ACUTE CHOLECYSTITIS FOLLOWING THE SURGICAL TREATMENT OF UNRELATED DISEASE*

FRANK GLENN, M.D.

NEW YORK, N. Y.

FROM THE DEPARTMENT OF SURGERY OF THE NEW YORK HOSPITAL AND CORNELL UNIVERSITY MEDICAL COLLEGE

ACUTE CHOLECYSTITIS following surgical operations other than on the biliary tract has attracted the occasional attention of surgeons for some time. Vest[1] reported a case from the Union Memorial Hospital in Baltimore of a 22-year-old woman who was operated on for subacute appendicitis. Palpation of the gallbladder at operation was reported normal. She made an uneventful recovery and was discharged a week after operation. Three days later she was seized with sudden intense pain in the upper abdomen associated with marked spasm and tenderness in the gallbladder region. A gallbladder containing large amounts of black bile and a single mulberry stone was removed after readmission to the hospital. Fisher[2] reported another case from Baltimore of a 19-year-old football player who was operated on for open reduction of the scaphoid. Two days later he developed manifestations of acute cholecystitis with a white count of 17,200. At operation a gangrenous gallbladder was removed and the patient made an uneventful recovery. One of the earliest cases in the literature was reported by Duncan[3] in 1844. The patient was a woman with a strangulated hernia of 24 hours' duration and general symptoms of intestinal obstruction. The hernia was easily reduced but the symptoms became more severe and suggestive of peritonitis. Death occurred in 48 hours. Postmortem showed the under-surface of the gallbladder to be gangrenous; it had perforated, resulting in bile peritonitis. No stones were found. Another instance was reported by Kocher[4] of a 51-year-old woman who developed acute symptoms of cholecystitis eight days after repair of a ventral hernia. At operation a gangrenous gallbladder was found.

Several years ago I saw at autopsy a patient who had died because of a generalized peritonitis secondary to an acute gangrenous cholecystitis with a free perforation into the peritoneal cavity. The patient was a 60-year-old male who had been operated upon for repair of a large sliding hernia that contained much of the sigmoid colon. He was obese, weighing 74.2 kilos. The operation was done without difficulty under spinal anesthesia. Because of the dissection required to liberate the incarcerated bowel, the patient after operation was maintained on clear liquids by mouth and infusions for six days. The diet was then increased and on the seventh postoperative day he complained of abdominal pain that was first generalized and then became most marked on the right side. This was accompanied by an elevation of temperature to 38° C., an increase in the pulse rate to 100, and marked abdominal distention. The latter was only partially relieved by enemas. Nausea and vomiting were marked on the 9th postoperative day and a flat plate revealed

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marked large bowel distention. Because of these symptoms and findings, a laparotomy was done ten days after repair of the hernia and particular attention was directed to the left colon which had been incarcerated in the large hernia. The fluid in the abdomen was blood-tinged and the lower bowel was distended but otherwise not unusual. The region of the gallbladder was not examined, although a colostomy of the transverse colon was done in an effort to relieve the bowel distention. Five days later the patient died. The gangrenous gallbladder containing stones had perforated into the peritoneal cavity, resulting in a generalized peritonitis, the cause of death.

Over a period of 14 years (from September 1, 1932, to September 1, 1946), at the New York Hospital, a total of 555 patients have been operated upon for acute cholecystitis. This phase of gallbladder disease, we feel, is well treated by surgery and for those patients under 50 years of age the operative mortality has been low, there having been four deaths, a mortality rate of 1.08 per cent in a group of 368 patients. The mortality rate was much higher in the 187 patients over 50 years of age; there were 11 deaths, a mortality rate of 6.1 per cent. During this same period over 2,000 patients were operated upon for non-malignant disease of the biliary tract.

TABLE I

ACUTE CHOLECYSTITIS—NEW YORK HOSPITAL

September 1, 1932, to September 1, 1946

Total cases	555
Deaths	15
Mortality, per cent	2.7
Operative Procedures	
Cholecystectomy	485
Cholecystostomy	70*
Common duct exploration	44

* 12.6% of total operations.

Cholecystostomy was performed in 70 instances and was followed by six deaths. This procedure is clearly indicated under certain circumstances, as when the patient is too ill to withstand cholecystectomy or when cholecystectomy presents too great difficulties. For the extremely debilitated patient or for the very ill, we doubt if there are any contraindications for cholecystostomy because it may be done under local anesthesia, disturbing the patient very little, and at the same time the simple procedure may be a life-saving one. The decompression of the biliary tract averts catastrophe by preventing progressive liver damage if complete biliary obstruction is present.

TABLE II

ACUTE CHOLECYSTITIS—NEW YORK HOSPITAL

September 1, 1932, to September 1, 1946

Patients fifty years of age or over

Total cases	187
Deaths	11
Mortality, per cent	6.1
Operative Procedures	
Cholecystectomy	150
Cholecystostomy	37*
Common duct exploration	24

* 19% of total operations.

In the series of 555 patients treated surgically, 187 were 50 years of age or over. There were 11 deaths, a mortality rate of 6.1 per cent. One hundred and fifty were subjected to cholecystectomy. Thirty-seven, or 19 per cent of the 187, were treated by cholecystostomy. Twenty-four, had in addition to these operations, exploration of the common duct. The mortality rate of 6.1 per cent of these patients who were 50 years of age and over indicates the definite greater risk associated with them than those of less than 50 years of age with a mortality rate of 1.08 per cent.

TABLE III

ACUTE CHOLECYSTITIS—NEW YORK HOSPITAL

September 1, 1932, to September 1, 1946

Patients under fifty years of age

Total cases	368
Deaths	4
Mortality, per cent	1.08
Operative Procedures	
Cholecystectomy	334
Cholecystostomy	33*
Common duct exploration	26

* 9% of total operations.

The remaining 368 of the 555 patients were under 50 years of age. There were four deaths, a mortality rate of 1.08 per cent. Three hundred and thirty-four, or 90.8 per cent, were subjected to cholecystectomy, and 33, or 8.9 per cent, were treated by cholecystostomy. Only 26, or 7.1 per cent, had in addition to one of the above procedures, exploration of the common duct. This is a far more favorable outcome than our experience with the group of patients who were 50 years and over.

During this period of 14 years I have observed 17 patients who developed acute cholecystitis following a surgical procedure unrelated to the biliary tract. They are as follows:

Diagnosis	Number Cases	Age of Patients
Hernia	4	60–62–60–58
Acute appendicitis	2	67–32
Hemorrhoids	2	60–58
Hydrocele	1	63
Fissure in ano	1	54
Ovarian cyst	1	29
Abscess of leg	1	67
Nasal packing for epistaxis	1	41
Bladder stones, hypertrophy of prostate	1	64
Tumor of salivary gland	1	63
Hypertrophy of the prostate	1	54
Carcinoma of the rectum	1	49
Total	17	

Five of these patients were observed during the last part of 1945 and 1946. Their case summaries are presented as illustrative of the common course of events.

Case 1: C. S.—#438487. This 67-year-old white male was admitted to the hospital because of a cellulitis superimposed upon dependent edema of the lower extremities secondary to cardiac disease. The cellulitis had followed a severe sunburn sustained in Florida. He was admitted to the hospital, placed at rest in bed, and digitalized. During this period he developed a subcutaneous abscess that was incised and drained under local anesthesia. He received morphine and codeine for discomfort and because of his cardiac condition was placed on limited intake by mouth. He received penicillin for his infection. Eight days after admission and two days after incision and drainage of the abscess, he suddenly developed pain in the right side of his abdomen associated with nausea and vomiting. There was no history of any similar previous episodes. His temperature within a few hours was 38.4° C. and his white count rose to 22,300. The entire right side of the abdomen was held so rigid that no masses could be palpated. A diagnosis of probable acute cholecystitis was made and under local anesthesia a cholecystostomy was done. There was bile-stained fluid free in the peritoneal cavity; the gallbladder was tense and acutely inflamed. It contained white bile and bile-stained material but no stones. The patient's postoperative course was satisfactory. Because of his cardiac condition he was discharged from the hospital and died some weeks thereafter of cardiac disease.

Case 2: S. G.—#461002. A 32-year-old male was operated upon for acute suppurative appendicitis with gangrene, having had symptoms for about three days prior to operation. Following the appendectomy the patient received nothing by mouth for several days because of peritonitis; morphine was given for pain. He had glucose infusions up to 3,000 cc. per day. He was a somewhat apprehensive individual who was very slow in resuming a normal intake by mouth. Solid food was first taken on the 9th postoperative day; the next day he complained of pain in the right upper quadrant which gradually increased in severity. He became nauseated and vomited, and associated with this was an elevation of temperature to 37.8° C. and of the white count to 24,000. At operation a large, acutely inflamed gallbladder containing 50–60 stones was removed. His postoperative course was entirely satisfactory and he was discharged two weeks later. It is probable that the prolonged period of fasting and a moderate amount of drug therapy may have precipitated this acute attack.

Case 3: C. R.—#446343. A 62-year-old man was admitted to the hospital for repair of an indirect inguinal hernia. In the course of a check-up cholecystograms were taken, revealing stones. The patient was operated upon for repair of the hernia under local anesthesia, having been given preoperative morphine, and clear fluids were given immediately after operation. He received morphine on the first postoperative day and codeine on the second, and he was then placed on a soft diet. On the third day he complained of severe pain in the right upper quadrant following the taking of a few bites of creamed shrimp. Within a few hours there was a palpable mass in the right upper quadrant which was believed to be the gallbladder. His white count was 12,000 and his temperature rose to 38.4° C. He was nauseated and vomited. A diagnosis of acute cholecystitis was made and operation recommended but refused by the patient. The acute episode gradually subsided over a period of three days and the patient was discharged from the hospital to return four months later when a gallbladder containing many stones was removed.

Case 4: F. C.—#403668. A 41-year-old hotel executive was admitted to the hospital because of epistaxis which was severe and persistent. His past history was significant. Eight years before he had had acute cholecystitis, and a cholecystostomy was done and stones removed. Six years later because of indigestion he had had cholecystograms done which revealed a poorly functioning gallbladder containing stones. For years he had taken several cocktails and highballs each day. His prothrombin time was prolonged but became normal following the administration of vitamin K. Upon admission to the hospital he was given transfusions. Repeated packing of the left nostril was necessary

and during this period the patient received morphine for pain and discomfort. Fluids were taken with difficulty and he received infusions; he took no food. He was running an elevated temperature of 39.8° C. which gradually subsided over the first five days of hospitalization, at the end of which time he was greatly improved. His temperature was almost normal and he received solid food for the first time on the 5th day after admission. Shortly thereafter the patient had severe right upper quadrant pain radiating around the right costal margin. He was nauseated but did not vomit. Within a few hours the entire abdomen had become rigid to examination, the pulse was elevated to 120, the temperature to 39.4° C., and the white count to 13,000. It was the impression of the author that the patient had a perforation of the gallbladder associated with acute cholecystitis. He was subjected to immediate operation but because of his poor general condition only a cholecystostomy was done for acute gangrenous cholecystitis with a perforation through which bile was escaping. There was a single stone which was removed. He was discharged from the hospital 22 days later. Four months thereafter he was readmitted and a cholecystectomy was done.

Case 5: P. H.—#455952. A 64-year-old male was admitted to the hospital because of a bladder stone and hypertrophy of the prostate. The patient had in addition to his urinary symptoms some indigestion, and prior to operation a cholecystogram was taken which revealed stones. Seven days after admission a suprapubic cystolithotomy and suprapubic prostatectomy were performed under spinal anesthesia. He received preoperative morphine and also morphine after operation, as well as parenteral fluids. During the following six days the patient was without appetite and took only clear fluids. On the 7th postoperative day he began to take his first solid food. The following day he complained of pain in the right upper quadrant and was nauseated but did not vomit. Over a period of 12 hours there developed a mass in the right upper quadrant and generalized muscular resistance of the right rectus. His temperature rose to 38.8° C. and the white count was 14,200. The patient was operated on and an acutely inflamed, distended gallbladder was found which contained a large stone in the ampullary region. Because the patient had at the time of this operation an upper respiratory infection as well as some elevation of his urinary nitrogen, the operation was performed under local anesthesia and only a cholecystostomy was done. Following this procedure he made an uneventful recovery and was discharged from the hospital on the 25th postoperative day. He is to return for cholecystectomy.

Because of the controversy commonly associated with the early surgical treatment of acute cholecystitis, we have been constantly reviewing our experience in an attempt to evaluate properly our policy. Our aim has been to interrupt biliary disease early by surgical interference. Acute cholecystitis is but a phase of biliary tract disease. It is an important phase, however, because in it certain complications may arise which are associated with a high mortality rate. And it has been reported again and again in the literature that these complications and their accompanying mortality account for a very definite proportion of the deaths that result from operations upon the gallbladder and bile ducts. In a paper entitled "The Factors Leading to Death in Operations Upon the Gallbladder and Bile Ducts," Heuer[5] in 1934 reported that 20 authors up to that time had recorded 502 instances of perforation of the gallbladder. Only eight of these recorded their mortality figures; however, these ranged from 33.3 to 100 per cent. In a review of the literature from 1934 to 1946 I have found reports of 25 authors who have recorded an additional 457 cases. Twenty-two of the 25 authors have given their mortality figures and these range from 5.8 per cent to 75 per cent.

TABLE IV

GALLBLADDER PERFORATIONS FROM THE LITERATURE—DEATHS AND MORTALITY

Heuer—1934

Author and Reference	Number Cases	Number Deaths	Mortality (Per Cent)
Blalock, A.: Bull. Johns Hopkins Hosp., 35:391, 1924	21	?	
Smith, M.: Tr. Am. S. A., 51:287, 1933	24	?	
Johnson: South. M. J., 19:889, 1926	9	9	100.0
Judd, Parker: Ann. Surg., 84:419, 1926	2	?	
Siegmund: Deutsches Arch. f. Chir., 230:359, 1924	8	5	62.5
Heuer, G.: West Virginia M. J., 26:1, 1930	18	?	
Danzia: S. Clin. North America, 6:1397, 1926	1	1	100.0
Stanton: Am. J. Surg., 8:1026, 1930	32	32	100.0
Santee: Ann. Surg., 93:1156, 1931	5	3	60.0
Alexander: Ann. Surg., 86:765, 1927	20	?	
Mitchell: Ann. Surg., 88:200, 1928	16	?	
McWilliams: Ann. Surg., 55:235, 1912	6	2	33.3
McWilliams: Ann. Surg., 55:235, cites	108	52	48.0
Gosset, Deplas: J. de chir., 25:259, 1925	111	?	
Darner, Cullen: Surg., Gynec. & Obst., 37:579, 1923	3	2	66.6
Zinninger: Ann. Surg., 96:406, 1931	16	?	
Miller: Ann. Surg., 92:644, 1930	8	?	
Graham: Ann. Surg., 93:1152, 1931	7	?	
Judd, Phillips: Tr. Am. S. A., 51:292, 1933	68	?	
Mentzer: Surg., Gynec. & Obst., 55:709, 1932	19	?	
Total	502		

TABLE V

PERFORATION OF THE GALLBLADDER—ADDITIONAL CASES FROM THE LITERATURE

Glenn—1947

Author and Reference	Number Cases	Number Deaths	Mortality (Per Cent)
Cowley & Hawkins: Surg., Gynec. & Obst., 77:661, 1943	25	4	24.0
Edwards & Goerig: Ann. Surg., 113:824, 1941	18	3	16.6
Stone & Douglas: Am. J. Surg., 45:301, 1939	17	1	5.8
Eliason & McLaughlin: Ann. Surg., 99:914, 1934	9	1	11.0
Niemeier, O.: Ann. Surg., 99:922, 1934	8	0	0
Sanders, R.: Surgery, 1:949, 1937	46	8	17.4
Noble, T.: Am. J. Surg., 38:259, 1937	9	3	33.3
Bachhuber & Deeb: Am. J. Surg., 67:40, 1945	22	3	13.6
Johnston & Ostendorph: Arch. Surg., 53:1, 1946	3	0	0
Heyd, C. G.: Ann. Surg., 101:797, 1935	6	1	16.0
D'Abreu, A.: Brit. M. J., 2:1156, 1936	3	2	66.6
Hotz, R.: Am. J. Surg., 44:706, 1939	53	19	35.8
Atlee, J. & Atlee, J., Jr.: Pennsylvania M. J., 44:731, 1941	15	3	20.0
Schaeffer, R.: Pennsylvania M. J., 45:566, 1942	20	8	40.0
Graham & Hoefle: Ann. Surg., 108:874, 1938	4	3	75.0
Blain & Harkins: Surgery, 21:110, 1947	9	5	55.0
Blumberg, N., & Zisserman, L.: Am. J. Surg., 70:38, 1945	21	7	33.3
Root & Priestley: Am. J. Surg., 61:38, 1943	22	8 ?	
Stout & Hibbard: Surgery, 13:734, 1943	6	4	66.6
Eliason & Stevens: Surg., Gynec. & Obst., 65:79, 1937	17	0	0
Wallace & Allen: Arch. Surg., 43:762, 1941	64	11	17.2
Wesson, H.: Proc. Staff Meet., Mayo Clin., 12:500, 1943	16	0	0
Taylor, F.: Surg., Gynec. & Obst., 63:298, 1936	15	3 ?	
Touroff, A.: Ann. Surg., 99:900, 1934	4	?	
Glenn & Moore: Arch. Surg., 44 (677-686), 1942	25	4	16.0
Total	447		

The genesis of acute cholecystitis following unrelated surgical operations may be accounted for as follows. The patient for a certain number of hours

before operation receives nothing by mouth; he then receives preoperative medication of morphine and atropine. It is believed that the flow of bile from the liver into the gallbladder is almost constant—the preoperative medication does not alter this. The bile is concentrated in the gallbladder. The operation then takes place, and the flow of bile under anesthesia may be reduced, but the operation is a matter of one to a few hours. Then the flow of bile into the gallbladder begins again. There is further concentration of bile in the gallbladder until some stimulus in the stomach or duodenum results in its emptying. At first the patient usually takes water, then clear liquids, full liquids and then a soft diet. Upon ingestion of a soft diet there may be, for the first time, since water and food were withheld before operation, an all-out attempt on the part of the gallbladder to empty its viscid and concentrated bile into the common duct and thence into the duodenum. If a stone or stones block the escape of the concentrated bile from the gallbladder then the mechanism for obstructive cholecystitis obtains and an acute episode in the cycle of gallbladder disease may result. However, there are instances of acute cholecystitis in our experience without stones.

The pathology of the gallbladder in the patient who develops acute cholecystitis following a surgical procedure is indistinguishable from that observed in patients commonly encountered. In cholelithiasis the degree of ischemia or edema would appear to depend upon the location and relation of the cystic vein and cystic artery to the segment of the cystic duct or ampulla, within which is lodged the stone. The gallbladder which has had many previous episodes of inflammatory reaction is more scarred and therefore does not become distended and enlarged to the extent that the more normal gallbladder does. Likewise the thickness of the gallbladder wall is dependent upon the amount of edema that may be the result of obstruction to the venous return and the nature and extent of the bacterial infection within the gallbladder wall. Certain types of infection, of short or long duration, tend to produce a great deal of reaction with the result that the thickness of the gallbladder wall is several times that of the normal organ. The thickness of the wall might determine to some degree the readiness with which perforation would take place, providing the type of infection were equal in the two. The rapidity with which gangrene develops and is followed by perforation is dependent upon the interference of the blood supply, the rapidity with which the infection takes place, and the virulence of the organism and its capacity to cause necrosis.

We would not imply that free perforation is to be anticipated in the majority of patients with acute cholecystitis. The omentum and its tendency to become attached to the inflamed gallbladder wall constitutes a normal protective mechanism, and it is probable that this comes into effect in the majority of patients. If the area of gangrene in the gallbladder wall is limited to the fundus, then attachment of the omentum may block the free escape of bile into the peritoneal cavity. If, however, the entire organ is involved, then it is probable that the omentum will be unable to protect the peritoneal cavity. Where there has been a free escape of bile into the abdominal cavity, there is

usually an absence of any pretext of adhesions between the gallbladder wall and the omentum. Whether or not this is due to the action of the bile or whether there is some other process with which we are not familiar that prevents it fulfilling its normal function is not known. In late bile peritonitis the omentum as a rule seems to be contracted and much smaller, and assumes the normal position down over the mid-portion of the abdomen rather than traveling to the source of the bile leakage.

In discussion of the treatment of acute cholecystitis with those who favor nonoperative treatment, we are often confronted with the statement that perforation of the acute gallbladder rarely, if ever, occurs. Our experience at the New York Hospital and that reported by other clinics suggest that it is much more common than is generally accepted.

Johnstone and Ostendorph[6] found on review of 12,000 consecutive routine autopsies done at the Los Angeles Hospital from 1936 to 1942 a total of 32 instances of perforation of the gallbladder as the principal cause of death. This is an incidence of 0.26 per cent, or approximately one out of every 375 cases coming to autopsy. This is the highest incidence of perforation that has been reported. Nineteen, or 43 per cent of these cases, were free perforations which without evidence of walling off had led to generalized peritonitis. Almost two-thirds of these patients were 50 years of age or more. They also found that there was a much higher proportion of male patients, 22, or 68 per cent of the patients, being men. This is of suggested importance in the consideration of the cases reported above, because all but one of these patients developing acute cholecystitis following operation unassociated with the biliary tract, were men.

Green and Coe[7] report perforation of the gallbladder occurring twice in the same patient. Cholecystostomy was done for the first perforation. The second perforation was followed by death. This was a free perforation of the gallbladder with an estimated 100 cc. of bile in the peritoneal cavity. The site of perforation was adjacent to an old sinus communicating with the fundus of the gallbladder. To all intents and purposes, therefore, it was a perforation at the same site, and in both instances the attacks were associated with pain radiating to the right shoulder as well as pain and tenderness in the right upper quadrant. Both were rapidly progressive.

Acute cholecystitis may be unrecognized as a complication following surgical procedures. The incidence of cholelithiasis in the population is rather large. This is especially true of those patients who are over 50 years of age. Our surgical armamentarium has resulted in an increase in the number of patients in the older age group who are daily operated upon throughout the country. The onset of pain in the abdomen localizing in the right upper quadrant, usually associated with nausea and vomiting and accompanied by some elevation of temperature and leukocytosis, would seem sufficient to make this diagnosis relatively certain. Of significance in evaluating the immediate situation is the patient's past history relative to biliary tract disease. Indeed, the patient over 50 years of age who is to undergo a major surgical procedure

for a condition unrelated to the biliary tract should have a careful evaluation of his history to determine any symptoms referrable to this system. If the history is suggestive of biliary tract disease, it is well to do a cholecystogram to determine the presence or absence of cholelithiasis and the capacity of the gallbladder to fill and concentrate the dye as well as its ability to empty. Then if a patient develops the symptoms of acute cholecystitis after operation it is less likely to be overlooked if stones are known to be present.

Once the diagnosis has been established, the therapy to be accorded the patient will be determined by a number of factors. Our experience over the past 14 years at the New York Hospital justifies, it seems to us, early surgical therapy. A patient who has been operated upon and who is suffering from acute cholecystitis as a complication may not in many instances be an ideal surgical risk. It is to be expected that there will be many patients in whom cholecystectomy is contraindicated. On the other hand, there can be no contraindications to cholecystostomy done under local anesthesia. This is a minimal procedure; it is also one which may be life-saving. There are many patients, perhaps in the majority, who will recover from this attack. Many patients will refuse a second operation, and there are those for whom the surgeon will be reluctant to recommend even a cholecystostomy for one reason or another. In the relatively young patient the risk associated with non-surgical treatment is, we feel, much less than in the older age group. In those patients who are over 50 years of age the temperature, leukocyte count, and even the clinical picture frequently do not parallel the pathologic process which is taking place within the gallbladder. It is in this group in particular that we feel early surgery is imperative.

If a cholecystostomy is done it should be followed in a matter of months, with the patient as well prepared as possible, by a cholecystectomy. In this respect, the report of Green and Coe describing a patient who had an acute cholecystitis with perforation treated by cholecystostomy and who recovered and then years later experienced another episode of acute cholecystitis with perforation followed by death, is significant. One of the patients listed above (F. C.—#403668) developed an acute cholecystitis associated with a large stone impacted in the ampulla of the gallbladder eight years after cholecystostomy. These two cases are evidence in favor of cholecystectomy being done within a reasonable period after the compromise procedure of cholecystostomy.

CONCLUSIONS

Acute cholecystitis may occur after surgical procedures, especially in male patients who are over 50 years of age. When it does the best interests of the patient require operation. This may be cholecystectomy or cholecystostomy. The procedure is determined by the patient's condition. It will frequently be found that cholecystectomy may be inadvisable and that only a cholecystostomy can be done. This procedure may, however, be life-saving. Cholecystectomy should be done later; cholecystostomy is but a compromise procedure. It is no insurance against future episodes of acute cholecystitis or accompanying perforation that may well end fatally.

REFERENCES

1 Vest, S. A., Jr.: Gangrene of the Gallbladder; Internat. Surg. Digest, 15, 131–160, 1933.
2 Fisher, W. A.: (Quoted by S. A. Vest, Jr.: Gangrene of the Gallbladder: Internat. Surg. Digest, 15, 131–160, 1933.)
3 Duncan, J.: Femoral Hernia: Gangrene of the Gallbladder; Extravasation of Bile; Peritonitis; Death. North. J. Med., 2, 151–153, 1844–1845.
4 Kocher, T., and H. Matti: Ueber 100 Operationen an den Gallenwegen mit Berücksichtigung der Dauererfolge; Arch. f. klin. Chir., 81, 655, 1906.
5 Heuer, George J.: The Factors Leading to Death in Operations Upon the Gallbladder and Bile-Ducts. ANNALS OF SURGERY, 99, 6, 1934.
6 Johnstone, G. A., and Ostendorph, J. E. Arch. Surg., 53, 1, 1946.
7 Green, E. I., and George C. Coe: Acute Free Perforation of the Gallbladder Occurring Twice in the Same Patient. Surgery, 7, 396–400, 1930.

DISCUSSION.—DR. HENRY F. GRAHAM, Brooklyn, N. Y.: I have had the pleasure of reading this paper in advance, so my discussion is a little prepared.

Dr. Glenn's theme seems to be (1) Acute cholecystitis is more apt to occur as a complication following operation for other conditions than its normal incidence as a primary disease. (2) It is more apt to occur in elderly people past 50 and in males. (3) He mentions, as a possible explanation of its occurrence, dehydration and medication which decreases secretion and causes concentration of thickened bile in the gallbladder which cannot easily be expelled upon food stimulation. This is an interesting hypothesis but might be open to question in view of the types of cases where operation has been followed by acute cholecystitis. I am convinced, however, that in many patients large doses of sedatives do have a deleterious effect. (4) The diminished resistance of the gallbladder to pressure and infection following previous disease may favor perforation. It would be easy for each of us to prove this by a review of his own records, and it would not be without chagrin if we look up those cases we have forgotten.

I checked up on three cases. One was a woman aged 56 who had an operation for appendiceal abscess. Sixteen days later she complained of pain around the waist line and had induration of the epigastrium and right upper quadrant. The appendiceal wound showed thick yellow pus. A high temperature was thought to be due to sulfonamides. The attack subsided after 12 days. Two weeks later she had another attack with pain in the upper quadrant, tenderness and vomiting. Empyema of the gallbladder was found at operation. Another case was a man aged 45, who had suffered from epigastric pain for six months with a loss of 40 pounds in weight. On his third day in the hospital, while being studied preparatory to operation for duodenal ulcer, he had a sudden attack of pain in the lower abdomen following an enema. The leukocyte count was 14,000. X-rays were taken to visualize free air under the diaphragm and, finally, after 24 hours delay, because of the confused picture a cholecystostomy was performed for a perforated gallbladder.

A physician, 72 years old, was under treatment for coronary thrombosis and acute diffuse nephritis. After six weeks in the hospital he had pain in the gallbladder region. He was observed for three weeks because of his poor condition. Operation then disclosed an empyema of the gallbladder with a sealed-off perforation covered by omentum.

This paper should stimulate an increased awareness of acute cholecystitis complicating other diseases and especially following operation for other conditions.