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A New Incision for the Surgery of the Bile Tracts.

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CHICAGO.

REPRINTED FROM THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. JUNE 26, 1897.

presented by the author

CHICAGO:
AMERICAN MEDICAL ASSOCIATION PRESS.
1897.

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The subject of the surgery of bile tracts is of recent development. In 1867 Bobbs of Indiana performed cholecystotomy. In 1882 Langenbuch removed the gall bladder, cholecystectomy. In the same year Gaston suggested cholecystenterostomy, which was later perfected by the introduction of the anastomosis button by Murphy. In 1890 Courvoisier performed and advocated choledochotomy, and later the removal of stones from the cystic duct and hepatic duct were reported.

In the last five years the value and possibilities of the surgery of the bile tracts has been so thoroughly demonstrated, that it is today a recognized field to all men doing abdominal work.

A few years ago, when I began to do surgical work on the bile tracts, I carefully reviewed the topographic anatomy of this region. I was surprised to find how completely the subject had been neglected by both anatomists and surgeons. And here let me say a word in behalf of surgical anatomy. It is the boast of some surgeons of the present brilliant aseptic period that they ignore anatomic boundaries and anatomic reasoning in their operative work. It is so easy to cut and ligate and suture deep and superficial structures and obtain primary union, that a careful study of operative procedures is regarded often as unnecessary, and is as a rule neglected.

In surgical training, for the time being, anatomy is overshadowed by pathology, and as a result, the surgeons of today are better pathologists to be sure, but much poorer anatomists than the surgeons of the past generation. This is a fault which is often evident

even in the work of eminent surgeons, and which must be corrected. A perfect mastery of the surgical anatomy is absolutely necessary for the performance of the best operative surgery in any field of surgical labor. This applies with special force to the surgery of the bile tracts, and yet many operations on this region are performed by men who have no clear idea of the anatomic relations of the parts or of the possible dangers, and who do not see the necessity of preparing themselves by cadaver study before undertaking such work. Such brilliant work as Kocher's teachings of making incisions in the lines of normal cleavage, as Bassini's hernia operation, as McBurney's and McArthur's splitting operation for appendicitis, as Hartley's removal of the Gasserian ganglion, as McEwan's studies of mastoid disease and brain abscess, as Kraske's incision for removal of the rectum, are all results of anatomic studies applied to surgery; they are what might be called anatomic surgery and they demonstrate its value.

With the objects of determining the best method of exposing the bile tracts for exploration and operative procedures, and for determining the position and relation of the bile tracts to other structures so that operations could be conducted with a minimum of danger to important structures, I undertook a series of twenty dissections. In this brief report I desire to present not the entire results, but one of the results of my investigations, namely, the abdominal incision which is best adapted for bile tract surgery.

In my early clinical work I made use of the incisions which have heretofore been generally employed. First, the vertical incision along the outer border or through the substance of the rectus; second, the transverse or liver border incision of the Germans; third, the ⊣ shaped incision made up of an incision along the outer border of the rectus and one joining it at right angles; and fourth, the incision in the upper half of the linea alba for common duct work.

The objections to these incisions are many. They could be summed up in a few words. These incisions

do not give room for extensive work unless they are made very long. When they are made very long, they carry with them the danger of hernia. Every one who has done much common duct work must realize the difficulty of obtaining free access to the operative field through the incisions usually employed, and in

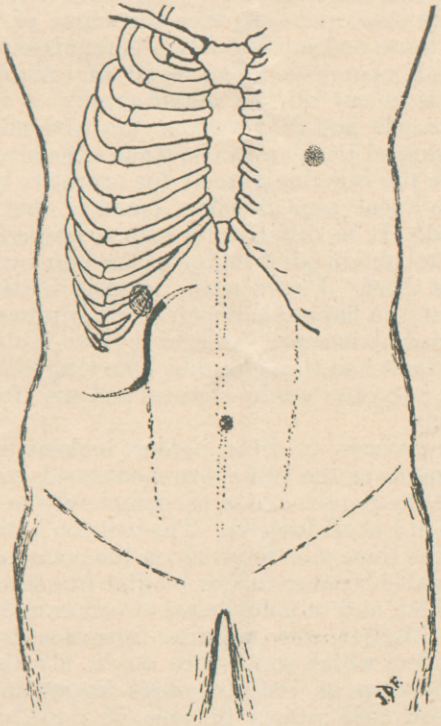

FIG. 1.—Heavy line the primary and light lines the extended portions of incision.

spite of statements to the contrary, hernias after extensive incisions for bile tract procedures are not uncommon. No surgeon can tell before opening an abdomen for an operation on the bile tracts how extensive an operation may be required, and it is therefore

desirable to adopt an incision which will be suitable for exploration and simple procedures and which, at the same time, can be readily extended to meet the demands of the most extensive operation.

The vertical incision along the outer border of the rectus answers very well for cholecystotomy, but does not give sufficient room for bile duct work unless made very long, and even then the edges of the incision are tense and much traction is required to expose the field of operation. The result of such extensive incision is to cut off the nerve supply of the right rectus muscle and thus weaken the abdominal wall. The ⊣ shaped incision can be made extensive enough to expose the bile ducts freely for operative work, but it is the most objectionable incision that can be employed. It is difficult to suture properly. It is difficult to obtain good union at the point where the incisions meet. I have seen necrosis of the sharp corners of the flaps at this point. It is prone to leave a weakened abdominal wall. In my own limited experience I have had three hernias following this form of incision; two after nephrectomies and one after choledochotomy.

The transverse or liver border incision is not as objectionable as the two above mentioned, but it does not meet the requirements as completely as the incision which I shall describe. The incision in the upper part of the linea alba for work on the common duct is objectionable because it does not give free access to the gall bladder, and in many cases of common duct work the gall bladder also requires operative treatment. The problem which was before me in my dissections was to develop an incision which would answer for exploration and which, in case of need, could be extended sufficiently to obtain free and easy access for the performance of any operation required, and at the same time this incision must impair the integrity of the abdominal wall as little as possible and carry with it a minimum of danger of subsequent hernia.

The incision which I have developed, I believe, meets these requirements, and as it can now be urged

both from anatomic grounds and clinical results, I feel warranted in presenting it to the profession as a small but not unimportant contribution to the surgery of the bile tracts.

My incision should be divided into a primary portion and the extended parts of the incision. The pri-

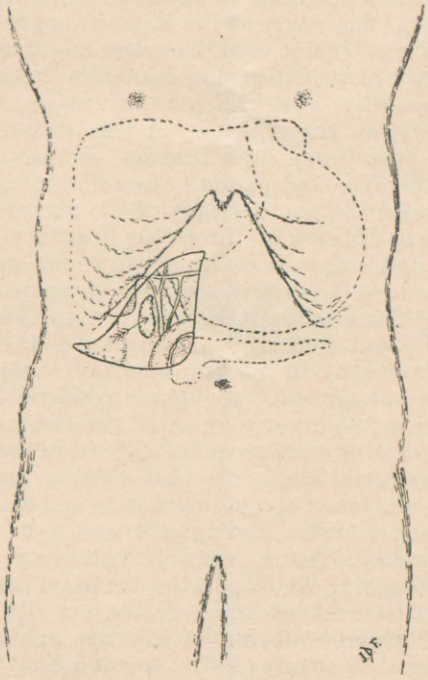

FIG. 2.—Abdomen opened and anterior layer of lesser omentum removed. Gall bladder, cystic, hepatic and common duct, portal vein, hepatic artery and branches in view. Arrow in foramen of Winslow.

mary part, which can be employed for exploration or simple cholecystotomy, is an italic letter *f*-shaped incision along or through the outer border of the rectus muscle, as shown by the heavy line in Fig. 1. This may be made from three to four inches in length. The extended parts of the incision are added to this

when required. These extended portions are seen as the faint lines in Fig. 1. These extended portions can be made from an inch to three inches in length as the thickness of the abdominal wall and the character of the operation demand. When complete, the incision furnishes much freer access to the gall bladder and bile ducts than can be obtained by any other form of incision. The edges of the incision are readily held apart without tension, and the entire bile tract is freely exposed for examination and operative procedures.

Anatomically the incision injures a minimum amount of the nerve supply of the abdominal wall, because, even though the incision is made of great length, the extended parts of the incision run almost parallel with the nerve supply of the abdominal muscles. By a division of the rectus in part and of the internal and external oblique and transversalis muscles, the incision can be widely separated without tension. The fact that the incision is in close contact with the costal arch makes resulting hernia improbable, as a cicatrix in the upper part of the abdominal wall does not as readily yield and produce hernia as a cicatrix in the lower portion of the abdominal wall.

The following structures are divided in the incision: Skin, superficial fascia, external oblique muscle and aponeurosis, internal oblique muscle and aponeurosis, transversalis muscle and aponeurosis, rectus muscle, the transveralis fascia, which is here very thin, and the peritoneum. A few of the terminal branches of the intercostal nerves to the rectus are divided, and the anastomosis between the internal mammary and deep epigastric arteries in the substance of the rectus is divided and usually needs ligating. The incision should not be nearer than three-quarters of an inch to the costal arch.

When the complete incision is made the following structures can be seen as represented in Fig. 2: the liver and gall bladder above, the round ligament of the liver and the stomach to the left. The duodenum, the transverse colon and great omentum below. The transverse colon and omentum should be pushed

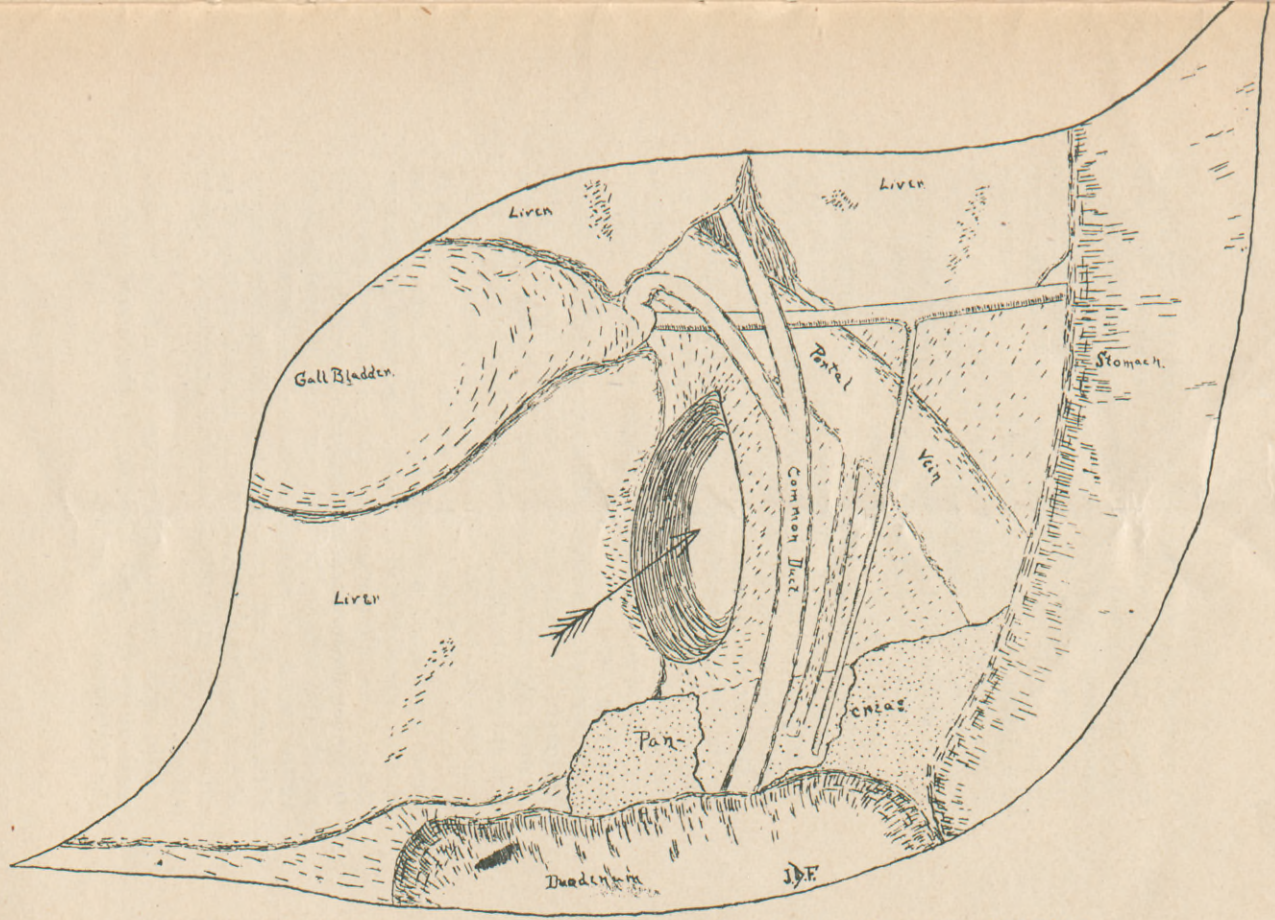

FIG. 3.—View of structures seen in incision after removal of anterior layer of omentum. Natural size.

downward, the stomach to the left, and the liver should be held up by the fingers of an assistant. We will then have exposed to full view the gastro-hepatic or lesser omentum, which contains the following structures between its two layers: the portal vein, the hepatic artery, the common, cystic and hepatic ducts, the gastro-duodenalis artery and sometimes vein, the nerve supply of the liver and the lymphatic vessels and several lymphatic glands. The foramen of Winslow is at the right free edge of the lesser omentum. These structures and their relations are well seen after the anterior layer of the lesser omentum has been removed, in Fig. 3. The left index finger can be passed into the foramen of Winslow and the extra-hepatic ducts palpated throughout their extent except the portion of the common duct covered by the pancreas.

It must be understood that as a rule in operations on the living subject that the normal conditions are altered by adhesions and changes in shape and size of the gall bladder and bile ducts, but after the separation of the adhesions the relations will be found practically as here represented.

In closing the incision, silkworm gut sutures should be passed through the entire wall, the margins of the wound approximated, and then before the silkworm gut sutures are tied, the abdominal muscles and aponeuroses are sutured accurately with buried catgut.

I believe that the incision which I here present is based upon good anatomic and surgical grounds and that its adoption will be a step in advance in the surgery of the bile tracts. It makes better work possible by giving freer access to the field of operation; it will enable the surgeon to work more rapidly and in some of the prolonged operations on the bile ducts this is a vital point. It will reduce to a minimum the dangers of hernia after these operations. It can be employed in all cases, in exploration, limited or extensive operations.

The accompanying plates were drawn from my dissections by Dr. J. D. Freeman of the house staff of the Presbyterian Hospital.