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GALLSTONE ILEUS

Eduardo Camacho, M.D.,* John G. Whitcomb, M.D.,* and
Douglas M. Evans, M.D.*

Report of three cases and a brief review of the literature.

It is the purpose of this report to stress some of the clinical manifestations of
the mechanical obstruction of the gastrointestinal tract caused by gallstones; this clinical
and pathological entity of which the infrequency has been overemphasized, occurs
in 1 to 2% of all cases of non-strangulating intestinal obstruction. Although the
mortality from intestinal obstruction has been reduced to 5 to 7% recent reports still
show a mortality from gallstone ileus of 40 to 50%¹. This cholelithic obstruction
of the alimentary canal is considered to be a potentially dangerous complication of
the so-called “silent gallstone”. In this paper, we review three cases seen in the last
three years at the Henry Ford Hospital, in which the diagnosis was proved at operation
or by passage of a gallstone through the rectum, thereby relieving the obstruction.

HISTORICAL DATA

Bartholin in 1654² published a case of perforation of a gallstone from the gall­
bladder into the jejunum. Curvoisier³, however, was the first one and justly deserves
the credit for having directed surgical endeavor into the proper channels. He published
131 cases which constituted a masterful production. Subsequently, numerous reports
have appeared. In 1914, Wagner⁴ collected 334 cases from the literature. Moore⁵
estimated the number as about 400 in 1925, later, in 1942, Foss and Summers⁶
collected an additional 150 cases; and, according to Deckoff⁷ in 1955, the number
of recorded cases of gallstone ileus at that time was 555.

It is very obvious that for gallstone ileus to occur, a gallstone must be first formed.
Most frequently, this takes place within the gallbladder, although it may form in the
extrahepatic biliary system which is very unusual. It is of interest that gallstone ileus
has been reported when the gallbladder was not present.⁸

Following the formation, the stone may obstruct the alimentary tract in one of
two ways: 1. Entering the peritoneal cavity. Inflammation about it may then cause
kinking and extra luminal obstruction of the intestine, however. 2. More often the
blockage is caused by entrance of the stone into the lumen of the bowel producing an
obturation type of obstruction. The latter may be caused by three different methods:
1. A gallstone free in the peritoneal cavity may ulcerate into the intestine, sometimes
long after perforation of the gallbladder had occurred. 2. The stone may enter the
duodenum via the common duct and ampulla of vater. This has been a very contro­
ersal point. Murphy⁹ reported a case in which the ductus choledochus was dilated
even to permit the passage of a stone measuring 4.5 cms. 3. Almost always, the
presence of gallstone ileus is associated with a cholecystoenteric fistula. Such a

*Department of Surgery.
fistulous tract connects the gallbladder with the duodenum in the vast majority of the cases but the colon, stomach and jejunum are connected with the gallbladder less frequently. In addition, rarities connecting the gallbladder and the pleural and pericardial cavities, the pregnant uterus and the renal pelvis have been reported. It is not the purpose of this paper to describe the pathogenesis of these fistulae which has been described in the past by Borman and Rigler in 1937.8

CLINICAL CASES

First Case. J. B. No. 643696, a 60 year old white female was seen in the emergency room at the Henry Ford Hospital in acute distress with the chief complaint of right upper quadrant and epigastric pain of sudden onset 4 days prior to admission to the hospital. This pain was stabbing in nature and localized to the previous mentioned areas up to the moment of admission, after which it became more generalized in the right side of the abdomen. Anorexia, nausea and vomiting accompanied the pain with the onset of the symptoms. The patient became progressively distended and obstipated. No flatus or bowel movement had been noted for the past 4 days. The past history disclosed evidences of previous “gallbladder attacks” and myxedema, produced several years ago by the administration of radioactive iodine. On physical examination, the appearance of the patient was that of an elderly woman, obese, with the classical myxedematous appearance. Vital signs were T. 99.4° F. Pulse 98, Respiration 18 and blood pressure 118/84. ENT examination was negative. Lungs were clear to percussion and auscultation. Heart tones normal with a regular rhythm; no presence of murmur or gallop. The abdomen was distended with no scars visible. The patient was tender in the right upper quadrant and right flank on palpation. The epigastrium was also moderately tender. The abdomen was tympanitic and bowel

Case No. 643696 J. B. Flat Plates of the abdomen shows on: A. taken on day of admission marked distension of the jejunum, and air in biliary tree. B. 2nd day after admission distension increase, special polyethylene tube with the mercury bag at level of the ligament of Treitz.
Gallstone Ileus

sounds were present but markedly hypoactive. Rectal and pelvic examinations were non-contributory. Laboratory work on admission was as follows: Diastase 110%, W.B.C. 6450, Hgb. 14.2 gms., urine negative, chest x-ray normal. The flat plates of the abdomen showed evidence of ileus and air in the region of the gallbladder and the biliary tree but no stone was identified within the abdominal cavity. Conservative therapy consisted of intestinal intubation and suction, parenteral fluid and electrolyte replacement. On the first and second hospital days the patient's condition remained the same. Seen by endocrinologist and Cytomel is given. The repeat x-ray films of the abdomen showed persistence of the air in the area of the biliary tree and no gas in the large bowel. On the fourth hospital day, a barium enema was obtained and showed diverticulosis with no evidence of diverticulitis or malignancy. The patient, in the afternoon, on expelling the barium with a saline enema, passed a large ovoid stone measuring 11/4 by 1/2 inches. This stone proved to be more than 90% cholesterol when examined by the x-ray diffraction method at the Edsel B. Ford Institute, Department of Physics.

After the passage of the stone, the patient underwent a frank period of recovery. Cholecystograms eleven days after the initial admission showed non-function of the gallbladder and the presence of a round density which represented another gallstone. Upper gastrointestinal series disclosed the presence of a cholecystoduodenal fistula. Patient was discharged on a bland diet and Cytomel for out-patient department follow-up.

Case No. 643696 J. B. Flat Plates of the abdomen shows on: the 3rd day after admission long polyethylene tube used for suction with mercury bag near the terminal ileum, small bowel dilatation with improvement — residual of barium enema shows diverticulosis.
Stone from Case No. 643696, J. B. Passed spontaneously per rectum on 6th day after admission. This proved to be 95% pure cholesterol.

Patterns produced by the x-ray diffraction of the stone. A. Normal pattern of cholesterol and — B — the pattern of the stone from Case No. 643696 — J. B.
Case No. 643696 J. B.: A. Barium enema shows transverse colon, the gallbladder area seen with a calcified stone and evidences of air. B. shows cholecystograms demonstrates non function of gallbladder and the calcified and laminated stone. C and D. upper gastrointestinal serial films, with demonstration of the cholecysto-duodenal fistulous tract.
Second Case. D. N. No. 819746 age 75. White male admitted via the emergency room with the chief complaint of abdominal pain, crampy in nature and diffuse, nausea and vomiting with marked obstipation for the last six days. There was a history of previous biliary colic. Laboratory data on admission was non-remarkable. Abdominal distention was present, diffuse tenderness with presence of hyperperistalsis. Rectal examination disclosed benign prostatic hypertrophy. The x-ray films of the abdomen showed distended loops of jejunum with the presence of aberrant or migratory calculi within the abdominal cavity. The calculi shifted from the left lower quadrant in the first set of films to the right lower quadrant on the second ones. Intestinal intubation was accomplished and suction instituted in addition to the electrolyte and fluid restoration. Antibiotics were given. 48 hours after admission the patient was taken to the operating room and a gallstone was removed from the jejuno-ileal junction measuring 3 to 3.5 inches in diameter. It was broken in two pieces and it was observed that the stone served as a nucleus for the deposit of stool all the way around it. The patient had a stormy recovery, including phlebothrombosis occurring on the 7th postoperative day. An acute hemorrhagic prostatitis followed, which subsided with medication and finally the patient was discharged in good condition.

Third Case. K. H. 63 year old white female, first seen at the Henry Ford Hospital in April of 1948, at the age of 53, with complaints of upper abdominal bloating and flatulence. Jaundice, melena and vomiting were denied at the time. The objective findings were mild hypertension, cystocele and rectocele with obesity. A clinical diagnosis of biliary tract disease was made at the time. While cholecystograms were being obtained, the patient did have a marked allergic reaction to the dye and was admitted for treatment of this. The films at the time showed a poor filling of the gallbladder with a large radio-opaque shadow suggesting cholelithiasis. Biliary drainage showed three plus cholesterol crystals. Surgery was advised but the patient refused. In view of this, she was placed on a low fat diet and appropriate medications. She was followed in the out-patient department for ten years. She presented herself in the emergency room on June 30, 1958, with a two day history of intermittent cramping abdominal pain and vomiting. The pain began in the epigastrium then shifted to the

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Case No. 819746 D. N. The presence of jejunal distension is very striking. There is a stone on the abdominal cavity on the first film (A) The stone lies on the L.L.Q. — on the second film (B) taken the next day, the stone is in the R.L.Q. — also a stone is seen on the area of the gallbladder.
Gallstone Ileus

periumbilical area. No bowel movement had been noted for the last several days and no passage of gases per rectum for the last 24 hours. Initial examination showed the abdomen to be soft with bowel sounds hypoactive. No hernia or any abdominal scars were noted. The blood pressure was 120/76, Hgb. 14.2, W.B.C. 12,000, F.B.S. 85, N.P.N. .38, Diastase 119%. Urine analysis negative. An initial diagnosis of small bowel obstruction due to diverticulitis was made. Conservative therapy was initiated, including Miller-Abbott tube suction and intubation of the small intestine and parenteral fluids. Clinical Course: When the patient did not show any evidence of resolution of the process at the fifth day of conservative measures, a barium enema was obtained on July 5, 1958. No diverticuli or tumor were present. An attempt to restore oral intake was made with the subsequent return of crampy abdominal pain. Intestinal suction and parenteral fluids were reinstated with symptomatic relief but no signs of restitution of bowel function. During this interval, the patient displayed no elevation of temperature or pulse and no abdominal findings of an intraperitoneal, localizing process. In view of the presence of persistent obstruction of the small bowel due to a non-inflammatory process, upper gastrointestinal x-ray films were obtained. A calcific density was demonstrated, obstructing the flow of barium. A question of

Case No. 536568 K. H. Administration of barium through the Miller-Abbot tube outlines the jejunum and ileum; suddenly stops at the place of the obstruction, where a round density is outlined. Barium in the biliary tree was raised. A diagnosis of gallstone ileus was made and the next day the patient was taken to the operating room. A huge stone was removed from the ileum; resection of this portion had to be done for trauma produced by the stone. The postoperative convalescence was uneventful. Patient was discharged on the 11th postoperative day and followed in the out-patient department where she continued to do well.

On September 14, 1958, the patient was readmitted to the hospital and on September 16, 1958, returned to the operating room where a cholecystectomy, common
bile duct exploration and closure of the cholecystoduodenal fistula was done. The recovery was uneventful and follow-up to date showed the patient to be in good condition.

Case No. 536568 K. H. Ileum shows the place and bulging area where the stone was lodged. Notice the local trauma and venous ingurgitation. A resection of this portion of the bowel was undertaken.

**COMMENTS**

In our first case, J. B., the diagnosis of gallstone ileus was suspected on admission to the emergency room and became strongly supported when, on some of the progress films, there was seen the presence of air in the area of the biliary tree. In retrospective analysis, the most likely possibility is that the stone was caught in the terminal ileum with the long axis of the stone in a transverse position in relation to the lumen of the bowel and, as has been stated by Foss and Summers,¹ 70% of these stones get caught in this area. The fact that the patient did obtain relief after the barium enema was due to the fact that reflux of barium through the ileocecal valve dislodged the stone from the original place. From the work of Murphy² and Wagner,³ it is known that the stones pass spontaneously through the rectum in the vast majority of the cases.

In view of the myxedematous condition of the patient and the lack of any clinical manifestations in relation to the gallbladder and biliary tract duct system, it was elected to follow the case conservatively.

The second case also was admitted through the emergency room. The diagnosis was elicited and confirmed on admission. Once the patient was prepared and suitable, the surgical procedure was carried out very successfully. Once more the stone was in the jejuno-ileal junction. This patient refused final surgical treatment to the cholecysto-intestinal fistulous tract and we have not seen him since that time.

In the third case, the patient was known to have gallbladder disease in the past. However, the first clinical impression was that of diverticulitis and, only when the
Gallstone Ileus

Barium enema was taken, was this entity ruled out and it was decided to subject the patient to a small bowel x-ray examination which showed the place of the blockage and the stone causing it. A classical sequence of events followed. First, the removal of the stone and, a month later, the final treatment for the cholecystoduodenal fistula, namely, cholecystectomy, common bile duct exploration and closure of the duodenum.

SYMPTOMATOLOGY

In general, these cases are very confusing and they are often misdiagnosed. This is the main reason for delay in therapy, with the consequent increase in mortality for this condition. A past history suggestive of cholelithiasis is found in just about 60% of the cases. We did have it in the three cases reported here. This is not always obtained. The probable reason for this low frequency is the fact that gallstone ileus is often the complication of the so-called “silent stone”. Symptoms of acute cholecystitis preceding the onset of the ileus is also a very uncommon situation according to Foss and Summers. Only in 25% of the cases is it seen. In our cases, there were none of these acute manifestations. Jaundice also was not present in any of the cases here reported and in Deckoff’s series, only one of his patients had icterus.

The initial episode may simulate biliary colic, acute cholecystitis or diverticulitis and may even resemble acute pancreatitis. In some cases there is a diagnosis of perforation of the gallbladder. The preliminary symptoms of small bowel obstruction may occur later, after the stone has passed into the bowel. Clute reported a case in which the symptoms did not appear until five years later. As the stone starts to travel in the lumen of the bowel, it causes partial, intermittent obstruction with cramps, nausea and vomiting. The nature of the delayed symptoms with spontaneous and sometimes with long periods of relief, influences the victim to delay medical treatment. With the final lodging of the stone, the signs and symptoms become acute, distention occurs, vomiting increases with obstipation being the main feature. In some cases, the patient may still pass some flatus and excrete feces from below the place of obstruction and then the clinical diagnosis of the condition is very difficult. The appearance of stones in the vomitus or in the feces is pathognomonic.

DIAGNOSIS

Preoperative diagnosis is infrequently made, mainly because most of the patients are aged, acutely and chronically ill and a good history is difficult to elicit. However, when there is a past history of gallbladder disease in an elderly female, obese and suffering with small bowel obstruction in whom abdominal surgery has not been done and no hernia is present, the diagnosis of gallstone ileus should be strongly considered. The abdominal findings usually are helpful to the diagnosis. Abdominal distention is present, although it may only be revealed by roentgenogram. The temperature and leucocytic count are normal or within normal limits. The average temperature of our cases was 99 and the leucocytic counts ranged from 5000 to 8000. The most valuable aid in the diagnosis is the roentgenologic examination of the abdomen. Flat, upright and lateral films of the abdomen should be taken and, in addition, spot films of the liver region in several positions.
The presence of distended loops of bowel either jejunum or ileum, may suggest the place of obstruction. In other cases, the stone may be seen in addition to the air in the biliary tree. In some other cases, like the third case, the ingestion of barium sulphate may outline the stone. A barium enema may outline the stone which is obstructing the colon. Finally, a gallstone ileus may be suspected if a previous film of the gallbladder shows stone and this is not present any more on subsequent examinations. The differential diagnosis includes all causes of intestinal obstruction such as hernia, adhesions, intussusception, tumor, mesenteric thrombosis, etc. Acute pancreatitis, acute diverticulitis, renal and biliary colics should be ruled out.

**TREATMENT**

Surgical intervention is the treatment of choice soon after the patient's condition has been restored to optimal, including water and electrolyte replacement. The use of the long intestinal tubes for decompression of the small bowel is of great and primary help in treatment preoperatively and postoperatively.

**SUMMARY**

Intestinal obstruction due to a gallstone, an infrequent condition, should be kept in mind in order to achieve a diagnosis in all the cases of intestinal obstruction. Awareness of this entity will produce a clinical diagnosis in many unsuspected cases. The diagnosis of gallstone ileus is suggested when the following findings are present: A. Intestinal obstruction in an obese, elderly patient, more often a female. B. Past history of gallbladder disease. C. Abdomen free of surgical scarring. D. Roentgenological evidences of air in the biliary tree and the presence of a calculus anywhere in the abdominal cavity. The treatment in the acute phase of the obstruction should be directed to produce decompression of distended bowel, restoration of fluids and electrolytes and blood volumes. Once the patient has been properly prepared, the treatment of choice is the removal of the stone unless it is passed in natural ways.

The final treatment of the condition where a cholecystoenteric fistula exists should be evaluated in each individual case since many of these patients will not tolerate an extensive procedure. The age of the patient and presence of associated diseases plays a very important role in the final decision. In the cases where surgery is indicated, the treatment of choice is cholecystectomy, common bile duct exploration and closure of the fistulous opening in the enteric tract. It should be possible to reduce the mortality of this condition from the high rate of 40%-50% to a point similar to the actual one accepted for simple intestinal obstructions; 2 to 7%. The ideal treatment is the prophylaxis by removal of gallbladders which contain stones.

A series of three cases is presented with no mortality.

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