if the ring is very large, an extra suture is put in on the outer side of the cord. A continuous suture of No. 0000 chromic 20-day catgut is inserted over the interrupted sutures, picking up the muscular margin and the inguinal ligament. When inserting the needle into the inguinal ligament, for both the interrupted and the continuous sutures, slightly different levels are taken to prevent splitting of the fibres. The remains of the cord are now laid back in this bed and the external oblique aponeurosis is sutured with No. 0 chromic catgut till the external ring admits the tip of the forefinger. The deep fascia is sutured with No. 0000 chromic catgut and the skin wound closed with interrupted silkworm sutures. After dressing, a firm spica bandage is applied.

After-care.—The stitches are removed on the 8th to 10th day and the patient is kept three weeks in bed, and a further two months must elapse before he starts heavy work. For the first week patients are nursed so far as is possible in the extended position, as it has been found that in some cases in which a knee pillow has been used or they have been allowed to sit up there is a complaint of slight discomfort in the groin of a dragging nature for a few months after the operation. After the first week, however, they can move about the bed as much as they care to do, although no special exercises are performed, but, when lying, the leg on the affected side should be kept extended. After leaving hospital the only instructions given are, for a period of three months, to lift no heavy weights which would necessitate their having to hold the breath to do so, as when the diaphragm is fixed in this manner a very considerable strain is put on the inguinal regions.

Points regarding the Operation

The *transversalis fascia* varies considerably in its strength. In some it is a good solid structure which could be used for repairing the posterior wall of the canal, but in the great majority it is thin, and by itself would be unlikely to stand up to much stress, particularly in cases of direct hernia. Bassini himself, however, used to divide the fascia and overlap it as well as bringing down the internal oblique muscle. This fascia is closely adherent to the under-surface of the internal oblique, and when this muscle is brought down there is bound to be a degree of plication and ultimate contraction. In cases in which the inner ring may be on the wide side and this fascia is of good quality there does not appear to be any reason why it should not be used for narrowing the ring, and in cases of direct hernia a wedge should be removed, after which the edges are sutured and the usual repair then done.

Internal Oblique.—When this muscle is brought down to the inguinal ligament before separating it from the external oblique there is often considerable tension, but once this manipulation is carried out remarkably little tension occurs in the great majority of cases. It has been contended that the margin of the muscle is destroyed and that its valvular function is diminished. This, however, is quite definitely not the case when the operation has been performed satisfactorily. The margin of the muscle does become stretched, attenuated, and fibrosed; but it forms a very excellent posterior wall to the inguinal canal, and if, in these cases, a finger is put into the internal ring and the abdominal muscles are contracted it is quite obvious that there has been no loss of function in the musculature of this region.

Occasionally at the inner angle considerable tension on the suture is present, and in these cases a flap from the anterior sheath of the lower rectus can be turned over to cover this defect, or a vertical relieving suture in the fascia can be made. In only one of the series quoted below was the latter procedure required.

Inguinal Nerve.—In all the cases cited below the ilio-inguinal nerve has been removed without any complaint afterwards of numbness or other symptoms. It is advisable to remove this nerve, for if it becomes incorporated in any fibrous tissue a very acute ilio-inguinal neuritis can be set up, and the canal has to be reopened and the nerve removed. Recently a patient had to be operated on for this complication after a Bassini operation had been performed elsewhere. As well as finding that the nerve had been incorporated in the external oblique sutures, it was noted how well the posterior wall of the canal and the internal ring were supported by the attenuated muscular bed.

Results

This paper is a review of 143 cases submitted to Bassini's operation since 1936, by either Mr. A. J. Hutton or myself, in Mr. Hutton's wards in the Western Infirmary. They included all types of hernia, both simple and strangulated, and all ages.

In the whole series there were two deaths, both of these in patients over 70 operated on for strangulated hernia.

A questionnaire was sent to all survivors, and 118 replies were received. Of these, eight had since died from some other cause than the hernia, which apparently was quite satisfactory at the time of their death, but they are not included in this list. In 10 cases the letters were returned "Not found," leaving 100 cases suitable for analysis. In the 100 cases 107 herniotomies were performed. These were subdivided as follows: bilateral, 7; right direct hernia, 8; left direct hernia, 6; right indirect hernia, 47; left indirect hernia, 32. Of this series 5 were recurrent and 11 strangulated. The age groups were: 10–20 years, 4; 20–30, 11; 30–40, 19; 40–50, 20; 50–60, 27; 60–70, 16; 70–80, 2; 80–90, 1.

Altogether there were three recurrences: the first of these was in a man 48 years of age, with a direct hernia and exceedingly poor musculature, and not really very suitable for this type of operation; the second, in a man of 65 who had had a bilateral operation nine years previously and had developed a recurrence with strangulation, also of the direct type of hernia, and with very poor musculature. The third of these patients, a man aged 62, returned to his work very shortly after operation and slipped while lifting a heavy weight, after which his hernia recurred.

The average time before resuming work was eight weeks, varying from three weeks to six months, and all returned to their normal occupations except four who were over 60, and of these two retired and two returned to lighter work.

Bassini's series of cases, numbering 216 simple herniae between 1884 and 1889, showed a recurrence rate of 3% and a suppurative rate of 5%. In the cases quoted above, beyond slight reddening of the skin round the silkworm sutures in a few cases, no further evidence of sepsis was found. At the Pio Istituto Bassini at Milan, where this operation is the method of choice, in a series of 10,000 cases, they state that the recurrence rate is between 1 and 2% for simple herniae.

Although figures can be very misleading they do give a fair indication when assessing results, and those quoted compare favourably with any given previously. This operation should therefore be considered as a standard operation and especially indicated in the middle-aged and old where a fairly satisfactory musculature is present. It must, however, be meticulously carried out to obtain satisfactory results. In fact, the tissues—both muscular and fascial—have to be exceedingly poor before the operation is contraindicated. The technique is easily acquired, and there is much less scope for error than in many of the procedures in common use to-day.

RELATION BETWEEN GASTRIC ACIDITY AND THE ANTERIOR-PITUITARY-LIKE HORMONE CONTENT OF URINE IN PREGNANT WOMEN

BY

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The earliest observations on gastric acidity in pregnancy were made in 1925 by Nakai, who showed that there was a striking diminution in both the free and the total acid content of gastric juice in response to a test meal. This was confirmed by Artz (1930) and Anderson (1932), both of whom drew attention to the fact that the lowest secretion of free acid coincides with the period of pregnancy when nausea and vomiting are common. Strauss and Castle (1932), investigating anaemia in pregnant women, confirmed that secretion is diminished, and further showed that there is a rise in secretion of free acid in the last month of pregnancy and a very great rise immediately after delivery. They also showed that the gastric response to histamine was greatly diminished.

In 1938, during a statistical investigation into the incidence of hyperemesis gravidarum, I noticed an extraordinarily high incidence of this disorder in patients who were suffering from

hydatidiform mole. Since hydatidiform mole is associated with the presence in the urine of large amounts of anterior-pituitary-like hormone it appeared to me that this hormone might be responsible for the low secretion of acid in the gastric juice.

Soon after this work was started an important piece of experimental evidence was published by Culmer, Atkinson, and Ivy (1939). They showed that in dogs with Pavlov pouches the secretion of free and total acid could be very greatly diminished, even after histamine, by the injection of fairly large amounts (1,000 to 5,000 rat units) of anterior-pituitary-like hormone. They were unable to produce this effect with any other hormone known to be secreted in excess during pregnancy.

It is well known that the secretion of anterior-pituitary-like hormone rises rapidly after the 28th day of pregnancy and reaches its maximum between the 56th and 84th days, when there may be as much as 50,000 rat units per litre in the serum, and the secretion in the urine may be as high as 150,000 rat units in 24 hours. Then there is a falling off, and at full term the amounts, although greater than in the non-pregnant, are comparatively small.

Method of Investigation

For the purpose of this investigation it was decided to correlate the secretion of free and total acid in response to a test meal with the secretion of anterior-pituitary-like hormone in the urine. Wartime conditions prevented estimations in units per 24 hours being made, so samples from 24-hourly specimens were taken and Aschheim-Zondek reactions performed on undiluted samples, and samples diluted 1 in 5, 1 in 10, and, in half the cases, 1 in 100. Since this high dilution gave almost consistently negative results it was abandoned. The technique of the test meal was that described by Dodds and Whitby (1931). Histamine was not used. Investigation was made of 63 patients, who gave no history of gastric disorders. Twenty-two were between the 35th and 40th weeks of pregnancy; 20 between the 20th and 29th weeks, and 21 between the 8th and 16th weeks. In addition four other patients were studied. One of these had a missed abortion and one a dead foetus at full term; one had a hydatidiform mole and one a chorion-epithelioma. Seven were studied at different stages of pregnancy and 12 before and after delivery or termination of pregnancy.

Results

Chart I shows the average secretion of free HCl, in three groups of patients, according to the period of pregnancy.

Chart I, showing average secretion of free HCl in three groups of patients according to period of pregnancy.

Group I (8-16 weeks) showed a maximum secretion of 0.023% HCl
 Group II (20-29 weeks) " " " 0.045% HCl
 Group III (35-40 weeks) " " " 0.079% HCl

Two normal pregnancies gave a positive Aschheim-Zondek reaction at 1 in 100; 28 were positive 1 in 10; 15 were positive

1 in 5, negative 1 in 10; and 18 were positive but negative in dilution. These cases form Groups A, B, and C in Chart II, which shows the average secretion of free HCl according to the degree of dilution in which the Aschheim-Zondek reaction was positive. Two cases positive 1 in 100 are included in Group A.

Chart II, showing average secretion of free HCl according to degree of dilution in which the A-Z. reaction was positive.

Group A—positive 1 in 10—shows a maximum secretion of 0.029% HCl

Group B—positive 1 in 5, negative 1 in 10—shows a maximum secretion of 0.044% HCl

Group C—positive, but negative in dilution—shows a maximum secretion of 0.079% HCl

In all three groups the maximum secretion occurred at 1 1/2 hours.

Chart III shows the average secretion of free hydrochloric acid in 12 cases immediately before delivery or termination of pregnancy and average secretion of same 12 patients one week after delivery.

Chart III, showing average secretion of free HCl in 12 cases immediately before delivery or termination of pregnancy and average secretion of same 12 patients one week after delivery.

pregnancy (maximum secretion 0.09% HCl) and the average secretion of the same 12 patients one week after delivery (maximum secretion 0.118% HCl). In these patients the Aschheim-Zondek reaction was completely negative on the second occasion.

The case with the dead foetus at full term and the missed abortion at 12 weeks both showed a normal response and had negative Aschheim-Zondek reactions. The chorion-epithelioma followed a hydatidiform mole. The patient was first seen three days after aborting the mole; the Aschheim-Zondek was weakly positive, but negative in dilution, and the maximum secretion 0.02% HCl. Six weeks later, when she had a large malignant mass in the uterus, there was complete achlorhydria, and the Aschheim-Zondek was positive up to a dilution of 1 in 100. Hysterectomy was performed, but the patient died after operation and no further studies were possible. The patient with the hydatidiform mole was not studied while the mole was present. When seen six months later the Aschheim-Zondek was positive up to 1 in 10 and the maximum secretion 0.124% HCl. No evidence of chorion-epithelioma could be detected at this time. Four months later the Aschheim-Zondek was only weakly positive and the maximum secretion 0.302% HCl.

The seven patients who were studied more than once in pregnancy showed a low secretion of acid (average 0.036%) when the Aschheim-Zondek was strongly positive in early pregnancy and a much higher secretion (average 0.078%) towards term, when the prolan secretion was very much lower. The total acidity ran a course very similar to the free acid, with the exception that it was depressed to a less extent and that the difference between the curves for high and low prolan concentrations was less than in the case of free acid.

Comment

The hypochlorhydria of pregnancy has been ascribed to the neutralizing effects of regurgitated duodenal contents. Bile appeared in fewer than 3% of my specimens, and some of these contained large quantities of free acid. Strauss and Castle (1932) also found but few bile-stained specimens, and are of the opinion that duodenal regurgitation is not the cause of hypochlorhydria.

Evidence is brought forward here to show that in human pregnancy there appears to be some relation between the free and total acid in the gastric juice and the amounts of anterior-pituitary-like hormone secreted in the urine, and that it seems to be inversely proportional. Further studies are being made.

I wish to thank the members of the staff of the Princess Mary Maternity Hospital, Newcastle-upon-Tyne, for allowing me access to cases under their care; my friend Dr. Frank Dickens for his advice and constant encouragement; Dr. Ruth Dearing and Dr. E. Wilkinson for their invaluable help in collecting specimens; and, last but not least, the 67 patients who so willingly submitted to these investigations.

The costs of this work were defrayed by a grant from the Research Committee of the Council of King's College, Newcastle-upon-Tyne.

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The 93rd annual report of the Board of Management of the Hospital for Sick Children, Great Ormond Street, says that during the period of the flying-bomb and rocket attacks as many children as possible were accommodated for safety in the various wartime country branches, but all the beds that could be made available in London were fully occupied. The hospital fortunately suffered only minor damage as a result of the attacks, and the casualty department gave service to many injured adults and children from outside. The report pays tribute to the late Sir Thomas Barlow, who was a member of the medical staff in various capacities for not less than 70 years, and continued to take a personal interest in the work long after his retirement from the active list. In the history of Great Ormond Street Sir Thomas held a unique position, for he was the last personal link with the founder of the hospital, Dr. Charles West, under whom he served in his earliest years. Another distinguished physician and very good friend was lost by the death of Dr. Hugh Thursfield, for 36 years an active, and afterwards consulting, member of the staff.

DIARRHOEA DUE TO GIARDIA LAMBLIA

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It had long been considered that the flagellate *Giardia lamblia* (which name is adopted here instead of *G. intestinalis* or *G. enterica*, as it is in more common use) was non-pathogenic, and Napier (1944) states that until recently he had questioned its pathogenicity except in children; but in the last few years, since the introduction of a specific treatment by Brumpt (1937) and Martin (1937), all his doubts have been dispelled. Manson-Bahr (1943), too, states that all authorities are by no means agreed as to the pathogenicity of *G. lamblia*. In 1942 a report was made to the Medical Research Council (Ormiston *et al.*, 1942) concerning an outbreak of enteritis due to *G. lamblia* in a nursery for evacuees.

The present series have been studied in the medical division of a British general hospital in India over a period of 18 months. During this period there were admitted 872 cases of diarrhoeal diseases; these were differentiated into the following classes:

1. Bacillary dysentery (Flexner, Sonne, Shiga, Schmitz, and Bayd) (4 of these had associated <i>G. lamblia</i>)	237
2. Clinical dysentery (Cases with an indefinite exudate, blood and mucus in the stool, but no isolated pathogenic organisms and no <i>Entamoeba histolytica</i>)	184
3. Amoebic dysentery (4 of these had associated <i>G. lamblia</i>)	158
4. Diarrhoea with no demonstrable organisms	272
5. Giardiasis	21

The proportion of cases in which *G. lamblia* was present was 3.32%. Napier (1944) records that in Calcutta, between 1935 and 1938, of 20,000 stools examined 6.27% contained *G. lamblia*. He does not state in how many cases the flagellate was associated with other diseases, but his series includes the stools of children, in whom *G. lamblia* occurs more commonly than in adults. The present analysis is confined to the cases in which no other cause was found to account for the diarrhoea. The total number of cases of giardiasis in this series was 21.

Symptomatology

Diarrhoea.—All cases had diarrhoea on admission, the number of stools varying from 3 to 12 in 24 hours.

Pain.—Six cases had no pain. In 15 pain of a colicky nature was complained of, with an urgent desire to go to stool. Evacuation of bowels relieved the pain. In only one case was tenesmus complained of.

Flatulence.—This was not a marked feature except in 2 cases.

General Malaise.—This was usual, but not so prominent as in cases of true dysentery of the same severity.

Fever.—Two cases had a mild pyrexia (100° F.), but in only one did this persist, and then for but four days.

Loss of Appetite.—This was noted only in cases which had been ill for a few days.

Vomiting.—None complained of vomiting.

The average duration of symptoms before admission was 5.5 days; limits, 1 to 35 days. The case lasting 35 days—that of a British officer—was exceptional, as most of the B.O.R.s were admitted on the first or second day of diarrhoea. The only system affected was the gastro-intestinal. The tongue was generally coated. In the abdomen no physical abnormality was detected in 10 cases. Sites of tenderness in the others were located as follows: Generalized, 2; R.I.F., 2; L.I.F., 1; in epigastrium and right hypochondrium, 6—the liver was palpable in two of these cases. In all but two cases the stools were watery faecal, rather paler than normal, but not approaching the colour or consistency of the stool of sprue. Generally they appeared greasy, but no fat estimations were done. In two blood and mucus were present, and in one mucus only. In two cases with a long history of continuous diarrhoea—35 days and 28 days—the stools were bulky, resembling those of sprue in consistency but not in colour.

In eight cases there was no history of diarrhoea previous to the present attack. The others gave a history of repeated