

4. Warwick, M. "Analysis of 176 Cases of Carcinoma of the Stomach Submitted to Autopsy", Ann. Surg. 88: 216-226, (Aug.) '28.

5. Schwyzer, A. "A Clinic on Surgery of the Stomach", Minn. Med. 10: 77-88, '27.

6. Balfour, D. "Annual Report on Operations on the Stomach and Duodenum for 1931." Proc. Staff Meet. Mayo Clinic 7:99-104, (Feb.17), '32.

7. Balfour, D. "The Curability of Cancer of the Stomach", Surg. Gyn. and Obst., 54:312-316, (Feb. 15), '32.

8. Gatewood Gatewood. "Carcinoma of the Stomach, An Analytical Study", Ann. Surg. 46:588-594, (Oct.) '32.

9. Ransom, H. and Coller, F.A. "Carcinoma of the Stomach", J. Mich. State Med. Soc. 31:87, (Feb.) '32.

10. Kasper, M. "Ergebnisse nach Magenresektion wegen Karzinom", Beitr. z. Klin. Chir., 152:339-350, '31.

11. Cughtersen, A. "End Results in the Treatment of Carcinoma of the Stomach", Yale Jr. Biol. & Med. 4: 711-728, (May) '32.

12. Saltzstein, H. & Sandweiss, D., "The Problem of Carcinoma of the Stomach," Arch. Surg. 21:112-127, '30.

13. Dwyer, Blackford & Turner. "Gastric Cancer," J.A.M.A. 93:1453, (Nov.) '29.

14. Hartman, H. "Les resultats eloignes de la gastrectomie dans le cancer de l'estomac (125 observations)" Bull. de L'Academie de Med. 57:95-98, Jan. 19, '32.

15. Alvarez, W. "How Early do Physicians Diagnose Cancer of the Stomach in Themselves?" J.A.M.A. 97: 77-83, (July 11,) 1931.

16. Holmes, G. W. and Hampton, A. O. "The Incidence of Carcinoma in Certain Chronic Ulcerating Lesions of the Stomach." J.A.M.A. 99:905-909, (Sept.10,) 1932.

17. Maes, U. "The Patient with Carcinoma of the Stomach." Am. J. of Cancer 16:815-829, (July) '32.

1. Introduction:

With the exception of a review of benign tumors of the stomach and the relationship between the acid values and the development of cancer

of the stomach, no attempt has been made to consider before this group the general subject of carcinoma of the stomach.

Today we have attempted to bring together certain facts concerning this disease and some of the problems connected with its origin, diagnosis and treatment.

The commonest tumor of the stomach is carcinoma. The types vary: (1) Bulky adenocarcinoma. (2) Gelatinous carcinoma (usually a variant of adenocarcinoma). (3) Carcinoma engrafted on peptic ulcer. (4) Diffuse infiltrating (flat or ulcerated) scirrhous carcinoma of which linitis plastica is probably a variant. Ulceration is probably present in all but varies in degree. This must be constantly kept in mind. Certain features of carcinoma of the stomach are of interest. As a general rule, they represent widely infiltrating, rather superficial neoplasms. The most suggestive origin aside from ulcer is precancerous polyposis or gastritis. While the disease is much more common than malignant lesions of the esophagus in most countries, Oriental races show a predominance of esophageal growths, e.g. China.

There are wide variations in the behavior of different tumors. With perforation of the muscularis mucosa, lymphatic invasion occurs to regional nodes and surrounding structures. Other metastases may occur to a variety of locations. The only treatment available is surgical removal of the lesion and its extensions. The result is frequently not good because of the poor general condition of the patient and the frequency of lesions difficult to resect. According to Balfour, palliation may often be obtained by partial resection. A few years ago the average case had little to expect in the way of surgical aid. The number of cures is now growing rapidly and should encourage us in attempting to diagnose gastric carcinoma earlier and improve our surgical technique so as to increase the number of cures.

2. Material Abstracted:

U. of Minn. Hospital	187 cases (consecutive)
Mayo Clinic	128 cured cases.
U. of Mich. Hospital	469 cases (consecutive).
Presbyterian Hosp., Chicago	417 cases (")

General Hospitals of Detroit (Group)	300 cases (consecutive).
Yale U. Malignancy Clinic	120 cases (")
Collected Statistics German Clinics	
Bell's Necropsy Studies (U. of Minn.)	176 cases (")
French series (Hartman)	125 cases surviving resection.

Impressions of Alvarez, Maes, Holmes (New Orleans A.M.A. meeting).

3. Frequency

Rigler: Cancer of stomach causes 1/3 of all cancer deaths. By comparison:

Ca. of stomach	4.6%	all deaths over 45.
Ca. of uterus and ovary	1.5%	
Ca. of breast	1.0%	
Pneumonia	3.8%	
Diabetes	2.0%	

4. Age:

U. Hospitals

By decades:

20 - 30	2 cases
31-- 40	6 "
41 - 50	21 "
51 - 60	64 "
61 - 70	59 "
71 - 80	35 "
All cases	58 (average)
Youngest	27
Oldest	77

By disposition:

No operation	59 yr. (avg.)
Laparctomy	53
Gastro-enterostomy	61
Resections	60

Note: (1) 4% of our own group under 40. (2) No significant difference in age between the different types of treatment possible.

5. Sex:

	<u>Male</u>	<u>Female</u>
U. Hosp.	84%	16%
Warwick	81%	19%
Gatewood	72%	28%
Oughtersen	71%	29%
Bansom and Collier	84.5%	15.5%

Statistics based on hospital or autopsy groups show a higher proportion of males. Proper adjustment might raise the percentage of females. In spite of this problematic difference, more recent series show a high percentage of males rather uniformly.

6. Duration of Symptoms: (months)

	U. Hosp.	Mayo	Detroit Hosp.
Resection	8	11	8
Gastro- enterostomy	6	9	9
Exploration	11	8	7
No operation	10	?	?

Balfour comments on the longer duration of symptoms in cases coming to resection. He feels that this is an indication of lower grade malignancy. The statistics found from Mayo Clinic do not correspond with this statement, but may be covered elsewhere. It is very difficult in many cases to accurately fix the actual time of onset of symptoms. In certain number, the patient is rather indefinite, while in others there is a long drawn out story of gastric disturbance.

J. Sagel, fellow in Radiology, University of Minnesota, attempted to do this by personal interview in the series of our cases. Follow-up studies were also made to find out if the diagnosis was correct. We are reporting his unpublished findings at this time.

Period of Study: July 1, 1929 to Jan. 1, 1931.

Material: 79 cases (Minneapolis General Hospital 11, Minnesota General Hospital 68.)

Sex: Male 63 (80%), Female 16 (20%).
Ratio 4 to 1. (Good sample).

Age Average: 59 years, youngest 39, oldest 81.

Average delay: in months between onset of symptoms and medical consultation: outside hospital: Of the group of 79 patients was able to use 56 (70%). Average delay - 2+ months.

Varied from none (within a month) to 10 months. 30% of cases could not be used because patients could not date the onset of symptoms (indefinite). Note how this compares with other series.

Time in months between seeing physician and diagnosis of gastric carcinoma:

Average delay 7 months. Varied from 1 month to 30.

Number who consulted doctor of medicine first: 77, others 2. However, many consulted other healers after primary consultation with physician.

Type of symptoms at onset: (late disease)

Pain	43
vomiting	23
belching	17
fullness	
after meals	10
anorexia	10
weakness	4
nausea	3
mass	1

Symptoms on admission to hospital:

Pain 89%, loss of weight 95%, vomiting 61%, weakness 95%, anorexia 66%, mass 37%. No symptom complex is characteristic of carcinoma of stomach except in very late stage. All series show above findings. One or more of these symptoms in adults in middle or late life should make one suspicious of carcinoma of the stomach.

X-ray examinations before admission to hospital (within 2 or 3 months) - 26 (33%). Positive diagnosis 3, questionable 2, negative 18, negative on two or more examinations 4. Of the 3 cases, negative diagnosis later positive at different place. While this may seem fairly good, majority were x-rayed just before admission.

Extent of lesion from local point of view (i.e. x-ray) (operability depends on extent of location: Operable - distal 1/2 to 2/3 - 27, inoperable 34, borderline 18.

No. cases operated and confirmed		
" " " by operation	42	
" " " and autopsied	20	
" " autopsied	25	
" " with wrong diagnosis by operation	3	
" " proven by operation or autopsy	47 - 60%	
" " with wrong diagnosis	6%	
" " " correct "	93%	

Other malignancies associated with cancer of stomach: 1 cervix, 1 corpus uteri, 1 prostate.

Three major factors prevent early diagnosis. Insidious onset similar to common gastric upsets does not call patient's attention to his illness. Peculiar individual characteristics, fear or economic distress cause delay. Third factor which is controllable is delay in making accurate diagnosis. By study of charts and personal interview, it was found that average duration of symptoms before consulting a physician was within 3 months. Diagnosis was delayed from 6 months to 2 years due either to inadequate examination, (sometimes inadequate facilities) or inability of physician to recognize findings. There was a definite tendency to place patients on alkalies, etc. and watch results for long periods of time.

Alvarez reviewed the case histories of a group of physicians afflicted with carcinoma of stomach. Physicians delayed as long with their own illness as long they did with their patients. In the group without history of previous gastric upsets, the average delay was 12 months. There was no difference in delay between the groups with and without expert x-ray facilities. The apparent conclusions to be drawn are:

- (1) The patient first comes to medical attention early (3rd mo.)
- (2) The delay from first examination to time of treatment averages from 6 mo. to 10 mo.
- (3) Lack of diagnostic facilities seems to play no part in the delay.
- (4) Delay due to the mild insidious nature of onset and the inability to distinguish this from benign gastric disorders.

7. <u>First Symptoms:</u> (Gatewood) (417 cases)	
Pain	302
Loss of weight	282
Vomiting	177
Weakness	165
Loss of appetite	123
Fullness	90
Indigestion	56
Anemia	50
Tarry stools	36
Diarrhea	35
Dysphagia	33
Hemorrhage	33
Tumor	27
Regurgitation	21
Jaundice	11

Other statistics show only minor variations but apparently statistical studies fail to give a clear picture. Note: Dwyer, Blackford and Turner emphasize that "Pain" may be distress, soreness or pressure. Others (Alvarez, Maes, etc.) plead for the recognition of the mildness of the symptoms at onset: some soreness or distress in the abdomen, a little loss of weight, a falling off of appetite, slowly developing malaise and later periods of nausea or emesis; symptoms which "the patient can find a hundred excuses to explain."

8. <u>Ulcer symptoms:</u>	
Gatewood	12%
Saltzstein and Sandweiss	25%
Oughtersen	22%

Ransom and Celler on basis of pathological specimens considered malignant degeneration of a previous ulcer present in 9%.

Dwyer, Blackford and Turner, however, found 38% with a long previous history. This analysis showed many cases characterized by a 10 yr. history of dyspepsia, onset of carcinomatous symptoms indefinite, 70% with positive Hcl in gastric content, and distribution pylorus 83%, body 17% and cardia 0. (Distribution different than in general group of ca.)

Alvarez in his group of physicians found 50% with a long previous history.

It is generally admitted that in this group (30-50%) it is impossible

historically to point out the earliest onset of the carcinoma history. These patients are entirely dependent upon the roentgenologist for their fate as will be noted.

Note: Sagel series shows 30% with history too indefinite to fix onset. The tendency to call such indefinite stories, ulcer histories may account for the rather uniform finding of approximately the same number in other groups (with exception of Alvarez's small series of physicians). This is not to be confused with the academic argument concerning the origin of carcinoma from ulcer but rather the more practical question of the inability of making a diagnosis of ulcer without adequate x-ray confirmation.

9. Physical Examination: (Gatewood)

Emaciation	70%
Tumor	50
Ascites	8
Virchow's node	2

Note: These are statistical studies of all cases. The early cases have an entirely negative physical examination?

10. Laboratory:

Stool, positive blood	95%
Achlorhydria	73
Normal acid	16
Hypoacidity	11

Note: U. of Minn. Hosp. Staff Meeting (Feb. 26), '31, Pollard and Bloomfield "Gastric Secretion in Carcinoma of Stomach". Summary: Gastritis is associated with carcinoma. Most observers have concluded that growth produces gastritis. Authors believe all evidence point the other way: that gastritis precedes the growth and that carcinoma is prone to occur in stomachs already seat of chronic changes.

11. X-ray:

	Accuracy	Misleading
Gatewood	100%	5%
Ranson and Coller	76	3
Oughtersen	81	7
Saltzstein	89	13

(Misleading: Negative examination, wrong estimate of size, etc.)

Alvarez: This author is not as optimistic. In 507 resected cases, there

were 30% in which a definite diagnosis could not be made. In 46 (9%) called "ulcer", in 92 (18%) "lesion" was diagnosis.

Rigler: Early diagnosis is impossible from history or physical examination. Adequate x-ray facilities, repeated examinations and competent experienced examiner necessary. In such cases, early diagnosis is possible in 92 to 98% of cases with about 5% error or misleading diagnosis.

Rigler asks, Who should be submitted to expensive x-ray examination? Suggestion: A person over 40 with gastric upset showing occult blood in stool and diminution of acidity of gastric content.

12. What are the chances?

X-ray examinations are expensive and are frequently not done. indications vary in different individuals and groups. Dwyer, Blackford and Turner: 3000 consecutive gastro-intestinal x-ray examinations: 15% organic lesion; D.U. 10%, Ga 3%, gastric ulcer 1.9%, others .1%.

At the University of Minnesota, indications for such examinations apparently are little more definite and the number of functional cases is smaller. Lester G. Erickson, Fellow in Radiology, analyzed the records of all gastro-intestinal x-ray examinations from July 1, 1926 to October 15, 1932. This is incomplete and represents only a preliminary report. It varies in many respects from similar reports elsewhere.

Total No. of Cases	4,236
Normals	2,554
Ptosis - severe	118
Indefinite	66
Duodenal Ulcer	838
Duodenal ulcer with niche	652
Duodenal ulcer with obstr	186
Gastric ulcers	129
Body	74
Prepyloric	43
Pyloric	12
Both D.U. and G.U.	15
Carcinoma	210
Pyloric region	114
Mid Portion	37
Cardia	34
Whole	25

Hypertrophic gastritis	61
Benign Tumors of stomach	?
Carcinoma of Esophagus	10
Stricture of Esophagus	6
Paraesophageal Hernia	44
Paraduodenal adhesions	46
Possible Ca, Head of Pancreas	27
Duodenal Diverticuli	58
Diverticulum of Stomach	1
Diverticulum of Esophagus	9
Diaphragmatic Hernia	1
Pylorospasm	16
Pyloric stenosis	5
Cardio-spasm	6
Gastro Jejunal ulcer	12
Stricture of Stomach	1
Situs Inversus	2
Hairball	1
Syphilis of stomach	2

13. Ulcerative lesions (benign or malignant).

The principle interest settles about the diagnosis of the "ulcerative lesions" of the stomach. The criteria of "crater" and "filling defect" for a diagnosis of ulcer and carcinoma is no longer tenable.

Alvarez: The idea of ulcerated lesion denoting a benign lesion has permeated general medicine and has definitely damaged the possibilities for diagnosis of early cancer. No one in a single x-ray session can diagnose a gastric ulceration as benign for the simple reason that the pathologist with the lesion in his hand often cannot distinguish the two lesions.

Holmes, still further, will not accept the pathologists opinion of "benign" based on gross study and one or two microscopic sections.

Still further proof of the inability to distinguish ulceration of certain parts of the stomach as benign or malignant is to be found in the records of the Mass. General Hospital. In a group of 8 pre-pyloric ulcerations diagnosed clinically and at operation as benign and for which a gastro-enterostomy was done, follow-up showed that "the diagnosis was incorrect in every case, the correct diagnosis being carcinoma."

Holmes and Hampton after study of all gastric ulcerations at the Mass. General Hospital for a period of 10 years are lead to believe that benign ulcerations are almost entirely limited to the pylorus

(not pre-pyloric) and to the wall of the lesser curvature. They believe that "any chronic, indurated, ulcerating lesion occurring in the pyloric antrum within 1 inch of the pylorus, but without involving the pylorus, should be considered malignant until proved to be otherwise. (Proof is serial microscopic examination). They feel that wide surgical removal is justified for lesions in this area without medical or palliative treatment.

L. G. Cole (discussion of above paper) objects violently to the above statement. He feels that by "intensive study" with x-ray and by subsequent examination after "2 or 3 weeks" of medical care and bed rest a certain diagnosis between benign and malignant lesion can be made.

14. Location of Lesion:

	Holmes Ulcer	Ca	Warwick Ca	Dwyer, etal. (Long hist., tory Ca.)
Pyloric end	35%	62%	42%	83%
Wall	63	14	37	17
Cardia	2	17	11	0
Diffuse		7	11	0

Note: Support of previous statements.

15. Cause of Death: (No metastasis present) Warwick

<u>No metastases</u>	23% of group
Peritonitis	45%
Postoperative	22
Perforation	22
Obstruction	12
Operative shock	10
Hemorrhage	8
Severe anemia	5
Others (unrelated to Ca.)	20
<u>Metastasis found in</u>	
Liver	38
Perigastric nodes	36
Retroperitoneal nodes	28
Peritoneum	20
Omentum	13
Lungs	12
Mesentery	9

Bronchial nodes	9%
Pleura	8
Pancreas	7
Adrenals	5
Kidney	4
Diaphragm	3
Spleen	2
Gall-bladder	2
Bladder	2
Ribs	2
Uterus	1
Brain	1
Vertebrae	0.6
Prostate	0.6

Note: 23% without metastasis. This is frequently misstated in the literature. This series includes postoperative cases whose life cycle was cut short by operation. If only unoperated cases had been included, percentage would have been slightly lower. 16 of 40 were post-operative deaths and 29 of 40 were more or less unnatural. Rearranged, this data would be:

Total deaths without metastasis	23%
Total unoperated deaths	
without metastasis	14
Total "natural" deaths without metastasis	6

16. Cause of death all cases:

Peritonitis	26%
Postoperative	10
Perforation	15
Obstruction	19
Bronchopneumonia	7
Gastric hemorrhage	7
Operative shock	6
Severe anemia	5
Obstructive jaundice	5
All others	15

Note: Incidence of peritonitis.

17. Factors in operability: (Balfour)

In addition to usual general factors of operability of all types of cases, author emphasizes three points.

Size of lymph nodes is no criteria of operability. Hyperplasia from absorption may be cause of large nodes.

Operation without complete excision of nodes is permissible because sufficient cases are now on record in which cure resulted in such circumstances (hyperplasia?).

Position of tumor influences resectability. Lesions of cardia offer greatest mechanical difficulties, lesions of pylorus infiltrate and metastasis soonest. Lesions of wall are most frequently resectable.

18. Fate of patient:

Pre-hospital stage: About 50% die without hospitalization, i.e. are taken care of at home by palliative methods by family doctors. Saltzstein (Mich. Vital Statistics), 365 deaths with only 58% in a hospital. Oughtersen (New Haven statistics of Public Health) 1921-31, 524 deaths with only 44%, i.e. "entered a hospital where a diagnosis was established." Therefore, all hospital statistics deal with only 1/2 of cases?

Note: If this be true, we have only been accounting for half our problems on the basis of hospital statistics. It is impossible to tell from the foregoing statements exactly what the authors mean. If the statement actually means that only half are ever hospitalized then the problem is worse than we have appreciated; if statements refer only to residence at time of death then they are not so significant.

19. Hospital Statistics

	No oper- ation	Ex- plor- ation	Gas- tro- enter- ostomy	Re- sec- tion
U. Hosp.	41%	18	13	26
Ranson & Coller	54	12	20.5	13.5
Oughtersen	34	22	28	16
Gatewood	50	12	20	14
Saltzstein				13
Mayo Clinic (1931)	43			24
Mayo Clinic (10 yr.)	50			19

"In 57% of the cases seen in 1931 in which a diagnosis of carcinoma of the stomach was made, surgical exploration was advised. In 42% in which exploration was carried out, removal of the growth was found possible." This is interesting in view of our figure of 26% but does not mean that the cases are selected on the same basis. The type of carcinoma of the stomach we

see may vary from the group which makes a long train or automobile ride to the Mayo Clinic for consultation.

20. Operative Mortality:

	<u>Explor- ation</u>	<u>Gastro- Enter- ostomy</u>	<u>Re- sec- tion</u>
Ranson & Coller	?	13	23
Oughtersen	4	32	53
Gatewood	33	26	33
Saltzstein	?	?	61
Balfour '31	?	?	10

The mortality of resection in European clinics is given by Kasper:

Kasper	24.5%
Finsterer	19
Eiselberg	20
Breslau Klinik	25-35% (in dif- ferent series).

Note: The variability in assigning the cause of postoperative death may account for some of the difference in the above figures.

21. Disposition: U. of M. Hospitals.

	<u>Cases</u>
No operation	77
Exploration	33
Gastro-enterostomy	24
Resection	49
Gastrostomy	2
Jejunostomy	1
Closure of malignant ulcer (perforation)	1
Total:	187

	<u>'26</u>		<u>'27</u>	
	<u>Cases</u>	<u>%</u>	<u>Cases</u>	<u>%</u>
No operation	14	54%	10	53%
Exploration	6)		3)	
Gastro- Enterostomy	1)	27	0)	16
Resection	5	19	6	31
Total	26		19	

	<u>'28</u>		<u>'29</u>	
	<u>Cases</u>	<u>%</u>	<u>Cases</u>	<u>%</u>
No operation	9	45%	12	53%
Exploration	1)		9)	
Gastro- Enterostomy	4)	25	4)	33
Resection	6	30	11	33
Total	20		36	

	<u>'30</u>		<u>'31</u>		<u>'32 (date (to</u>	
	<u>Cases</u>	<u>%</u>	<u>Cases</u>	<u>%</u>	<u>Cases</u>	<u>%</u>
No oper.	12	33%	13	44%	7	33%
Explor.	4)		6)		4)	
Gastro- Enter. Resection	6)	33	4)	21	5)	43
Total	34		27		21	

21. End Results

What happens to the patient who survives gastric resection:

Balfour:

128 patients alive after 10 years. Represents 20% of resections surviving operation.

Schwyzler:

3 cases over 10 years.

German data: (Kasper)

(Note these figures refer to percent of those surviving operation).

Breslau Klinik

3 yr.	18.5%
5	12.0
10	9.0

Person (Stockholm): (200 cases)
19%, 5 yr. cure.

Schmieden:

3 yr. cures - 33%

Finsterer (340 cases)

40% (over 60 yr. old) - 5 yr. cures
22% (younger than 60) - 5 yr. cures

Anschutz:

5 yr. cures: 19, 23, 13%. (Di-
vided according to extent of lesion.

Eiselsberg:

12%, 3-1/2 yr. cures.

Panchet and Herschberg:

31%, 6 yr. cure.

Presby. Hosp. (Chicago) (58 survivals):

Over 3 yr. - 18

Over 5 yr. - 14

Yale University:

Living 2 - 3 yr., 4% (of survivals)

U. of Michigan: (27 survivals)

Living 2 - 2-1/2 yr., - 4

(13 cases under 3 yr. still living).

Palliation: (Gatewood)

Follow-up of the cases explored or submitted to gastro-enterostomy showed average duration of life in explored cases to be 6.1 mo. In cases with gastro-enterostomy, it was 8.7 mo., or only 2.6 mo. longer.

Note: An attempt was made to complete the University Hospital follow-up in time for this meeting. As it was incomplete because of a few tardy replies, it was thought best to wait before reporting same.

22. Summary of Fate:

In 1000 cases, the theoretical survival:

Never in hospital	500
Enter hospital	500
Not operated	250
Operated	250
Resectable	125
Survive resection	75 (40% mortality)
Survive 5 years	25 (30%)
Survive 10 years	15 (20%)
Total survival	1 to 3%

Oughtersen estimates only 8.6% of total number have resections. Saltzstein and Sandweis estimate 8%. This is even lower than estimated above.

Impressions:

1. Deaths from carcinoma of stomach form 4.6% of all deaths over 45 -- greater than deaths from pneumonia.

2. Age averages 58 years.

3. Several cases are reported under 30 years of age, 4% under 40.

4. 80% are males.

5. Duration of symptoms before operation ranges from 7 to 10 months.

6. Patients consult physician on average in 3rd month. Delay between first consultation and treatment ranges

from 6 to 10 mo.

7. Delay due to several conditions: Insidious onset of disease, inability on part of physician to recognize these symptoms and poor x-ray facilities are factors. Physicians treating themselves delay as long as with their patients. City physicians delay as long as country physicians. Most important factor seems to be mild insidious nature of onset and inability to distinguish these symptoms from those of benign gastric disorders.

8. Duration apparently longer in resectable cases?

9. This is taken to indicate a less malignant lesion.

10. First symptoms in order of frequency are pain, weight loss, vomiting, weakness and loss of appetite.

11. Too much emphasis cannot be made upon the importance of recognizing that the symptoms at onset are mild, insidious and apparently do not differ from those of a multitude of benign gastric lesions. A long preceding history suggesting an ulcer history is present in 10 to 50% of cases.

Physical examination in early cases is entirely negative. In late cases, 70% show emaciation and 50% tumor.

12. Stool is positive for blood in 95% of cases (late).

13. Achlorhydria is present in 73%, 16% have normal acid.

14. All cases of gastric distress with blood in stool and low HCl acid in stomach should have gastric examination by x-ray.

15. X-ray is accurate but not omnipotent. In largest series, 30% of cases resulted in indefinite diagnosis. Carcinoma of stomach forms 3% in diagnoses of large series of consecutive G.I. x-ray examinations. Chief error in x-ray diagnosis is in estimating operability and diagnosing nature of ulcerating lesions.

16. It is generally admitted that ulcerating lesions, particularly in prepyloric region, cannot be diagnosed from a single series of x-ray examinations.

17. Lesion cannot be diagnosed by pathologist in excised specimen on gross examination or on one or two microscopic sections.

18. Further proof of this is offered by record of 8 cases of prepyloric ulceration diagnosed clinically and at operation as benign and in which follow-up showed subsequent death from carcinoma.

19. In this group, men feel that gastric prepyloric ulcerations should be considered malignant and resected as such without qualification; others object and feel that 2 or 3 weeks of medical care and bed rest with subsequent examinations will result in a certain diagnosis between benign and malignant lesions. In series of all types of carcinoma of stomach, approximately 50% are at pyloric end, in contrast to 35% of ulcers at pyloric end of stomach. In carcinomas with long preceding histories, 83% are located at pyloric end.

20. Pylorus is involved in 43%, wall in 37% and cardia in 11%.

21. Cause of death when no metastases are present is in unoperated cases, perforation (peritonitis) and obstruction; in operated cases, peritonitis, shock or hemorrhage.

22. 23% of all cases die without visible metastasis. When postoperative cases and those dying of intercurrent causes (i.e. life cycle shortened), this percentage falls to 6%.

23. Liver and local lymph nodes are more frequently involved. All organs may be involved. In series (Warwick), available bones showed metastasis (ribs and vertebrae 2.5%) suggesting that all bone metastasis may be a sizable percentage.

24. Cause of death in all cases is peritonitis (postoperative and perforation) 26%, obstruction 20%, pulmonary infection 2%, hemorrhage 7%.

25. Size of lymph nodes is no criteria of operability.

26. Cure may result if enlarged nodes are left behind.

27. Lesions of wall are most resectable.

28. About 50% of cases never reach hospital.

29. Of those reaching hospital, 50% cannot be operated.

30. Of those operated, 50% are resectable.

31. Of those resected, 5 to 60% die. Mortality appears to average about 40%.

32. Of those who survive resection, about 30% survive 5 years and 20% survive 10 years.

33. In a hundred cases of cancer of stomach, 1 to 3 will be cured by present methods.

V. MEETING

Date: November 17, 1932.

Place: Interns' Lounge, 6th Floor, West Building.

Time: 12:15 to 1:15.

Program: Chronic arthritis, pellagra (first case).
Non-tropical sprue (second case).

Present: 99

Discussion: Leo G. Rigler
H. E. Michelson
C. M. Jackson
G. A. Burr
R. B. Radl
Irvine McQuarrie
H. A. Reimann

Theme: "Time" is accurate only to a certain degree. It costs New Haven Department of Health and Board of Education \$1.25 per case (?). We are doing Health Service cases at \$1.30, and are using films, not paper. Very simple to make a machine with x-ray tube fixed behind to do chests only. Films on roll original. This makes it more simple. Same thing could be done with films. Paper used before but never satisfactory. Doubt whether it is satisfactory now. Approximate difference of 40 cents in our costs and theirs. Questionable if it is worth sacrificing the difference in detail. They fail to consider cost of reading films. That might, of course, amount to the most important item. Done on research basis, persons who read films do it gratis. L.G.R.

First Case

Our experience with pellagra rather large now. 30 cases seen in last few years. From dermatologic standpoint, sensitive skin manifestation closely related to sun injury. Cases seen in pictures largely alcoholic in type. Occurs somewhat in epidemics. Most

of them eat canned alcohol, lie down in sun, get sunburned. Starts from central point, spreads out to certain point, then stops. Why? Pellagra occurs in fasts and in people trying to lose weight. Treatment not of particular importance in most of our alcoholic cases. H.E.M.

A condition resembling pellagra can be produced experimentally, by experimental diets, but still cause obscure. Goldberger found yeast was a cure in black tongue in dogs (experiment). Experimental pellagra open to question as to whether it is like human pellagra or not; at any rate it resembles it. Can be cured by vitamine F or G; English authorities call it B sub 2. Present in yeast, liver, lean meat, certain vegetables. So far as laboratory findings are concerned experimental disorders seem to have certain relationship to human pellagra, and same remedy will prevent it or cure it. C.M.J.

Note using liver treatment apparently more than yeast. Yeast is known to be much higher in P-p value than liver so far as rat experiments go. Why is it that liver is used in preference to yeast? G.A.B.

(Impression of liver treatment) Don't think we need it in alcoholic group. H.E.M.
Down south always treated with yeast. C.S.R.

Second Case

Gall-bladder - unsatisfactory films. Gastro-intestinal - rather small duodenal bulb. Bones - a little less calcium in bones than normal.

Response to therapy: to liver therapy good, but diarrhea did not respond to any treatment. In reading about disease got the idea that most cases responded to fresh vegetables (strawberries, bananas). Our patient did not respond to these. Patient might have had some constitutional basis for his condition. Had bilateral inguinal hernias. Also had peculiar condition of the nails. R.B.R.

Simple story of failure in absorption of calcium and phosphorous. Use of parathormone hardly rational. Simple relief from tetany can be obtained in many ways. Phosphorous high in tetany. Phosphorous in blood in this case probably about half normal. I.McQ.

Look for unpleasant things. At stools, - characteristic of disease. Could have made diagnosis sooner. H.A.R.

Gertrude Gunn
Record Librarian