suture but will in course of time cause movement in the stomach wall or set up vomiting, thus interfering with that complete rest so necessary for repair.

Various suggestions have been made as to the best way to treat the perforation, and while it may not be possible to follow out one plan in all cases we must favour that method which, while it is efficient, will make the least demand upon the patient's power of endurance. The most radical method is to excise the ulcer with its indurated base and then suture up the rent. This plan, however, does not commend itself favourably to me for various reasons:

1. It necessitates the removal of a considerable portion of the stomach wall, consequently the difficulty of efficiently closing this will be great.

2. It must cause free hæmorrhage, and the patient is not in a condition to stand any loss of blood.

3. This hæmorrhage will cause a waste of valuable time.

Closure of the Perforation without its Removal.—This seems to offer in many cases the most satisfactory plan of treatment. To carry this out, the stomach must be drawn up as near the surface of the body as possible, to facilitate which it may be necessary to enlarge the abdominal incision. In applying sutures, which should be of the Lembert type, we must remember that for a considerable distance around the actual perforation the stomach wall is so indurated that it is impossible to cause sufficient inversion of this part so as to get the peritoneal surfaces in opposition, nor, indeed, will the tissues bear the strain put upon them by the sutures. It is therefore necessary to go outside this area of induration, so as to get a good hold of the stomach wall at a point where it can be drawn over the orifice so as to meet the peritoneum from the opposite side. Three Lembert sutures of stout silk passed in this way in the case I have recorded buried the perforation together with its surrounding induration, and completely shut off the cavity of the stomach from that of the peritoneum. I would suggest, however, that in addition to these deep sutures, some small superficial ones should be inserted in the intervals between them, and that a similar precaution should be taken at each end of the resulting puckering.

Suturing having been effected, our attention must be turned to cleansing the peritoneum, and here the question will arise as to whether it will be necessary to drain the pelvis. Bearing in mind that fluids tend to gravitate into that cavity, and the extreme difficulty there is in being sure that every particle of foreign matter has been removed, it seems probable that, at any rate in most cases, pelvic drainage is desirable. If the operator, therefore, intends to use the drainage tube here, he had better at this stage of the operation make the necessary incision for it. This will also facilitate the thorough flushing of the peritoneum, which should be carried out in the most liberal way and with volumes of hot water, the intestines being moved about and the current directed in such a manner as to remove, if possible, every particle of the extravasation. There is no doubt that this is a most important step in the operation, and one that must be persevered in as long as the anaesthetist considers the patient can stand it, unless the operator is satisfied before any such prohibition is necessary that sufficient has been done. All excess of fluid should then be removed, the drainage tubes inserted, and the wounds sutured in the usual way. I feel that it is necessary to emphasise the importance of this thorough flushing of the peritoneum, not only from the fact that the chief cause of failure after operation has been suppurative peritonitis, but on account of a somewhat natural feeling on the part of the surgeon that, after the time already spent in finding and suturing the ulcer, the patient's condition will not permit more than a limited amount of flushing, which, while it satisfies the surgeon's conscience, is of no real value.

It is on every ground undesirable to have a patient die either during an operation or very soon after as an immediate result of it. But it must be understood that a clean peritoneum is the patient's only chance, and therefore the anaesthetist must most carefully watch the general condition of the patient, and only stop the surgeon if he considers that further time spent on the operation will prove fatal.

Two other methods of treatment have been suggested, and

these may be considered under one heading. By these the perforation is brought to the abdominal incision and fixed there, either by suture or a bone plate, so as to leave a gastric fistula. While such a procedure may be the only possible course to take in some cases, it is hardly the one to follow where a more complete operation can be done, for, if temporarily successful, it necessitates a second operation later on for the closure of the fistula.

Before closing this paper I should like to suggest whether, considering the dangers incident to a gastric ulcer, it would not be well in a case where the symptoms are unequivocal to seriously consider the question of opening the abdomen with a view to the treatment of the ulcer. This might in some cases be of such a size as to permit of excision, or the stomach wall might be drawn across it so as to prevent perforation; or why might not its base be strengthened and protected by grafting on to it a piece of omentum carefully removed for that purpose? Unfortunately, however, the cases where surgical treatment could be best carried out are just those where, owing to the absence of adhesive peritonitis, symptoms are either entirely absent or do not point so clearly to the nature of the case as to warrant even the slight risk of an exploratory incision. Moreover, we must not lose sight of the fact that ulceration of the stomach frequently occurs at several points, so that the difficulties in the way of dealing successfully with such cases are so great as to offer but little hope of benefiting them to any extent.

THE EFFECT OF REPEATED TAPPINGS ON HYDROCEPHALUS.

By JOHN HERN, M.D., F.R.C.S. EDIN.,
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THE operation of tapping the enlarged and distended lateral ventricles in cases of hydrocephalus which have resisted medicinal and all other forms of treatment, and in which the head continues to increase in size, has, with English surgeons at any rate, not been looked upon with favour. Mr. Erichsen condemns it in his last edition. Mr. Treves does not even mention the operation in his *Manual of Practical Surgery*.

My own cases (6 in number), all tapped more than once, would appear to show much less danger than is usually supposed, and as 5 have improved, and 2 of the 5 appear to have almost recovered, it appears to me that the operation is a justifiable proceeding, even granting the dangers usually ascribed to it, for without operation the result usually is an early death, or a mere existence worse than death, in which the poor child lies perfectly helpless, and is in fact a hopeless imbecile. In all my 6 cases the head was much enlarged, and continuing to enlarge rapidly; in 5 this ceased after the first tapping; in the sixth case the enlargement progressed, and the child died of convulsions. At the *post-mortem* examination a large cerebellar tumour was found, but there was no trace of any harm done by the tapplings. The most successful of my cases was, according to notes, copied from my notebook as follows:

Born August 9th, 1887. Head not enlarged. Three convulsions at 6 weeks old. Head noticed enlarging in the tenth week. Continuous treatment for more than a year (thirteen months). No treatment up to thirtieth month—two years and a-half.

Condition then.—Head much enlarged (circumference 22½ inches), Hydrocephalic shape. Fontanelles not ossified, but apparently covered by a tense membrane. Face small and idiotic. Internal strabismus and blindness (total) of left eye. Body emaciated and ill developed (equal to about 10 to 12 months). Height 26 inches; weight 23 lbs. Lies still most of the day, but cries almost all night; crying accompanied by twitchings of the limbs.

First tapped April 29th, 1890. Two ounces and a-half removed. Immediate relief of the crying at night, and all the acute symptoms.

Second tapping July 17th 1890. Head same size as three months previously (date of first tapping). Child uses its limbs freely, and takes more notice, but the fontanelles have ceased to pulsate, and crying at night has returned. Three ounces and a-half removed. From this time progress was steady and uninterrupted.

It would be absurd to expect the tapplings to relieve all cases, for obviously this condition can be induced by many and diverse pathological conditions, some of which are incurable. Nevertheless, I consider that, although it is dangerous to argue on such a small number of cases, it is

advisable to put these on record that others may publish their cases, and thus some conclusion may be arrived at which might guide us in the treatment of these unfortunate cases.

To sum up, the points which my cases seem to illustrate are:

1. That the operation, if performed aseptically and the fluid drawn off slowly with the head well depressed, is not attended with the danger usually ascribed to it.

2. That improvement follows the operation as a rule.

3. That if operated on sufficiently early, there is some prospect of the child becoming a useful member of society.

Mr. ARBUTHNOT LANE congratulated Dr. Hern on the results which he had obtained. He had used interrupted and continuous drainage for these cases, the latter being obtained by the use of a fine hypodermic needle and hydraulic pressure, extending over a considerable period of time, but the result in every case was, though temporarily mitigating the patients' symptoms, yet to produce no permanent benefit. He could quite understand that cases occasionally occurred in which the mechanical conditions were so evenly balanced that the removal of some fluid on one or more occasions might determine the recovery of the patient. It had, however, never been his good fortune to meet with such a case. He considered that Dr. Hern had more than his share of good fortune.

Mr. R. J. GODLEE said that the congratulation must be qualified by the reflection that this case might have recovered spontaneously. He had tried this method of treatment, and had been much disappointed with the result. He had not only tried repeated tapping but continuous drainage, but had never met with a successful result. He had spoken to numerous surgeons at children's hospitals in London on the subject, and had always met with the same answer, namely, that they had tried the treatment in the earlier days of their practice, but had ultimately given it up.

Dr. DAVID NEWMAN asked Dr. Hern if he observed any difference in the percussion of the skull after tapping from what it was before the operation was performed. When the pathology of acquired hydrocephalus was considered he thought very little hope was held out of a complete or permanent cure by tapping. In most cases of hydrocephalus the veins of Galen were obstructed by pressure from without, and so the vessels of the choroid plexus became distended, and excessive exudation into the ventricles was the result. This led to increase in the intracranial pressure, to anæmia, and in some instances to atrophy of the brain. If they could remove the cause of obstruction then a cure might be effected, but simply to draw off the exudation could only give temporary relief, for it was certain to reaccumulate.

A NEW AND EASY METHOD OF PERFORMING INTESTINAL RESECTION.

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IN cases of intestinal growths complicated by obstruction, of irreducible intussusception and gangrenous herniæ, an operation to be successful must be rapidly performed, and should be complete. Resection of the intestine with immediate suture has been followed by some brilliant results, but the operation is long and difficult, requires special skill with trained assistants, and even then has a large mortality. With my instrument (Fig. 1), it is possible to complete such operations in from ten minutes to half an hour.

The principles of the operation I have devised are (1) to provide for the formation of a fæcal fistula primarily, and (2) that a large intestinal anastomosis shall follow the same operation. The advantages are that the distended intestine is drained by the most direct route, and that at one quickly and easily performed operation a radical cure is made possible. The operation will be easily understood by referring to the accompanying diagrams. The steps for an ordinary case are:

1. Draw out the diseased knuckle of bowel through a convenient opening in the abdominal wall (Fig. 3).

2. Pack round the abdominal opening, and make an incision $\frac{1}{2}$ inch long in either intestinal tube on the convex surface away from the mesentery (Fig. 3).

3. Introduce into the upper distended intestine the blade of the forceps with tube affixed.

4. Pass a thick silk ligature through the mesentery, and tie the intestine firmly to the blade and tube in the groove provided (Fig. 2). The most convenient method of passing the silk is to push a pair of sinus forceps through the mesentery, open them slightly on the other side, grasp the silk, and draw it back with the forceps closed.

5. Introduce the other blade of the forceps into the distal end of the intestine, turn the convex surfaces of intestine towards each other, lock and screw up the instrument.

6. Pass a thick silk ligature round the whole loop of intestine, mesentery, and instrument, embracing the ligature previously applied, and cut off mesentery and intestine beyond the ligature, cleanse the whole, then dust the cut surfaces and the ligatures with iodoform.

7. Introduce a continuous or a few interrupted sutures to fix the intestinal loops securely together on the convex surface and below (Fig. 4). On the opposite side the mesentery makes everything secure.

8. Put the intestine with the instrument back into the abdomen to within three-quarters of an inch from the ligature.

9. Suture the abdominal wall and fix the intestine to it.