

SURGERY OF THE GALL-BLADDER *

WITH ESPECIAL REFERENCE TO CHANGES IN TECHNIC

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NUMEROUS incisions have been devised through which to reach the gall-bladder. The incisions most frequently used in this country are Mayo-Robson's and Bevan's.¹ The longitudinal part of Bevan's incision is in the linea semilunaris. This is objectionable because the intercostal nerves to the rectus muscle cross the linea semilunaris and are likely to be cut, and also because at the linea semilunaris there is aponeurosis only and no muscle, and the strongest closures are made where there is both aponeurosis and muscle.

In the Mayo-Robson incision the rectus muscle is split longitudinally, which injures it and interferes with the nerve supply to the inner portion.

A few years ago one of us (Collins²) devised a diagonal incision for reaching the gall-bladder, which had three advantages. First, it was a non-continuous incision in that it did not give a direct opening through all the layers of the abdominal wall into the abdomen, which permitted, in closing, the strong features of a gridiron incision. Second, it did not injure the nerve and blood supply of the rectus muscle. Third, it was placed over a portion of the abdominal wall that contained both aponeurosis and muscle.

It had one disadvantage in common with Bevan's incision. It could not be extended upward or downward. If the gall-bladder was found lying above or below its usual location, or, if it was found desirable to remove the appendix, this was, at times, a disadvantage. The recent tendency in surgery has been toward general exploration of the abdomen while the incision is open, which demands larger incisions capable of extension, if necessary.

In order to remove this disadvantage, and at the same time retain the advantages, the diagonal part of the incision is now made longitudinally. This makes a non-continuous longitudinal incision, or what might also be called a "tongue-and-groove" incision. The skin, fat,

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and anterior wall of the sheath are incised longitudinally about an equal distance from the edges of the rectus muscle (Fig. 1). The inner half of the muscle is separated from its sheath, which is easily done by blunt dissection except at the lineæ transversæ, where knife or scissors will be required. The uninjured muscle is retracted to the outer side and a longitudinal incision made through the posterior wall of the sheath of the rectus and peritoneum (Fig. 2). The muscle is preserved intact with its nerve and blood supply undisturbed. This incision may be placed over any portion of either rectus muscle and may be extended in either direction if the need should arise. While this incision has been the result of a gradual development with us and has proven very useful in our work, we wish to state, in order to forestall controversy, that in looking up the literature we have found it described before.

A short muscle- and fascia-splitting incision may be made over the gall-bladder for a cholecystostomy, by making the incision diagonally from above downward and outward through the skin, fat, and anterior wall of the sheath. The rectus may be split longitudinally with forceps, or retracted outward, and the posterior wall of the sheath and peritoneum may be perforated with forceps and split (Fig. 3). The fibres of the posterior wall split easily in a diagonal direction. This has all the advantages of a strong closure in the upper abdomen that the McBurney incision has in the lower abdomen. The drainage tube may be brought through the incision or through a separate stab wound. We prefer the latter method. This incision is applicable only in patients where an incision has been made at some other location through the abdominal wall and the size, position, and condition of the gall-bladder are known. It is not large enough to permit a cholecystectomy with the latest technic. If an inflamed gall-bladder, containing stones, is found incidentally during a pelvic or other abdominal operation, the condition of the patient at the end of the operation may prohibit anything but a cholecystostomy at that time. If the gall-bladder is large enough to permit the fundus to be brought close to the abdominal wall, this short muscle- and fascia-splitting incision may be used. It will thus be seen that its use is extremely limited. This incision was described by Collins² in 1909 and re-described by McArthur³ in 1915. McArthur advises incising the posterior wall of the sheath of the rectus, but this is not necessary, as its fibres are easily split.

Without entering into a discussion of the relative merits of and indications for a cholecystostomy and cholecystectomy, it may be definitely stated that at the present time cholecystectomy is the operation of choice. It is manifestly impossible to cure a chronic inflammation

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in an almost closed sac by a few days' drainage through its top, and this has led to a change in the technic of a cholecystostomy.

In the early history of cholecystostomy one of the results the surgeon dreaded was a permanent fistula. This was caused, sometimes, by the practice at that time of suturing the edges of the gall-bladder to the aponeurosis which frequently permitted the fistulous tract to become lined with mucous membrane, but it was more frequently caused by an overlooked stone in the cystic duct. These errors in technic having been remedied, we no longer fear a permanent fistula. This fear of a fistula caused the surgeon at that time to desire a prompt closure of the drainage tract and led to the practice of tucking in the edges of the opening in the fundus of the gall-bladder, so that peritoneal surfaces would come in apposition when the drainage tube was removed and result in a prompt closure of the drainage tract.

We now know that whenever drainage of the gall-bladder is desirable it should be prolonged to get the best results. Therefore, the practice of tucking in the edges of the gall-bladder opening should be abandoned, as advised by Mayo.⁴

In cases where it is necessary to open the gall-bladder and drainage is not necessary, an "ideal cholecystostomy" may be done. We have had three patients in whom a single stone was found, during a pelvic operation, in a gall-bladder which had caused no symptoms, and was without evidence of chronic inflammation. In these patients the gall-bladder was opened through the short split-muscle incision, the stone removed, and the gall-bladder closed. Reports from these patients after a long period of time said they had had no trouble referable to the gall-bladder.

It is better, when possible, as has been pointed out by Judd⁵ and others, to remove the gall-bladder from below upwards. In this way the cystic artery can be clamped near its origin and the hemorrhage controlled at the beginning of the removal.

One of the serious dangers of a cholecystectomy is permanent occlusion of the hepatic or common ducts by including them in a ligature or clamp and cutting off a portion of them. Kehr⁶ has described various abnormalities in the location of the hepatic duct in its relation to the cystic duct, and shows that the hepatic duct is occasionally very close to the cystic duct and even at times lying below it, which demonstrates how easily this accident can happen in some cases. The only safe way to avoid this accident is to thoroughly expose the cystic duct, which will also expose the cystic artery, and do the ligation under the guidance of the eye.

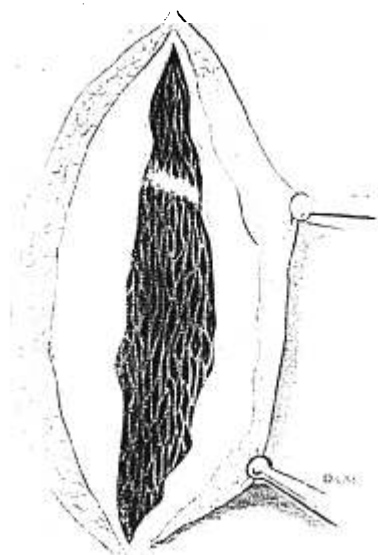


FIG. 1.—Longitudinal incision through skin, fat, and anterior wall of sheath of rectus muscle.

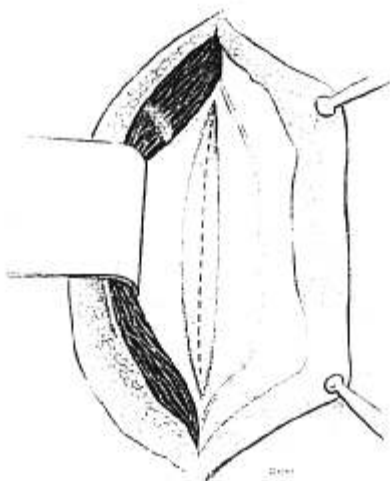


FIG. 2.—The rectus muscle is retracted outward and a longitudinal incision is made through the posterior wall of the sheath and the peritoneum.

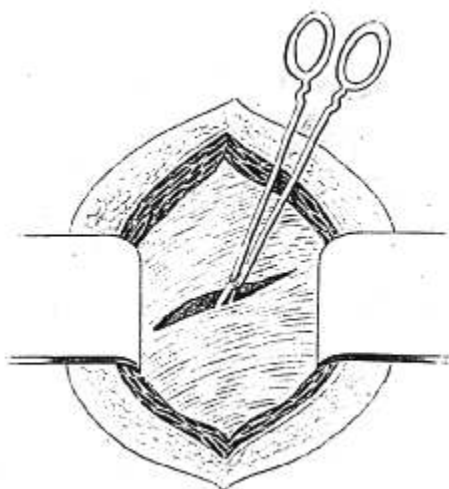


FIG. 3.—Short split muscle incision. The fibres of the posterior wall of the sheath are split by passing a forceps through them.

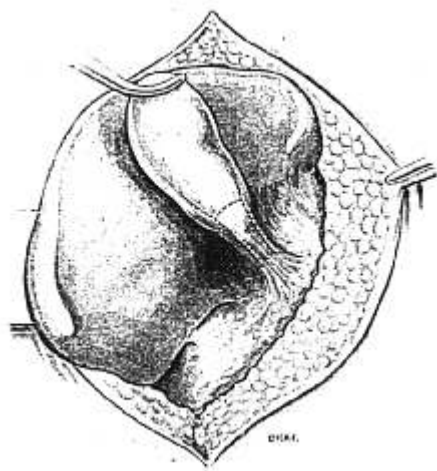


FIG. 4.—A flap of peritoneum is outlined over the lower portion of the gall-bladder and cystic duct by cutting along the direction of the dotted lines.

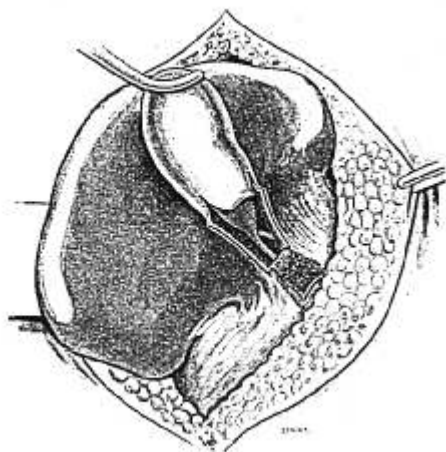


FIG. 5.—The flap of peritoneum is dissected free and turned back, exposing the cystic duct and artery.

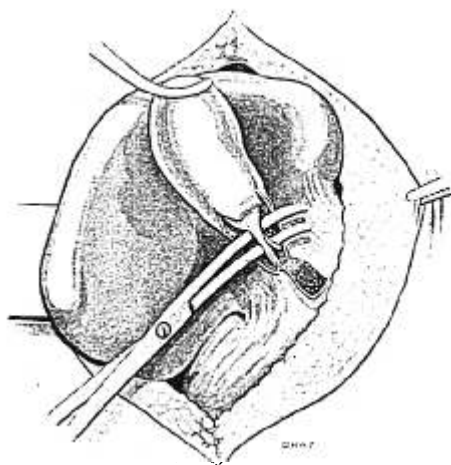


FIG. 6.—A forceps is passed beneath the exposed cystic duct and artery.

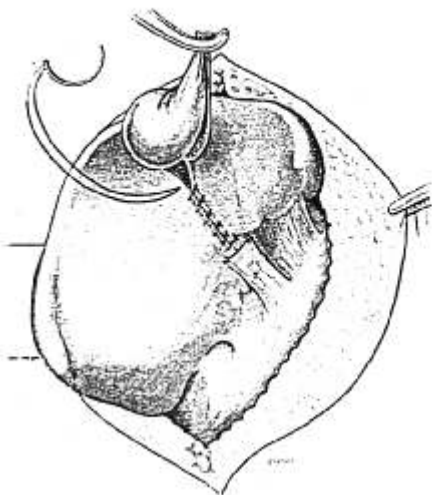


FIG. 7.—After the cystic duct and artery are clamped, cut and ligated, the flap of peritoneum is replaced over the raw surfaces and held in place by sutures.

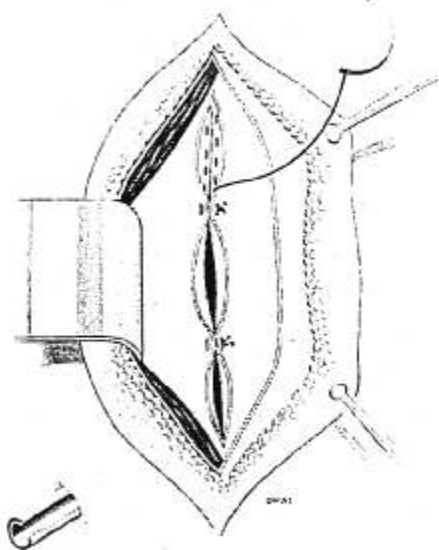


FIG. 8.—The incision in peritoneum and posterior wall of sheath is divided into three or more sections by mattress sutures, which evert the edges of the peritoneum and permit the easy closing of the peritoneal incision by a right-angled continuous suture, which leaves no raw surfaces on the under surface.

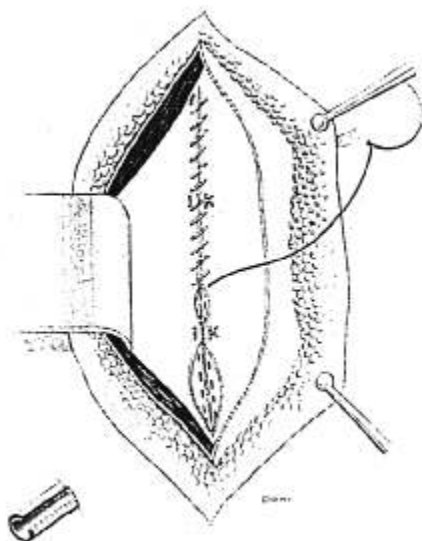


FIG. 9.—The edges of the incision in the posterior wall of the sheath are carefully approximated by a continuous suture.

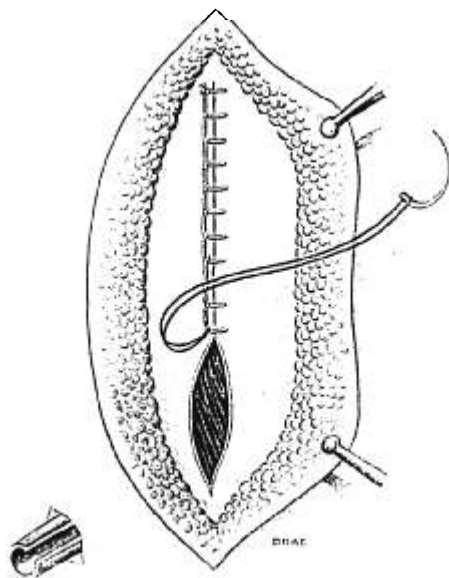


FIG. 10.—The uninjured rectus muscle which has been retracted is allowed to slip into its place and the incision in the anterior wall of its sheath is united by a continuous interlocking suture.

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A large stone lodged in the lower end of the cystic duct, or partially in the cystic and common ducts, is frequently the cause of occlusion of the hepatic or common ducts during a cholecystectomy. The operator thinks the stone is lodged in the upper end of the cystic duct because the duct is large and dilated behind the stone, and places his clamp and ligature below the stone with assurance. A gradually increasing jaundice after the operation brings the horrifying evidence that the hepatic or common duct has been occluded. If the stone cannot be dislodged and pushed back into the gall-bladder, the duct had better be incised and the stone removed. Then the duct can be exposed and its relation to the surrounding tissues determined. The forceps devised by Colins² for removing stones from the common duct is a useful instrument for bringing an incarcerated cystic duct stone up into the incision, where it can be easily removed.

The necessity of exposing the cystic duct and artery to view before ligation and the desirability of covering the stumps with peritoneum caused one of us (Weber) to devise the following technic for doing a cholecystectomy: A rectangular flap of peritoneum is outlined and dissected off from the lower end of the gall-bladder and the cystic duct (Fig. 4). The lower end of the flap is left attached. This thoroughly exposes the cystic duct and artery and permits of their easy isolation from the surrounding tissues (Fig. 5). They can be ligated separately without danger of including the hepatic or common duct in the ligature (Fig. 6). After they are ligated and cut, the flap of peritoneum may be laid back over the stumps and sutured in place, thus leaving no raw surfaces (Fig. 7). The gall-bladder may then be removed and the fissure closed in the usual manner. The flap of peritoneum can be cut large enough to provide for any contraction. If the peritoneum is cut longitudinally over the cystic duct, the peritoneum dissected up on each side contracts so that it is frequently impossible to draw the two edges of peritoneum over the stump of the cystic duct. Frequently the peritoneum only goes one-half or two-thirds the way around the cystic duct, and this makes it difficult to dissect back a cuff sufficiently long to cover the stump of the cystic duct, as recommended by Moynihan. No such difficulties are encountered in making and replacing the peritoneal flap.

Since reading Ruth's⁷ article advocating drainage in gall-bladder work through a separate small incision or stab-wound, we have followed that plan. This permits of complete closure of the large primary incision, which must have a tendency to prevent a post-operative hernia.

Probably every surgeon has had difficulty at times in closing the

peritoneum and posterior wall of the rectus sheath in a gall-bladder incision, because of retraction of the edges caused by the side pull of the external and internal oblique and transversalis muscles. It is not best to catch the edges of the peritoneum with two rows of forceps, as has been advocated by Robins,⁸ because of the post-operative soreness caused by the crushing action of the forceps on the tender sensitive peritoneum. The edges may be united at two or more places with mattress sutures, which will divide the incision into three or more sections. The edges of these short sections can then be easily united with continuous sutures (Fig. 8). If forceps must be used to facilitate the placing of these mattress sutures, they should grasp the edges of the posterior wall of the sheath only, as this structure is not so sensitive as the peritoneum, which can be closed by a right-angled continuous suture, thus leaving no raw surface on the under side (Fig. 8).

The edges of the posterior wall are closed by a continuous suture, and considerable care is used in closing the edges of this layer, as we believe, with Bartlett,⁹ that it is necessary in order to avoid a post-operative hernia (Fig. 9). The rectus muscle is then allowed to slide over into its place and the anterior wall of the sheath is closed with an interlocking suture (Fig. 10). It is not necessary to suture the muscle in any way. In this way the intact uninjured rectus muscle lies between the closed incisions of the anterior and posterior walls of the sheath and there is no continuous incision down through the various layers of the abdominal wall.

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