

Original Articles.

CONTRIBUTIONS TO THE SURGERY OF THE BILE PASSAGES, ESPECIALLY OF THE COMMON BILE-DUCT.¹

BY W. S. HALSTED, M.D., BALTIMORE, MD.,
Surgeon-in-Chief to the Johns Hopkins Hospital; Professor of Surgery
in the Johns Hopkins University.

JUST now I am very much impressed with the splendid results of operations for gall-stones in the common duct, for we have had of late a series of cases very desperately ill, and so transformed by their emaciation and discoloration, and so feeble in body and mind, that I could hardly picture to myself the various stages of the metamorphosis toward convalescence. Every one has seen a patient whose life has been despaired of convalesce from acute disease; they watched his rapid decline and expected an almost equally rapid recovery; but when the decline has covered a period of five or ten or perhaps twenty years, the changes wrought are so great and apparently of such permanent character that the complete restoration to health is the more astonishing. The large cirrhotic liver, the dry slate-yellow skin, the enfeebled intellect, the body emaciated to the last degree, seem at times almost to preclude all hopes of recovery to the practitioner who has not witnessed the changes so quickly brought about by nature as soon as the mechanical obstacles to recovery have been removed by the surgeon. What nature accomplishes without the surgeon's aid in her attempts to rid herself of the obstruction in the gall-passages and to repair self-inflicted damage is marvellous; but her methods are very crude and attended with much suffering and great danger, immediate and remote. I have, however, in mind at this moment two particularly creditable examples of nature's surgery.

In the first one the gall-passages were shortened to just the length of the two large stones, which completely filled them. One occupied the gall-bladder, the other the pancreatic portion of the common duct; the duodenum was not only adherent to the gall-bladder, but served in place of its anterior wall, which had been destroyed; the stone in the gall-bladder, therefore, rested on the wall of the duodenum, which was pasted, so to speak, over the great hole in the front wall of the bladder. There was nothing that could be called cystic duct; the choleductus was almost completely covered by the duodenum; the hepatic duct was much distended, admitting easily one finger. All signs of inflammation, except its results, had disappeared. The simplest conditions had been produced, and those most favorable to the expulsion of the stones in some subsequent attack; gall-bladder and common duct were reduced to a short, wide, nearly straight tube, which bore a striking resemblance to an atheromatous aorta. The stone in the common duct was behind the duodenum and buried in its wall.

The second patient had his first colic twenty-one years before admission to the hospital. He was never jaundiced. In the third attack, which began one month prior to operation, his temperature reached 106°. A physician aspirated pus from the distended gall-bladder about twenty-four days after the onset of the third attack, or three or four days before we op-

¹ Read at a meeting of the Surgical Section of the Suffolk District Medical Society, May 3, 1899.

erated. The gall-bladder was opened in two acts. The fluid in the gall-bladder was almost clear and not bile-stained. Diagnosis: Stone in the cystic duct. Cover-slips showed few bacilli. Cultures yielded bacillus coli communis, pure. Patient applied for readmission in eighteen months because he had noticed a hard body just beneath the skin in the mouth of the sinus. By simply dilating the sinus I removed four large, very dark green, almost perfectly cylindrical stones, which were piled up upon each other in this sinus, forming a column 10 centimetres high. Nature would herself have extruded these stones which she had brought to the surface without causing the patient any discomfort.

Equally marvellous are the processes by which nature destroys all traces of her surgical handiwork. I have operated upon two cases in which perforation of the gall-passages and intestinal walls, and the expulsion of the stone, had undoubtedly occurred, but was unable in one of them to find any evidence of the perforation other than a few light and easily separable adhesions. Again, in a case of appendicitis, followed by gangrene of the greater part of the cecum and a wide preternatural anus, there were, within a year, only a few very light adhesions about a pinhole opening in the colon to tell the story. These facts are enough to make the ordinary operations for fixation of the spleen, liver, uterus, etc., seem ridiculous. Adhesions about an artificial opening fortunately never disappear. If innocent fistulae could be established, with the organs to be suspended or fixed, the problem might in a way be solved.

I wish to ask your attention to-night to a few of the unusual facts observed by us in our operations upon the bile passages, particularly the common bile-duct. Almost every one of our common duct cases has presented us with a new fact or two which can hardly fail to interest the general practitioner, as well as those who concern themselves with the surgery of the bile passages. To be as brief as possible, for the time is short, I will summarize at the outset some of the more noteworthy incidents observed by us in this department of surgery.

I. Dilatation of the first part of the duodenum caused by constricting adhesions; as the result, perhaps, of the dilatation, an ulcer ("distention ulcer" — Kocher) on the confines of the pylorus; the ulcer gave rise to a dissecting submucous abscess (chronic), rich in organisms because not reached by the most painstaking sterilization of the stomach. This abscess was punctured during the operation and a fatal peritonitis resulted (terminal infection), although, literally, only a drop or two escaped, and these were carefully wiped away.

II. Primary carcinoma of the duodenal papilla and diverticulum Vateri.

First operation. — Excision of portions of the duodenum (nearly its entire circumference), pancreas, common bile duct and pancreatic duct in order to give the little growth, no larger than a pea, a wide berth; circular suture of the duodenum and transplantation of the stumps of the common duct and the pancreatic duct (Wirsung's) into the line of this suture.

Second operation. — Cholecyst-cystico-enterostomy by the writer's method² for intestinal lateral anastomosis.

III. Dynamic dilatation of the first portion of the duodenum and of the pyloric portion of the stomach,

² Bulletin of the Johns Hopkins Hospital, No. 10, 1891.

corresponding accurately to the limits of a sharply-circumscribed peritonitis; gall-stones in the gall-bladder; hydrops vesicæ. Case full of interest for diagnostician. Beautiful instance of circumscribed dynamic dilatation caused by local inflammation; no adhesions.

IV. Conditions suggesting hepaticocholecystostenterostomy (hepaticocholecystostcholecystenterostomy) as a possible operation; common and cystic ducts reduced to fibrous cords; dilated hepatic duct and gall-bladder. Remarkable toxic (?) renal colic resembling closely intestinal colic, associated with anuria; colic and anuria entirely relieved by salt infusion.

V. Choledochotomy performed twice. The gall-bladder, which was shrivelled at the first operation when two stones were probably in the common duct, was large and distended at the second operation when only one stone occupied the common duct (the ampulla). Hematemesis after the second operation.

VI. The densest adhesions that I have ever encountered in these operations, and probably the most difficult of my operations upon the bile passages. A small abscess in the midst of the adhesions; muscular coat of the duodenum converted into fibrous tissue; the exposed submucosa resembled gall-bladder so closely that the duodenum was aspirated and opened.

VII. Case illustrating the rapidity with which adhesions after perforation and extrusion of stone can be absorbed. Renal pains resembling intestinal colic (third observation of the kind within eighteen months). Tachycardia, believed to be due to toxemia of some kind (possibly benign embolism), suddenly disappeared during counting of pulse and while preparations were being made for subcutaneous infusion.

VIII. Discharge of pus and blood by mouth and rectum during severe gall-stone attack. Two years later, adhesions so extensive and so dense that the common duct was reached by a retroperitoneal route, over the right kidney. A stone in the ampulla had just ulcerated through the wall of the common duct and through its duodenal coverings.

CASE I. *Duodenal stenosis from gall-stones; dilatation of the stomach and of the pyloric end of the duodenum; duodenal ulcer giving rise to a dissecting abscess.*—J. S. age thirty-six, admitted February 5, 1899. Never had typhoid fever. Had malarial fever ten years ago with shaking chills. Never suffered from stomach trouble until present illness. Ever since he was eight years old has had sick headaches, lasting three to four hours, once a month; these would be relieved by emptying his stomach. Has never been jaundiced nor had clay-colored stools. Present illness began very gradually. Three years ago he noticed that his stomach would swell after eating and hardly regain its normal size before the next meal. Had more or less pain in the epigastrium, which was most marked about one hour after eating. No nausea or vomiting at first; bowels regular. About the first of last October the pain became worse, and his sick headaches were more numerous and more severe. His vomiting now began. The vomiting was accompanied by colic, so severe as to double him up. Patient was obliged to stop work for two weeks. He then resumed work until Christmas, since which time he has been unable to work. Patient now vomits much more frequently. The vomiting is preceded by heartburn for about three hours and much pain in the epigastrium. Patient feels greatly relieved after the vomiting. For two weeks after Christmas he had eructations of gas; none since then. Bowels usually constipated; sometimes did not move for three weeks. He still suffers much from headache. His appetite is good, but he is afraid to eat. In October, 1898, patient weighed one hundred and forty-five pounds; he now weighs one hundred and twenty-three pounds, and is

very weak. Neither stools nor vomitus have ever been blood stained. Urine normal. Stools clay-colored. Patient not jaundiced.

On palpation of the abdomen no distinct tumor can be felt, but one detects an increased resistance just to the right of the umbilicus. The stomach's longest diameter is 31 cm.; its shortest diameter, 21 cm. The lowest limit of the stomach (tympanitic) is $3\frac{1}{2}$ cm. below the umbilicus. Spleen not palpable. Heart and lungs normal. Glands nowhere enlarged. Pulse slow, feeble, 60 beats to the minute.

January 24th. Test breakfast (Ewald). Two hundred and sixty c. c. removed one hour later; green color; acid. Total acidity, 5.9 c. c.; 0.1 normal NaOH. Free hydrochloric acid; no lactic acid. No sarcinæ nor Opper-Boas bacilli.

February 4th. Test breakfast. Sixty c. c. removed. Total acidity, 20. No hydrochloric acid; no lactic acid. A few Opper-Boas bacilli (?).

February 5th. Stomach tympanitic. Clapage readily obtained. Stomach peristalsis quite marked at times. Gurgling felt over small intestines. Stomach washing with sterile salt solution, as preparation for operation, begun. Stomach holds about two litres. Cover-slip preparations show streptococci and staphylococci and numerous bacilli.

February 7th. Stomach washing continued. Cultures taken from the residual material. Cover-slips show only a few streptococci in short chains; number much decreased since February 5th.

February 8th. Only a trace of free hydrochloric acid; no lactic acid. Total acidity, 6.2 c. c., 0.1 NaOH solution. Stomach peristalsis readily seen at times. Patient has been kept on sterile diet ever since his transfer to the surgical side. Has carbolic-acid gargle three times daily. Teeth cleansed three times daily with listerine and brush. Ingesta are boiled water, boiled milk, soft-boiled eggs, albumin. Micro-organisms seem to have entirely disappeared from the stomach, for the Petri plates are now sterile. Patient has shown great irregularity in amount of hydrochloric acid—at one time five per cent., at another zero.

February 9th. *Operation.*—Vertical incision through left rectus. This incision was made with the expectation of a possible gastro-enterostomy. Stomach much dilated. In the region of the gall-bladder is a mass of tissue tangled by dense adhesions. In this mass are gall-bladder and pylorus. The mass feels not unlike a new growth. Search for metastases negative, but a small, hard, dark tumor, the size of a pea, is discovered in the right lobe of the liver, near its edge, evidently an angiosarcoma. Pylorus separated from gall-bladder with the greatest difficulty. The separation had to be effected with the knife. It was impossible at first to determine accurately the relations of gall-bladder, pylorus and duodenum to each other. In the course of the dissection a pinhole opening was made in what proved to be the duodenum. The surrounding parts had been well protected against such an accident. A drop of fluid escaped, and from these cultures were taken. The little hole was immediately sutured. The gall-bladder was next opened, and not until then could it be determined positively that the pinhole opening was not in the gall-bladder, the contents of duodenum and gall-bladder so closely resembled each other; it was a thick, ropy, mucoid, colorless material. The gall-bladder was finally completely isolated. It was small and misshapen and contained two or three hard mulberry-like gall-stones. The cystic duct contained no stones and seemed to be very short and very fine. It was surrounded by numerous small vessels, two of which were tied. There was no bile in the freely-opened gall-bladder, which was drained in the usual way with a rubber tube, a catgut purse-string suture sealing the bladder hermetically about the tube. Bismuth gauze was packed about the outside of the gall-bladder. The peritoneum was closed with silk; the muscles, fascia and skin with silver. Patient bore the operation very well. At 6 P. M., temperature 101°; respirations quiet and regular; some distention of upper abdomen.

February 10th. Patient has been vomiting. Complains

of pains in stomach and tightness across abdomen. Pulse 108 and feeble; respirations 24; temperature 101°. Leucocytes at 12.30 P. M., 26,800; at 1.30 P. M., 34,000; 5.30 P. M., 36,000; 7 P. M., 37,800. At 6 P. M., patient drowsy, quiet; respirations 34; hands cold; pulse barely perceptible. Cover slips show no micro-organisms in the blood. Five hundred c. c. salt solution infused under each breast. At 10 P. M., 1,000 c. c. salt solution infused under breasts. Pulse improved, 140 to minute; low tension but regular rhythm. Respirations 36; expirations accompanied by short groans. Occasional hiccough; no vomiting; no nausea; no pain.

February 11th, 2.15 A. M. Patient died quietly.

Autopsy.—General peritonitis. Organisms, streptococcus pure. In the walls of the first portion of the duodenum, very near the pylorus, was an accumulation of thin muco-purulent fluid. This fluid was held in bounds by a soft wall of granulations; it was evidently an old abscess between mucosa and submucosa, which communicated with the lumen of the duodenum by a fine opening. A minute ulcer had perhaps been the starting point.

The first portion of the duodenum was distended, and the stomach was dilated; the distention was due to the constriction produced by the adhesions for which the gall-stones were responsible; as a consequence, perhaps, of the distention and the resulting venous stasis, a minute duodenal ulcer; and from the ulcer, the abscess, which was probably responsible for the fatal streptococcus peritonitis.

Of special interest in this case is, (1) the fact that carcinoma had been suspected. The duodenal stenosis, the dilatation of the stomach, the presence of Oppenboas bacilli (?) justified the suspicion; (2) the success which attended Dr. Cushing's efforts to sterilize the stomach; the micro-organisms had apparently entirely disappeared from the stomach on the day preceding the operation, for the Petri plates, which from day to day showed fewer colonies, for that day were sterile; (3) the dissecting intermural abscess, starting probably from an ulcer which may have been due to thrombosis of a small artery, or to distention of the first part of the duodenum, or to vascular disturbances of some kind, infectious or mechanical. Although thrombosis of a small intestinal artery does not lead to infarction it may cause hemorrhages into the lumen of the intestine and slight intramural extravasations.³

Kocher⁴ has demonstrated that in consequence of distention of the gut by retention of its contents and the resulting venous stasis very considerable changes take place in the wall of the intestine. He writes as follows: "Arnold has proved that in strangulated hernias when the circulation is greatly interfered with micro-organisms make their way into the mucous membrane and can pass through the intestinal wall (diapadesis of the micro-organisms). On the other hand, Cassin⁵ and Charrin⁶ have shown how very important the normal epithelium of the intestine is as a protection to the intestinal wall against micro-organisms as well as ferments. The absence of this protection against ferments and bacteria leads to intoxication and infection. Finally, Reichel⁷ has demonstrated that the considerable accumulation of fluid above the site of the obstruction is due in part to a hypersecretion of the mucous glands. Under the in-

fluence of the intestinal contents which, increased in amount and stagnating, are the more rapidly decomposing (the oftentimes considerable phenoluria and indicanuria is proof of the increased decomposition), the epithelium in the first place becomes destroyed because its nutrition is interfered with under the influence of the venous stasis. There result circumscribed necroses and hence ulcerations of mucous membrane, particularly in places where the venous stasis led to ecchymosis, and, finally, perforation of the serosa and peritonitis may occur. For the origin of these ulcers which, many times observed, have not been properly estimated in their relations to ileus, various explanations have been given. The most substantial explanation is the one which attributes them to the pressure of hard scybala, and it is not to be doubted that hardened fecal matter, just as foreign bodies, gall-stones, for example, can have pressure ulcers as a consequence. But the ulcers which we have pictured are certainly not dependent upon hard intestinal contents and the decubitus which they may mechanically bring about. They occur in jejunum and ileum as well as in colon by the filling up of these intestines with fluid or gas. The only factor which constantly accompanies these ulcers is over-distention of the intestine. Inasmuch as one can experimentally bring about a significant impairment of the circulation of the intestinal wall and its consequences by over-stretching of the gut, we hold to the proposition that the ulcers are best called distention ulcers (*Dehnungsgeschwüre*). Long ago I called attention to the fact that ulcers of just this kind could also in cases of strangulated hernia lead to a fatal peritonitis after constriction had been relieved, or a gangrenous loop of intestine had been resected and an entirely trustworthy suture had been made."

CASE II. Primary carcinoma of the duodenal papilla and the diverticulum of Vater, successfully removed by operation; cystico-enterostomy three months after the first operation.—Mrs. M. L., age sixty. Until August, 1897, patient was well. Her first symptom was itching of the skin, which came on suddenly and soon became severe. Patient says jaundice did not appear for nearly a month after the onset of the itching. Before the appearance of jaundice diarrhea set in, and there were six or seven stools a day which were watery and clay-colored. Patient has had no chills, no fever and no sweating. With the onset of the jaundice she noticed shortness of breath and an occasional swelling of the feet and legs. About the first of January, 1898, she had persistent bleeding of the gums for three days, following the extraction of a tooth. At times the hemorrhage was profuse. Two months ago a tumor was noticed in the region of the gall-bladder. This tumor does not seem to the patient to have increased in size and has never been tender. In March, 1897, she had several attacks of severe pain in the epigastrium. These attacks were not accompanied by vomiting or fever or sweating. A few weeks later she had a second but milder attack. The stools were light in color for two or three days at the beginning of these attacks, but patient recalls no change in the color of the urine or the skin at that time. The daughter of the patient states that these attacks of pain were very severe, and that her mother seemed very ill.

Examination February 14, 1898. Patient somewhat emaciated, but fairly well-nourished. Mucous membranes pale. Heart and lungs normal. There is a distinct prominence on the right side, the highest point of which is midway between the umbilicus and anterior superior spine. The prominence descends markedly with inspiration. On palpation the prominent area proves to be pear-shaped and distinctly fluctuating. The border of the liver, which reaches almost to the crest of the ileum, can be distinctly felt.

³ Archiv für pathol. Anat. u. Physiol., 1875.

⁴ Kocher: Mittheilungen aus den Grenzgebieten der Medizin und Chirurgie, Bd. IV, Heft 2, 1898.

⁵ Mittheilungen aus Kliniken der Schweiz, Basel, 1898.

⁶ Fonctions protectrices de la muqueuse intestinale, Soc. de biologie, December, 1895.

⁷ Zur Pathologie der Ileus, Deutsche Zeitschrift für Chirurgie.

February 14, 1898. *Operation.*—Vertical incision through rectus muscle. A greatly dilated but not especially dense gall-bladder presented; no adhesions. Liver projects five cm. below costal margin. Four silk sutures^s placed in fundus of gall-bladder with French needles. Small aspirator introduced in centre, between sutures; syringeful of clear fluid withdrawn. Gall-bladder opened; contents evacuated. In the latter part of the fluid were many fine, sand-like, hard, greenish, round particles, suggesting miniature gall-stones. Common and cystic ducts were dilated to the size of one's thumb. A longitudinal opening two cm. long was made in the common duct. The same colorless fluid escaped from this incision. Duct explored with probe and finger. What seems to be a small, very hard stone is felt at site of ampulla. To determine the nature of this body, an incision was made through the wall of the duodenum. No glandular metastases discoverable. The stone-like body proved to be, as was feared, a carcinoma of the papilla.

Excision of the cancerous growth.—To give the growth a wide margin, a large piece of duodenum was excised, a wedge-shaped piece with the apex at the mesenteric border of the intestine. About three-quarters of an inch of the common duct and a shorter piece of the pancreatic duct were excised. The wound in the duodenum was closed in the usual way with mattress sutures. This was practically an end-to-end anastomosis of the duodenum. The common duct and pancreatic duct were transplanted into the duodenum along the line of suture. A linear incision into the common duct, which had been made for diagnostic purposes, was closed over a hammer. The gall-bladder was sutured to the peritoneum.

Abdominal wound closed in the usual way: the peritoneum with a running silk suture, the muscles and fascia with buried silver sutures, and the skin with a continuous subcuticular silver suture. Bismuth gauze inserted to protect the suture of the intestine and common duct. Drainage tube surrounded by bismuth gauze, and gutta-percha tissue inserted into gall-bladder and held in place by a purse-string suture of catgut. Wound dressed with silver foil. Gutta-percha tissue placed between the raw edges of the skin and the gauze packing. Operation lasted three hours and ten minutes. Patient experienced apparently no shock from the operation.

February 16, 1898, first dressing. Profuse discharge of bile in dressing. Icterus less intense. Considerable abdominal distention, but no signs of peritonitis.

February 18, 1898. Distention has almost completely disappeared. Tongue clean. Patient comfortable.

February 22d. Discharge of bile into dressings still profuse. Stools becoming distinctly bile stained. Icterus rapidly disappearing. Urine dark and gives bile reaction. Patient hungry.

February 27th. Skin sutures, tube from gall-bladder and the last of the bismuth gauze removed. Evacuations not bile stained.

March 4th. Discharge of bile diminishing. Opening in gall-bladder has been plugged for several days with bismuth gauze in order to determine, if possible, whether or not the transplanted common duct is patulous. Yesterday patient vomited 125 c. c. of brownish fluid.

March 5th. Patient has had a large stool, quite dark in color. There is very little leakage from the opening into the gall-bladder, which is almost closed.

March 13th. Icterus continues undiminished. Stools are still slightly bile stained. Abdomen somewhat distended. Active peristalsis is occasionally visible through the abdominal walls. Liver still readily palpable, the right lobe extending almost to the iliac crest. Appetite good; tongue clean; no indigestion.

March 27th. Attempts to plug the opening of the gall-bladder, with the hope of forcing bile into the intestine, not satisfactory, although there is some bile in the stools.

* We find this a very useful procedure. The gall-bladder is manipulated by these sutures and handling is thus avoided. These sutures are of additional service when it seems advisable to distend, subsequently, the gall-bladder with fluid, and when it is desirable to close it temporarily during the operation.

Patient's general health good. Icterus has disappeared. Patient able to walk about, and is gaining strength rapidly.

April 5th. The conjunctivae are clear, but there remains still some evidence of pile pigment in the skin. No bile whatever in the stools, although the opening into the gall-bladder is almost closed: it is barely large enough to admit a probe. Patient is beginning to have indigestion. The appetite as a rule, however, is good. The liver is diminished in size.

April 8th. Patient complains of colic and abdominal pain. Considerable abdominal distention. Dressings bile stained. No nausea; tongue is clear.

April 12th. Some nausea and vomiting. No distention of abdomen. Dressings very slightly bile stained.

April 15th. Abdomen soft and relaxed, but borborygmi heard by attendant and appreciated by patient. Little or no bile in dressings.

May 5th. *Second operation: cholecystoduodenostomy or cysticoduodenostomy.*—Suture of fundus of gall-bladder. Complete closure of abdominal wound except for drainage. Incision alongside of old cicatrix, circumscribing fistula. Gall-bladder quite small, no larger than one's thumb. Liver about normal in size. Many fine adhesions about gall-bladder, which were easily separated. Gall-bladder and ducts thoroughly exposed. The line of suture of common duct at previous operation was readily distinguishable by black-silk stitches, but it was almost impossible to find any trace of the duodenal suture. Common duct incised at site of old suture. Probe cannot be passed into the duodenum, but there is no positive evidence of recurrence of the cancer. Unsuccessful attempts have been made before the operation to pass a probe from the gall-bladder through the common duct into the duodenum. Opening into the common duct closed in the usual way with mattress sutures over hammer. An anastomosis between duodenum and the gall-bladder or cystic duct was effected without much difficulty, although the parts to be sutured were very deeply situated and inaccessible. The duodenum was probably a little less freely movable than at the previous operation, and the gall-bladder was so much reduced in size that we were compelled to pass some of the stitches into what seemed to be the cystic duct: in any event, the neck of the gall-bladder had to be used for the anastomosis. A *bougie à boule*, passed into the gall-bladder, was used as a darning ball to assist in the placing of the sutures. All the sutures were passed, and none of them tied, before the openings into the neck of the gall-bladder and duodenum were made, the method employed being that which I described many years ago for intestinal anastomosis. The opening in the fundus of the gall-bladder was closed with mattress sutures which inverted the wall. The abdominal wound was completely closed except for protective wicks which were passed through this line of suture into the gall-bladder. What seemed to be an enlarged gland was palpated during the operation but not removed. It was forgotten. Patient suffered little or no shock from the operation.

May 6th, 4.30 p. m. Patient very restless, tossing about and occasionally vomiting. 10 p. m., has had occasional quiet naps and is more comfortable.

May 7th. Complains of pain in back and abdomen.

May 8th. Is very comfortable. Yellowish stool, containing small particles of brown fecal matter.

May 9th. Large greenish-yellow stool.

May 11th. Patient has had daily since last note one or two greenish-yellow soft stools. She still complains of slight pain in abdomen.

May 12th. A large, quite well-formed greenish-brown stool. Considerable flatulence expelled. Complains of gas in stomach. Slight nausea. 4 p. m., vomited thick, mucus-like, chocolate-colored fluid containing milky curd.

May 29th. Patient complains of itching in the hands, where the pruritus has always been the greatest when icterus was pronounced. No jaundice, however, is apparent.

June 8th. Slight chill followed by rise of temperature to 39°. Trace of bile in the urine. Nausea, but no vom-

iting. No pain and scarcely any tenderness of the abdomen. Wound almost completely closed.

June 9th. Temperature normal. Patient feels well.

In the early autumn of 1898 this patient returned to the hospital too ill for operative interference, and in a few weeks died. During the summer I had corresponded with her urging her to return to the hospital, for it was clear from her letters that the fistulous communication between the gall-bladder and the duodenum was not working well. At the autopsy it was found that the carcinoma had recurred in the head of the pancreas and duodenum, closing the common duct and interfering with the perfect action of the cholecystenterostomy, or cystico-enterostomy. The anastomosis, as we had supposed, had been made between the dilated cystic duct and the duodenum; the fistula was still perfectly pervious and should have acted nicely except for the interference, a little twisting or bending, created by the new growth.

The result in this case is not encouraging, for it was my opinion at the time of the operation that the case could not have been more favorable. But I did in this case what I never do if it can be avoided, namely, cut well down to or perhaps a little way into the new growth for the sake of diagnosis. It is furthermore a rule in my clinic that pieces shall not be excised from new growths *in vivo* for diagnostic purposes; we must learn to make the diagnosis in other ways. In the case of a very small breast tumor it is occasionally impossible to make the diagnosis. In such cases I have approached the tumor with the knife very cautiously, and could tell before I reached the growth, from the findings in the outlying tissues, whether we had a malignant tumor to deal with or not. I shall have more to say about this at another time, but I feel that one cannot condemn too strongly the universal practice of exploring tumors with the knife or with the harpoon or even with the needle. After investigating the subject superficially, I have the impression that amputations for the truly malignant sarcomata have comparatively seldom been successful when preliminary exploration has been done. If I find it necessary to make an incision into a sarcoma of an extremity, I first apply an Esmarch bandage, and if the tumor is a malignant growth, the bandage is not removed until the growth has been removed. So, too, in cysts of the breast; we should not aspirate them because (1) they may be malignant and the aspiration harmful, and (2) if malignant, the aspiration does not tell us so. This is the first and I believe the only instance in which an operation for primary carcinoma of the duodenal papilla has been done; moreover, I know of no other case of excision of a portion of the common duct. Heidenhain⁹ (Worms) demonstrated last year at the twenty-seventh Congress of German Surgeons, a shrivelled gall-bladder which he had removed for a small cancer of its wall; after extracting six calculi from the bladder, a little button-like prominence on its wall caught his eye. The microscopical examination showed little or no thickening of the mucous membrane, but unmistakable alveoli in the muscular wall of the gall-bladder; furthermore, some of the lymph vessels were plugged with cancer cells. In three months the patient succumbed to liver cancer which had attained great dimensions, although at the time of the operation the liver was apparently perfectly normal. At the same session Hollander¹⁰ (Berlin) reported an extirpa-

tion of the gall-bladder and cystic duct and resection of a portion of the liver for cancer, which *per continuitatem* involved the liver. The result he could not give, for he had performed the operation only three weeks before. There can be little doubt as to the ultimate result of Hollander's operation, although, having operated only three weeks previous to his report, he could not give it.

CASE III. *Dynamic or paralytic dilatation of first portion of duodenum and of pyloric end of stomach. Gall-stones in gall-bladder and cystic duct. Obstruction of cystic duct and hydrops vesicæ.*—Mrs. S. G. M., age forty-six. Admitted January 31, 1899. Never had typhoid fever. Headaches at intervals all her life, sometimes very severe and lasting several days; especially severe during menstruation. Digestion has been bad for sixteen years. After meals a heavy feeling in epigastrium followed by fullness and a feeling of suffocation. Belching of gas common; occasionally would regurgitate a mouthful or two of food. Rarely vomited; never any blood in vomitus. Bowels generally constipated. Micturition frequent, occasionally twenty times a day; generally several times at night. Menses regular. Average weight, one hundred and fifteen pounds. Has lost in weight of late. Present illness, patient states, began December 31, 1898, although she was much run down before that time. This attack came on gradually. Some distention of stomach, and in the afternoon some pain which became severe at night. The pain was in the epigastrium—a colicky pain—which, as she expressed it, “went through the abdomen.” Morphia exhibited.

Next morning patient felt easier. Morphia continued for next two days. Pain relieved but not entirely subdued. Stools after this were very black, like tar. Physician found something in the stools which he thought might possibly be a gall-stone. Since this attack patient has never been well; constantly in bed. Great deal of soreness through abdomen, and at times attacks of colic. These attacks usually came on in the evening without known cause. Much belching of gas. Bowels regular. Stools not clay-colored. No jaundice. Patient's daughter states that for many years her mother has had attacks of abdominal pain, for which the doctor gave morphia hypodermically. There were intervals of several months between the attacks.

Examination.—On palpation no tenderness except beneath the right costal margin. Here there is to be felt a rounded mass resembling a distended gall-bladder. Right rectus muscle very hard. The mass which is to be felt at the outer edge of this muscle seems lobulated.

January 29th. Attack of what patient calls “colic.” She is nervous and distressed and complains of abdominal pain. Swallows air and belches it up again.

January 31st. Transferred to surgical side. On inspection a distended piece of gut between umbilicus and tumor, extending obliquely from the left and above to the right and below, probably six or eight inches in length. Peristalsis is to be observed at intervals; it is not very active, but at times is quite constant. A tumor suggesting gall-bladder projects from the lower border of the liver. It seems to be nodular, or rather has a nodule on it at its upper part. This tumor descends with respiration, and is somewhat tender. The edge of the liver can be felt on each side of the tumor.

February 3d. *Operation.*—Vertical incision through right rectus muscle. No fluid in abdomen. Gall-bladder distended to size shown in diagram on blackboard. Its walls were greatly thickened and white. The first portion of the duodenum and the pyloric end of the stomach were distinctly distended. Corresponding accurately to the distended portion of the bowel was a slight peritonitis, scarcely more than an injection of the serosa, and an exudate, only enough to cause very fresh adhesions between the duodenum and the gall-bladder. We should hardly call them adhesions; the duodenum seemed rather to be lightly glued

⁹ Heidenhain: *Verhandl. d. deutsch. Ges. f. Chirurgie*, 1898, p. 126.

¹⁰ Hollander: *Loc. cit.*, p. 131.

to the gall-bladder just as it might be an hour or two after an operation.

I was extremely interested to find that the vascular injection seemed to correspond accurately to the limits of the dilatation (almost ileus at times). The adhesions, if we choose to call them such, were so fresh that they were separated by very slight pressure of the finger. The general abdomen being walled off by gauze packing, the gall-bladder was opened. Its contents were colorless and in consistency like the white of an egg. Cover-slips were negative. First, one large gall-stone was found, with a facet at each end. Then a second stone was detected with a probe in the cystic duct, but it could not be dislodged. Cysticotomy was performed and the stone removed in fragments. The previous attempts to dislodge it had evidently broken up the stone. Incision in cystic duct closed by mattress sutures. Gall-bladder treated in the usual way; namely, hermetically sealed about a rubber tube and protected by bismuth gauze from the general peritoneal cavity. Abdominal wound closed in the usual way.

At first no bile escaped by the tube, but on the 10th of February bile was abundant in the dressings.

March 2d. Wound has completely healed. Patient discharged cured.

Various diagnoses had been made in this case: (a) distended gall-bladder with adhesions; (b) cancer of bile-ducts and liver involving secondarily the colon; (c) carcinoma of the colon involving secondarily the gall-bladder and gall-ducts. The distended intestine I watched with much interest several times. It seemed to me too small for colon; and no mass could be felt in the distal side of the distended gut to explain the distention. Peritonitis is undoubtedly the most common cause of paralytic ileus, and I have repeatedly observed in appendicitis that dilatation of the cecum and of the ileum may be caused by a very slight, perhaps merely a toxic peritonitis, but I have never before noticed such a sharp line of demarcation between the inflamed and non-inflamed portion of the intestine. The dilatation corresponded accurately to the vascular injection. This was the more striking because two portions of intestine so very different were involved. That the comparatively thin wall of the duodenum should be more or less affected by inflammation of its serosa is to be expected, but that such a thick-walled gut as the pylorus and the pyloric end of the stomach should be paralyzed by such a very slight inflammation of the serosa was surprising.

CASE IV. *Conditions suggesting hepaticocholecystostocholecystenterostomy as a possible operation. Renal colic simulating intestinal colic; relieved by salt infusion.*—Mr. —, age sixty, had been suffering from gall-stones for several years, but not until he became persistently icteric and very ill was the first operation performed. The operator, a distinguished surgeon, found most difficult conditions confronting him. The entire common duct was impervious and reduced to a fibrous cord; the cystic duct, greatly narrowed, was probably impervious; the gall-bladder and hepatic ducts were dilated. The surgeon, very skilfully, I am told, attempted to construct a new common duct over a tube or catheter from the tissues which he had at his disposal. Just what these available tissues were I do not quite understand. For about five weeks, and until this tube was removed and the surgeon went away on his vacation, the patient was fairly comfortable and seemed to be gaining a little. Then he developed high daily fever and occasional chills, and became jaundiced again. I saw the patient in consultation with Dr. Gardner, of Providence, about one week, I believe, after the fever and the symptoms of obstruction had manifested themselves. The gall-bladder could not be felt. There was perhaps a little more muscle resistance on the right side over the region of

the bile-ducts than on the left side, also perhaps the suggestion, rather indefinite, of a little induration, such as might be caused by fresh adhesions. It occurred to me that in case the gall-bladder and hepatic ducts were still both dilated one might establish a fistulous communication between them, making an hepaticocholecystostomy and then, immediately, a cholecystenterostomy; in all an hepaticocholecystostenterostomy. In any event, we thought that an operation for the relief of the symptoms was imperative. Accordingly a vertical incision through the inner margin of the right rectus muscle was made, avoiding the fistulous tract which remained after the withdrawal of the tube over which the new common duct had been constructed. I worked for two hours trying to identify and to separate the parts concerned in this operation. The gall-bladder, the ducts and the duodenum were glued tightly together and to the under surface of the liver. The gall-bladder which was finally extricated from the tangle was very small, contracted and empty; the cystic duct was a fibrous cord. When bile was at last reached the patient was in such bad condition that the operation had to be discontinued. The parts in the neighborhood of the common and hepatic ducts were so firmly matted together that neither the latter nor the remains of the former had been demonstrated when it was necessary to bring the operation to a close.

The patient rallied satisfactorily from the immediate effects of the operation; but twelve or fourteen hours thereafter complained of very severe abdominal pain, which, as he indicated the location of it, seemed to be in the region of the colon and passing from right to left. The pain, though perhaps constant, became excessive during the paroxysms. It was never referred by the patient to his back or sides, nor did it radiate to the testicles or groin or crest of ilium. The abdomen was perfectly flat, and peristalsis could not be observed. Nevertheless, large high enemata of hot water were given, but without appreciable relief. The urine was scanty and very dark and contained albumin and casts and a few blood cells. Dr. Gardner promptly attributed the pains to the kidney, and related a somewhat similar case. Believing his interpretation of the pains to be correct and recognizing the fact that something must be done quickly for the relief of the kidneys, I transfused about 750 c. c. under the breasts. The pulse, which was alarmingly rapid before the transfusion, dropped 40 beats within thirty minutes, and 20 beats within five minutes, and the colicky abdominal pains disappeared. Within twenty-four hours the infusion was repeated with similar results. The kidneys responded promptly to both infusions.

I report this case because (1) it suggested a new operation, hepaticocholecystostocholecystenterostomy, or hepaticocholecystostenterostomy; (2) it was the first of three cases of colic which I have seen associated with scanty high-colored urine; and (3) it was, so far as I know, the first instance of subcutaneous infusion of salt solution for the relief of toxic renal colic. Soon after this Dr. Young, by salt infusions, undoubtedly saved the life of one of my patients whom I had operated upon for appendicitis, and who was suffering from perhaps the most furiously rapid toxemia that I have ever known of. This case has been reported by Dr. Young in the *Maryland Medical Journal*. The resemblance to intestinal colic is so great that it would undoubtedly be mistaken for it even by experienced practitioners of medicine. This was a valuable experience for me, for since then I have twice recognized as renal colic this pain, which had been regarded as intestinal colic and treated with high injections. Our list of desperate cases of toxemia treated advantageously with infusions of salt solution is assuming large proportions.

CASE V. *Choledochotomy performed twice within four and one-half months. The gall-bladder, very small and contrac-*

ted at the first operation when two stones were in the common duct, was large and distended when only one stone occupied the common duct (the ampulla). — Mrs. M. P. R., age fifty-eight, admitted May 3, 1897. October, 1892, patient began to have moderately severe attacks of pain in the region of the gall-bladder. The attacks would come on suddenly and last several hours unless relieved by anodynes. The pain, milder at first, would gradually increase until it became very severe; it commenced in the epigastrium and extended into the right hypochondrium. During the winter of 1892–1893 the attacks occurred every two or three days. Occasionally there would be an interval of two or three weeks. During the remainder of 1893 and all of 1894 the attacks persisted at longer or shorter intervals, the pain always beginning in the epigastrium and radiating to the back. Sometimes during a severe attack there would be slight vomiting. Morphia generally gave relief. Patient says that the attacks were not accompanied by tenderness nor tumefaction. In the attacks observed by me there was always tenderness and, after the first operation, distention of the gall-bladder. In the spring of 1895 she went to Hot Springs, Va., where she remained several months. After this she had no pain for fifteen months but did not seem to gain or to improve in health. In September, 1896, in Italy, the pain returned. The attacks recurred with great regularity for seven or eight weeks. Most of them were attended by nausea and some by vomiting. She became jaundiced for the first time in December, 1896, and has remained more or less icteric until admission. Just after the paroxysms the icterus is deeper. For the past five months she has remained in bed most of the time. She vomits frequently, is seldom free from nausea. The bowels have not been markedly constipated; appetite is poor; headaches occasional but not severe. Prior to this illness, however, she suffered very much from headaches. At no time has she had chills or sweating.

Examination. — Patient is quite deeply jaundiced; her color is a dark slate-yellow; tongue heavily coated; body much emaciated; expression rather dull, eyes lustreless. Heart not enlarged; no adventitious sounds. Lungs negative. Urine dark, almost coffee-colored, trace of albumin, much bile-stained sediment. A few bile-stained casts and epithelial cells. Red blood corpuscles, 4,220,000; white, 6,000.

May 4, 1897. *First operation.* — Longitudinal incision through right rectus muscle; resection of cartilages of eighth, ninth and tenth ribs because the common bile-duct was very inaccessible. Choledochotomy; removal of one small mulberry calculus. Exploration of duct fails to detect a second stone. Suture of duct wound. Gall-bladder atrophied and not opened. Bismuth gauze packing to suture in duct. Peritoneum sutured with fine silk, muscles and fascia with silver wire, and skin with a buried suture of catgut. Little or no shock from the operation.

On opening the abdomen the tissues were bile stained. There was no fluid in the peritoneal cavity. The outer surface of the contracted gall-bladder was covered with new connective tissue in which were little masses of fat. The omentum was loosely adherent to the gall-bladder. The cystic and common ducts were easily isolated after division of three of the costal cartilages. No stones could be felt in the bladder or cystic duct. The stone found in the common duct could be moved quite freely up and down in this duct, but could not be forced into the cystic duct, the common duct, about $1\frac{1}{2}$ cm. in diameter, being uniformly dilated. Bile flowed from it when opened. It was carefully explored with the fingers but not with an instrument. The gall-bladder was not opened. Two mattress sutures closed the opening in the duct, one preliminary suture being taken before the duct was opened. The sutures were passed without difficulty, the wall of the duct being about three mm. in thickness. No leakage occurred after the stitches were tied. The calculus, without facets, was spherical, about 1.6 cm. in diameter, and had a granular surface like a mulberry calculus.

May 15th. Patient has recovered uneventfully from the operation. She is easily nauseated, however, and has

very little desire for food. The stools have about the color of dark coffee and the skin has become lightened perceptibly. She complains, however, of an aching pain in the back, not relieved by posture.

May 24th. Patient has no inclination to eat. Takes almost nothing by mouth. Nutritive enemata, which have been administered uninterruptedly since the operation, are still well borne. About every two days there is a quite definite attack of pain in the umbilical region and back, ushered in by nausea. Vomiting usually follows in a few hours and the distress is relieved.

May 29th. Condition little changed. Patient is fairly comfortable except for the attacks. Takes a little more food. Stools semi-solid and still quite dark. Urine has trace of bile.

June 13th. No bile in urine. Vomitus contains considerable hydrochloric acid.

June 26th. Appetite and digestion have steadily improved. Nausea less constant, often absent. Patient constipated, requires enemata, stools normal as to color.

July 4th. Much more comfortable. Nausea has disappeared; color greatly improved, but the attacks of pain continue although they are less frequent.

July 13th. Slight chill at 5.30 P. M., accompanied by pain in the back and head. Temperature reached 103° at 7.30 P. M.; fell to 99.2° at 5 A. M. Examination of blood for malaria, negative.

July 25th. Patient has lost one and one-half pounds in weight in the past week. The right lobe of the liver is enlarging. The spleen is palpable. Patient is having short attacks of fever accompanied by slight chills; headache and yawning usually associated with them. The attacks of pain continue; they are still controlled by very small doses of morphia, one-sixtieth to one-fortieth of a grain. She sits up out of bed most of the time.

July 27th. The pain in the back has of late been accompanied by a slight rise of temperature, 99.2° to 105.5° . The urine contains no bile. The stools consist of light and dark portions sharply separated. Patient is gaining quite rapidly in weight.

August 5th. Stools clay-colored. Temperature reached 102° last night during an attack of pain. Skin is becoming icteric, urine contains bile; slight pruritus. Patient's weight has increased five pounds in ten days. From August 8th to 12th no bile in urine.

Sept. 12th. The attacks of pain and the pyrexia continue. Patient is decidedly icteric after some of the more severe attacks. What we have feared ever since the operation we are now quite certain of, namely, that there is still a stone in the common duct, probably in Vater's diverticulum. The liver is considerably enlarged but the gall-bladder has not been definitely made out.

September 13th. *Second operation.* — Vertical incision near linea alba. Adhesions from previous operation separated without much difficulty. Liver much enlarged, gall-bladder and common duct distended with bile. The wall of the common duct was much thicker, the wall of the gall-bladder, on the other hand, was probably thinner than at the previous operation. A small stone was palpated deep down behind the duodenum, presumably in the ampulla. The line of the old suture in the ductus choledochus could not be very definitely made out, but a short yellowish-white streak, evidently cicatricial tissue, corresponded, I thought, to the site of the original slit in the duct. A fine suture was placed in the common duct to serve as a handle for the subsequent manipulations. The duct was opened, and about 60 c. c. of clear greenish bile escaped. A gauze plug was inserted into the proximal end of the slit to prevent the stone from slipping into the hepatic duct. Interrupted sutures were then taken over a hammer of the proper size. The dislodgment of the stone was somewhat difficult. It was a little smaller than the first stone, but otherwise repeated the original exactly. The gall-bladder was opened, sewed to the peritoneum, and drained in the usual way; a rubber tube surrounded first by gauze and then by protective being held in place by a purse-string suture of catgut. Wicks of bismuth gauze

protected the line of suture in the common duct. The operation was attended with very little shock and the patient reacted very well.

Sept. 20th. There has been more or less nausea ever since the operation. Patient objects decidedly to stomach washing. Bile is draining actively from the tube. There has been little or no nausea to-day, but patient is weak and much depressed. The removal of a piece of gauze from the gall-bladder gives patient the first sensation of "heart-burn," which she has had since the operation; it lasted several hours.

Sept. 22d. Patient is thin and emaciated and alarmingly weak; speaking is a great exertion to her. Temperature subnormal. There are no wound complications, nor any signs of peritoneal irritation or obstruction. Alimentation is almost exclusively rectal; 6 P. M., vomited 1,000 c. c. of fluid thick with "coffee grounds." Patient very restless. Examination of vomitus: No bile; blood corpuscles abundant; altered blood pigment; free hydrochloric acid; no lactic acid.

Sept. 23d. Patient has vomited several times during the day; in all about 2,000 cm. of the same dark coffee ground vomitus. The pulse is very feeble.

Sept. 24th, 8 A. M. Pulse barely susceptible early this morning; rallied a little after exhibition of salt solution per rectum. Still vomiting large amounts of same fluid, though nothing is being administered by mouth. 12 M. Patient is very low but still conscious. Infusions of salt solution were given under breast and in buttocks. 5.15 P. M., one drachm of one-per-cent. solution cocaine given by mouth. 5.30 P. M., patient vomited 360 c. c. of same dark fluid. Cocaine given again. No vomiting since second dose.

Sept. 25th, 1 A. M. Patient responds a little to the saline infusions. She is moaning and restless. Her nose and extremities are cold. She sleeps in short naps, with her eyes open and eyeballs rolled up. Complains greatly of thirst. Champagne and albumin retained and apparently relished.

Sept. 28th. Infusion again soon after midnight. Involuntary stools and small amount of dark vomitus. Is somewhat flighty at times. Pulse is thready, irregular, and cannot be accurately counted. She is sighing and seems almost moribund. Too weak to recognize surroundings or members of the family. About noon to-day I saw the patient for the first time since the third day after operation, having returned to town as rapidly as possible in response to a telegram sent forty-eight hours ago. Dr. Cushing, house surgeon, who had attended her constantly, day and night, met me at the door of the hospital with the words "no hope, she is dying." We went to her room; she was cold and almost unconscious; her eyes were open, the eyeballs rolled up; the lower jaw had dropped. She had had more involuntary movements and could retain no nourishment. Her pulse was little better than a flutter and could not be counted. In less than forty-five minutes I returned to the patient and found her pulse 120, and fairly regular in force and rhythm. I doubted my senses when I counted it. She was moreover not so cold, her eyes were not staring, and her lower jaw was raised. A miracle! From that moment her convalescence was uninterrupted. She slept an hour, and on waking looked better than she had in two or three days. For twenty-four hours she was so weak that she could barely move her arms. She remembers nothing that transpired on the 23d, 24th and 25th of September.

In eight weeks, on November 22d, this patient left the hospital, not only able to walk but to take a long journey on the railroad. In one period of seven days she gained nine pounds. Her liver was rapidly diminishing in size.

In April, 1898, I had the pleasure of seeing this patient again. Her color was natural, her digestion excellent, her weight above normal and her strength steadily increasing. Her liver did not extend below the costal margin.

I have seen many cases regarded as hopeless recover, but never a being so near death as this have I

known to escape it. I have speculated much as to the possible explanation of the very sudden change in her favor, but it would lead us beyond the limits of this paper to discuss the matter. In toxemias I have noted almost instantaneous drops in the pulse rate. Twice within a month I have observed a fall of 30 beats to the minute follow in less than thirty seconds the opening of an abscess. The abscesses were large and very acute; one was a suppurating laparotomy wound and the other was a circumscribed abscess in the peritoneal cavity. The very instant that the abscesses were opened the change in the pulse was noted. A few months ago we were preparing to infuse with salt solution a patient upon whom I had operated for gall-stones and whose condition gave me not a little anxiety. His respirations were about 40 per minute and his pulse between 130 and 140. The physical signs indicated not very clearly some consolidation of the lower lobe of the right lung. While the instruments were being sterilized for the infusion, and while Dr. Cushing, the house surgeon, was counting the pulse, it fell to less than 100.

Was the hemorrhage from the stomach in the case of Mrs. R. (Case V) due simply to the prolonged vomiting; or to interference with the circulation of the portal vein (liver cirrhosis, pressure of packing); or to thrombosis of a small arterial branch; or to a retrograde embolism (Recklinghausen,¹¹ von Eiselsberg¹²) or malposition of the pylorus or duodenum? It could hardly have been due to sepsis. As long ago as 1867, Billroth¹³ remarked that in septic cases we might have duodenal ulcers and fatal hemorrhages therefrom. He showed in his experiments upon animals that sepsis might cause intestinal hemorrhage, although, in his experience, it seldom did so in man; if, however, there existed an obstruction to the circulation, such as liver cirrhosis causes, little hemorrhages in the stomach plus the action of the gastric juices might lead to the formation of ulcers. The nausea began almost immediately after the operation. Whatever was the cause of this almost continuous nausea and frequent vomiting was also, at least, the remote cause of the hemorrhage. Von Eiselsberg has just reported seven cases of stomach and duodenal hemorrhage following operations upon the abdomen. Hematemesis occurred in six of his cases, and never later than the second, usually on the first day. The hemorrhages were demonstrated in three cases post mortem.

In my case the vomiting of "coffee grounds" was not observed until the tenth day. This patient was so carefully watched that I am quite sure that if hematemesis had occurred earlier it would not have been overlooked. In seeking for a common cause for the stomach and duodenal hemorrhages, von Eiselsberg excludes vomiting because in two cases there was no vomiting, and in two, hematemesis occurred only a single time; he also excludes sepsis because in four of the cases there was no infection, and reaches the conclusion that "If the behavior of the wound is to be regarded as the cause of the hematemesis, then it must be assumed that in the cases which healed by first intention a retrograde embolism from a non-infected thrombus had taken place."

¹¹ Die Störungen des Blutkreislaufes.

¹² Die Verhandlungen der deutschen Gesellschaft für Chirurgie, 1899.

¹³ Ueber Duodenalgeschwüre bei Septicæmie. Wiener med. Wochenschr., 1867.

I wish that there were time to discuss this feature of the case more fully, but I must pass on to the consideration of another fact which this remarkable case developed. There were at the first operation almost certainly two stones in the common duct, one in the ampulla, the other more or less freely movable in the duct, although it fitted it quite snugly; but the gall-bladder was small and contracted and not opened, and the liver was little if at all enlarged; the color of the skin was a light slate-yellow or ash-yellow — not the darker bronze-yellow of complete obstruction. At the second operation, however, when there was only one stone in the common duct, the gall-bladder was distended with bile and quite large, and the liver was greatly enlarged, its right lobe almost reaching the crest of the ilium. The patient's color and symptoms indicated that the stone in the ampulla did not at all times obstruct the duct completely. It sounds almost paradoxical to say that the removal of a stone should increase the obstruction, or that the one stone plugged the duct more completely than the two. I believe that a stone in the diverticulum, particularly a small one, is more likely to block the duct effectually and to lead to distention of the gall-bladder than a stone, however large it may be, elsewhere in the common duct. A stone in the middle of the duct may at first occlude it completely, but the duct-wall soon becomes infiltrated and thickened, it loses its elasticity, and, when distended with bile, stretches. The stone no longer plugs the duct tightly and bile trickles by into the intestine even when a second stone occupies the diverticulum, but when the proximal stone is removed, the bile instead of trickling up to the distal stone is probably jetted against it with sufficient force to hold it as a ball-valve. In 1885 I operated upon a patient whose common duct contained a stone larger than the largest pecan nut; at times one half of this stone projected into the duodenum, the other half occupied the duct; a flange had been cut on the calculus by the cicatricial ring, which engaged it and prevented it from slipping into the intestine; and yet this patient was so very slightly jaundiced that a stone in the common duct had not been suspected.

CASE VI. Miss M. H., age thirty. Transferred to surgical from medical side January 27, 1896. Indigestion for eight years. For past four years the "gastric distress" has been very great. Patient describes a "gnawing sensation" in the epigastrium. Colicky pains radiated throughout thorax, but were at times very severe "in the back." Two years ago she had typhoid fever. For the past six months she has had frequent definite sharp gall-stone attacks with nausea, and four times with vomiting. Never blood in the vomitus. No chills, fever or jaundice. Patient is a confirmed invalid. She suffers from headache and occasionally from vertigo.

Examination. — Abdomen flat. On deep inspiration spheroidal tumor is to be seen just below the costal margin on the right side. This tumor can also be felt. It moves with the enlarged liver, ascending and descending with the respirations. Last September patient first began to have attacks of pain in right hypogastrium, and accompanied by nausea and sometimes by vomiting. Spleen not palpable. The severe pain suffered by patient could be relieved by drawing up the knees. This pain radiated to the right shoulder-blade.

January 28, 1896. **Operation.** — Cholecystostomy. Vertical incision through the right rectus muscle. Elongated right lobe of liver. Very dense fibrous adhesions between the gall-bladder and duodenum. These adhesions were divided with great difficulty, and finally what appeared to be gall-bladder

presented. It was aspirated, and a thick, greenish fluid withdrawn. It was consequently opened with some confidence, but proved to be duodenum. It was sutured again at once, the suturing being very difficult because the muscular coat had been separated from the submucous coat during the dissection of the adhesions. The muscular coat, owing to the chronic inflammation which had existed for so many years, had become sufficiently fibrous to resemble cicatricial tissue, and consequently was unintentionally stripped from the submucosa. When the submucosa presented, it did so in the form of a little knob-like bladder, this coat resembling almost precisely the wall of the gall-bladder. The gall-bladder was finally found, deeply imbedded in adhesions, about four cm. to the right of its usual position and far under the enlarged liver. It was opened and one large oval stone, two cm. by one cm., removed. In the course of the operation a small abscess was discovered in the midst of the adhesions. Patient's recovery was considerably retarded by digestive disturbances, which finally disappeared completely.

April 1899. Patient says that she is in robust health and wishes to become a masseuse.

Case VII is unavoidably omitted.

CASE VIII. Discharge of pus and blood by mouth and rectum during severe gall stone attack. Two years later adhesions so extensive and so dense that the common duct was reached by a retroperitoneal route, over the right kidney. — Mrs. M., age thirty-five. Admitted March 1895. No typhoid fever. First attack of gall-stones, six years ago, began with sharp attack of pain in the right side of the abdomen. Two years ago miscarriage at seventh month; was ill in bed thereafter four months. While in bed patient had great pain in region of gall-bladder, with high fever, for ten weeks; was continually blistered over liver. Eight weeks after the abortion she felt suddenly something "give way"; this giving way was followed by great relief, and by horribly offensive discharge of pus and blood from the rectum and mouth. These discharges were irritating, gave her a very sore throat and mouth. She spat blood and matter for two or three weeks, and the stools during this time were very offensive. She has had pain and tenderness constantly with occasional severe attacks since this time; has been jaundiced more or less ever since, but more markedly so since last July. On admission, body jaundiced and greatly emaciated; tenderness over the entire abdomen, especially in the region of the gall-bladder. Liver, in deep inspirations, extends two fingers' breadth below costal margin, and has a fairly sharp edge. Spleen palpable; stools acholic.

March 19th, 1895. **Operation.** — Liver small, barely reaches costal margin; its high position complicated the operation. Colon adherent to liver by rather loose bands; gall-bladder exposed when these were divided. It was high up under the liver and no larger than the tip of the little finger; it was not opened. Adhesions were so dense over the common duct that the peritoneum was opened over the right kidney, and the common duct approached from behind under the peritoneum. A stone being felt, the common duct was the more readily exposed; the stone was extracted through a hole made by ulceration. This hole proved to be at the junction of the duct and the duodenum, and was shut off from the peritoneal cavity by very delicate adhesions. The intestinal part of the opening was closed completely, the duct part as well as possible. The sutures were passed with great difficulty. The opening in the duct could not be completely closed, the tissues being necrotic, and bile escaped through it even after the sutures were drawn tight. Probing of the duct was carefully done. No other stones found.

October, 1895. Six months after operation, patient is very well. She weighs one hundred pounds.

April, 1899. Examined in my private office: patient still enjoys perfect health; she now weighs one hundred and ninety pounds. Patient states that she has recently given birth to a healthy child.

I report the case of this woman (Case VIII) because (1) she was so very ill when operated upon; (2) it is one of the two cases in which intestinal perforation had undoubtedly occurred prior to operation; (3) the com-

mon duct was approached in a new way, namely, from behind the peritoneum; (4) the stone, in the ampulla, had ulcerated through the walls of the ductus choledochus and the duodenum, and would perhaps soon have been extruded; (5) the increase in the weight of the patient seemed phenomenal; it was almost doubled in the year following the operation.

What the result to the patient would have been if this stone had ulcerated its way out of the common duct is quite certain, and yet I have several times found stones imbedded in adhesions outside of the bile passages; they were usually close to the gall-bladder. Once I discovered a stone in the wall of a thick-walled gall-bladder; it was completely buried and was causing no disturbance, and was discovered in the process of sewing in the drainage tube. This is, I believe, the only case in which I have not divided all of the adhesions encountered. If no contraindication exists, such as necessity for abbreviating the operation, we should separate the adhesions if possible. The chance of meeting fistulous openings between bile passages and the intestine I regard as an indication for thorough exploration rather than a contraindication to it. Not infrequently adhesions alone are responsible for the symptoms which persist after the calculi have been removed by the surgeon or have escaped in other ways.

UNLOOKED-FOR DYSTOCIA IN CERTAIN MULTIPARÆ.¹

BY E. S. BOLAND, M.D., SOUTH BOSTON.

If this title is ambiguous or misleading I shall try to explain it as I go along. It is difficult to develop any new fact or plausible theory in obstetrics when the entire field has been gone over so often and so thoroughly by competent writers of large and varied experience. But some accepted facts will bear repeating, and mooted points, if not settled, are better understood by new discussions. I have found difficulties with which I was not familiar, and I shall try to state these difficulties and earnestly solicit your discussion and help.

We are occasionally called to attend in labor women who have already been delivered of from one to several children, and as they got through with these deliveries without special delay or trouble we unhesitatingly accept their cases. Their first deliveries may or may not have been slow, and some later ones may have been precipitate. It is not unusual to be told in such a case that the child had been born before the doctor reached the bedside. Under such circumstances we have no misgivings about the patient's condition nor prospects, and may not even examine or estimate her pelvic measurements; hence, when later we encounter delays and difficulties in delivery, we can certainly regard them as "unlooked for." Why should delivery have been rapid and easy formerly and so impossible now? When called to such a case, if we examine digitally we find the cervix high up and but little dilated, even after some hours of ineffectual pains. We watch the patient awhile, encourage her to be patient, and possibly give an opiate. The pains, though frequent enough and severe, seem to be singularly inefficient, for the head does not engage, much less descend. If after some time we examine again we shall probably find some relaxation of the vagina and a fairly dilated

(or easily dilatable) os, and the head or possibly the breech within reach, quite movable, if the waters are still intact, and no attempt at engagement in the inlet or of the necessary moulding essential thereto.

After many hours or even days so spent we find the patient getting anxious and urgent for relief, and with the pulse and temperature rising, and other evidences of exhaustion, we begin to realize that for safety of the mother, as well as for the baby, something more than masterly inactivity is demanded of us.

When we look for the determining cause in these cases it is very hard to find. The history of former easy and possibly prompt deliveries excludes any great departure from normal in the parturient passages, bulky neoplasms of course, being excluded. It has been suggested that possibly there is persistent at term the globose shape of the gravid uterus which is normal up to six or seven months, instead of the ovoid shape that ought to obtain in the last weeks of pregnancy. If this assumption is correct it would explain the arm or trunk presentations occasionally seen. In most of the cases that I recall the usual polar presentations of head or breech could be easily felt. Sometimes the head seemed to rest on a veritable shelf formed by the os pubes (as a bracket) and the expanded anterior uterine wall.

The most plausible theory of the origin of these cases is based on the fact that in multiparæ we so often find relaxed abdomens and presumably some fault of direction of the uterine ovoid, or failure in contraction in the uterine walls in consequence. We have no doubt this same condition may occur in primiparæ, but in any given case when it is suspected, we must first exclude the more common causes of dystocia, under sacral promontory prominence, narrow superior strait or uterine inertia. If these are excluded we probably have to deal with the same condition primarily which we are assuming is a vicious development in the multipara from some weakening or aberration of originally competent normal forces. However, the occurrence of the difficulty is certainly rare in primiparæ as compared to multiparæ. In two of my cases the development of large mural fibroma seemed to be the cause of breech presentations but neither gave special trouble to the artificial delivery of living children.

Frequency. — In this condition it is not possible to give exact figures as to frequency, clinical varieties as to positions of head or breech, or infant mortality. Excluding doubtful cases occurring in first labors, I doubt if they occur more than once in 150 or 200 cases. This is merely an estimate from my own experience.

Treatment. — Aside from operative interference the treatment is unsatisfactory, and can best be expressed in negatives. Don't hurry; don't give ergot; don't rupture the waters (twins being excluded); don't keep the patient in bed at first, or out of it later; don't fail to empty the bowels and bladder at intervals; don't insist on the patient making expulsive efforts unless the abdomen is manipulated so as to direct the uterine ovoid, especially if the abdomen is pendulous. Usually after many hours have been wasted in these attempts, little will have been secured except possibly greater ease of dilating the soft parts, but your patient will be in poor state to meet the exigencies of artificial delivery. But meet it she must, for we are now face to face with the old problem of high forceps or turning.

That penitent darkey at the camp meeting who, when the fervid though illiterate preacher described

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