

Original Articles.

CERTAIN ASPECTS OF BILE DUCT DISEASE.*

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WHEN you come to consider disease of the bile passages there are two questions which present themselves at once:

- (a) *Shall you operate?* and
- (b) *How shall you operate?*

To the first of these questions let us turn ourselves; but let us get on firm ground. I believe that much of the prevailing phraseology regarding these conditions is misleading. Writers continually talk about *disease of the gall bladder* and *gallstone disease* — phrases well enough so far as they go, but they do not tell the whole story. Even Mayo Robson, in the various editions of his well-known book, uses the title, "Gall Bladder and Bile Ducts." The classical word *cholelithiasis* is equally misapplied. We are discussing *disease of the bile passages*, of a system of passages. The gall bladder is but a *part* of the system; *cholelithiasis* is but *one manifestation*, though an important one, of the disease. We have to deal with infection, inflammation, stone formation, suppuration, ulceration, cicatrization, stenosis, perforation, fistula formation, adhesions, peritonitis, local or general, malignant changes, and the involvement of other organs.

If you will view carefully this complex process you will see that the confusing and involved, many-titled investigation quickly resolves itself into the study of one broad, progressive and far-reaching problem.

The first and most important fact for the practitioner to appreciate in connection with disease of the bile passages is that the underlying cause is an infection; and the method of that infection is worth considering, although indeed writers are not as yet altogether in accord as to what that method may be. Certain facts, however, are to be regarded as fairly well established: that the organism concerned is commonly the colon bacillus, though the bacillus typhosus is not infrequently the offender; and that the mode of entrance is either through the blood current or through the ducts, working upwards from the intestine. The probability is that infection from the intestine is far the more common method. C. A. Ewald, in a paper read before the Congress of American Physicians and Surgeons at Washington, in May, 1903, said: "It is an established fact that our ideas concerning this disease have experienced marked fundamental changes during the last ten or fifteen years. We now know that this condition is due to a bacterial infection and not to the presence of gallstones, the origin of which has always been more or less hypothetical."

There seems to be no doubt that in addition to an invasion of organisms, stagnation of bile is essential to gall stone formation, and it is obvious that bacterial invasion associated with swelling of the mucosa in the ducts results in stagna-

tion. For many years it was assumed that fresh bile in healthy subjects acted as an antiseptic. Recent observations do not confirm this view. Fresh bile is sterile at the best, while some observers have found that it may act as a culture medium. Indeed, Ewald says that in the lower portion of the common duct the bacillus coli communis is commonly found, but that ordinarily it is harmless there.

It is agreed now that stones arise from a catarrhal condition of the mucosa associated with a swelling and desquamation of that membrane, and it is the fact of that catarrh, due to infection, upon which we must constantly fix our attention; that catarrh in itself is not always a trifling condition. It may cause severe symptoms and it may go on to severer grades of inflammation without necessitating the formation of stones, though it is fair to assume from such knowledge as we have, that stone formation very commonly is associated with the process.

In the lay mind, indeed, in the minds of very many physicians, actual stones are the *sine qua non*; and that impression has been the source of countless errors. I recall vividly a recent case in which the diagnosis of "gallstones" was made on the strength of frequent, long-continued attacks of boring pain in the right hypochondrium. Finally, an operation was consented to by the patient, when nothing was found but a thin-walled gall bladder, containing bile-stained infected mucus, draining ineffectually through a partially obstructed cystic duct. The patient and her family were chagrined that no stones were found, and were skeptical about possible benefit from the operation. However, the cholecystostomy which was done, followed by three weeks of drainage, relieved the congestion, freed the ducts and resulted in a permanent cure.

These infections of the bile passages do not commonly make any permanent impression on the hepatic and common ducts, for those structures are main channels and are subject to fairly constant natural drainage, but when the inflammation spreads to the cystic duct and gall bladder it finds conditions there very different anatomically, — conditions which seem designed to favor especially chronic inflammation and stasis, and stone formation.

The acute forms of infection do not result finally in stone formation. The acute forms are ugly things; they go on rapidly to suppuration, ulceration and gangrene even. It is to the chronic, indolent catarrh that we look as the important factor in the etiology of calculi.

Now there is another term as to the definition of which we must be agreed in discussing these processes, — *cholangitis*. The books are not in agreement. According to some, *cholangitis* is an acute infection of the bile passages within the liver, rare and fatal. According to others it is an infrequent suppurative inflammation of the common duct and of the radicles of the hepatic duct. Such conceptions are rather ancient, and do not appear to me to express modern know-

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ledge of infections of this region. We must regard cholangitis as a not infrequent disease, and I see no reason for limiting the term to inflammation of a portion of the bile passages, nor do I regard it as indicating any particular degree of activity in the infection. Cholangitis is an inflammation of the bile passages, localized or general, mild or virulent, acute or chronic, as the case may be; and cholecystitis is but one manifestation of cholangitis.

Authors tell us that the great majority of gallstones form without the patient's knowledge of discomfort and that often the discovery of their presence is made at autopsy only or in the course of an operation undertaken for some other lesion.

From my own observations I believe that such statements may be variously interpreted. The gallstones actually present as one result of the processes I have been discussing may never have caused the typical pain or jaundice leading to their recognition; but other symptoms may have been present. We know that trouble in the bile passages is one of the common causes of digestive disorders, or that such trouble may be the result of processes in other organs giving rise to digestive disorders. The close anatomical association of the bile passages, especially of the gall bladder, with the duodenum and stomach, must not be forgotten, and surgeons and pathologists very well know that associated diseases of all these organs are common.

Granted now that some sort of disturbance affecting the bile passages has begun; the disturbance may be a simple primary catarrh or it may be an inflammation secondary to disease elsewhere — how are you to know that there is trouble? Why should you suspect it? Does it progress insidiously leaving the patient free from symptoms for months and years or even for a lifetime?

About all that, and in spite of armies of statistics, we can give no definite answer, and we never shall be able to do so. For who indeed may tell? Certainly not armies of statistics. Until very recently statistics were not concerning themselves with such elusive matters. Even now the inquiry is half hearted or is neglected and depends too largely for accuracy upon the personal equation of countless patients and numerous physicians. Moreover, we have yet much to learn about these diseases. Individual clinical experience, and personal impressions must still be invoked largely, and though such sources of information are far from exact they do furnish us with abundant food for thought. See, for example, my own partial experience. Since taking up this line of inquiry I have had to deal in *private practice* with twenty-four cases of operations for bile-duct disease. All of these persons have been cross-examined repeatedly and carefully. In not a single case did it appear that the final and convincing symptoms appeared suddenly and without premonition; that is to say, those final symptoms which led immediately to the operation. To be sure there was no uniformity in these histories, but in all the cases there had

been some symptoms of faulty digestion running often over many years.

Here is one common symptom, — common but suggestive: a small and quickly appeased appetite associated with a tendency to corpulence. I have seen this association in several cases and have come to regard it as significant. There are usually other symptoms, — constipation, occasional distress after food, indefinite but sharp occasional pains in the upper part of the abdomen; a bad taste in the mouth, furred tongue, sometimes nausea, frequent headaches, lack of vigor, exhaustion after slight exertion, diminished diaphoresis, high colored urine and frequent blurring of vision. Such patients will tell you that they are "bilious."

When you have to deal with a "bilious" patient bear in mind that the true condition may be an infection of the bile passages, and that the man may some day be seized with the classical symptoms of gallstones — indeed the stones may even now be present. These bilious folk usually are victims of a defective metabolism. Their digestive processes frequently are at fault; fermentations take place in their intestines and auto-infections result. They may be sufferers from sundry "neuralgic" or rheumatoid pains, — sciatica, lumbago, "stiff neck"; they may experience attacks of arthritis. We used to call such things "rheumatic fever." These are the people to whom the old clinicians assigned "diatheses."

In this discussion it is needless to dwell *in extenso* upon details of the treatment for such cases. Much of it is summed up in the word Carlsbad; change of air and scene, recreation, a carefully regulated life, a restricted diet, exercise, massage, proper bathings, the abundant drinking of saline waters.

The effect of all this is obvious enough. The patient's general condition is improved; the systemic circulation is stimulated and the affected parts are flushed. Hyperemia is diminished, catarrh is relieved, local swelling subsides, normal drainage of the ducts is re-established. In a few weeks the sufferer is well. With proper care and some attention to the conduct of his life after that he may continue indefinitely in good health.

Operations: In considering the question of how to operate in diseases of the bile passages, you will find in the analysis of cases and the experience of many operators that certain clearly defined and fundamental principles become salient — principles as old as surgery. These biliary diseases are infectious in their origin, and in operative treatment you must employ the sound and ancient maxims applicable to the treatment of all infections. If you are dealing with a carbuncle or a palmar abscess you remove the offending material and drain the parts. You drain until all possibility of reinfection has been eliminated.

Apply those same sound principles to infection of the bile tracts and you will be able to meet all the problems of this often obscure and much

debated subject by formulating and observing the following three rules:

- (1) Remove stones.
- (2) Remove so far as possible all disorganized, degenerated and permanently crippled tissue.
- (3) Drain.

In given cases, of course, the intelligence of the surgeon may prompt him to modify or depart from these principles. The condition of the patient may not permit of a radical operation at one sitting; malignant involvement of the parts may render impossible complete removal of the disease; extensive adhesions and associated, complicating disease of other organs may prohibit more than palliative measures, but always we should keep in mind and aim to observe those three cardinal rules.

At present the debate, such as it is, centers around the questions: How shall we operate? Shall we remove the gall bladder or drain it? Shall we remove stones whenever present? Shall we drain the hepatic duct? Shall we ever omit drainage of the operative field? How shall we avoid hernia?

The discussion of *cholecystostomy* and *cholecystectomy* was waged for a number of years, and the multitude of papers bearing on the subject may still be read with interest and profit. Enthusiasm almost to the verge of acrimony was at times displayed and the points of view of sundry writers often were so divergent that it seems as though their premises were too dissimilar to admit of arriving at the same conclusions. Starting with the proposition that *cholecystostomy* was simple, safe and easy, the advocates of that procedure wished to apply the principle practically to all operations on the bile passages; while those who favored *cholecystectomy* averred that the gall bladder was analogous to the appendix, and that when involved in disease, it should always be removed.

We have now learned that there is a distinct place for both operations, though at times, in a given case, the conditions are so intricate and the indications so over-lap each other that it may be difficult for even the experienced surgeon to be sure of which procedure to follow.

Statistics of sundry operators also are unsatisfactory, for we lose the personal equation. The statistics of six or seven years ago may not in fairness be compared with the statistics of to-day, and the desperate chances taken by one operator may be shirked or wisely avoided by another.

Not long ago Frederick Winslow of Boston collected into a valuable paper, as yet unpublished, the statistics of operations on the bile passages performed by a variety of surgeons at the Massachusetts General Hospital. Beginning with the year 1894, he traced the histories with the end results of three hundred cases. Very many of those operations were done in the early days, and if you were to study their records you would find much to censure. During most of that time, when it came to dealing with the gall bladder, *cholecystostomy* was the favorite operation. There were nearly four times as many

cholecystostomies as *cholecystectomies*. Without a knowledge of actual conditions in the individual cases a comparison of figures and an estimate of the value of any operation is futile; nevertheless, these figures have their interest.

	<i>Cholecystostomies.</i>	<i>Cholecystectomies.</i>
Total cases,	170	44
Traced cases,	128	38
Good results,	46,35.9%	25,66.9%
Poor results,	59,45.6%	4,10.5%
Deaths,	23,17.9%	9,23.6%
Hernias,	4,3.1%	0

Contrast that with the later statistics of the Mayo brothers published in 1903. W. J. Mayo reports 342 *cholecystostomies* with 8 deaths, a mortality of 2.3%; and 66 *cholecystectomies* with 2 deaths, a mortality of 3.03%. His "mortality" is a great improvement over Winslow's figures, but it is interesting that the percentage of deaths following the two operations respectively is in about the same ratio in both sets of statistics.

In that paper of his, Mayo does not deal with the question of end results, so that we are unable to make a more extensive comparison of the subsequent histories in the two sets of cases. Mayo's death-rate, however, is so greatly lower than that recorded at the Massachusetts General Hospital that we must assume for it some cause other than that of unsatisfactory pioneer work in the latter case. One salient cause probably is the fact that competent operators in their private clinics can make a better choice of material and are likely to encounter fewer desperate cases than fall to the lot of surgeons doing routine work in a great municipal hospital. As a matter of fact, from inquiries among surgeons of the Massachusetts General Hospital staff we find that their experience in private operating showed a mortality markedly lower than the hospital mortality.

Other writers give a mortality so variable for these two operations of *cholecystostomy* and *cholecystectomy* that it is difficult to make any comparison between clinics. We can say merely that complicated operations give a high mortality in the hands of all surgeons; that simple operations give a low mortality; that the mortality when *cholecystectomy* has to be done is slightly higher than when *cholecystostomy* is done, because conditions necessitating the former operation are graver, and that the statistics of all surgeons are improving with increased experience, a better appreciation of indications and an improved technique.

Here is a little table showing the results of sundry men. It is arranged chronologically:

	<i>Cholecystostomies.</i> Mortality.	<i>Cholecystectomies.</i> Mortality.
1890 Courvoisier,	21.14%	(1890) 25%
1893 Martig,	17 %	(1894) 17.24%
1896 Kehr,	6 %	(1894) 5%
1900 Delageniere,	—	(1900) 23%
1901 Terrier,	—	(1901) 25%
1902 Kehr,	2.1%	(1902) 3.1%
1904 Robson,	2.7%	(1904) 6.2%

After reading such a set of figures as those you think you see very convincing facts, but when you come to analyse the reports you despair of

statistics; for then you see at once — indeed the reporters distinctly state that there are various types of diseases — some indiscriminately mingled, some carefully separated. Take, for instance, those figures attributed to Kehr in 1902: Stern, Kehr's pupil, tells us that Kehr had 237 cystostomies with 5 deaths, a mortality of 2.1%; while Robson quotes Kehr: "but the complicated cases, including malignant disease, had a mortality of 97%." Robson concludes, "cholecystectomy has hitherto undoubtedly been a more serious operation than cholecystotomy [cholecystostomy], but since the method of complete exposure of the operation area has been adopted, it has been rendered both easier and safer."

As I have insisted, such a statement as that last of Robson is open to endless discussion, for safety and ease depend on the conditions presented by individual cases. At any rate all the figures at hand seem to prove that such cases as have been submitted to cholecystostomy show a slightly lower mortality (dependent again on the severity of conditions present) than do the cases treated by cholecystectomy.

A fact more interesting and significant than that of mortality, however, is that of the permanence of cure. Winslow's figures give us information on such end results, and his findings resemble those given in Robson's latest elaborate tables. Winslow found that of the cholecystostomies 35.9% showed good results, while 45.6% showed poor results. On the other hand, of the cholecystectomies, 66.9% were permanently cured and only 10.5% had recurrences or continued to suffer. It should be recognized, however, that "poor results" is a flexible term, and that very many of those unfortunate ones were much better off than before operation, whether cystostomy or cystectomy was done.

Bearing in mind, now, our three cardinal principles, let us see if we can devise any rules to guide us in given cases, as to the choice of cystostomy or cystectomy.

If we find no damage to structure our indications are plain enough. Drain the gall bladder. The various writers on the subject have formulated their ideas regarding the indications for *cystostomy*, and the evidence is convincing that there are three classes of cases in which that operation as a rule is indicated:

(a) When the gall bladder and ducts, though containing stones are uncrippled by the inflammatory process.

(b) When *acute* inflammatory processes exist with or without the presence of stones.

(c) When the common duct is obstructed by unremovable malignant disease.

As an example of class *a* take the familiar one, a freely movable, normal-appearing gall bladder—full of faceted stones—the cystic duct free or containing only small movable stones. In such cases removal of the stones followed by drainage will surely result in restoring the parts to the normal.

Sometimes, rarely, when the patient is too

exhausted to endure a long, severe operation, a cystostomy preliminary to cystectomy may be unavoidable.

Class *b* furnishes the greatest variety of cases suitable for cystostomies. It is a complicated class. Class *a* deals with the simplest of stone cases; we may call class *b* the inflammation class.

In empyema of the gall bladder, without disorganization of that viscus cystostomy is indicated; also, in certain cases of chronic catarrh of the gall bladder or bile ducts; in infective cholangitis; in obstruction by hydatids; in dropsy of the gall bladder; in some cases of phlegmonous cholecystitis accompanied by great prostration.

The conditions just described call for cystostomy because serious infections demand imperatively thorough drainage, with the minimum of risk to the surrounding parts.

As for class *c* it must be obvious that with an obstructive jaundice due to tumor occluding the ducts, a cystostomy or sometimes a cystenterostomy is essential for permanent biliary drainage.

Except in cases of malignant disease cholecystostomy done for the conditions described above gives a very low mortality and a large proportion of permanent cures. Such are the conditions for which experienced surgeons are now doing the operation, the effect of which is that by observing your first and third cardinal rules the parts are restored to their normal condition, and interrupted function is resumed.

When it comes to the indications for *cholecystectomy* our course is by no means always so safe and easy. There are two conspicuous indications for that operation:

Class (a), Disease crippling the cystic duct;
(b) Disease crippling the gall bladder.

These two conditions often are interdependent, often are present together. When the gall bladder is inflamed, thickened, ulcerated, necrotic, disorganized, we must expect and look for extensive disease—erosions and strictures of the cystic duct, inflammation and dilation of the hepatic and common ducts; sometimes adhesions and ulcerations with fistulae into neighboring organs; obstruction at the ampulla of Vater with involvement of the pancreas in the general inflammatory process, even disease of the liver and, at times, duodenal ulcer, gastric ulcer, pyloric obstruction and eventually cancer, as the result of long continued inflammatory disease.

Such are the conditions calling for the application of all three of our cardinal rules, and of rule *two* not least of the three: "Remove, so far as possible, all disorganized, degenerated and permanently crippled tissue." That means cystectomy. A diseased gall bladder, thickened, inelastic, ulcerated, adherent, contracted, is functionally useless; it may remain a nidus of infection.

Damage to the cystic duct, even if other parts are unimpaired, renders the gall bladder relatively useless.

Ulceration of the duct means cicatrices, kinks, twists, stricture, occlusion often, with dropsy of

the gall bladder, or chronic catarrh and future destructive processes.

So with damage to "cysticus" or gall bladder, cystectomy is essential; cystostomy means only palliation and future trouble.

As examples of class *a* we may have stricture of the cystic duct, mucous fistula due to stricture of the cystic duct, hydrops of the gall bladder due to stricture of the cystic duct, and certain other cases in which the gall bladder is very much dilated.

As for class *b*: in that are to be found the manifold conditions involving structural damage to the gall bladder. With or without the presence of stones, for stones often are an incident merely in the course of the disease, we may find phlegmonous cholecystitis and gangrene of the gall bladder, multiple and sometimes perforating ulcers, chronic cholecystitis with contracted gall bladder, or possibly with a gall bladder enlarged, thickened, ulcerated while the common duct is unobstructed; those cases of empyema of the gall bladder in which there is serious damage to structure, cancer or other tumors limited to the gall bladder, and calcareous gall bladder.

I shall have a few words to say, shortly, about the method of removing the gall bladder, but here and now I must insist upon the essential importance of *drainage* in all these operations. You are dealing with an infection and you never can be certain that with the tying off of the cystic duct some leakage may not take place. A rubber tube rolled in gauze or otherwise protected by gauze always should be sewed with catgut into the stump of the duct.

The question of what incision to use in operations on the gall bladder has been much debated; but most surgeons now enter the abdomen through a long incision, splitting the right rectus muscle; and I believe it a good practice when enlarging this incision, to carry it up in the interval between the xiphoid cartilage and the right costal margin as high as possible. The upper surface of the liver will thus be exposed very freely, and as Robson points out, by lifting the lower border of the liver, in bulk, and rotating it (if needful first drawing the organ downward from under cover of the ribs), the whole of the gall bladder and the cystic and common ducts are brought quite close to the surface.

M. H. Richardson has felt for some years that this method of opening extensively the abdominal cavity involves risk of subsequent hernia, and in a valuable paper, read before the American Medical Association in 1904, he urged the advantage of entering the abdomen by a muscle-splitting operation after the manner of the "McBurney incision" for appendicitis. Just how valuable an advance in the surgery of this region his method may prove, is a question. The careful suturing of the present day, and gall bladder drainage through a separate stab-wound, have greatly reduced the chances of hernia in any case. Another and an important advantage of the long incision near the median line, together with the extensive exposure of the ducts, is that explora-

tion of adjacent organs is thus rendered easy, and supplementary operations are facilitated.

As for the method in cholecystostomy, I believe that the employment of the so-called Mixer tube, in common use at the Massachusetts General Hospital, has great and material advantages.

The advantage of the use of the Mixer tube is that no suturing of gall bladder to abdominal wall is employed, with the result that by just so much is the danger of a mucous fistula diminished,—granted, of course, that the ducts be free from stones. At the end of five or six days the wicks are removed; at the end of eight or ten days the ligature is cut away from the tube at the knot, by means of a sharp-pointed bistoury, and the tube is withdrawn. A long narrow track completely shut off by adhesions remains. It shrinks rapidly and closes entirely after a few days.

In my experience it is a great advantage to establish this gall-bladder drainage through a separate stab-wound opening outside of the linea semi-lunaris. The long abdominal incision may then be closed. The danger of hernia is thus reduced to a minimum. In a considerable series of cases, thus treated, I have seen no subsequent hernias.

Speaking of cholecystectomy, W. J. Mayo, writing in 1903, says that in most cases of stone impacted in the cystic duct, cholecystectomy is indicated: "The ducts and cystic vessels are caught with curved forceps just beneath the impacted stone and tied. These sutures are then cut across and the gall bladder and duct with the stone removed from below upwards, almost by traction alone, with an occasional division of some more firm adhesion to the liver." And again, "should the walls of the gall bladder have undergone marked changes, or angulation and stricture of the cystic duct resulting in mucous fistula seem a possible outcome, cholecystectomy is more certain to afford permanent relief. If the cystic duct is completely obstructed so that the walls of the gall bladder participate in the biliary circulation, in spite of the obstruction, detach the organ from the liver and ligate with catgut at the base; but if the gall bladder participated in the biliary circulation, in spite of the obstruction, it is not always wise to ligate the cystic duct, especially if there is a cholangitis present." Under such circumstances Mayo advises removal of the gall bladder and drainage of the cystic duct. To facilitate such drainage he has devised his well-known procedure of removing the fundus and enucleating the lining membrane of the gall bladder leaving the outer layer as a shell or pouch into which the drainage tube may be fastened securely.

The removal of damaged bladder and cystic duct carries out the second of our cardinal principles; but when we come to the question of operation upon the passages lower down—upon the hepatic and common ducts, we find obviously that removal of damaged tissue is rarely possible though removal of gallstones is essential and inevitable.

Up to a few years ago most surgeons felt that

the operation of choledochotomy should be performed with the greatest caution and the least possible disturbance to structure. We have now learned, however, that suture of the ducts is not essential to their restoration of function. When slit up they heal as readily as does the urethra after the operation of perineal urethrotomy. It is our custom nowadays to open the ducts fearlessly when that is necessary for the removal of stones, and to drain them usually without suture when such drainage readily can be applied.

It was an appreciation of the practicability of such drainage that led to the adoption of the so-called hepatic drainage — commonly associated with the name of Kehr, though Richardson employed it so long ago as 1888; and other surgeons frequently have adopted the same measure. The object of hepatic drainage is to withdraw all the bile at once to the surface leaving dry the common duct so far as possible, and to encourage the expulsion by drainage of stones possibly lodged in the hepatic duct or its radicals.

Various incisions for hepatic drainage have been employed; but as long as the opening in the duct is large enough comfortably to admit the drainage tube the results are almost uniformly satisfactory, no matter where the duct be opened. Kehr incises the common duct and pushes his tube up two inches into the hepatic. Other surgeons slit up the cystic and common ducts and through this large orifice insert a tube which in either case should be lightly stitched in with catgut.

This drainage of the ducts serves to carry off infectious material. That is a great object. Cholangitis, in varying grades, is nearly always present, especially if there be stones in the ducts, and drainage in such cases is as essential as is drainage for pleural empyema.

From what has been said it must be apparent that the removal of all stones, when possible, is imperative. Stones in the gall bladder and cystic duct may be reached readily and always. Stones in the hepatic duct may be encouraged to escape through long continued and effective hepatic drainage. Stones in the common duct and ampulla may usually be removed at a primary operation, the patient's strength permitting. However, sometimes, owing to the patient's weakness or to extensive adhesions or to the presence of malignant disease, deep dissection of the common duct may be impossible. Efficient and permanent biliary drainage is demanded, however, even in such cases, and for this the operations of cholecystenterostomy and choledochenterostomy were devised.

Richardson, in an article already quoted, urges the propriety of removing gallstones whenever discovered in the course of abdominal operations undertaken for lesions other than those of the bile passages. I believe his argument to be cogent and final; for, as I have frequently pointed out, gallstones, even though quiescent, may, at any time, give rise to trouble; and their removal through cholecystostomy with a small stab

wound and drainage does not add materially to the risks of an abdominal section.

From the foregoing paragraphs it must be apparent that I deem drainage of the deep field an essential in all operations on the bile passages. I have shown that an infection always is present, even when symptoms are quiescent; that infection demands drainage. I do not recognize as proper the maneuver, sometimes undertaken, of removing by cholecystectomy an apparently innocuous bag of stones, discovered in the course of some other operation, *e. g.*, appendectomy, unless, at the same time, drainage be established. Such a cholecystectomy occasionally has been done, and the abdominal wound has been closed tightly without resulting damage; but we must recognize this result as a piece of undeserved good fortune to the surgeon, for every operator of experience knows that the ligature on the cystic duct does not always hold and that leakage sometimes occurs with a resulting general infection of the peritoneum. If you remove the gall bladder you must drain the stump.

I hope that enough has been said to demonstrate without cavil the soundness of the three cardinal rules with which I began this consideration of the manner of operating:

(1) Removes stones; for if left behind they are very sure to cause subsequent disturbance, and we know conversely that after the thorough removal of stones their recurrence is almost unknown.

(2) Remove so far as possible all disorganized, degenerated and permanently crippled tissue; for we have seen how such tissue, when left behind, may become the nidus for subsequent inflammation, stone formation and a return to the invalid condition.

(3) Drain, for without drainage we have no certainty of the removal of infectious material.

PTOSIS OF THE ABDOMINAL ORGANS WITH SPECIAL REFERENCE TO THE KIDNEY.*

IMPORTANCE OF CONSIDERING PTOSIS OF OTHER ORGANS IN THE TREATMENT OF THE KIDNEY.

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SPLANCHNOPTOSIS is a condition with which all present are familiar. Some of the suggested causes are anatomical peculiarities, constipation, rapid loss of flesh, frequent pregnancies and errors in dress. Of these the first, second and fifth were present in a considerable percentage of my cases, the fourth in a few, loss of weight (rarely rapid) in a large percentage. In my experience the first three may be considered results of the real cause of ptosis, and each of the five a contributing cause or coincidence. Often we find marked ptosis of kidneys and viscera in young women who have never been pregnant, never lost flesh excessively or rapidly and never worn corsets. They quite uniformly con-

* The following papers were read at a meeting of the Boston Medical Library in conjunction with the Suffolk District Branch of The Massachusetts Medical Society, Surgical Section, Nov. 30, 1904.