the levatores ani muscles, in order to bring these muscles and the posterior vaginal wall into close apposition (Fig. 3). The skin edges are next united with interrupted catgut sutures and the silkworm-gut sutures tied through small pieces of india-rubber tubing, thus completing the operation (Fig. 4). The last or most posterior silkworm-gut suture is passed so as to prevent the anal orifice falling backwards, which is not infrequent after operations for complete rupture of the perineum. Catgut may also be employed for this suture.

A "sacral anus" is a complication which should not be encountered where the necessary precautions have been taken during the operation to restore the anal canal. After this operation I believe it is best to refrain from administering purgatives at least for some days in order that healing may remain undisturbed. Should the patient be uncomfortable in consequence of the bowel not acting, warm olive oil should be run into the rectum through a small india-rubber tube, and a dose of castor oil given by the mouth. The bowels should afterwards be kept acting by a gentle laxative.

The result of the operation described was completely satisfactory, the wounds healed well, and there was complete sphincteric control. The patient has been enabled to be about and lead an active life, whereas formerly she was more or less of an invalid, spending most of her time either in bed or on a couch, and being forced to give up her business in consequence of her physical suffering.

When writing this paper I received unexpectedly a letter from this patient, in which she states:

"I am writing to tell you the operation has proved a perfect success. It was some time before the bowels acted naturally, but now I am like another woman. I was a long time making up my mind to the operation, but I am glad I did, and I am very grateful to you for your care and skill. I only wish other sufferers knew the benefit."

Although this type of operation remedies the anatomical defects which seem to accompany this variety of prolapse, yet congenital predisposition is an etiological factor which cannot be overlooked, for these two women were sisters, and I am informed that another sister and two cousins suffer from rectal prolapse. Exercises to cause contraction of the levatores ani muscles and sphincter ani should be practised after this operation, and such exercises are still more necessary in the presence of congenital muscular weakness. Finally, this operation offers a prospect of cure, not merely to the surgical derelicts cast adrift because of the failure of other methods, but to those who bear their suffering not knowing that anything can be done for their relief, as well as to those who from knowledge of failures have lost faith in modern surgery.

SPIRIT AND BIPP TREATMENT.

BY

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PROFESSOR RUTHERFORD MORISON's bipp treatment is not, I think, always clearly understood, and if employed haphazardly and without attention to detail may be disappointing. The following case, which recalls that of Dr. Monica Bell and Professor Morison (December 10th, 1927, p. 1077), shows a remarkable result obtained by the use of this procedure.

On December 7th, 1927, a feeble old lady of 77 was knocked down by a motor lorry and sustained a severe compound comminuted fracture of the lower end of the right tibia and fibula, involving the ankle-joint. She was brought into the Barry Surgical Hospital suffering from shock and haemorrhage. Although a rough tourniquet had been tied round the leg the wound was still bleeding, and there was evidence from the saturation of her clothes that the haemorrhage had been profuse. A large dose of morphine and atropine was administered, and a more efficient tourniquet applied. At the end of about one hour she was sufficiently recovered from the initial shock to justify operation.

Under gas and oxygen the wound was freely opened up and the bleeding points secured. The bone was found to be badly comminuted, and many completely detached loose pieces were removed; other fragments showing a reasonable attachment to the periosteum were left. Attention was now directed to the rest of the wound. The skin edges were excised, and badly lacerated portions of muscle and fascia were removed. Fortunately it was possible to save the anterior tibial nerve; this had been completely

stripped by the violence of the injury, but remained in continuity. The wound was now freely swabbed out with methylated spirit, after which it was carefully dried, one or two additional bleeding points being secured at the same time. (There is always a fair amount of bleeding after the application of spirit.) The wound was temporarily packed with dry gauze during the changing of the gloves and towels. On resuming, a small quantity of bipp was introduced into the cavity, and thoroughly rubbed into every available nook and cranny. Lengths of thick linen thread were carefully bipped, and by their means the skin edges were roughly approximated; owing to the loss of tissue accurate apposition without tension was not possible or desirable. The dressing consisted of long pads of gauze freely soaked in spirit, each pad being liberally sprinkled with boric powder. The pads were laid along the wound and did not encircle the limb. A top dressing of wool was temporarily held in position by a bandage.

The plasters were applied as follows. The first plaster extended from above the wound to above the knee—the knee being slightly flexed during the application. The plaster was reinforced with thin laths of wood. The second plaster encircled the foot below the wound. Traction was now made on the foot by means of a weight and pulley, and when alignment of the foot was perfect the intervening space was rapidly filled in with the third plaster. Before the plasters were firmly set a large window was cut out over the wound, and the whole case was divided longitudinally from top to bottom. This division was continued through the wool and bandages until the skin was exposed. This step was an important one in view of the possibility of subsequent swelling, and the very real danger of gangrene in a patient of this age.

The patient stood the operation well, and returned to bed in a fair condition. Before leaving the theatre 500 units of antitetanic serum were injected. I would now also employ anti-gas gangrene serum, but I did not have a stock in readiness at the time.

Prognosis.—The prognosis given to the relations was a bad one. Apart from the immediate dangers of shock and haemorrhage, there remained the possibility of gangrene, and later of severe sepsis with osteomyelitis. At best only healing by granulation could be hoped for, and a very poor functional result.

Progress.—The old lady remained very feeble and debilitated, but no special pain was felt in the foot, and the temperature caused no alarm. There was some trouble with the bladder and bowels. On the seventh day—more from curiosity than necessity—I removed the dressing. The wound was quite dry. The skin was healthy right up to the cut edges, between which lay a hard dry mass of coagulated blood. I took out the stitches and dressed the wound with spirit gauze and powder. A week later a similar dressing was applied. From start to finish not a bead of pus or even serous oozing occurred. At the end of a month the splint was removed daily for massage, and a fortnight later discarded altogether. At the present time she can bend her knee to a right angle, and can voluntarily move the foot through 30 degrees. The wound is healed and the fracture firmly united.

Comments.

The technique used in this case was almost identical with that instituted by Professor Morison at the Northumberland War Hospital. Points to notice are:

1. The full excision of the wound.
2. The liberal use of spirit.
3. The small quantity of bipp required. This must be well rubbed into the exposed surfaces and no excess left.
4. The use of bipped sutures; this prevents infection of the needle holes and the spread of sepsis from the skin to the deeper structures.
5. The dressing with spirit and boric powder.
6. The absence of any encircling bands round the limb.
7. The infrequent dressing of the wound.

The last requires courage, but is most essential if secondary infections are to be avoided.

AN ATYPICAL CASE OF HYPERGLYCAEMIA IN GENERAL ANAESTHESIA.*

BY

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THE unusual extent of the increase in the blood sugar during general anaesthesia in the following case, combined with the absence of glycosuria or of any untoward symptoms, make it worthy of record.

A woman, aged 50 years, was the subject of a major operation on account of gastric ulcer, hour-glass stomach, and chronic appendicitis. She was prepared for operation in the normal manner, having no food on the morning of operation, and receiving 1/4 grain morphine and 1/100 grain atropine about an hour previous to the administration of the anaesthetic.

* This case is one of a series in a research towards the expenses of which a grant has been made by the British Medical Association.

Urinary tests before operation showed no abnormality as regards the presence of albumin or of sugar. Induction of anaesthesia was by chloroform-ether mixture, and then ether was employed to maintain the anaesthesia. Blood samples were taken from the finger before, and at intervals during and after, operation, and the blood sugar content estimated by MacLean's method. At the end of operation, which consisted of partial gastrectomy, gastro-enterostomy, and removal of the appendix, since shock was present, she received a rectal saline injection, containing 5 per cent. glucose. The first two urines passed by the patient after the anaesthetic were collected and tested for glucose by the fermentation test and by Fehling's test (Bertrand's modification). The result with each test was negative. Albumin, acetone, and diacetic acid were similarly found to be absent. The patient made an excellent recovery from the operation, and was discharged later from hospital in a reasonable state of health.

The time record for this case is as follows :

Time in minutes.	
0	First blood sample taken—0.150 per cent.
10	Induction of anaesthesia begun with CE mixture.
30	Change over to closed ether.
50	Second blood sample—0.181 per cent.
75	Third blood sample—0.260 "
85	Fourth blood sample—0.350 "
100	Anaesthetic stopped.
105	Fifth blood sample—0.386 per cent.
105	Rectal saline with 5 per cent. glucose.
280	Sixth blood sample—0.229 per cent.

Commentary.

This case, which forms one of a series in an investigation into the blood sugar changes in general anaesthesia, is interesting for the following reasons.

First, it is an example of the fact that general anaesthesia, whether by chloroform, ether, or CE mixture, is accompanied in practically every case by an increase in the concentration of the sugar in the blood, manifest within a very few minutes of induction, and continuing, within limits, throughout the period of anaesthesia.

A. Blood sugar curve of case as here described. Anaesthesia lasted for eighty-five minutes. Sugar absent from urine, both before and after anaesthesia. This curve, which is unusually high, may be compared with the two following curves, which are more typical of those found in the longer anaesthesias.

B. Blood sugar curve in a case of gastro-enterostomy, on a man aged 60, for malignant stenosis of the pylorus. Anaesthesia lasted for fifty-five minutes, and a rectal saline was given as in Case A. Urine did not ferment with yeast after operation.

C. Blood sugar curve in a case of hydatid disease of the liver in a man aged 35. Anaesthesia lasted for seventy minutes, and there was no glycosuria before or after operation.

For purposes of comparison there has been superimposed upon the above curves and on the same scale that of curve D, which shows the course of the blood sugar after a 50 grams glucose meal, as carried out by MacLean (1925).

Secondly, this case demonstrates that the extent of the increase may be far above that caused by the giving of a 50 grams glucose test meal, as carried out by MacLean. This is well seen by comparison with MacLean's curve (curve "D" on the accompanying figure) and the curves of two other cases (curves "B" and "C"), in which anaesthesia lasted for about an hour. These latter curves are quite typical of the usual anaesthetic hyperglycaemia, and differ only from the case here described in the degree of hyperglycaemia recorded.

Thirdly, in this case the unusual amount of hyperglycaemia to 0.386 per cent. would lead one to expect some subsequent degree of glycosuria, if the doctrine of a renal threshold for sugar of about 0.180 per cent. is to be accepted in its entirety. But such glycosuria was proved absent in this case by the two chief tests for sugar. Like-

wise, in the two other cases the curves of which are shown here, although the renal threshold was exceeded for some considerable time there was no subsequent glycosuria. As urinary secretion is not usually suppressed in anaesthesia, curves such as these lead one to doubt the validity of the renal threshold value, or to postulate for the anaesthetized state the existence of some other factor as yet unexplained.

Summary.

A case of anaesthetic hyperglycaemia of great extent, and unaccompanied by glycosuria, is described.

I wish to thank Mr. Deanesly, F.R.C.S., honorary surgeon to the Wolverhampton and Staffordshire General Hospital, for permission to record the details of this case.

REFERENCE.

MacLean (1925): *Diagnosis and Treatment of Glycosuria and Diabetes.*

RUPTURE OF UTERUS EARLY IN THE FIRST STAGE OF LABOUR.

BY

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THE following case is reported because it is of interest from several points of view. In the first place, rupture of the uterus apparently occurred early in the first stage of labour before rupture of the membranes, and without any of the usual causes, such as malpresentation or disproportion between the size of the child and the mother's pelvis. Secondly, the patient had had ten normal labours previously; all were of short duration and free from complications. Lastly, she survived the rupture, though hysterectomy was not performed until twenty-four hours had elapsed from the presumed time of its occurrence.

The patient, a European woman, aged 36, was admitted to hospital at 12.30 a.m. on October 6th, 1927, for labour at full term accompanied by severe abdominal pain. She stated that two days previously she had not been feeling well, so took castor oil, which resulted in four motions, and at 6 p.m. slight labour pains commenced. At midnight the pains were more definite, but were not severe enough to require medical aid of any sort. At 2 a.m. on October 5th, after two or three sharp pains, she suddenly felt an acute pain of a different sort; after this the child seemed to alter its position to the upper part of the abdomen, and within two or three hours its movements ceased. At the same time bleeding began from the vagina, and pain was felt on taking each breath. A doctor was called in the morning, and after an injection she slept; the bleeding became less, but on waking she felt no better. She vomited several times during the day, and from 3 p.m. the vomit was dark brown. The bowels did not act that day. As her condition was becoming so much worse she was brought to hospital at midnight.

The past history was that she had had ten children, the last one two and a half years previously. All the labours were quite normal and quick. She had never needed instruments. The last menstruation had occurred in February, 1927.

She was of medium height and nutrition, and was evidently in great pain on admission, especially in the upper part of the abdomen, which caused her to cry out all the time. The pulse rate was 110, and the tension was fairly good. The temperature was 100.4° F. and the respirations 30. The abdomen was markedly distended, especially above the umbilicus, where the outline of the dilated stomach was clearly seen; there was great tenderness all over it. The child was lying transversely across the middle of the abdomen, and was felt just under the abdominal wall; it could be moved about easily, but much pain was caused. No foetal heart sounds were heard. There was a small quantity of bright blood coming from the vagina.

The patient was so restless that a little chloroform was given for satisfactory vaginal examination. The cervix was found dilated, and the placenta lying above it was almost completely detached. The otherwise empty uterus lay on the right. On the left the membranes led out through a large tear in the lower part of the uterus and cervix, and the child could be felt lying in the unruptured bag of membranes among the intestines. Fresh bleeding was caused by the examination. A catheter was passed, and two ounces of slightly blood-stained urine were drawn off.

It was decided to open the abdomen, and the patient was prepared at once. By that time her pulse had risen to 132 and was decidedly weaker. She had vomited coffee-ground material once. Saline injections were commenced, and a 6-inch incision was made in the middle line, two-thirds being below and one-third above the umbilicus. The child, a full-term female of normal size, was