Note on Surgical Findings, by Mr. Welsh

The patient presented as a case of septicaemia, with probably a focus of pus in the abdomen which could not be located by clinical or x-ray examination. Laparotomy, by a transverse upper abdominal incision, led to the discovery of a small appendix abscess containing thick greenish-yellow pus in the right iliac fossa. There was a small amount of blood-stained free fluid in the general peritoneal cavity, and the spleen was found to be enlarged.

Appendicectomy, aspiration, and drainage of the abscess were performed. No definite search was made for thrombosed portal-vein tributaries. On the sixth post-operative day it was decided to reopen the abdomen and search for and ligate the ileo-colic vein. The tissues at the root of the mesentery were all matted and oedematous, but a portion of what was believed to be thrombosed vein was removed between ligatures. Subsequent histological examination did not confirm the presence of vein wall in this tissue.

Notes on the Laboratory Findings

The organism, *Bact. fragilis*, was first isolated from Robertson's meat medium. It was subsequently cultured on blood agar under micro-aerophilic conditions. It closely resembled the characters of the organism described by Schwabacher and Mitchison (1947).

The sensitivity results were as follows:— Penicillin: sensitive to 20 units per ml., insensitive to 10 units per ml. Sulphadimidine: sensitive to 5 and 50 mg. per 100 ml. (plate method). Chloramphenicol: sensitive to 5 units per ml., insensitive to 4 units per ml. Streptomycin: sensitive to 25 units per ml. (plate method). Aureomycin: sensitive to 0.1 unit per ml. Terramycin: sensitive to 0.4 unit per ml.

Comment

A case of pylephlebitis and septicaemia is described with recovery on large dosage of aureomycin. It was of great interest for the following reasons: (1) The failure to respond to penicillin, streptomycin, and chloramphenicol. (2) A Gram-negative bacillus of the *Bacteroides* group and *Str. haemolyticus* were isolated from the blood and the appendix abscess. (3) The relative absence of toxic effects despite the large dosage of aureomycin used. (4) The development, on recovery, of ascites, which was possibly related to pylephlebitis. (5) The long duration of the illness, with complete recovery.

Thanks are due to Professor A. P. Thomson for permission to publish; to Miss V. M. Jones for technical assistance, and to Miss M. N. Ellis for secretarial assistance.

ADDENDUM.—Since this case was seen rules have been formulated for the combined use of antibiotics. A leading article in the *Lancet* (July 26, 1952, p. 173) divides these agents into two groups. Group 1: Bactericidal—for example, penicillin, streptomycin, and bacitracin. Group 2: Bacteriostatic—for example, aureomycin, chloramphenicol, terramycin, and possibly sulphonamides. Where the organism is sensitive to a drug of Group 1 the addition of a bacteriostatic agent may result in antagonism (this may have occurred in the above case when streptomycin and chloramphenicol were given in combination). If the organism is only partially sensitive to the bactericidal agent the combination with a bacteriostatic may result in synergism.

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CONGENITAL OBSTRUCTION OF THE SMALL INTESTINE IN TWO PREMATURE INFANTS

BY

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The neonatal mortality rate has fallen by more than a half over the last 40 years. The rate in England and Wales in 1949 was 19.31 per 1,000 live births. Over half the deaths (10.2 per 1,000 live births) were due either to prematurity or to congenital malformations (Ministry of Health, 1949). This paper describes the successful treatment of two infants presenting both of these two main causes of neonatal death. One was a premature infant with an ileal atresia, the other a premature infant with exomphalos and congenital obstruction of the small intestine.

Wangensteen (1942) estimated the incidence of congenital atresia of the small intestine as 1 in 20,000 births. This estimate is based on necropsies and hospital births, and, although the condition must be considered rare, it is probable that the true incidence is higher. O'Neill *et al.* (1948), in a comprehensive review of the literature, could find only 36 cases of atresia of the small intestine which had been successfully treated by operation. A further case has been described by Stevens (1951). The 37 cases include three premature infants with birth weights of 4 lb. 11 oz. (2.12 kg.) (Stetten, 1940), 4 lb. 11 oz. (2.12 kg.) (Ward and Cooper, 1943), and 4 lb. 8 oz. (2.04 kg.) (Duncan *et al.*, 1943). The 52 babies operated upon by Ladd and Gross (1941) showed a mortality rate of 80% for duodenal, 50% for jejunal, and 91% for ileal atresia.

Exomphalos is commoner. Jarcho (1937) estimated its incidence as 1 in 5,000 deliveries; again this estimate is based solely on hospital births, and the true incidence is probably higher. The chances of survival depend largely on the size of the sac. Gross (1948), in a series of 60 cases, found that with a sac less than 7 cm. in diameter there was about a 75% chance of survival following surgery. When the sac was 7–9 cm. in diameter survivals were cut to about 30%. When the sac was larger than 9 cm. the survivals were reduced to about 15%.

Case 1

The baby, a boy, was born a month prematurely. The birth weight was 4 lb. 6 oz. (1.98 kg.). The mother's pregnancy had been uneventful. She had had one previous pregnancy in 1949, and a three-months miscarriage in 1945. Her blood was Rh-positive; the Kahn test was negative. Delivery was rapid, the mother suffering mild obstetrical shock. The baby was left undisturbed for 24 hours, when a small amount of glucose-water was given and retained. The following day $\frac{1}{2}$ -oz. (14-ml.) feeds of breast milk were given two-hourly, and taken readily. Early on the third day vomiting started, and soon became bile-stained. At about this time a normal meconium stool was passed, no food residue being noted.

The baby showed the usual signs of prematurity and dehydration. The abdomen was slightly and evenly distended and peristaltic waves could be clearly seen over the gastric area, and also up and down each side of the abdomen. The child's weight had fallen by this time to 3 lb. 8 oz. (1.59 kg.), and he had lost a fifth of his birth weight. Radiographs taken of the abdomen with the child in various positions showed several loops of gas-distended small intestine with fluid levels, confirming a small-intestine obstruction (Fig. 1).

Three hours were spent in pre-operative treatment: the stomach was washed out and aspirated half-hourly (an intranasal catheter being kept *in situ*), and 200 ml. of 5% glucose in N/5 saline was given intravenously by continuous drip.

FIG. 1.—Case 1. Radiograph of abdomen showing fluid levels in stomach and small intestine. No air present in large intestine.

A laparotomy was performed 80 hours after birth, by which time the baby's weight must still have been under 4 lb. (1.81 kg.).

Atropine, 1/200 gr. (0.32 mg.), was given pre-operatively, and the abdomen was opened through a right paramedian incision, under "vam" and oxygen anaesthesia → ether and oxygen on an open mask (Miss K. M. Watson). There was bile-stained free fluid. Part of the omentum was adherent to the ileum about 12 cm. from the ileo-caecal

junction. At this point the lumen appeared to be obstructed by a short imperforate portion, or diaphragm, the ileum above being distended to a diameter of 2 cm., while distally it was collapsed, though probably canalized. No bowel contents could be milked along. The caecum, appendix, and ascending colon were normally developed, though empty.

It was decided that relief of the obstruction could most simply be obtained by making a stoma between the distended ileum and the caecum. The short length of collapsed ileum would then be left as a blind diverticulum draining into the caecum through the ileo-caecal valve. The anastomosis was sutured in two layers with catgut, antiperistaltically, without difficulty. No attempt was made to close the gap in the mesentery or to explore the rest of the abdomen. The abdominal wall was closed in layers. The baby stood the operation very well.

Post-operatively the baby was nursed in an oxygen container with a minimum of clothing; 5% of CO₂ was added for five minutes of each hour. Aspiration of the stomach was continued half-hourly. The intravenous drip of 5% glucose in N/5 saline was continued until the first signs of oedema appeared, by which time a total of 750 ml. of fluids had been given. The drip was then changed to whole fresh blood (from the father), 100 ml. being given in the following two hours. Twenty-four hours after the operation glucose was given by mouth. The next day this was changed to expressed breast milk $\frac{1}{2}$ oz. (14 ml.) two-hourly, slowly increasing to 2 oz. (57 ml.) two-hourly. Streptomycin, 25 mg., and penicillin, 100,000 units, were given intramuscularly four-hourly for four days. The baby's temperature (per rectum) remained between 95 and 96° F. (35 and 35.6° C.) for three days. No attempt was made to raise this. On the fifth day the baby passed a normal stool. The stitches were removed on the tenth day and the baby was

discharged home three weeks after the operation, weighing 6 lb. 8 oz. (2.95 kg.). He was last seen at 3 months of age, by which time he weighed 10 lb. 2 oz. (4.59 kg.), and was having no trouble with breast-feeding or bowel action.

Case 2.

This baby, a female, was born six weeks prematurely. The birth weight was 4 lb. 4 oz. (1.93 kg.). The mother's pregnancy had been uneventful. She had had one previous miscarriage; in 1951. Her blood was Rh-positive; the Kahn test was negative. The presentation was a breech with extended arms and legs. An episiotomy was performed under pudendal block and the after-

coming head delivered with forceps. The baby was badly shocked. A small defect was seen in the anterior abdominal wall, through which a translucent rounded mass about 8 cm. across protruded. This mass could be seen to contain intestine. The precarious condition of the child and the danger of rupturing the thin-walled sac precluded any immediate conservative or radical attempts at reduction. The infant was placed in an oxygen container and left undisturbed for 36 hours, when small amounts of glucose-water were given by mouth, followed by $\frac{1}{2}$ -oz. (14-ml.) feeds of expressed breast milk. By this time the mass had become opaque and friable. On the fourth day the baby began to vomit. It was apparent that a loop of intestine in the sac had become obstructed. This was confirmed by a plain x-ray film of the abdomen, which showed gaseous distension of the small intestine. The exomphalos was also seen to contain a small loop of intestine (Fig. 2).

FIG. 2.—Case 2. Radiograph of abdomen showing gaseous distension of the stomach and small intestine and a loop of small intestine in exomphalos.

The same pre-operative regime as in Case 1 was followed, 150 ml. of 5% glucose in N/5 saline being given intravenously over two hours. Ninety hours after birth the baby was operated upon. Atropine, 1/200 gr. (0.32 mg.), was given, followed by vam and oxygen → ether and oxygen on an open mask (Miss K. M. Watson). An incision was made over the upper and lower angles of the hernia and the sac opened. A loop of small intestine was seen to have herniated through a small hiatus in the transversalis fascia about 2 cm. in diameter. The sac was excised, the constricting neck divided, and the loop of intestine replaced in the abdomen, which was then closed in layers.

The post-operative regime was the same as in Case 1—a total of 500 ml. of 5% glucose in N/5 saline followed by 75 ml. of fresh blood being given by continuous intravenous drip over the next 36 hours. By the fourth post-operative day the baby was taking $1\frac{1}{2}$ oz. (42 ml.) of expressed breast milk two-hourly. She was discharged home three weeks after the operation.

Discussion

The development of regional neonatal surgical centres for the treatment of congenital malformations has been

strongly advocated (Rickham, 1952). Most paediatricians will agree that certain congenital abnormalities such as oesophageal atresias and genito-urinary malformations require the specialized surgical techniques available only at regional centres. Abdominal malformations of the alimentary tract, particularly obstructions of the small intestine, are probably the most urgent of the remedial congenital malformations. Early diagnosis and immediate pre-operative treatment are required. Available statistics suggest that after 96 hours the operative mortality even in the most capable hands is practically 100%. The delay and disturbance necessarily involved in transferring such cases from outlying hospitals to regional centres is unjustified. Rickham (1952) points out that a surgeon working in one hospital group is unlikely to see more than one or two such cases a year, and therefore unlikely to gather enough experience to deal correctly with the complicated surgical problems. On the other hand, the general surgeon, owing to the development of other surgical specialties, is a specialist in abdominal surgery, and neonatal abdominal surgery should rightly remain within his province.

Summary

Two cases of congenital obstruction of the small intestine in premature infants, with recovery after operation, are reported. The question whether congenital surgical abnormalities in the newborn should be treated locally or at regional centres is discussed. It is suggested that certain congenital abnormalities requiring specialized surgical technique should be transferred to regional centres, and that others, such as obstructive malformations of the small intestines, should be treated locally.

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In 1911 Dr. M. David Eder read a paper on "A Case of Obsession and Hysteria Treated by the Freud Psychoanalytic Method" to the neurological section at the Annual Meeting of the B.M.A. It was the "first public contribution to clinical psycho-analysis" in Britain to be described publicly, and was later published in this *Journal* (1911, 2, 750). Now, 42 years later, the case has been followed up—which in that respect probably makes it unique in the psychiatric literature, as Drs. Hunter and MacAlpine indicate in the *British Journal of Medical Psychology* (1953, 26, 64). The patient first consulted Dr. Eder in 1910 because he was worried by a dull aching pain in the back of the neck which caused considerable depression. He was treated twice weekly for three months—the technique being based mainly on free associations and dream analysis. At the last session he was hypnotized, and Dr. Eder suggested to him that he was cured. At the age of 68 he still has some symptoms, mainly of intense pain and tension in the head, which he relieves with barbiturates. But on the whole, says the report, he seems to have made a satisfactory adaptation to life, and learned to live with his symptoms. An interesting point mentioned by these authors is that the patient, who was found to have a "mother complex" displaced on to his sister Ada, probably chose Dr. Eder because of the homophony of the names. But this, involving the concept of transference then little appreciated, went unnoticed by Dr. Eder.

SUCCINYLMONOCHOLINE

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Whittaker and Wijesundera (1951) reported that the product of succinylcholine (succinylidicholine SDC) hydrolysis by horse serum was succinylmonocholine (SMC). We decided to study this process, using human serum. While this work was in progress another communication by Whittaker and Wijesundera (1952) described work done with a highly concentrated horse pseudo-cholinesterase (33,000 units per ml.) confirming that, in the enzymatic breakdown of SDC, first SMC was formed, but that this was an intermediate which was subsequently hydrolysed to succinic acid and choline: $\text{SDC} \rightarrow \text{SMC} + \text{choline}$; $\text{SMC} \rightarrow \text{succinic acid} + \text{choline}$. We found the same with human serum, and when using similar concentrations (SDC 1.1, SMC 0.7 mg. active cation per ml.) could show that SDC was at first hydrolysed four to six times as fast as SMC, but that between 40 and 60% hydrolysis point the speed slowed and became identical with that of hydrolysis of pure SMC. Thus, using a highly concentrated human cholinesterase, we found that it contained for one unit SMC hydrolysis six for SDC. One unit equals $1 \mu\text{l. CO}_2/\text{ml.}/\text{min.}/37^\circ \text{C}$. obtained by the bicarbonate method according to McArdle (1940). At higher substrate concentrations the difference falls, and when they reach 15 times the values with which Whittaker and Wijesundera worked the ratio becomes less than 2 : 1 (see Table I).

TABLE I.— $\mu\text{l. CO}_2/\text{min.}/\text{ml.}$ of Pseudo-cholinesterase (Human, 16,000 Units) Produced at 20% Hydrolysis Point of Succinylidicholine and Succinylmonocholine. Total Volume, 3 ml.; Enzyme Dilution, 1:60

Substrate Concentration 10^{-3}M	Succinylidicholine SDC	Succinylmonocholine SMC
55	580	350
5.5	514	134

Whereas SMC resembles SDC in its response to pseudo-cholinesterase, as a substrate of the true cholinesterase of the red cells it occupies a position midway between acetylcholine and SDC. Table II shows that SMC, like acetylcholine and unlike SDC, is hydrolysed by true cholinesterase at low substrate concentrations. It resembles SDC in inhibiting acetylcholine hydrolysis by the true cholinesterase, but whereas SDC is still effective at very low concentrations (Evans *et al.*, 1952) SMC inhibits only at the high levels at which the acetylcholine itself becomes an inhibitor.

TABLE II.— $\mu\text{l. CO}_2/\text{min.}/\text{ml.}$ of Packed, Washed, and Laked Human Red Cells, 37°C ., Bicarbonate Buffer. Substances are Referred to as mg. Active Cation/ml. Total Volume, 3 ml.; Enzyme Dilution, 1:75

	0.7 mg. Acetylcholine	0.9 mg. SMC
—	149 $\mu\text{l.}$	24 $\mu\text{l.}$
+7 mg. acetylcholine ..	71 "	71 "
+9 mg. SMC ..	69 "	21 "