

of the diagnosis. In all pancreatic lesions, except cancer, the exploration which establishes the diagnosis may be followed by curative operation, especially cholecystostomy for chronic pancreatitis.

The diagnosis between gallstones and certain lesions of the liver is interesting; but hepatic diseases are so rare that the question of differential diagnosis between these two conditions seldom comes up.

During my last service at the Massachusetts General Hospital a patient was transferred to my care who had been operated upon for suspected gallstones. None were found; but on the anterior surface of the great lobe of the liver there was a rounded, smooth prominence which suggested to the operator a neoplasm, probably malignant. Cholecystostomy was performed to relieve the existing jaundice. There was much hemorrhage following this operation, but the patient survived. For several weeks I watched the case, trying to decide upon the diagnosis and the best treatment. Before I had decided, however, the patient began to bleed from the nose, and she died of uncontrollable hemorrhage. The autopsy showed a hypertrophic cirrhosis, which no physician or surgeon had for a moment suspected.

Abnormal liver conditions, whether accompanied by jaundice or not, sometimes suggest gallstones and are operated on uselessly. Can these diseases be successfully eliminated in making the diagnosis? I do not think that they always can. I have found gallstones in a hard, irregular tumor which was supposed to be a mass of cancer, but which was really an enlarged, irregular and thickened gall bladder. In other cases the diagnosis of gallstones has proved correct, but there has been also malignant disease.

Cancer of the liver, not associated with gallstones, is eliminated by its painlessness and by the character of its jaundice, as there is jaundice from obstruction of bile in one part of the liver, and bile in the stools from another part. Liver abscess might be confused with an acute cholecystitis, were the abscess in the immediate vicinity of the gall bladder. Such a condition would, however, be so rare that it need not be seriously considered.

Perhaps the most important disease to eliminate is cirrhosis with jaundice. This condition, however, is extremely unusual in a form which even remotely suggests gallstones; an hypertrophic cirrhosis might; no cirrhosis with ascites would, for the presence of ascites would immediately rule out a gallstone origin.

Many errors in diagnosis in diseases of the right upper quadrant come from inadequate study. Except in the plainest cases the patient in whom gallstones are strongly suspected should be examined several times, if the symptoms are not urgent. If the case is obscure, much time should be spent upon it, and the prognosis should be guarded. Cases of obscure origin, however, in which the symptoms are severe, must be explored at the earliest possible moment, even under the possibilities of an unnecessary operation.

Next in importance to the establishment of the diagnosis, especially with reference to gallstones, are the indications for treatment.

In many diseases the indications for treatment are comprised in the disease itself. In gallstones, for example, once the diagnosis is made from the symptoms that they cause, operation in the absence of contra-indications is always advisable. These contra-indications are the existence of serious lesions of other important organs, cachexia, anemia, hemophilia, inadequate powers of resistance from other causes, and perhaps the habit of tardy convalescence from trivial diseases — of falling an easy prey to evil complications.

Shall we operate when gallstones which cause no symptoms have been demonstrated at other operations? Are exploratory operations indicated when gallstones are only suspected? Gallstones which are known to exist should be removed the moment symptoms dependent upon them appear. I personally believe that removal is wise in all cases, whether they offend or not, provided the patient is in the best of conditions; if he is not in perfect condition, I should await developments. In cases in which gallstones are suspected, we should explore if the suspicion lies between gallstones and other conditions as serious or more serious. When, for example, the diagnosis lies between gallstones and a simple dyspepsia, the benefit of the doubt would consist in postponing exploration; when the diagnosis lies between gallstones and cancer of the pylorus, the benefit of the doubt demands immediate exploration.

The rule by which I have been guided and which I have rarely if ever had occasion to regret is that when symptoms exist in the right upper quadrant which are of a chronic character, when the attacks of pain or distress continue especially at irregular intervals, and when the attacks of pain in any form suggest the presence of gallstones, exploration is indicated, particularly when palliative measures have been employed in vain for a reasonable length of time. When later signs confirm the existence of gallstones, any measures other than surgical are unreasonable and ineffectual.

#### DISEASES OF THE BILIARY PASSAGES INCLUDING THE LIVER, THE GALL BLADDER AND THE PANCREAS.\*

BY ELBRIDGE G. CUTLER, M.D., BOSTON.

For convenience of consideration we may group the most important diseases of the biliary passages under four heads:

- (1) Calculi or gallstones in the gall bladder and gall ducts and their effects.
- (2) Inflammation of the gall bladder and gall ducts and their effects.
- (3) New growths of the gall bladder and gall ducts and their effects.
- (4) The various combinations of these three groups.

These diseases are not equally frequent.

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Riedel and Kehr say that calculi of the biliary passages are found in 10% of all adult autopsies. Robson states that post-mortem records on persons of all ages and both sexes prove gallstones to be present in from 5% to 10% of all Europeans; in Strassburg the record being 12%, in Kiel 5%, and in Manchester 7.4%. Mosher found in the first 1,655 autopsies of the Johns Hopkins Hospital there were 115 cases of gallstones or 6.9%. Rolleston found them in 5.7% in the post-mortem records of the St. George's Hospital in London. Brewer found them 12 times in 100 subjects examined in the dissecting room of the College of Physicians and Surgeons, New York. Wright in his first 1,400 autopsies, at the Massachusetts General Hospital, found there were 120 cases of disease of the biliary passages and pancreas. Of these 95 were stone, 9 thickened bile, 6 cholecystitis, 4 adhesions of gall bladder to intestine, 3 small and contracted gall bladder, and 1 each hemorrhagic pancreatitis, stricture of ducts and cancer of the common duct. Among these cases were 3 of cancer of the gall bladder with gallstones, 3 of cancer of the pancreas without stone, 1 with cancer of the pancreas and secondary cancer of the common duct, 1 of lymphosarcoma of pancreas, gall bladder and liver with stone. In view of the greater frequency of gallstones I shall devote myself, in the short time at my disposal, more particularly to that form of disease.

In by far the greater number of gallstone cases there are no symptoms. Kehr says 95% are without them, and one or more stones may remain indefinitely without symptoms in a healthy gall bladder with pervious gall ducts. In the remaining 5% symptoms result which vary from the very slightest evidences to fatal consequences.

The chief symptoms produced by the above-named groups of disease are pain, local tenderness, chills and fever, vomiting, sweating, alteration of the rate of the pulse, jaundice, tumor of the gall bladder, changes in the urine, blood and stools.

*Pain.* — The pain is acute, paroxysmal, in the right upper quadrant, though it may be in the left according to Naunyn, occurs more often when the stomach is empty, frequently comes on at night, in most cases is referred to the stomach region and begins in the epigastrium and not in the region of the gall bladder (Ewald). Sometimes it is present all over the abdomen; it extends often to the right shoulder and back, both sides of the vertebræ; it is frequently relieved by eating, and sometimes by the escape of gas from the intestine. Its duration, frequency and severity are very irregular. Kehr and many authorities claim the pain to be dependent on inflammatory changes. Riedel says it is due to the advance of a stone in scarcely half the cases, but is caused by inflammation. Murphy, Ferguson and others say that it is due to the effects of gallstone or to distention of the gall bladder or ducts independent of infection. Ewald says colic is caused by contractions. Characteristic is the sudden onset, its colicky nature, its sense of boring, tearing

through. There is nothing peculiar to the pain *per se* which enables us to distinguish between inflammation, stone and cancer, though its accompanying symptoms will often enable us to make a diagnosis.

*Tenderness.* — The next most characteristic symptom is local tenderness in the part involved in the disease. Its greatest intensity is just underneath the free border of the ribs at the junction of the ninth rib and its cartilage. It is best elicited, according to Moynihan, by bimanual examination, the left hand pressing firmly up from behind the lower two or three ribs and the fingers of the right hand hooking under the costal margin while the patient draws a long breath. Robson's point is above and to the right of the umbilicus at the junction of the upper two-thirds with the lower one-third of a line drawn from the ninth rib to the umbilicus. He says it is the site of reflected pain passing along the splanchnic to the eighth and ninth dorsal nerves and thence reflected to the surface of the termination of these nerves. Tenderness is a sign of considerable importance. The tenderness is generally nearer the median line and slightly lower when the common duct is the seat of trouble.

*Fever and Chills.* — With the attack of colic, when due to stone, a severe rigor not infrequently occurs and may be repeated several times. It is accompanied by a rapid rise of temperature to 102° F., 103° F. or more, and with the subsidence of the pain it as rapidly disappears. Murphy has called attention to the fact that the temperature is a series of angles not curves. When inflammation of the gall bladder or ducts or their sequences have occurred fever is constant with exacerbations.

*Vomiting.* — Vomiting is of very frequent occurrence in an acute attack and follows the pain. It may be the most troublesome of the symptoms. It is reflex and may be independent of nausea. Its severity may be so great that a gallstone may be dislodged from the straining with temporary subsidence of the attack.

*Sweating.* — Sweating may occur during the acute attacks of gallstone colic or it may be the result of septic infection.

*Pulse.* — The pulse is quickened and its tension increased during an acute attack of gallstone colic; while in inflammation of the gall bladder or ducts it is simply accelerated and the tension may be diminished.

*Jaundice.* — Jaundice is one of the least constant of the symptoms. According to Brewer it is absent in from 80% to 90% of all operative cases. It may be caused by stone in the hepatic duct, or in the common duct, by inflammation of the hepatic or common duct, as a late symptom in cancer of the gall bladder, tumors of the hepatic duct, tumors of the common duct or neighboring viscera, by localized peritonitis distorting or constricting the common or hepatic ducts. It may be the result of functional disturbance (Ewald). Prolonged, persistent, deepening jaundice with progressive loss of weight and tumor of gall bladder is strongly suggestive of cancer,

though it has been observed in impacted stone in the common duct.

*Tumor of Gall Bladder.* — Tumor may be found in inflammation of the gall bladder, in concretions in the same, and in obstruction of the cystic or common duct. It projects below the edge of the ribs and may be felt as a mass of almost any size, pyriform, moving with respiration, may or may not be tender, and may or may not be hard. Often its lower end is parabola shaped and gradually disappears toward the liver.

*Urine.* — The urine may or may not contain bile either temporarily or constantly. It frequently contains albumin as well; albumin is always found immediately after an attack of biliary colic due to stone and may rapidly disappear.

*Blood.* — Leucocytosis may be found in supuration in all infections save those of typhoid fever (present in 50%. Musser).

*Stools.* — Examination of the stools determines the presence or absence of bile and degree of jaundice. Gallstones may be found a few days after an attack of colic, even as late as the fourteenth day (Robson).

Disease of the biliary passages is to be differentiated from gastric ulcer, appendicitis, renal colic, pancreatitis, angina pectoris, portal phlebitis, subphrenic abscess; gastric crises of tabes.

In *gastric ulcer* there is permanent hyperacidity and hyperchlorrhidria. In gall bladder colic chemical examination of the gastric contents during the interval shows no change from the normal. During or immediately after the attack there may be increase of the hydrochloric acid in the stomach, which disappears with the subsidence of the attack. In ulcer, ingestion of food brings on the pain regularly; whereas that of gall bladder colic is irregular, appears at varying intervals and frequently at night. Cholecystitis is frequently mistaken for perforation of peptic ulcer.

Appendicitis is sometimes difficult to differentiate, especially when the appendix occupies an abnormal position with its tip directed upward and perhaps near the liver. Inflation of the colon may be of service by displacing the painful point. Leucocytosis points here to appendicitis as empyema of the gall bladder has no leucocytosis (Ewald).

In *renal colic* the pain originates in the flank, extends down along the ureter and ends in the testis, or ovary, and there is frequently hematuria and vesical irritation.

*Pancreatitis.* — It may be impossible to distinguish between acute pancreatitis and acute cholecystitis or phlegmonous cholecystitis. As a rule, the clear description of Fitz will enable us to keep in the right direction.

*Angina pectoris* could only be confounded with biliary disease in irregular cases.

*Portal pylephlebitis* is distinguished by its antecedent history, its enlarged and painful liver and its pyemic symptoms.

*Subdiaphragmatic abscess*, the previous history, the physical signs (abdominal as well as tho-

racic), and exploratory puncture would serve to differentiate.

*Gastric Crises of Tabes.* — The other accompanying nervous symptoms would stamp the disease.

This short *résumé* illustrates the occasional difficulty of diagnosis, and, as said before, an absolute diagnosis may sometimes be impossible.

The diagnosis having been made, however, the indications from a medical point of view are to alleviate symptoms, to promote a free passage of bile to the intestine and to prevent stagnation of bile. The first of these indications is met by the well-known means and may be successful. They are, for the pain of gallstones, the subcutaneous injection of  $\frac{1}{4}$  gr. of morphia or, better, morphia gr.  $\frac{1}{4}$ , atropia gr. 1-150, nitroglycerin gr. 1-100, repeated without the atropia in fifteen to twenty minutes if relief is not obtained in the first instance. Hot bath and hot fomentations to the hepatic region. Inhalation of ether or chloroform till the morphia has begun to act. Rest in bed and local applications till the tenderness subsides.

The promotion of the free passage of bile to the intestine and the prevention of concentration and stagnation in the gall bladder is thought to be favored by the giving of some of the soda salts as the sulphate or phosphate in doses of from 1 to 2 dr. daily. Oleate of soda in pill form has received the indorsement of Robson in cases that declined or were unfit for operation. The attempts to dissolve the gallstones *in situ* have not thus far been successful. Something may be accomplished in the way of prophylaxis by regulation of diet, prescribing regular exercise, the use of saline purgatives and care of the general health; but after all the case is almost always sooner or later sure to come into the hands of the surgeon, and it is far wiser to call him in early as soon as the diagnosis is established and together to determine on the future course rather than to wait till some serious complication has arisen and the surgeon must work at a serious disadvantage.

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DISCUSSION OF DR. CUTLER'S AND DR. RICHARDSON'S PAPERS.

DR. R. H. FITZ, of Boston: Despite the recognized importance of the liver in promoting digestion, maintaining nutrition and acting as a safeguard against certain poisons, it must be admitted that our means of determining a failure in its various functions are extremely limited. There is but little difficulty in making a diagnosis of probable gallstones, and possible complications, requiring active, and more or less immediate mechanical treatment. More important is the diagnosis of the conditions which lead to the formation of gallstones with a view to their prevention. For generations such terms as congestion, torpor and sluggishness of the liver have been in common use, but the well-informed physician recognizes that they are merely conventional, and are by no means indicative of demonstrable disturbances of function of this organ. The liver thus is made the scapegoat for what frequently must be regarded as a faulty action of the stomach or bowels, too often induced by excesses or negligence on the part of the sufferer. Indeed, the remedies which are given with the announced purpose of acting on the liver, if they do not produce a more or less energetic catharsis, are considered to have failed in their effort to produce "portal depletion."

At present, as in the past, the clinician has no other means of satisfactorily determining an alteration of the functions of the liver than by an inquiry into the greater or less ease with which the bile leaves the biliary tract. He is unable to recognize alterations in the quantity or quality secreted under the influence of disease, and it is impossible for him to determine the state of other functions of the liver under morbid influences.

The same holds true in great measure with regard to the clinical determination of functional disturbances of the pancreas. These were made the subject of an address before the Congress of American Physicians and Surgeons a few years ago, and an attempt was made to bring forward what had been done in this direction, and to outline what was in process of investigation. It is unnecessary to state that the work of the intervening period has served no other purpose than to show that the expectations of the past have not been fulfilled, and that no material advance has been made in the clinical recognition of disturbances in the function of this organ.

It is the province of the future to throw light upon these questions. They are, in the first instances, problems for the laboratory, and the splendid provision made for such researches in the new buildings of the Harvard Medical School are indication of their importance. It is of especial significance that a new laboratory is to be added to the series,—one for the study of clinical pathology, in which the investigation of matters of importance in the practice of medicine shall be paramount.

The diagnosis of diseases of the liver and pancreas, therefore, must depend now, as heretofore, upon the determination of the position, shape, density, mobility and sensitiveness of the parts concerned in addition to the data derived from the history of the patient.

With the admission of the impossibility of making an accurate clinical diagnosis of the disturbances of function of the liver and pancreas, comes the simplification of treatment. To attempt to stimulate or to depress

assumed disturbances in the function or functions of the liver incapable of recognition is a leap into the dark. It is far safer to undertake the treatment only of those disturbances connected with obstruction to the passage of bile and pancreatic juice into the intestine, with suppurative and necrotic areas, and with calculi and tumors. It is the mechanical treatment of mechanical disturbance which is fruitful at present, while the functional treatment of disturbances of function is the task of the future. It is left for the physician to aid in the determination of the time when such mechanical measures shall be applied, either through his recognition of the failure of diet and drugs to afford relief, or by the appreciation of persistent evidence of the maintenance of nutrition despite the increasing size of the tumor. With the exception, perhaps, of certain syphilitic lesions of the liver and pancreas it must be admitted that the independent diseases of these organs of a serious nature, if not remediable by surgery, are incapable of cure by any other method of treatment.

DR. S. J. MIXTER, of Boston: The subject is such a tremendous one that in a discussion there is little time to lay stress on more than a very few of the points that occur to the speaker.

First, I want to say one word as to diagnosis,—the importance of recognizing the fact that recurrent attacks of pain in the region of the liver almost always mean gallstones. If one goes on that idea, and with a history of frequent recurrent attacks of pain makes an exploration, it is very seldom that he goes wrong. He may not find gallstones, but he will find something that produces this condition.

There is one condition which we find instead of gallstones, which produces similar symptoms, and that is a chronic inflammation of the gall bladder.

I think it is the duty of the surgeon also, in the way of diagnosis, in all cases of laparotomy, except in very young people, where the incision is large enough, where the patient's condition is such as to warrant and where there is no dealing with a septic condition, to examine the gall bladder with the hand. I also think it is his duty to remove gallstones when they are found, if the patient's condition is such as to warrant it. This procedure is simple and harmless, and I think should always be done, but it should be done in a proper manner. In certain cases, as Dr. Richardson has said, you know there are gallstones present, and you do not remove them. I have done hysterectomies on cases where the patients had in their gall bladders gallstones of considerable size or number, but for some reason or other their condition at the time was such that it was considered best not to remove the stones; but with those patients, any symptoms appearing later can be acted upon immediately.

It must be recognized, however, that the most serious of all the gall bladder diseases are those which depend on acute inflammation without the presence of gallstones. Some are due to the presence of gallstones, but they are absent in some where there is a severe inflammation. We see such in typhoid fever.

A patient was brought into the hospital without any history, without any friends, a very sick man, with high temperature. I discovered a tumor in the region of the gall bladder. I operated and found an enormously distended gall bladder filled with pus, and drained it. The man died and we found that he had a severe typhoid fever. Some of my friends found fault for operating upon a case of typhoid fever.

The question of choice of operation has not been spoken of, and I think that is something which is important, but about which surgeons differ to a certain extent.

