ELECTROSURGICAL OBLITERATION OF THE GALL-BLADDER WITHOUT DRAINAGE

(THOREK'S OPERATION)

BY

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(WITH SPECIAL PLATE)

When an operation has given, and is giving, satisfactory results in the hands of a generation of surgeons it is difficult to bring convincing evidence that any change in the accepted practice is warranted. Extirpation of the gall-bladder by Thorek's method is a case in point. Our experience of 129 consecutive cases of this method compels us to admit that in changing our technique we have made a change for the better.

Principles of the Operation

Standard cholecystectomy and cholecystectomy by Thorek's method differ only in one essential particular. In standard cholecystectomy the gall-bladder is removed *in toto*; in Thorek's cholecystectomy the portion of the gall-bladder attached to the liver, and that portion only, is left attached and its mucosa destroyed by electrocoagulation. By allowing this strip of the gall-bladder to remain the integrity of the liver as an encapsulated organ is preserved. When in standard cholecystectomy the gall-bladder is dissected from the liver, of necessity there is a bare area—an area bared of capsule—from which seepage of bile and venous oozing are bound to occur, and drainage of the peritoneal cavity becomes a necessity. In Thorek's operation bile canaliculae or venules are not opened, and therefore drainage is unnecessary. *Prima facie* examination of this statement might lead to an assumption that the absence of a drain is basically unimportant. On the contrary, practical experience has convinced us that, by obviating the necessity for drainage, extirpation of the gall-bladder becomes an operation carrying a smaller risk, much less post-operative pain, and a shortened convalescence.

Disadvantages associated with Drainage after Cholecystectomy

Pulmonary complications are encouraged because of the patient's unwillingness to expectorate and to aerate his lungs fully. Restricted respiratory excursions are due (a) to the presence of the tube itself; (b) to the local peritonitis caused by free bile. It will be realized that drainage in this instance is the reverse of being dependent. A puddle of bile and blood collects in Rutherford Morison's pouch or even extends beyond it. This sub-phrenic irritation must cause reflex as well as voluntary restriction of diaphragmatic movement. Approximately half the deaths after standard cholecystectomy are due to pulmonary complications.

Pain.—A medical man operated upon by us before we were familiar with Thorek's technique stated that every time he took more than a shallow breath it seemed as though a knife was sticking into his liver. He was afraid to cough, for even if he supported his abdomen with his hands the pain associated with coughing was intense.

These symptoms disappeared when the drainage tube was removed.

Frequent dressings are required in standard cholecystectomy. With Thorek's operation the wound need not be disturbed until the stitches are due to be removed.

Infection of the wound in the immediate neighbourhood of a cholecystectomy drainage tube is inevitable. True, this infection is usually so limited as to be unimportant, but it may add days or even weeks to the period of invalidism.

An incisional hernia is always more liable to occur when the peritoneal and muscular suture line is interrupted by the passage of a tube.

Technique

Thorek's operation is based upon the fact that the gall-bladder bed can be rendered dry by electrocoagulation. Thorek emphasized the distinction between monopolar sparking, or fulguration, in which charred tissue prevents penetration and consequent sterilization, and bipolar electrocoagulation, during the application of which the tissues turn white and are coagulated. The steps of Thorek's operation are as follows:

1. The operative field is exposed in the manner favoured by the individual surgeon, and the necessity for cholecystectomy is established.
2. The gall-bladder is emptied by aspiration, or, if necessary, stones are expressed through an incision in the fundus. Thorek has devised an aspirator and bile receptacle for this purpose, but suitable arrangements can be improvised.
3. The cystic duct and cystic artery are exposed by dissection, and divided between ligatures, as in the standard operation.
4. The gall-bladder is split (Plate, Fig. 1) and the redundant portion excised with scissors or by electrocoagulation. The posterior wall of the gall-bladder, which remains attached to the liver, is then treated by electrocoagulation (Fig. 2). A current of low voltage and high amperage causes rapid dehydration and yields the best results. The current should be turned on when the electrode is firmly in contact with the tissues, so as to avoid fulguration.
5. When the posterior wall of the gall-bladder has been electrocoagulated the edges are approximated with catgut sutures, either interrupted or continuous. The needle should not penetrate the liver substance.
6. A detached portion of the falciform ligament or a free omental graft is stitched over the sutured remnant of gall-bladder (Fig. 3). Surgical toilet receives attention, and the abdomen is closed without drainage.

The following are the results obtained in our series of cases by the employment of Thorek's method:

Results

No. of Cases	Uneventful Recovery, and Healed by First Intention	No. of Cases with Complications	Average Stay in Hospital	Mortality
129	122	7	20 days	Nil

The *complications* include four patients who developed infection of the abdominal wall, probably due to accidental soiling by infected bile. One of these, whose condition on the table necessitated rapid closure, developed partial disruption of the wound, and a biliary fistula, but eventually made a good recovery. Another patient, a medical man who had had considerable post-anaesthetic cough and vomiting, burst his wound on the fourth day. The wound was resutured, and he then made an uninterrupted recovery. During resuture the operation field was inspected and found to be perfectly dry, and the flap

of falciform ligament was firmly adherent to the gall-bladder bed. Two cases, in which drainage of the common bile duct with a T-shaped tube was necessary, developed a biliary fistula, which subsequently closed spontaneously.

In a few cases where the gall-bladder possessed a more or less complete mesentery we have removed the entire gall-bladder without damage to the liver capsule, and coagulated the narrow strip of cellular tissue which represented the gall-bladder bed, covering the area with a flap of falciform ligament or omental graft, as described above.

The above series of cases is entirely unselected. Furthermore, we have performed Thorek's cholecystectomy in several instances where previously, owing to the enfeebled state of the patient, we would have substituted cholecystostomy for the standard cholecystectomy. This series includes a child of 8, one patient of 85, another of 81, and three over 70 years of age. There were also seven patients with an empyema of the gall-bladder, all of whom made an uneventful convalescence after the wound had been closed completely. In four cases, omitted from the above table, Thorek's operation was considered inadvisable, and a standard cholecystectomy was performed. In two cases this was due to difficulty of access owing to fibroses and contraction of the gall-bladder in obese patients, and in another recent inflammation had rendered the gall-bladder friable and local peritonitis was present. With regard to the fourth patient, four previous operations rendered accurate dissection impossible, so a cholecystostomy, followed later by cholecystgastrostomy, was performed.

Summary

Experience confirms our opinion that electrosurgical obliteration of the gall-bladder is a distinct advance on the standard operation of cholecystectomy. A summary of the more important advantages is as follows:

Diminished Mortality.—Thorek found his mortality in 376 unselected cases to be 0.5 per cent. The average mortality of the standard operation in skilled hands is 2 per cent.

Post-operative discomfort is reduced to a minimum. We have been deeply impressed by the smoothness of the convalescence and absence of worrying symptoms as compared with those which commonly occur during the first few days after the standard operation. Many patients have no more discomfort than if they had undergone a simple appendicectomy.

Rapid Convalescence.—It is exceptional for the wound to heal other than by first intention.

BIBLIOGRAPHY

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Electro-encephalograms of Psychotics.—Electro-encephalograms of 180 unselected cases and fifty-two chronic schizophrenics have been studied. The fundamental patterns in these cases cannot be distinguished from those of a control series of 500 "normals." There was, however, a larger proportion of patients whose records showed variations outside the normal range. All the patients clinically diagnosed as having epilepsy or "psychosis with associated cerebral arteriosclerosis" showed abnormal variations, though equally abnormal variations were distributed throughout all the other diagnostic groups.—Electro-encephalograms of Psychotic Patients. P. A. Davis and H. Davis.—*Amer. J. Psychiat.*, March, 1939, 95, 1007.

URETHROGRAPHY

TECHNIQUE, INTERPRETATION, AND UTILITY

BY

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(WITH SPECIAL PLATE)

While the use of pyelography and cystography has helped to revolutionize diagnostic precision in genito-urinary surgery, the recognition of the utility of urethrography has lagged behind in the advance. Urethroscopy, like cystoscopy, affords a great deal of essential information in the investigation of local disease. But there are several pathological conditions in which additional data, and in some cases the only exact data, can be obtained by the x-ray examination of the urethra after the injection of a radio-opaque fluid, which outlines the canal and any irregularities in its walls.

Technique

THE FLUID

The essentials of a fluid for use in urethrography are: (1) That it should be innocuous. (2) That it should cause no pain and no spasm during injection into the urethra. (3) That it should be sufficiently opaque to x rays to give a shadow of good definition in contrast with bone and with the great thickness of soft tissues which must be penetrated in taking these pictures. It must also be of sufficient opacity for clear outlines to be cast in the radiograph by even small amounts of the fluid in tiny recesses of the urethra. (4) It should not be so thick in consistency as to fail to enter the smallest sacculi of the urethral canal, or so thin as to flow too readily out of recesses into which it has been injected.

Trials have been made with several fluids. Sodium bromide or sodium iodide in watery solution is thin and is miscible with urine, but it is not so radio-opaque as other fluids available for urethrography, although it is efficient for cystography where a large bulk of fluid is photographed and for pyelography where less depth of soft tissue has to be penetrated or where the injection of a thick fluid might be attended with danger. The same considerations apply to uroselectan. The ordinary lipiodol (Lafay) or neo-hydriol viscous (May and Baker) is 40 per cent. iodine in poppy-seed oil. This has all the properties desirable for urethrography except that it is too thick in consistency to penetrate freely into very small recesses which may be present in the urethra. This thick fluid also requires to be injected under a greater degree of pressure, a condition which tends to add dangers to the procedure.

The preparation that has proved most satisfactory in obtaining urethrograms with complete filling and precise outline, without difficulty and without danger, has been lipiodol fluid (Lafay) or neo-hydriol fluid (May and Baker). This has the same iodine content—namely, 40 per cent.—as the ordinary lipiodol, but the medium is the ethylic esters of the fatty acids of poppy-seed oil, which is a much thinner fluid, of lower viscosity, and it runs much more freely in the urethra. This fulfils all the requirements of urethrography, and I now use this fluid for all urethrograms.

METHOD OF INJECTION AND RADIOGRAPHY

The instrument I would recommend for making the injection is a simple all-glass urethral syringe of 20 c.cm.

A. C. LENDRUM AND W. A. MACKEY: PAINFUL SUBCUTANEOUS TUBERCLES—THE GLOMANGIOMA

FIG. 1.— $\times 8$. H. and E. Illustrating topography of tumour from Case VI, the lesion situated principally in the dermis, but extending as a lobulated nodule into underlying fat.

FIG. 2.— $\times 250$. H. and E. Silver impregnation of reticulum (Case IV). Showing abundance of reticulum and its intimate relation to glomus cells.

FIG. 3.— $\times 500$. Masson's trichrome stain (Case VII). Illustrating the typical relation of glomus cells to blood spaces in paucivascular form of glomangioma.

FIG. 4.— $\times 100$. H. and E. Showing typical arrangement of layered glomus cells in wall of cavernous space (Case VIII).

HAMILTON BAILEY AND R. J. McNEILL LOVE: ELECTROSURGICAL OBLITERATION OF THE GALL-BLADDER WITHOUT DRAINAGE (THOREK'S OPERATION)

FIG. 1.—The cystic duct and artery have been divided. The gall-bladder is being split open, and the contents evacuated into Thorek's receptacle. Packs omitted for the sake of clearness.

FIG. 2.—The portion of the gall-bladder which remains attached to the liver is electrocoagulated.

FIG. 3.—The detached round ligament of the liver, or a piece of omentum, is sutured over the gall-bladder bed.