play a part. Strong (1942) quotes Clements and James's view that dietary deficiency, especially in vitamin B₂, may play a part, while Shera (1953) blames a vitamin-C deficiency leading to bruising of the bowel.

Summary

The scanty literature on strawberry lesion of the recto-sigmoid has been reviewed. A case is presented to help clarify the confusion which arises when a patient is seen with "granular (or idiopathic) ulcerative recto-sigmoiditis." A plea is made for the diagnosis of "strawberry lesion" to be borne in mind, investigations to be carried out, and the therapeutic response to arsenicals to be tried. It is recommended that carbarsone suppositories be used as the method of treatment of choice for the usual chronic case affecting the recto-sigmoid.

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VALUE OF "HIBERNATION" IN SEVERELY SHOCKED PATIENTS

BY

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The use of the "hibernation" technique for major surgery in gravely ill patients was described by Gordon, Grant, and Grigor (1954), and in 1953 Nichol, Mattéi, Brun-Buisson, François, Jaffry, and Lagneau had reported its value in the treatment of shock in war injuries.

The appearance, within a period of 10 days, of three moribund patients requiring immediate operation, and the dramatic success following the use of the hibernation technique, has prompted this report. All three cases were in a state of advanced shock with marked peripheral vasoconstriction. There was no response to normal resuscitative measures, and operation under standard methods of anaesthesia carried grave risk. Hibernation, in blocking the sympathetic nervous system, relieved the vasoconstriction, improved cerebral and tissue oxygenation, aided fluid replacement without concomitant dangers, and provided ideal operating conditions.

Case 1

A man aged 60 was admitted to hospital complaining of severe abdominal pain for 12 hours. On examination he was found to have an imperceptible pulse, unrecordable blood pressure, and board-like rigidity of the abdomen. He was very cold and pale, and was sweating. Resuscitation with plasma and saline was at once carried out, being main-

tained for six hours without any signs of improvement. An L-noradrenaline bitartrate drip running for five minutes at 10 drops a minute produced no rise in blood pressure. A diagnosis of peritonitis following perforation of 18 hours' duration was made, and in view of the deterioration in the patient's condition it was decided to "hibernate" him and operate.

In the theatre two transfusions of blood were run in concurrently and 5 ml. of a hibernation mixture—chlorpromazine hydrochloride, 50 mg., promethazine hydrochloride, 50 mg., and pethidine, 100 mg., in 14 ml. of normal saline (the dilution suggested by Smith and Fairer)—was given very slowly. This allowed the blood to run more rapidly, and in five minutes the pulse was recordable. In 10 minutes, when 10 ml. of the mixture had been given, the patient became warm and pink, and a blood pressure of 50 mm. Hg was recorded. The remaining 10 ml. of the mixture was given within a further five minutes; the patient was intubated and moved to the operation table. His blood pressure was labile, and moving him caused an instant fall in blood pressure.

The operation was begun with the patient on a 50% mixture of N₂O and O₂, and 2 pints (1,140 ml.) of blood were running concurrently. The systolic blood pressure was now 85 mm. Hg. For opening the peritoneum a dose of 5 mg. of D-tubocurarine was necessary, and adequate. Irregularity of the pulse caused some anxiety, and 0.24 g. of aminophylline was added to a pint (570 ml.) of transfusion fluid. Digoxin, 0.25 mg., was given intravenously with obvious improvement. The blood pressure was maintained at 80–90 mm. Hg with the help of a fast-running transfusion. A large perforation at the pylorus was found, and 10 pints (5.7 litres) of fluid was sucked from the peritoneal cavity. There was marked generalized peritonitis. Routine closure of the perforation and abdomen was performed—his total time in the operating theatre being one hour.

The patient was kept under mild hibernation, chlorpromazine hydrochloride, 25 mg., and promethazine hydrochloride, 25 mg., once a day, for seven days. For the first 24 hours he was nursed without blankets, being covered by a sheet only. In the first 48 hours urinary secretion was very low and caused some anxiety, but its return to normal on the third day suggests that the trouble was due to the prolonged hypotension. A severe ileus developed on the second post-operative day; intermittent gastric suction and fluid and electrolyte replacement were continued for nine days. During this period his blood pressure was maintained at 120 mm. Hg by regulating the speed of fluid replacement. There was no rise of temperature at any time. He was discharged on the twentieth post-operative day in very good condition, and has made satisfactory progress.

Case 2

A man aged 82 was admitted to hospital in a collapsed condition with a history of four days' abdominal pain and faecal vomiting. His pulse was weak and irregular, and his blood pressure was 80/66. His colour was poor, and the skin cold and clammy. On examination of the abdomen a firm swelling was felt on the left side above the left inguinal ligament. He had a history of left inguinal hernia, but there was no evidence of strangulation. He had suffered from auricular fibrillation for four years. A Ryle's tube was passed with intermittent aspiration. Standard resuscitation was carried out for five hours with little improvement, and operation was considered to be essential and hibernation the method of choice.

The patient was brought to the theatre and 5 ml. of hibernation mixture was injected slowly. The blood pressure fell to 30 mm. Hg, and 2 pints (1,140 ml.) of blood was run in very fast concurrently, and within five minutes a blood pressure of 70 mm. Hg was recorded. When a total of 15 ml. of the mixture had been given it was possible to intubate the patient and to begin operation, the blood pressure being 80 mm. Hg. Anaesthesia was maintained with a 50% mixture of N₂O–O₂. No other agent was required. On opening the abdomen a considerable amount of pus was

found in the peritoneal cavity. Massive oedema and inflammation of the pelvic colon were present, probably from a perforated diverticulum. The picture appeared to be so hopeless that the temptation was to close the abdomen, but a transverse colostomy was performed. No relaxant was needed for the closing of the abdomen. During the operation 4 pints (2,270 ml.) of blood was administered, and the systolic blood pressure was steady at 100 mm. Hg. The pulse continued to be irregular, but it improved with 0.4 g. of aminophylline in a drip and 0.25 mg. of digoxin intravenously.

The patient was kept under mild hibernation for nine days, receiving chlorpromazine hydrochloride, 25 mg., and promethazine hydrochloride, 25 mg., four times in the first day, three times in the second, and only once daily for the remaining seven days. During this time he was very quiet and easily aroused; there were no technical difficulties with the intravenous therapy, the same needle being used for three days. He made an uninterrupted recovery and was discharged four weeks after operation.

Case 3

A man aged 63 was admitted to hospital complaining of severe abdominal pain, with a thready rapid pulse, tending to disappear, and a blood pressure of 90/70. There was a history of sudden onset of severe pain in the left iliac fossa six hours previous to admission. Examination of the abdomen showed a swelling in the left iliac fossa, but palpation was difficult owing to the size of the patient—17 stone (108 kg.). Intravenous therapy and general resuscitative measures were started, but his condition gradually deteriorated. A diagnosis of ruptured aneurysm was made, and it was decided to operate under hibernation.

On his arrival at the theatre 2 pints (1,140 ml.) of blood was given concurrently and 8 ml. of hibernation mixture administered. The speed of the drips increased automatically; the patient became warm and pink and the blood pressure was 80 mm. Hg. He then received a further 18 ml. of hibernation mixture, and was intubated and moved to the operating table on a N_2O-O_2 50% mixture. It was apparent that he was still bleeding, as the blood had to be run in very fast to maintain the blood pressure at 80 mm. Hg after the sympathetic block was complete.

Before opening the peritoneum thiopentone, 150 mg., and D-tubocurarine chloride, 5 mg., were given. There was a huge retroperitoneal haemorrhage, but the obesity of the patient made palpation of the aneurysm extremely difficult. The operation continued for six and a half hours, the patient receiving 9 pints (5.1 litres) of blood, but, apart from 50 mg. of suxamethonium chloride for closing the peritoneum, no further anaesthetic was needed. The technical difficulties of ligating the left common iliac artery above the level of the aneurysm were such that it was decided to insert fine stainless-steel wire into the aneurysm. While this was being done the pulse suddenly became extremely irregular. X-ray examination showed that the wire had entered the auricle via the inferior vena cava; its removal was technically very difficult, owing to tangling. A further attempt at ligation above the aneurysm stopped all bleeding and pulsation from the aneurysm. One hour after the patient was moved off the operating table he collapsed suddenly and died. It is believed that the wire had caused clot formation in the inferior vena cava, but unfortunately a post-mortem examination was not possible.

Technically the whole operation was extremely difficult owing to (1) the patient's obesity, (2) the massive retroperitoneal haemorrhage, and (3) the size of the aneurysm, which appeared to originate from the left common or internal iliac artery and completely filled the pelvis and left iliac fossa, making "landmarks" impossible to find. Though the patient died, we believe some form of treatment was essential, as he would most certainly have died without operation. His condition during the operation was excellent, and the value of the hibernation technique for such cases was clearly demonstrated.

Comment

The clinical picture presented by these three cases is of relatively common occurrence in a general hospital when the decision to operate is often influenced by the superimposed risk of general anaesthesia. This, while producing a further deterioration in the patient's hypotensive state, offers no solution to the problem of speedy and safe fluid replacement.

The dramatic improvement in the patients' condition, occurring as it did as a result of the sympathetic block and before the benefit of the restored fluid and electrolyte balance could be experienced, was most impressive. It is of the utmost importance to ensure that the replacement of fluid keeps step with the enlargement of the vascular bed resulting from the sympathetic block, and to this end the induction of hibernation must be performed very slowly and with constant supervision of the blood pressure. The speed and relative safety of fluid replacement are an important factor throughout the management of these cases.

Summary

Three cases of severely shocked patients who had operations performed under "hibernation" are described. Dramatic improvement in the patients' condition occurred before completing the induction of hibernation.

The ease of fluid replacement during the operation and in the post-operative period was a vital factor.

The smooth course of anaesthesia in all cases was very impressive.

The post-operative course of these severely ill patients was practically without incident. They were restful and free from worry, requiring little nursing care and no sedative or analgesic drugs apart from small doses of chlorpromazine hydrochloride and pethidine.

I should like to thank Mr. Eric Fenelon for allowing me to publish these three cases and for his helpful co-operation, and the resident and nursing staffs of the Adelaide Hospital for their unremitting care and interest during the conduct of the cases.

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Medical Memoranda

Benign Multilocular Intraperitoneal Air Cysts Simulating Carcinoma of the Colon

Air cysts of the abdominal cavity and parietes are apparently rare. A comprehensive account and discussion of some is presented by Koss (1952). They are normally chance findings at operation or necropsy, and the correct pre-operative diagnosis is seldom made. The following case is an example.

CASE REPORT

A married woman aged 61 was admitted to hospital as an emergency on July 7, 1954, complaining of bouts of colicky upper abdominal pain, vomiting, and a feeling of fullness in the epigastrium for a month before admission. The pain occurred in sudden attacks, four or five times a day, each attack lasting about ten minutes. She was symptom-free between attacks. There was no shoulder pain or any history of jaundice. She had complained of dysuria for three weeks before admission but no longer suffered from it, and had been constipated for as long as she could remember and was addicted to aperients. There was no recent change in bowel habit or any history of recent loss in weight.