

GENERAL STAFF MEETING  
MINNESOTA GENERAL HOSPITAL  
UNIVERSITY OF MINNESOTA

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**ABSTRACT****GALL-BLADDER DISEASE.**

Abstr. Wallace Ritchie.

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**Introduction:**

There are many questions which arise when this subject is discussed. "What are some of the long time end results?" "What preoperative measures should be taken to insure against an untoward result?" "What is the best operative procedure, cholecystectomy, cholecystostomy, choledochostomy, etc.?" "Just how much faith can the clinician have in cholecystography, and is the intravenous method more or less practical than the oral method?"

The literature of the last two years only partially satisfies our curiosity regarding these and many other questions. We are presenting partial abstracts of some of the contributions of the last few years together with an abstract of Dr. Manson's review of 497 cases at the Minnesota General Hospital and a summary of the results obtained by the roentgenologist at this hospital in 266 cholecystectomies.

#### General:

Chronic disease of the gall-bladder is considered to be the most frequent organic cause of dyspepsia. In a recent study by Dwyer and Blackford (5) of 3,000 patients complaining of gastric symptoms, the gall-bladder was held responsible in 21%. The approximate relative frequency of abdominal organic disease causing dyspepsia was:

Gastric ulcer	1
Gastric cancer	2
Duodenal ulcer	5
Gall-bladder disease	11

Throughout 10 years it had been a very constant finding in that 1 out of every 5 patients complaining of gastric symptoms were diagnosed chronic cholecystitis (5). X-ray results in 1525 routine examinations in patients with gastrointestinal complaints at Minnesota General Hospital show (rayed for possibility of gall-bladder disease):

Negative	917
Possible gall-bladder	372
Possible gall-bladder and stone	215
Poor function (doubtful)	21
	<u>1525</u>

Our figures show about 1 in every 3 persons having gastro-intestinal complaints is diagnosed gall-bladder disease.

It is difficult to estimate the actual incidence of gall-bladder disease as many patients must go through life without symptoms. Mentzer (see Manson for reference) found stones in 20% and cholesterosis in 37% of 1,647 routine autopsies and 88% of these had had no symptoms relative to this condition.

Crump reports 33% of 1000 autopsies in Vienna had gallstones while 60% had some type of cholecystopathy. This seems rather high. In 9,531 consecutive autopsies at the General Infirmary of London, England, Gross (17) concluded that 6% of all men and 12% of all women had some type of cholecystopathy.

#### Sex:

The ratio of females to males in most series is about 3 to 1. In Manson's series, it is a good deal higher, being about 5 to 1. Dwyer and Dowling (5) state that the familiar saying "gall-bladder disease is a disease of females fair, fat and 40" is probably true in the majority of cases but in their 600 cases 35% of the cases were under 40 and 43% weighed less than 140 pounds. Manson's average fits the saying as it was 42 years which is the same as Judd and Priestley's (1).

Gall-bladder disease in children under 15 years is not as infrequent as commonly thought. Vest states that Mohr collected 150 cases of all types of gall-bladder disease in children in the literature (1931). Vest adds a case of gangrenous cholecystitis in a boy 10 years of age (6).

#### Incidence of types of gall-bladder disease:

In Manson's series at this hospital, 96% were chronic. This is somewhat higher than other series but the incidence of acute cholecystitis is relatively small. Mentzer (8) found 8.2%. At Johns Hopkins it is higher, acute cholecystitis being diagnosed in 234 of 1000 operative cases (23%) (6). Difference in interpretation?

Gangrene of the gall-bladder is uncommon. Vest (6) found 80 cases in the literature. Incidence at Johns Hopkins is .7%. In 4575 pathological specimens examined by Baumgartner at the Mayo Clinic, the incidence was 1.3%. This is the one condition in which all surgeons agree on immediate operation. It is well that the incidence is so low as the condition is extremely

## Difficult to diagnose.

Carcinoma of gall-bladder constitutes 8 - 10% of all carcinoma in women. Relation of carcinoma with cholelithiasis is interesting.

Lentze	5.1%
Rolleston	4.5
Moynihan	5.1
Reidel	7 - 8% (for ref. see 18b)

Because of possibility of carcinoma developing with cholelithiasis, Graham advocates removal of all gall-bladders with stones even if they are symptomless (18b).

## Presence of stones:

Stones were present in our series (Manson) in 65% of cases and of this 65%, 91% were females. The incidence of stones is high. In 6 other series, the percentage ranged from 44 to 84%. This suggests that our clinicians have waited for fairly definite proof of gall-bladder disease before operating. From a conservative standpoint, this is good but it suggests that operation is only done when the case is fairly well advanced. (Note: Certain amount of selection by patients who come here?)

## Pathology (7):

No adequate pathological classification so far as a correlation between the clinical symptoms and gross and microscopic findings is concerned. Three well defined types of chronic cholecystitis are found:

1. Chronic cholecystitis due to infection (true chronic cholecystitis).
2. Chronic cholecystitis due to metabolic disturbance (cholesterosis)
3. Clinical cholecystitis without obvious pathological basis in the gall-bladder (Judd).

The disease is in the wall. The organism in the infectious type seems to invade the gall-bladder from the outside. Andrews (11) found majority of bacteria in outer layers. B. Coli and streptococci are most common organisms.

The changes are thickening of the wall with an abundance of fibrous tissue replacement. The mucosa may be hypertrophic, atrophic or destroyed. Extensive cellular in-filtration is found throughout all layers.

The strawberry gall-bladder presents another type with cholesterol crystals deposited in the subepithelial layers of the mucosa. There are a certain group of cases in which the macroscopic and microscopic changes are scanty yet there is a good history of gall-bladder disease and post-operatively the condition is improved. Usually the pathologist finds a few scattered areas of lymphocyte cells but these areas do not seem to be sufficient to cause the symptoms. Further investigations in this group may show that the primary condition is in reality a hepatitis or cholangitis and the gall-bladder is playing only a part?

## Symptomatology and diagnosis:

After all, a diagnosis of cholecystitis is made on a good history and physical examination rather than upon any other type of procedure (typical cases only). This is particularly true in the acute types of the disease, and it is in this type that a true picture of the underlying process is so necessary.

Clinicians are beginning to realize that a diagnosis of acute cholecystitis can be made and must be made without the classical picture of severe epigastric or right upper quadrant pain of 3 or 4 days duration, radiating posteriorly to the right shoulder, with chills, fever, nausea and vomiting, marked leucocytosis and possible jaundice. Mentzner (8) in discussing 43 consecutive operative cases of empyema, gangrene or acute perforation found that only 2 of the 43 had all of these symptoms: 11 had all signs except jaundice (25%). One patient lacked fever and leucocytosis, the remaining 17 had leucocytosis but were lacking in either fever, vomiting, rigidity, or severe pain. The majority

of the patients lacked one of the so-called cardinal signs of an acute inflammatory biliary lesions.

One cannot fail to be impressed by the frequent reference to lack of the cardinal signs and symptoms of gall-bladder disease. One is not so surprised as far as chronic cholecystitis is concerned but even in acute cases this seems to be true, as shown by Mentzner (8). References are frequent which bring out the fact that it is often impossible to tell the degree of the underlying pathology from the physical signs and symptoms. This is one of the chief arguments for those who believe in early operation in acute cholecystitis. The symptoms of chronic gall-bladder disease are well known. We shall abstract the interesting points in Manson's survey. 43% had jaundice, 98% had some type of pain and in 73% of these right upper quadrant pain was the predominate symptom while epigastric pain was the predominant symptom in 27%. 46% had gas and in 5% of the total cases this was the predominant symptom. 73% had nausea and vomiting but in only 8% of the total was this the predominant symptom. Dwyer and Dowling (5) stated that 73% of their cases sought relief because of chronic gastric distress and only 17% because of "gallstone colic".

Wear (see Manson for ref.) in 100 cases of cholelithiasis found:

Abdominal pain in 100	
Nausea	60
Vomiting	50
Eructations of gas	48
Chills and fever	32
Jaundice	30

#### Gastric analysis:

Manson and Blackford (2) report 402 cases in which gastric analysis was performed. In 56% of these cases, the analysis showed either an absence of a low acidity. In only 7% was free hydrochloric acid above normal. They suggest that the clinician should hesitate before making a diagnosis of chronic cholecystitis, in the presence of hyperacidity.

Manson found in our cases (167 re-

corded cases), 133 had free hydrochloric and 34 had no free hydrochloric (20%). Rowlands (see Manson for reference) found achlorhydria in 40% of cases with gallstones. John (see Manson) hypoacidity in 87% of his cases and it was only in some of his acute cases that there was a hyperacidity. This fact may help to confirm a diagnosis of chronic cholecystitis.

#### Onset:

Dwyer and Dowling (5) call attention to interesting fact that 50% of their patients with duodenal ulcer dated the onset of their symptoms to before the age of 25 and only 22% of patients with gall-bladder disease had symptoms before 25.

#### Temperature and white count:

Mentzner (8) brings out a few points in his discussion of acute cholecystitis. 6 of his 43 cases had normal temperature during hospitalization period before operation. One patient's temperature was normal for 3 weeks yet at operation a perforated gall-bladder with abscess was found. One patient had a temperature of 98.8, yet at operation 10 hours later was found to have a gangrenous gall-bladder with perforation and free bile in the peritoneal cavity. The other 4 cases had essentially the same story. These cases are undoubtedly unusual but they do call attention to the fact that the underlying disease may be serious and yet the temperature remains normal. The white count seemed to be the most stable factor to rely on. A majority were above 16,000. The differential count was also high. In all of his cases of empyema, the white blood count was above 15,000.

#### Roentgenology:

Cholecystography has been a great chapter in the history of gallbladder disease. It is undoubtedly the best single laboratory test but it is by no means a substitute for clinical diagnosis, nor should it be relied upon to the exclusion of all other data to affirm or deny the presence of disease

of gallbladder. Because of Dr. Rigler's report, we shall include some of the many reports in the last few years, each under a separate heading.

1. Ferguson and Palmer (Chicago) (10):

Material: Dye given to 2,070 patients more or less routinely although most of them had been referred because of some type of gastro-intestinal disturbance.

3 groups:

a. 1,398 cases (2/3) fall into the group with good visualization and no stones. In 35% of these, there was a suggestive history of gall-bladder disease, 7 of these were operated on and in only 1 was a positive pathological diagnosis made. This tends to show that in good visualization and no stones, x-ray diagnosis of no biliary disease is fairly conclusive.

b. 192 cases in which stones were demonstrated, 43% positive shadows (calcium containing stones) and 56% negative shadows (non-opaque stones). Of the former (positive shadows), the operative result showed a 100% correct diagnosis, while in the non-opaque group 96% correct diagnosis.

c. 480 cases (20% total).

310 cases no visualization.  
170 cases faint visualization, both without evidence of stone.

Diagnosis checked by 102 specimens. Conclusions: The accuracy of faint visualization (combined with clinical history) is 58%; that of non-visualization (combined with clinical history) was 90%. Whereas, in the absence of a clinical history, plus suggestion of biliary disease, the accuracy in faint visualization was less than 14% and accuracy in non-visualization was less than 66%. Therefore the percentage of accuracy is probably above 98% when good visualization is seen. From the clinical standpoint, it is advisable to consider seriously the cholecystographic report of a faint or a total absence of visualization

in a report only if it corroborates the clinical history.

2. Hawley (12).

Comparison of intravenous and oral cholecystography (500 cases).

	Oral	Intra-venous
Total	265	235
Normal	117	119
Diseased	135	107
Inconclusive	13	9
Operated upon	78	68
Proved errors	8	6
Normals, confirmed at operation	6	9

The proved errors make a better showing by the oral group. The author feels oral cholecystography is as accurate, safer and simpler than intravenous cholecystography and therefore advocates it.

3. Brailsford (9).

Results of 500 cholecystographies in 1928. Advocated intravenous method as more accurate. Now (Sept. '32) still has that opinion but feels technique in oral examination makes this method alone as accurate as the intravenous method.

4. Kirklin.

35,000 patients at Mayo Clinic; percentage accuracy by oral method slightly over 90%. Since 1928, intravenous method has been discarded even as a method of verification in doubtful cases and is now reserved for patients of highly irritable stomachs and in cases where oral method is impractical.

Other laboratory procedures:

Icterus index, van den Bergh, galactose tolerance test and serum bilirubin curve are all of importance in determining the type of jaundice, if present, also function of the liver (important) and time of operation.

Cholecystography: (Eneboe and Rigler)

Historical:

Before cholecystography, the diagnosis of gall-bladder disease was made by inference and by demonstration of stones. Carl Beck (1899) was first to report calculi exhibited on a roentgenogram. As technic improved diagnosis of stones increased until about 1920. Case was of opinion that 40 to 50% of stones could be demonstrated in flat plate of the gall-bladder area. (Today, most authorities agree that 25 - 30% is closer figure). Gall-bladder diagnosis remained unreliable until 1924 when Graham and Cole introduced what we today term cholecystography. They based their work on the preceding work of Abel and Rowntree who had shown that the phenolphthaleins, as a class, were largely excreted by the liver into the bile.

#### Explanation of test:

Graham and Cole found that when phenolphthalein, containing either iodine or bromine, was injected intravenously, it was excreted in the bile and a sufficient concentration of the halogen was obtained in the gall-bladder to cast a shadow on a film when exposed to the roentgen rays.

#### Methods of administration:

There are 2 common methods of administering the dye today: (1) the oral, and (2) the intravenous routes.

Oral method: The evening before the examination, the patient eats a light, moderately fat free meal, not later than 7 P.M. One hour later, the dye is mixed with a glass of grape juice and taken by mouth. Nothing (food nor medicines) is to be taken by mouth except water until the examination has been completed.

It has been often said that when oral administration is used, one does not know the amount and rate of absorption of the drug, inferring that in the faint and non-filling gall-bladders the interpretation is fraught with errors. There is considerably more latitude for errors by the oral administration. Some of the more common ones are:

#### 1. Violation of directions

on the part of the patient.

2. Dye reactions.
  - a. Emesis, b. Diarrhea.
3. Impure dye.
  - a. Chemical change of dye.
  - b. Vehicle impeding assimilation.
    1. Capsule fails to disintegrate, etc.
4. Causes due to faulty assimilation.
  - a. Hines calls attention to the fact that a shadow may not develop in achylia gastrica.
  - b. Retention of dye due to esophageal and pyloric stenosis.

Intravenous method: The technic is essentially the same as the oral method with the exception that the dye is administered intravenously. The evening before the examination, the patient eats a light, moderately fat free supper, not later than 7 P.M. At 8 P.M. the dye is injected intravenously, followed immediately by injection of about 50 cc. of normal saline to dilute the dye and prevent thrombosis or other complications.

#### Technic of radiography:

Technic of radiography is the same for either method. At 8 A.M. the following morning, 2 films are taken, mainly to localize the gall-bladder. At 11 A.M. another film is made of the area in which the gall-bladder was found and after this a fatty meal consisting of 2 eggs and a glass of cream for the purpose of stimulating contraction of the gall-bladder. At 1 P.M. another film is made.

The reactions to the dye vary with the method of administration. The more common reactions which we expect and occasionally encounter are: with the oral method:

1. Nausea, 2. Vomiting,
3. Diarrhea, 4. abdominal cramps,
5. Headache.

Intravenous method:

1. Headache, 2. Chilly sensation,
3. Erythema, 4. Urticaria,
5. Venous thrombosis.

Evaluation of methods:

The intravenous is more time consuming to the doctor or his assistant administering the dye, it necessitates careful sterilization, more apparatus, and the reactions, when they occur, are usually more alarming. Robins and Goldberg, reporting on 1000 cholecystographic examinations, conclude that the intravenous method is more reliable in the very early cases of functional disturbances, but in the final analysis of the statistics, such a close approximation exists between the 2 methods as to warrant the oral as the method of choice. Incidentally, we might add that a negative by the oral method means just as much as by the intravenous method.

Conclusions:

In the final analysis, one might say that when using the oral method, failure of visualization of the gall-bladder at one examination is inconclusive for a positive diagnosis and re-examination should always be advised if the gall-bladder shadow is not seen or poorly outlined. If the results are the same at subsequent examinations, the diagnosis of a diseased gall-bladder is made.

Indications for intravenous method at Minnesota General Hospital:

In cases where the oral method gives no shadow on 2 examinations and clinically the patient appears normal, it may be advisable to check by the intravenous method. In cases where the patient persistently vomits the dye or where there is a known obstruction at the pylorus, the intravenous method should be used.

Dangers and contra-indications:

Cholecystography is not entirely devoid of danger in all cases. According to Graham cardiac decompensation and threatened uremia are the only 2 conditions which definitely contraindicate the employment of intravenous method.

There has been one death probably due to cholecystography: this was in a patient with common duct obstruction. He died of an acute gangrenous pancreatitis. Since then, it has been experimentally proven that in cases of common duct obstruction, the danger of acute pancreatitis occurring will be much greater if the regurgitated bile contains the phenolphthalein salt.

Also, the toxicity of the drug on the liver is greater when biliary obstruction is present. It is reasonable to believe that the drug exerts a greater toxicity on an organ whose function is already impaired. For this reason, we also believe it is best not to do the examination in cases of active jaundice.

Pregnancy by some is thought to contraindicate cholecystography, not so much from any harm done the patient, but due to the rather frequent invisibility of the gall-bladder in cases known to be or thought to be and later proved to be normal. According to Crossen and Moore, cholecystography is a safe procedure in pregnancy, and the dye has apparently no effect on the uterus or contents.

What case to examine?:

The "frank" gall-bladder case, i.e., one presenting a typical history, needs no gall-bladder study except to rule out disease in the stomach or duodenum. A report of 224 such cases, diagnosed clinically at Rochester, proved to be 91% correct at operation. But the doubtful and indefinite case is where cholecystography is indicated.

Rochester's figures:

Kirklin reports on a series of 5,000 cholecystographies, 506 of which were operated on:

Patients examined and operated on:



<u>Notes at operation</u>	<u>Cases</u>	<u>Roent. ray diag. of Cholecyst. dis.</u>	<u>Roent. Neg.</u>	<u>Correct Diag.</u>	<u>% Error</u>
Diseased gall-bladder with stones	250	246	4	98.4%	1.6
Severe disease of gall-bladder without stones	124	98	26	79.0	21.0
Slight change in gall-bladder	21	14	7	66.6	33.4
Normal gall-bladder at operation	111	27	84	75.6	22.4

In 374 cases of severe disease with and without stones, the cholecystogram was positive in 344 (92%).

In 396 cases of cholecystic disease with and without stones, the cholecystogram was positive in 358 (91%).

In 506 cases, some with and some without disease of the gall-bladder, the cholecystogram was correct in 442 (87%).

Invisibility is obviously the most important of all signs in cholecystography. In his figures, gall-bladder disease with

and without stones was found in 95% of the 244 cases in which the gall-bladder was invisible and stones were found at operation in 68% of these.

Also, we see from his figures that a negative or normal cholecystographic response is the least reliable of all signs since the percentage of error varies from 26 - 30%.

Kirklin has some unpublished figures which show even better results. They show:

Diagnosis confirmed at operation

Normally functioning gall-bladder	89.5%
Poorly functioning gall-bladder	94.8
Non-functioning gall-bladder	97.1
Normally functioning gall-bladder with stones (124)	99.6
Poorly functioning gall-bladder with stones (78)	
Non-functioning gall-bladder with stones (92)	
Tumor	100.0

Minnesota General Hospital Results:

Of 266 cholecystectomies performed, from January 1928 to January 1933, we examined cholecystographically 201 cases.

201 patients examined and operated on:

<u>Notes at operation</u>	<u>Cases</u>	<u>X-ray diag. of Cholecy. Disease</u>	<u>X-ray Neg.</u>	<u>Correct Diag.</u>	<u>% Error</u>
Severe disease of gall-bladder with stones	119	116	3	97.4%	2.6%
Severe disease of gall-bladder without stones	60	58	2	96.6	3.4
Cholecyst. at Oper.	75	58	17	77.3	22.6
Normal gall-bladder at operation	6	1	5	83.3	16.4
	<u>Cases</u>	<u>Path. Positive</u>	<u>Path. Neg.</u>	<u>Correct Diag.</u>	<u>% Error</u>
Normal gall-bladder diagnosis	24	19 (Includes 15 cases P.I.)	5	20.9%	79.1
Considering P. I. as being normal	24	4	20	83.4	16.6

In 179 cases of severe disease with and without stones, the cholecystogram was positive in 174 (97.2%).

In 194 cases of cholecystic disease with and without stones, the cholecystogram was positive in 174 (89.7%).

In 194 cases of cholecystic disease with and without stones but considering the pathological I (one) cases (those with slight lymphocytic infiltration into the walls of the gall-bladder) as normal, the cholecystogram was positive in 189 (97.4%).

Few authors mention importance of tests for liver function. The dye retention test (phenoltetraiodophthalein ((isoiodeikon)) staining blood serum) employing the Young Evers Universal Colorimeter and the galactose tolerance test (Minnesota Staff Meeting Bulletin, Vol. 4, #24) seen to be the two most reliable and probably should be done in all cases of long standing disease when there may be considerable liver damage.

In 1931, E. A. Graham (18) presented

some interesting statistics in regards to liver function tests. He uses phenoltetraiodophthalein (isoiodeikon) routinely. A normal patient will have a dye retention of 10 - 15% within a half hour. Patients who show dye retention of 50% (or more) are placed on a strict course of preparation for operation. (Bed rest, large doses of carbohydrate and small amounts of calcium).

His results are striking:

3 years preceding use of dye test

	<u>Cases</u>	<u>Mortality %</u>
1925	78	5.1
1926	63	10.1
1927	75	4.0
	<u>216</u>	<u>6.0</u>

3 years in which test was used

	<u>Cases</u>	<u>Mortality %</u>
1922	90	0
1929	68	0
1930	66	1.5
	<u>224</u>	<u>.4%</u>

Preoperative Care:

1. Surgeons state that a diseased gall-bladder is almost always accompanied by inflammatory changes in the liver and in the biliary ducts with resultant damage to liver function (2). The damaged liver functions best with a high glycogen reserve. Dextrose by mouth passes through the portal circulation and is quickly stored as hepatic glycogen. The excess reaches the general circulation and is stored in the muscles and is not so readily released. Also intravenous glucose dextrose in large quantities often spills over and much is lost in urine. Conclusion: Give large quantities of dextrose by mouth preoperatively (Mann and Blackford) and postoperatively.

2. Mann has shown that animals with damaged livers are kept alive much longer on a carbohydrate than a protein diet. High carbohydrate low protein diet may be indicated preoperatively (?).

3. When obstructive symptoms are present, frequent serum bilirubin determination should be made to determine if jaundice is increasing or decreasing (7).

4. When jaundice is present, several transfusions preoperatively may be indicated (7).

5. Although the part played by calcium chloride is not definitely understood, it seems to increase the coagulability of the blood. Judd (7) gives .5 gm. of calcium chloride in 100 cc. of normal saline intravenously each day for 3 days preoperatively (in patients with jaundice).

6. Rowlands (14) advises giving hexamine as a biliary antiseptic.

7. Symptomatic treatment.

8. Keeping up fluid level.

9. Liver function tests (Graham 18) before operation.

Treatment:

The lack of any discussion of the conservative treatment in the current literature is quite striking. Most of the articles go to an opposite extreme and appeal for an early operation in all cases.

Mason and Blackford (2) however present some excellent results of medical treatment.

Medical treatment:

(1) Use of diet avoiding foods that generally disagree with patients, and highly seasoned foods.

(2) Periods of use of morning saline, usually sodium phosphate.

(3) Biliary salts before meals combined with oleic acid.

(4) Alkalies occasionally.

(5) Infectious foci removed.

(6) Reasonable emphasis on physical exercise.

In 200 cases representing a successful follow-up of probable, typical and proved cases after an average of  $9\frac{1}{2}$  years history, the following results were obtained:

(1) One-third of these patients under simple medical treatment became symptom free.

(2) One-third come to operation from 3 to 5 years after diagnosis was made.

(3) One-third because of the continuation of their symptoms should have been operated on.

This study is included to emphasize that in a fair number of cases with medical treatment cure can evidently be effected. The authors state that the risk of developing a surgical emergency under medical treatment is no less than under the best elective gall-bladder surgery.

Surgical treatment:

A. Time of operation: As with

acute appendicitis, there is a very marked divergence of opinion on when to operate in the acute cases. All surgeons concur in one opinion and that is in cases of the gangrenous gallbladder, immediate operation is necessary. The difficulty here of course is the inability to distinguish gangrene of the gallbladder from acute cholecystitis and empyema. Vest states that the conservative treatment or postponement of operation in acute cases is probably practiced by most surgeons. This treatment is based on certain protective factors concerning the situation of the bladder in which the omentum, colon, liver and peritoneum aid in inhibiting the spread of infection and prevent general abdominal sepsis. Perforations are late and usually occur after the organ is fairly well walled off.

There is another group particularly foreign and some Americans who advocate early operation. A. F. Graham (Brooklyn) (16) reports 198 cases, 20 of which were operated on in the first 48 hours after acute onset. (Group A), and 178 operated upon more than 48 hours after onset (Group B)

	<u>Group A</u>	<u>Group B</u>
Mortality	5%	6.2%
Average time in hospital	19 days	26 days
Postoperative complications	5%	18.0%

He summarises:

In Group A:

1. There were no deaths from early operation when acute cholecystitis was the only disease present at time of operation.

2. The necessary operations were simple ones.

3. Postoperative complications few.

4. Hospital days less.

In Group B:

1. Mortality increased. Many deaths could be attributed directly to delay.

2. Longer and more difficult operations were necessary.

3. Number of postoperative complications were increased.

Note: The results seem a perfect case for early operation?

Another series of Mentzner (8) shows that the operative mortality is greater in delayed operation in acute cholecystitis. His series are small, he admits, but he feels that operations should be undertaken early in every doubtful case.

Miller (1) also questions the laissez-faire policy, and, states that from 1/4 to 1/2 of the cases are not walled off well enough to justify procrastination.

Yet another series is found accompanying the 2 types of treatment.

Zininger divided 89 cases of acute gall-bladder into 2 groups:

A. 35 cases operated on immediately upon admission.

Total duration of attack before operation

	<u>Less than 48 hrs.</u>	<u>2-5 days</u>	<u>More than 5 days</u>
Number of cases	12	15	8
Days in hospital	22.1	24.1	24.7
Mortality	0	6.6	25.0
Simple acute cholecystitis	11	5.0	0.
Empyema	0	9.0	1.0
Empyema with abscess	0	0	2.0
Empyema with gangrene	1	1.0	4.0
Empyema with rupture	0	0	1.0

B. 54 patients observed.

Total duration of attack before operation

	<u>Less than 1 week</u>	<u>More than 1 week</u>
No. cases	24	36
Hospital Stay	25	27
Mortality	5.5	8.5
Chronic cholecystitis	4	11

(Cont'd.)	<u>Less than 1 week</u>	<u>More than 1 week</u>
Acute cholecystitis	10	10
Empyema	4	8
Gangrene	6	2
Rupture	0	5

In this group (B), only 38% showed improvement and in these subacute or chronic inflammation was found. 35% showed no change for better or worse and in these acute gall-bladder and empyema was most frequently found. 28% became definitely worse and in all these empyema was found. Note: white blood cells were over 15,000 in all cases of empyema.

The mortality of the whole group was 7.8%. The incidence of sericus pathological lesion and the mortality were found to rise with duration of the attack. From these, it would appear that there is a definite movement on foot for the earlier intervention in acute gall-bladder disease.

#### Type of Operation:

Judd and Priestly (1) draw the following conclusions from a study of 606 cases.

1. A greater percentage of good results follow cholecystectomy than cholecystostomy.

2. Ordinarily, the gall-bladder is removed except in face of certain definite contraindication.

a. If the patient is an extremely poor surgical risk as in jaundice or atrophic liver.

b. If it is anticipated that the gall-bladder will be needed because of disease of the common bile duct and if there is too much inflammation around the gall-bladder. (Empyema, etc.) In these cases, cholecystostomy is performed.

3. If it is necessary to open the common bile duct, primary closure is never advisable. A variable period of drainage with a T tube from 3 to 4 weeks to a year is advisable.

#### Mortality:

Mortality at Minnesota General Hospital as recorded by Manson. No. of cases 497. Of the cases which were not complicated by other operations, such as gastro-enterostomy, etc., there are 17 deaths. Mortality rate 3.4%. The operations were performed by 19 different surgeons, however 71% were done by 7 surgeons.

Some of the causes of death are:

Wound infection.	Peritonitis	12	days
Shock		1	"
Partial obstruction of			
	duodenum	22	"
Pulmonary embolus		10	"
Atrophy of liver		?	"
Distension.	Toxemia.	3	"
Cardiac - renal		28	"
Bile peritonitis		1	"
Distension		2	"
Bile peritonitis		4	"
Acute empyema		2	"
Empyema		22	"

Incidental appendectomy was done in 40.6%. The mortality compares favorably with other groups. Lahey 1926 - 5.4%. 1925 - 1931 - 2.2 Judd - 1.7%.

#### Results:

Manson has good follow-ups on 230 of 550 patients to whom questionnaires were sent.

Of 218 the gross clinical results can be tabulated:

Excellent	- 25%	) 57% satisfaction
Good	- 32%	
Fair	- 28%	
Poor	- 15%	

He tabulated the results as regards improvement in cases with jaundice, in cases with stones and in cases without stones.

1. Jaundice	- 56%	satisfactory results
2. With stones	- 52%	" "
3. Without "	- 45%	" "

He also tabulated weights and found that there was a marked increase in weight over the expected weight.

The results on relief of food distress are interesting. Before presenting this, Manson felt that one could not say that a cholecystectomy was unsuccessful because the cases still had food distress, as he felt that in a group of normal females, all of them would have some type of food distress. He gave 144 nurses a questionnaire and found that over 50% of them had some type of food which distressed them. If a patient who had had a cholecystectomy and still had distress to fatty and rich foods, he felt that the result was not successful but where a patient still had some food distress as for instance mustard, etc., he felt that the gall-bladder condition had little to do with this. He found the types of food which his gall-bladder patients were susceptible to are:

150 consecutive patients (before operation)

Meats:	Fried	72%
	Boiled	32%
	"	30%
Condi- ments:	Olive oil	28
	Mustard	32
	Pickles	46
	Spices	30
Vege- tables and fruits:	Cabbage	66
	Cauli- flower	18
	Onions	66
	Beans	52
	Apples	40
	Potatoes	60
Eggs:	Fried	56
	Boiled	20
Misc.:	Candies	18
	Nuts	32
	Pie crust	46
	Cake	18

The outstanding ones are fried meats, cabbage, onions, potatoes, fried eggs, beans.

His tabulation is as follows:

### 138 cases

	<u>Before opera- tion</u>	<u>After opera- tion</u>	<u>Re- lieved</u>
<u>Meat</u>			
Fried	76%	36%	52%
Baked (roast)	34%	14%	57%
Boiled	29%	11%	63%
<u>Condiments</u>			
Olive oil	28%	12%	56%
Mustard	39	24	39
Pickles	54	29	47
Spices	41	24	42
<u>Veg. &amp; Fruits</u>			
Cabbage	64%	43%	34%
Cauliflower	22	12	43
Onions	65	43	33
Beans	60	40	33
Apples Raw	48	24	50
" cooked	12	9	29
Potatoes,			
fried	66	33	49
" boiled	15	7	57
Eggs, fried	60	30	51
" boiled			
soft	15	10	33
" " hard	33	16	52
<u>Miscel.</u>			
Candies	25	17	32
Nuts	38	25	15
Pie crust	50	27	46
Cake	25	11	57

Comparing with other series, ours compares favorably.

Dwyer and Dowling (5) have 300 patients.

1. Relief of symptoms following cholecystectomy.

<u>Degree of relief</u>	<u>%</u>
Complete	56
75% relief	24
50% relief	10
25% relief	6
No relief	5

## 2. Condition of digestion following cholecystectomy.

Much improved	70 %
Partially "	17
Not benefitted	11
Worse	1

11.8% of patients had several attacks of colic following the operation.

Judd's results in 606 cases 22 years or more after the time of operation are significant.

1. Recurrence: In general, better results were obtained from cholecystectomy than cholecystostomy. Good results were obtained following cholecystostomy in 60%, whereas good results were obtained in 84% of those who had had cholecystectomy.

After cholecystostomy, there was a group of 17% in which a recurrence necessitated a second operation on the gall-bladder.

2. The pathology in the recurrent cases showed stones in 50% of the cases.

3. Length of time between 1st and 2nd operation was over 10 years in over half of cases.

### Postoperative Pain:

Following cholecystostomy, 38% had postoperative pain but following cholecystectomy only 17% complained of further pain.

### Factors influencing results:

1. Age seems to be a factor. A higher percentage of older patients experience good ultimate results than younger patients.

2. Whether appendix was removed or not seemed to have no influence.

3. Patients with colic, chills and fever, etc. preoperatively are more liable to obtain better results than those who only complain of dyspepsia.

4. As in our series, the presence

of stones seemed to prognosticate a better result.

Other reports of Mann and Blackford, etc. closely parallel those given.

### Impressions:

1. Gall-bladder disease is probably the commonest cause of organic gastro-intestinal complaint. More common in females, usually chronic when seen by surgeon.

2. Incidence of gall-bladder disease is a great deal higher than is evident by the number of patients who are diagnosed gall-bladder disease.

3. 44 - 84% of cases have stones.

4. Microscopic pathology is the stumbling block as far as a true evaluation of ultimate results is concerned. The pathologists have difficulty in correlating microscopic findings with clinical symptoms, as most gall-bladders removed show some change.

5. Many cases of acute cholecystitis do not have the cardinal signs of gall-bladder disease.

6. Hypoacidity is often found in gall-bladder disease. May help to confirm diagnosis.

7. Age of onset of most peptic ulcers is earlier (before 25) than that of gall-bladder disease (usually after 25).

8. When the white blood count remains elevated, about 15,000 the probability of empyema is greater.

9. Cholecystography properly applied is greatest aid in diagnosis, next to a good history and physical examination.

10. Graham has a strong case for routine preoperative liver function test (isoiodeikon) (lowering his mortality from 6 to .4%).

11. A certain percentage of cases can be cured by a carefully controlled medical regimen.

12. Conservative treatment of acute cases is practiced by most surgeons but the literature contains many articles showing good results from early operation.

13. Best results are obtained where cholecystectomy is performed.

14. Mortality reports range from

.4% to 5.5%.

15. Best results are obtained in cases with stones, then with jaundice and poorest results in those cases which have neither.

16. To say that a cholecystectomy is unsuccessful because a patient still has some food distress is not justifiable as many normal people have food distress.

17. In over half the cases of recurrence stones are found.

18. Gall-bladders containing stones should be removed as a precancerous measure?

19. Older patients experience better results than younger.

## II. OUR GUEST TODAY

Byrl Raymond Kirklin, M.D. Indiana, Head of Radiology, Mayo Clinic, breaks food with us today. Gall-bladder disease, his favorite subject, is on tap in his honor. Although a heavy contributor to this field, his major activity is gastro-enterology. Called back to the Clinic to head his division, he has developed one of the best co-ordinated, highly specialized units in this country. His interest extends throughout the state and, with Brother Rigler, we have the greatest team of Radiological Evangelists in our time. "When you are at the Clinic drop in and see us" is no idle jest from B.R.K. The Minnesota General Hospital counts him as an Al friend and loyal supporter. That's why we are glad you are here today. May your tribe increase!

## III. CONTINUED

from last week.

I.McQ.: Our chief interest is vulvovaginitis of children and gonorrheal ophthalmia, both much less common than before. I had an opportunity to observe gonorrheal ophthalmia treated intensively and conservatively. The second type of case comes off with far better results. The same is true in vulvovaginitis. Best treatment is the use of an alkali solution of sodium hydroxide once daily even as high as 20th normal. This can be stood very well if gently irrigated. My impression after trying out antiseptics, isolating patient, and treating very

gently, probably use alkali or other less irritable antiseptics. Use of diathermy enthusiastic. Little boy, 12 years ago, had frank purulent urethral discharge, loaded with gonococci. Put immediately in hot tub twice daily and kept him there until his temperature curve went up twice daily. After five days he had so little discharge unable to get smear. Did not have any recurrence.

H.W.C.: I would like to add in regard to diathermy in treatment of acute gonorrhoea. I know that country doctors have cures for most everything. When I was at the General Hospital, patient came in with acute gonorrhoea. He had scarlet fever, running temperature 106 and 107. At the end of time discharge entirely cleared up. When I was out in the country I treated acute case of gonorrhoea with three tongue depressors and block tin wrapped around penis. Easy to run temperature up so far as the thermometer would go. In about a weeks time hardly any discharge was found.

N.L.L.: We always hear that if patient could be made to stay in bed he would get well. Not borne out in our experience with surgical cases, i.e., fractured femur plus gonorrhoea, etc.

## IV. MEETING

Date: May 25, 1933

Place: Intern's Lounge, 6th Floor, West Building.

Time: 12:14 to 1:31

Program: Kidney Tumors

Present: 95

Discussion: H. L. Dunn  
L. C. Rigler  
C. D. Creevy  
A. D. Wethall

H.L.D.: We have apparently been taking care of too many patients. (Apparently as many patients thus far



this year as we did last year.) Due to the fact that over-charges stand no chance of collection, it will be necessary for us to limit the admission of county patients to 210. Next year we will have a definite quota of patients, distributing them through the year, approximately 240. This means that we will have to cut down a couple of nursing stations as we simply cannot keep all beds open. I hope we can fulfill our functions as a teaching hospital.

It is going to be difficult to take anything but emergency cases. We suggest that the staff be absolutely certain that all cases are emergencies. In order not to handicap teaching material I suggest that fellows cooperate with the administration and admit no patients who cannot be discharged. I do not know what stations should be closed. We are trying to redistribute the quota of beds, and I want to talk to all of you about it. I do hope that you will make an attempt to discharge patients as soon as possible. 210 refers to county patients, not to per diem patients.

L.C.R.:

Note: Excellent x-ray demonstration of diagnosis of renal tumors. Emphasizing use of flat plate, retrograde pyelograms, and bizarre manifestations of tumors (in all organs and parts of body). Apparently atypical are as common as typical.

C.D.C.: There are 2 chief difficulties with kidney tumors from the clinical point of view. The first is that a very high percentage of cases have no symptoms whatever until metastasis develops. In addition a fairly large number of cases have symptoms referable to other organs or to lower urinary tract. A review of cases in the Department of Pathology and those cases that we have had here shows that 43 of the 46 cases in the Department of Pathology had metastasis while 35 of 48 had involvement in our own series. The hematuria is perhaps the most common symptom in those patients who have symptoms referable to the urinary tract. Its oversight by the patient and by the family physician very often leads to delay until the tumor has become inoperable. It is impossible to

overemphasize the importance of thorough urological investigation in every patient who has hematuria as his symptom. This investigation must include a retrograde pyelogram since our experience has shown that intravenous urograms are rather unsatisfactory in renal tumors. It is also important not to conclude that every middle-aged patient who has renal colic and hematuria has a stone since in many instances the clinical pictures of nephrolithiasis and renal tumor are identical. An example of the manner in which treatment is often delayed in cases of kidney tumors is the adult patient cited in the staff meeting who had had renal colic and hematuria for 6 years before admission to the hospital. There is another case in our records who had had hematuria and had passed stones and the diagnosis of tumor was not suspected until it was found at operation. Such cases merely serve to emphasize the importance of pyelography in every patient with blood in the urine.

It is remarkable what a variety of conditions may be simulated by renal tumor. The commonest confusing picture in our experience is that of a bone tumor which may be taken for a primary. Not infrequently metastasis may simulate brain tumor, gall-bladder disease, carcinoma of the stomach, and a considerable variety of other conditions. The tumor might infiltrate the colon and cause an acute intestinal obstruction. Blood may be passed in such quantities that the clots cause retention and the lesion may then be mistaken for prostatic hypertrophy or a bladder tumor by an inexperienced examiner. The picture of renal tumor will continue to be a hopeless one in a certain percentage of cases; namely, in those in which metastasis constitute absolutely the first symptom. If we learn to insist on complete investigations of all patients with renal blood or renal colic who come within the cancer age our results can be very much improved.

A.G.W.: Many people think that by means of an intravenous pyelogram everything can be diagnosed in the kidney. In my experience with intravenous pyelograms they are not worth

anything except in this case where you cannot pass cytology. I had a case last week where leukemia in a young woman. In cytologic examination nothing found. Normal cytogram. Intercourse does not reveal disease. If patient can be cytologized and you can do a cytologic cytogram by all means have that done.

L.S.L.L. We feel intercourse is not as reliable as retrograde. But use it as a screen or in cases mentioned by Dr. Bethell. It appears that it is not of any value.

Gertrude Dunn,  
Laboratory Librarian.