and the ulcer was healed within three weeks. He has been seen since on many occasions, and when last examined, seven years after the operation, he was in good general condition, able to do some work and to walk at least 300 yards without trouble.

Prognosis

The prognosis of this form of thrombosis may be described as good with regard to the life of the limb, but as poor with regard to function. Some degree of claudication and restricted use is the rule.

Summary

A condition of sudden thrombosis in the arteries of the extremities is described and treatment is discussed. For the more severe and persistent disabilities section of the sympathetic supply is advocated.

VOLVULUS OF CAECUM, ASSOCIATED WITH PUTRID PUERPERAL ENDOMETRITIS AND GANGRENOUS VULVITIS

BY

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The following case should prove of interest to the consultant obstetrician as well as to the general practitioner.

Case Report

A primigravida aged 38 was admitted to St. Helen Hospital at 3 p.m. on November 19, 1940, with "obstetric shock and complete perineal tear." About seventeen hours before admission she had been delivered, with forceps, of a stillborn infant twenty-two inches long. The delivery had been difficult—the head at 10.40 p.m. and the shoulders at 11.20 p.m.

On admission she was extremely ill, restless, dyspnoeic, cyanosed, and toxæmic. Her temperature was 97°, pulse 132, and respirations 32. The heart sounds were rapid, soft, and muffled in character, with systolic bruits over the praecordium. The chest was clear, but there was extreme gaseous distension of the abdomen, with generalized tenderness but no rigidity. Vaginal examination revealed a stinking lochial discharge and a complete perineal tear, the edges being black and gangrenous for half an inch on each side. The infection must have been very virulent to cause gangrene within seventeen hours of delivery.

Owing to her extreme restlessness 1/3 grain of morphine was prescribed. Mixed anti-gas-gangrene serum (40,000 units) was injected intramuscularly and subcutaneously, compresses of 50% aqueous urea solution were applied locally to the perineum, ergometrine was given, and she was nursed in the high Fowler position. I was greatly interested in her pronounced abdominal distension, as within the previous two years I had seen the following three cases, in which this extreme distension was a prominent feature:

Case A.—A multigravida with obstetric shock. Forceps had been applied by her own doctor with the head "floating" and the cervix not fully dilated. A deep left lateral cervical tear was caused, opening up the base of the broad ligament, with rupture of the cervical branch of the uterine artery, producing a huge retroperitoneal haemorrhage extending from the pelvis to the left perinephric region. In this connexion Berkeley, Bonney, and MacLeod (1938a) state: "It is important to remember that haemorrhage under the peritoneum produces even more marked flatulent distension of the intestines than that taking place into the abdominal cavity, and if the patient lives long enough this will be a very pronounced sign."

Case B.—A primigravida with a complete perineal tear (after difficult forceps delivery for an occipito-posterior presentation). She had puerperal pyrexia, phagedaena of the perineum, and extreme abdominal distension, which had been

diagnosed as pelvic peritonitis. She was extremely ill and toxæmic, vomited excessively, and looked so much like a case of paralytic ileus that I decompressed her gradually, using Holt's modification of Wangensteen and Paine's technique (Holt, 1936). She was completely deflated within twelve hours, and made an uneventful recovery under the usual routine treatment.

Case C.—This patient had puerperal pelvic peritonitis due to haemolytic streptococcal infection which cleared up after suprapubic drainage under local anaesthesia and sulphonamide therapy. In this respect Berkeley, Bonney, and MacLeod (1938b) state: "Great difficulty is experienced in diagnosing the presence of peritonitis [in the puerperium] and its characteristic signs, since those of rigidity and acute tenderness are frequently absent. The patient usually complains of abdominal pain, though tenderness is not pronounced. On the other hand, distension and the presence of diarrhoea are highly suggestive."

Bearing these three cases in mind, I carefully exposed the cervix with a speculum and found it to be intact. At the same time cervical and vaginal swabs were taken for culture. A tentative diagnosis of post-partum paralytic ileus or of post-partum peritonitis was made. Throughout her stay in hospital the patient did not vomit.

Slow intestinal decompression by the Holt-Wangensteen-Paine method of suction by duodenal tube was instituted, and, while the apparatus appeared to be working satisfactorily, there was not the dramatic deflation that was seen in Case B, although the abdominal distension was not so pronounced as on admission. The duodenal tube was left *in situ* for twenty-four hours. The patient's general condition improved, but her temperature began to rise. A further 40,000 units of anti-gas-gangrene serum was injected, and 1 gramme of sulphanilamide was given four-hourly. She took nutritious drinks and light diet readily.

The patient became very restless in the early hours of November 21, and morphine 1/3 grain was administered. At 10 a.m. she collapsed and was given a hypodermic injection of atropine 1/100 grain, adrenaline 5 minims, and strychnine 1/60 grain, this being repeated four-hourly for six doses. Later in the day 30,000 units of anti-gas-gangrene serum was injected. She was very restless and the abdominal distension had increased. I considered it unwise to give her enemata, as the bowel contents would be returned via the vagina and probably aggravate the local gangrenous condition. At 6 p.m. she was extremely ill, with rapid thready pulse and cold and clammy skin. A pint of human citrated plasma, Group A(II), was given intravenously, followed by a small suprapubic incision and drainage under local anaesthesia. A large quantity of sero-sanguineous fluid escaped, some of which was sent for examination and culture. The tentative diagnosis of peritonitis appeared to be justified. On return from the theatre her general condition was improved, but the abdominal distension was still severe. A further 40,000 units of anti-gas-gangrene serum was given intramuscularly and 20,000 units intravenously. Her general condition became poor again at 9 p.m., and 1½ pints of Group A(II) citrated plasma was given intravenously, followed by glucose saline drip. She improved for a few hours, then gradually became worse in spite of stimulants, prontosil soluble, and calcium gluconate therapy. She died at 11.50 a.m. on November 22.

At necropsy a volvulus of the caecum and about two inches of the ascending colon was found, with a twist of one and a half turns. The caecum was enormously distended, its walls showing patchy areas of haemorrhage, but there was no gangrene. The apex of the volvulus appeared to be the site of a mass of inflamed tuberculous mesenteric glands. There was a gangrenous vulvitis and vaginitis with putrid endometritis. The pelvis was a typical small one, through which an average-sized foetus would be delivered with great difficulty. Culture of the cervical and vaginal swabs gave a growth of haemolytic and non-haemolytic streptococci, staphylococci, and *B. welchii*. Culture of the peritoneal fluid produced a growth of haemolytic and non-haemolytic streptococci, *B. coli*, and *Staph. albus*.

An inquest was held, and the midwife who had supervised the patient ante-natally gave the following facts in her evidence: (i) The patient had vague pains on November 11. (ii) The pains had gone on the 12th. (iii) On the 14th an enema was returned clear. (iv) The membranes ruptured on the 16th—no pains. (v) Pains began again on the 17th, but were weak and

irregular. The bowels had not acted. An enema was returned clear. (vi) The patient fell out of bed on the evening of the 17th and broke an iron fender in her fall. The midwife noticed that the abdomen seemed larger after this accident. On being questioned she stated that the distension was more pronounced below the umbilicus—no bruising was seen on the abdominal wall. The midwife was not aware of the post-mortem findings.

Discussion

The most interesting question is, When did the volvulus occur? Had the injury on the evening of November 17 pre-disposed to this condition? The bowels had not been opened from November 14, when the result of an enema was clear. Clifford White (1914) recorded a case of volvulus of the caecum that was not diagnosed before operation, and asked, "When did the volvulus occur?" Margaret Basden (1934) reported the case of a woman in labour in whom laparotomy (and Caesarean section) was done for a suspected intra-abdominal condition and a volvulus of the caecum was found at operation. J. H. Spence (1937) quoted a case of volvulus shortly after delivery in which too much attention was paid to the associated uterine infection. He stated that "during pregnancy and the puerperium there should not be much delay in performing laparotomy in doubtful cases."

Extreme abdominal distension occurring in the puerperium may be due to (1) pelvic peritonitis; (2) a condition simulating paralytic ileus; (3) retroperitoneal haemorrhage from extraperitoneal rupture of the uterus; (4) an intra-abdominal catastrophe such as volvulus of the bowel; or (5) a combination of (1) and (4) or of (1), (2), and (4). The cause of the distension may be difficult to assess. Retroperitoneal haemorrhage would be suspected from the history of the labour and speculum examination under a good light. If the diagnosis is still in doubt intestinal decompression for twelve hours should be attempted. If dramatic deflation does not follow, it would be advisable to do a laparotomy. The error in the above case was in performing a small suprapubic incision for suspected peritonitis instead of a laparotomy. Even if a diagnosis of peritonitis is reasonably certain it seems preferable to do a laparotomy so as to exclude any associated abdominal condition.

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GIFT OF OXYGEN INSTALLATION TO HOSPITAL

• A complete installation for oxygen and nitrous oxide has been presented to the Royal Infirmary of Edinburgh by Colonel S. J. L. Hardie, chairman of the British Oxygen Company. It incorporates three miles of copper pipe-line running to various parts of the building, and has 342 points, including points at bedsides in the wards where oxygen can be obtained, and in the theatres, for oxygen and nitrous oxide. There are two manifolds, one for the surgical side and the other for the medical, where big cylinders are housed in banks of four. If a bank of four oxygen cylinders begins to run low an automatic warning is given, a reserve bank of four cylinders comes into operation, and the four exhausted cylinders are replaced by four full ones, which in their turn become the reserve. Normally the cylinders require replacement every three or four days. Oxygen can be obtained at the bedside only when the valve attached to the ward has been turned on by the sister in charge. The oxygen is administered through a mask of American pattern, leaving the patient's mouth free, so that he can eat if necessary while breathing oxygen through the nose. At the opening ceremony the thanks of the managers to Colonel Hardie were expressed by Mr. John R. Little, chairman of the Royal Infirmary Board.

SOME FACTORS AFFECTING THE INCIDENCE OF POST-ANAESTHETIC VOMITING

BY

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The purpose of this article is to bring forward, with the aid of illustrative series of cases, some facts about post-anaesthetic vomiting which are well recognized, and some which I think have been less well recognized in the past. I shall try to show that the incidence of post-anaesthetic vomiting is modified by such factors as the anaesthetic used, the operative procedure, sex, etc., in a manner which does not seem to have been fully realized hitherto.

The cases making up these illustrative series are drawn from the anaesthetic records of the Westminster Hospital and from personal records obtained in the E.M.S. maxillo-facial unit to which I am attached.

Figures given regarding the incidence of post-anaesthetic vomiting vary widely according to their source, and also according to the observer's view as to when true post-anaesthetic vomiting begins and when it ends. The figures quoted below are from unselected series (except where otherwise stated), and represent anaesthetics, anaesthetists, and surgical procedures of every type and degree. The record is absolute—i.e., the patient who vomits once after the first post-operative drink is said for the purpose of obtaining these figures to have vomited once. In addition I have visited all cases in these series, whether referred to directly or indirectly, in an effort to eliminate any varying personal factor that might well arise if more than one investigator had been concerned.

First, taking as a basis 1,000 consecutive cases, the following figures for the incidence of post-anaesthetic vomiting were obtained:

Nausea only..	..	..	..	..	2.6%
Vomited once only..	..	..	..	..	15.7%
Vomited 2 to 5 times	..	..	..	..	20.9%
Vomited more than 5 times in less than 18 hours	..	..	..	..	6.5%
Vomited more than 5 times in more than 18 hours	..	..	..	..	0.8%

These degrees will be referred to as N, 1, 2, 3, and 4.

Secondly, it was decided to take four anaesthetic sequences: nitrous oxide, oxygen, and ether; pentothal, nitrous oxide, and oxygen; pentothal, nitrous oxide, oxygen, and ether; and pentothal, cyclopropane, nitrous oxide, oxygen, and ether. In all the series 100 consecutive cases of each anaesthetic sequence have been taken (see table on opposite page).

Series II and III.—It will be seen from the table that, as might be expected, the use of nitrous oxide, oxygen, and ether produces the highest incidence of post-anaesthetic vomiting. But it is rather surprising to find that the preliminary addition of pentothal sodium (the dose varying from 3.5 to 12 c.cm. of 5% solution) reduces the incidence by almost 20%. From the work of Seeley, Essex, and Mann (1936) this effect might well be considered possible, but that it is so great is indeed surprising.

Series IV.—The next effect that stands out is that, contrary to the opinion of some anaesthetists, the addition of cyclopropane to the anaesthetic sequence appears to have little effect on the post-anaesthetic vomiting rate. This may be because a large proportion of these patients suffered only a relatively small degree of surgical trauma; but this may well be offset, at any rate in part, by the fact that