

Neo-Natal Intestinal Obstruction

By DENIS BROWNE, F.R.C.S.

THERE are certain requirements for the efficient treatment of small babies who suffer from some impediment to the normal passage of the intestinal contents:

(1) *A nursing staff* skilled in the difficult and most important task of feeding and tending these minute patients. They depend, to an extent far greater than those older and larger, upon continuous observation and immediate intelligent reaction to emergencies for their chances of survival. To give only two examples: it is extremely easy to give a baby a heat-stroke by wrapping it up in a blanket with an equal mass of hot water in a rubber bottle; and a newly born child will choke to death from an obstruction that in later life would be dealt with by a single cough.

(2) *An anaesthetist* trained in the particular technique involved. The keeping of a free airway and complete control of anaesthesia in a small baby is only possible by eliminating the obstruction of the glottis, which at that age is so liable to spasm, by holding it open with a soft rubber tube.

I believe that it is most important in difficult cases to keep the amount of anaesthetic as low as possible; that it is far better to have the anaesthetic so light that the child struggles slightly under the operation rather than so deep that it takes long to recover the power of coughing and crying, so aerating its blood and clearing its air passages. One manœuvre which I consider of great value in certain critical cases is what I call the "double induction". Supposing that after opening the abdomen the surgeon finds that a longish procedure such as a resection of gut is needed: he packs off the abdomen and asks the anaesthetist to stop all administration of anaesthetic. When the anastomosis is completed, he holds the bowel controlled by a swab, and asks for a second induction of the child to a depth that will permit closure of the peritoneum. With an intratracheal tube, and in a small exhausted infant, this is easily and rapidly obtained; so saving the absorption of the anaesthetic that otherwise would have been administered over half an hour or so. Success in operations on the newborn depends very largely on the understanding and confidence between surgeon and anaesthetist that are necessary for such teamwork. Speed and ease of operating bought at the cost of deep anaesthesia are also bought at the cost of danger to the child.

(3) *An operating equipment* suitable for the type of surgery that may be expected. It is merely necessary to ask the average operating theatre staff to set out a table for an anastomosis of the bowel in a newly born infant to see that instruments of the necessary fineness are simply not available. As a personal preference I like to do all my surgical sewing with needles of the curve used by Moynihan, that is to say of about two-thirds of a circle. Needles of the fineness necessary for the newborn bowel must of course be handled with a needle-holder, and the stock patterns show one of the curious deficiencies to be noticed in surgical instruments; which, as a general rule, are made by people ignorant of their use and used by people ignorant of their making. This fault is that the body of a curved needle is made round, so that it spins in the grip of a needle-holder, although it can be used satisfactorily in the fingers. For many years I have had fully curved minute needles made with flattened shafts, and have tried in vain to stop them being called "cleft palate" needles. Although their immunity from twisting in metal grips certainly makes them most efficient in cleft palate operations, it does not cease to be useful when other flimsy and inaccessible tissues are being sewn.

A retractor that will enable the surgeon to pull any piece of tissue in any direction which he may wish is indispensable to the surgeon who has once learnt to depend upon it: and the only form of lighting that will enable him to see into deep narrow clefts, that is to say a headlight, will probably come into general use when an efficient one does not have to be made up by the operator himself.

(4) *A surgeon* specially skilled and interested in such cases is the final and not unimportant requirement. These cases are few in number, technically difficult and of critical importance. When a department of surgery has these characteristics there is only one way of gaining efficiency in it; that is to concentrate it in certain special centres, possessing the four desiderata which I have set out. The average competent general surgeon will have no greater success with neonatal bowel obstructions than he would have with brain tumours.

DIAGNOSIS

It may seem a platitude to say that the indications for operation on intestinal obstruction are the same at all ages. In the cases of these small babies, however, there is a grave tendency for a vicious circle to arise; and until it is broken results in general will not be good. It

arises from the natural dislike of the pædiatric physician, under whose care most of these cases first come, to subject such a very fragile patient to the severe operation of laparotomy. In consequence he postpones the calling in of a surgeon until it is obvious that "medical treatment" is going to lead to disaster. The surgeon is faced with a starved and exhausted baby, only too often hopelessly distended; and not infrequently has the mortification of finding in a moribund infant a condition that in itself could have been easily set right by surgery. If he protests to the physician he is met by the statement that the cases which are operated upon do very badly; and so the vicious circle proceeds. It should be recognized that small babies stand laparotomies very well while they are in good condition.

One simple and valuable means of investigation which is far too little used is the straight X-ray of the abdomen. In many cases this demonstrates with the utmost clearness a distended gas-filled loop of bowel, with a consequent need for urgent operation. Barium meals are of very limited usefulness, and in many conditions the adding of an insoluble mass of mineral to the other difficulties the bowel has to contend with is far from helpful.

PREPARATION FOR OPERATION

An intravenous drip should be invariably set up, to supply the fluid and food which are invariably lacking. Expert advice as to the state of blood chlorides and other biochemistry is necessary if the drip is to be kept running any time. Time, however, should not be wasted in trying to get the body chemistry right while neglecting to attack the condition which has set it wrong.

I think it is a great advantage to have the baby fastened to a cross of padded wood during operation. This enables the anæsthetic to be kept at a level which otherwise would need manual restraint, and also avoids the risk of undue chilling of exposed limbs.

INCISION

I have come to the conclusion that a transverse incision across both recti muscles is distinctly better than the more usual paramedian or mid-line approach. For an equivalent length of cut it gives a wider exposure, and if mischief is found on one side or the other, it can be safely and rapidly extended into the loin. I have been struck on many occasions by the failure of explorations of the deep abdomen and the loin conducted through paramedian incisions, though it is long since Rutherford Morison demonstrated the advantage of transverse muscle-cutting ones.

EXPLORATION

At one time I used to try to determine what was wrong without allowing the bowels to escape from the abdomen. I am convinced this was wrong, and that the speed and clarity of diagnosis permitted by a deliberate turning out of the whole mass of bowel far outweigh the possible shock it may cause. I think that the main factor in "surgical shock" is an overdose of anæsthetic, caused by insistence on complete relaxation and by keeping the patient too long on the operating table.

TECHNIQUE OF BOWEL ANASTOMOSIS

It is, of course, impossible in a short paper to go into the methods of treating the various technical problems that may be found. There is one, however, that constantly confronts the surgeon, to which very little guidance can be obtained in textbooks of operative surgery. It is that of anastomosing a widely dilated blind end of the bowel to a correspondingly shrunken empty tube below it. The ordinary end-to-end, end-to-side, or side-to-side anastomoses are useless here: the ordinary technique of controlling the bowel by clamps is inapplicable. The best method I have found is as follows:

(a) Two holding stitches are inserted into the dilated blind end, about an inch apart on either side of its apex. By these the blind end is held up so that the gas in it rises to beneath where an incision some half-inch long is made between the holding stitches. When the gas has escaped a suction tube is inserted to empty the distended gut. An assistant can aid in this by cautiously "milking" the bowel towards the sucking orifice.

(b) When the blind end is empty an incision is made along the free edge of the empty bowel below, corresponding in length to the half-inch slit made above it. The two slits are then anastomosed together by means of a single row of fine silk mattress stitches. The double row of stitching of the conventional intestinal anastomosis is impossible to insert without unduly narrowing the minute lumen of the empty lower piece of bowel. An anastomosis of this kind enables the flow of intestinal contents to pass straight down the tube of bowel, without the eddies and backwaters that are inevitable in a side-to-side or end-to-end junction (Figs. 1 and 2).

TECHNIQUE OF COLOSTOMY

In many varieties of imperforate anus, with or without high urethral or vaginal fistulæ, a colostomy is probably the best primary treatment. Usually this is made in the left inguinal region without a spur which has many disadvantages:

(a) The situation of the opening hinders access to the pelvis in any subsequent operations that may be attempted to give a normally working anus, and in addition anchors the pelvic colon, whence should come the extra length of bowel that is needed if the blind end is to be brought through the perineum without tension.

(b) The spurless colostomy is notoriously difficult to close.

(c) Such colostomies are particularly liable to large prolapses.

The most satisfactory method is to make a transverse skin incision between the umbilicus and the xiphisternum, and then to open the abdomen in the mid-line. Through this incision the abdomen is explored. A piece of rubber tubing is then passed through the mesentery of the transverse colon about its centre. While the bowel is held by the tubing a spur is formed in the ordinary way by fine sutures, and then the tubing followed by the loop is brought through a separate small incision splitting the left rectus, which has been exposed by the skin incision. This incision should be made on the small side at first, and enlarged to the exact dimensions the surgeon considers will give a suitable anal ring (Figs. 3 and 4). To be sure of the final size of this ring when the ordinary technique is used is very difficult.

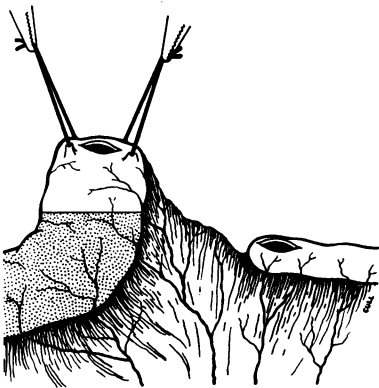


FIG. 1.—Preparation for the anastomosis of a blind end of bowel to a contracted segment below it. The dilated upper segment is shown held up by two sutures, with an incision between them through which the contents will be removed by suction. The empty segment has been incised along the free border of the bowel. Actually the contrast in size between the two segments is usually much greater than is shown in the figure.

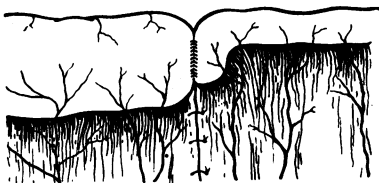


FIG. 2.—Stitching of the bowel shown in Fig. 1. The course of the intestinal flow is continued down the axis of the upper segment.

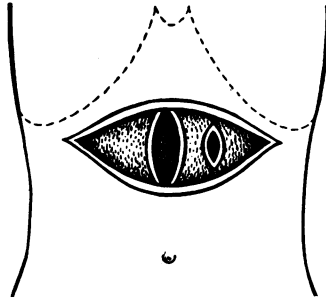


FIG. 3.—Incision recommended for colostomy. The skin cut is transverse. In the mid-line can be seen the longitudinal incision through which a laparotomy has been carried out. Through the left rectus there is a small incision which will just allow the double loop of transverse colon to be drawn through it.

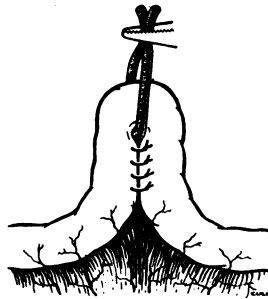


FIG. 4.—Preparation of the transverse colon for a spur colostomy, to be drawn through the small incision shown in Fig. 3. When the colostomy is in its final position a plastic rod is thrust into one end of the rubber tubing shown, and so drawn through the loop to lie on the skin and prevent retraction.

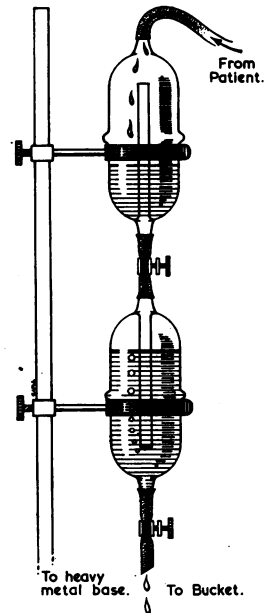


FIG. 5.—Diagram of suction apparatus recommended. The upper flask acts as a trap for extracted fluid, and the lower one supplies the suction by the tendency of its contents to run downwards.

The flasks can be arranged side by side.

AFTER-TREATMENT

Small babies upon whom a laparotomy has been performed should be kept on gastric suction by means of a Ryle's tube passed down the nostril until the bowel has begun working. This diminishes the risk of the child inhaling a sudden back-flooding of gastric and intestinal contents, and also much diminishes gaseous distension of the bowel with its consequent paralysis. There is no generally accepted neat and compact apparatus for gastro-duodenal suction, and it is difficult to avoid the conclusion that the lives of a good many patients of all ages are lost through failure to make use of this treatment. I have found that two large versions of the common dropper used in intravenous transfusions arranged one above the other with the inner tubes opening in opposite directions act very well. The lower "Suction flask", filled as necessary by disconnecting its upper end and running in water by a funnel inserted into the lower piece of tubing, supplies the suction and shows the passage of gas. The upper flask collects the fluid drawn off (Fig. 5).

[February 7, 1951]

The following specimens were shown:

(1) Ring Gallstones. (2) Adenoma of Suprarenal.—Mr. JOHN HOSFORD.

Pneumonectomy for Carcinoma of Lung. Death 10½ Years Later from Pneumonia, but No Recurrence.—Mr. IVOR LEWIS.

(1) Fibrosarcoma of Breast. (2) Leiomyomata of Bowel. (3) Synoviomata.—Dr. GEORGE LUMB.

Retrograde Jejuno-duodenal Intussusception.—Mr. T. LEVITT.

Disobliterative Endarteriectomy.—Mr. FRANK FORTY.

(1) Volvulus of the Stomach. (2) Partial Ametanephrogenesis.—Mr. R. H. GARDINER.

Specimens of Neurofibromata (Two of Vagus Nerve).—Mr. J. R. B. WILLIAMS.

Neurilemmoma of the Small Intestine.—Mr. H. H. G. EASTCOTT.

Two Cases of Neurofibrosarcoma of the Thigh.—Mr. D. L. B. FARLEY.

Carcinoma of the Common Bile Duct.—Mr. DAVID TIBBS.

(1) Sarcoma in Case of Paget's Disease. (2) Cystic Adenocarcinoma of the Pancreas.—Mr. P. G. LARGE.

Specimens Relating to a Case of Carcinoma of the Breast.—Mr. B. H. PAGE.

(1) Dermoid Cyst of Testicle. (2) Partial Hepatectomy for Tumour of Liver.—Mr. A. S. TILL.