in infolding of the ulcer, excision, or destruction by means of the cautery. This line of attack should be pursued in all cases of haemorrhage. In America Balfour excises the ulcer by means of a diathermy knife, and this destruction of the ulcer is an additional safeguard in forestalling the onset of malignant change. More recently a bolder technique has been employed in the form of partial gastrectomy; the ulcer-bearing portion of the stomach is removed, and the remainder united to the jejunum. This method is particularly advocated by Sir Berkeley Moynihan and the Mayo brothers. Other operations have been devised to meet special contingencies, and many modifications of the technique have been suggested, into the details of which I do not propose to enter.

In dealing with the grosser complications, such as hour-glass stomach and adhesion of the ulcer to the pancreas and to the surrounding structures, no hard-and-fast lines can be laid down. Most of these patients, whose general condition is very poor indeed, have to be treated according to their special requirements, and the ingenuity as well as the finer sense of judgement of the surgeon may be taxed to their utmost limits. Finally, every operation should include a thorough exploration of the abdominal cavity, especially of the gall bladder and appendix, for it is useless to operate on an ulcer and leave such a focus of infection untreated.

Operative Findings.

There were 22 cases of ulcer of the lesser curve of the stomach. Of these, 2 were kissing ulcers, 2 were associated with duodenal ulcers, 4 were posterior, and 2 were hour-glass.

There were 23 cases of pyloric ulcer. Of these, 3 were posterior, 4 were multiple, 3 were pyloro-duodenal, 3 were adherent, and 5 were associated with stenosis.

There was one case of jejunal ulcer; this was due to a silk stitch.

Operative Procedures.

Operation.	Gastric Ulcer.	Duodenal Ulcer.	Carcinoma.
Posterior gastro-enterostomy ...	32	26	12
Anterior gastro-enterostomy ...	2	4	2
Partial gastrectomy ...	7	1	1
Sleeve resection ...	4	—	1
Pylorotomy ...	1	1	—
Ulcers excised ...	3	—	—
Ulcers cauterized ...	2	—	—
Ulcers infolded ...	3	3	—
Double gastro-enterostomy ...	1	—	—
Gastro-gastrostomy ...	1	—	—
With appendicectomy ...	—	5	—
Inoperable cases ...	—	—	11
Total cases ...	51	33	27
Deaths ...	3	1	1

Total mortality=4.5 per cent.

BRIEF REPORTS OF CASES.

Case 1.—C. S. for some years had had intermittent attacks of epigastric pain radiating to the back; it was of a drawing or burning character, and came on one to two hours after food; it was relieved by bismuth. The appetite was good, but the patient was afraid to eat; had lost 8 lb. in four months. There was tenderness over the epigastrium. X-ray examination suggested pyloric ulcer. Test meal showed delayed secretion for one hour, then hyperchlorhydria. At operation an ulcer was found just beyond the pylorus.

Case 2.—Mrs. F. C., aged 60, had suffered from indigestion for fifteen years. Immediately after food there was an intermittent heavy feeling in the epigastrium which radiated to the right iliac fossa; it was relieved by vomiting and hot drinks. Haematemesis had occurred on several occasions. The appetite was poor, and the general condition feeble; she had lost 4 st. in the last few years. X-ray examination revealed an hour-glass stomach. At operation a chronic ulcer was found on the lesser curve; sleeve resection was performed. (See Plate, Fig. 1.)

Case 3.—T. G., aged 63, for twelve months had had a gnawing pain three hours after food; it was relieved by taking food. The patient was awakened between 2 and 3 in the morning, and had been much worse in the nine weeks previous to seeking advice. Vomiting sometimes accompanied the pain. The appetite was good; there had been slight loss of weight; splash. X-ray

examination: seven hours' delay; ulcer crater on lesser curve; notch on greater curve. Operation, partial gastrectomy, revealed an ulcer on the lesser curve and a coexisting ulcer on the anterior inferior portion of the first part of the duodenum. The history suggested duodenal ulcer, but the x rays showed only gastric ulcer. (See Plate, Fig. 2.)

Case 4.—R. J., male, aged 57, had for two years had dull aching pain across the epigastrium and colicky pain across the lower abdomen. The pain came on two hours after food and was relieved by vomiting. The vomitus resembled coffee-grounds. He was afraid to eat, and had lost half a stone in three months. There was general tenderness over the abdomen. The x rays showed a filling defect of the stomach, with seven hours' delay. A test meal was not estimated owing to the presence of bile in each specimen. Operation showed that the filling defect was caused by a rolled up piece of omentum fixed to the pelvis and dragging on the stomach; the ileum and mesenteric glands were tuberculous. (See Plate, Fig. 3.)

(a)

(b)

(c)

Typical Test Meal Curves: (a) Duodenal ulcer; (b) gastric ulcer (no radiographic signs); (c) carcinoma of greater curvature.

Case 5.—E. A., male, aged 51, complained of pain of a tingling and later of a boring character localized to the left epigastrium and radiating downwards; it was relieved by various means. For the past twelve months it had come on once in every twenty-four hours, and he had induced vomiting to relieve it. His appetite was good, but he had lost 2 st. in three months. X rays revealed a typical lesser curve ulcer. The test meal showed very low acidity. At operation a large chronic ulcer was found high up on the lesser curve. (See Plate, Fig. 4.)

Case 6.—J. F., a woman aged 40, had for seven years had intermittent attacks of pain, lasting about a fortnight, with intervals of freedom lasting for several months. Pain of a sharp nature coming on half an hour after food, and aggravated by food, was relieved by vomiting; the pain extended to the shoulders. She had lost a good deal of weight; there was resistance in the epigastrium, and rigidity. Occult blood was present. X rays showed a stomach of small capacity; over seven hours' delay; large filling defect of pyloric antrum. Inoperable carcinoma. (See Plate, Fig. 5.)

Case 7.—Mrs. F., aged 53, for two years had had constant dull aching epigastric pain conducted to the back; it was increased by taking food and relieved by medicine. There was almost daily vomiting after food. The appetite was poor, and she had lost a stone in six months. She was anaemic and wasted, and had enlarged glands in the axilla and groin. A blood count showed lymphatic leukaemia. X-ray examination suggested an ulcer on the lesser curve. A test meal showed hypochlorhydria (see chart). At operation (lesser curve ulcer), posterior gastro-enterostomy, an indurated mass was found in the caecum. Microscopy of appendix—lymphatic leukaemia. (See Plate, Fig. 6.)

Note.—Many of these cases were collected while I was surgical registrar, and I am indebted to the surgical staff, especially Mr. H. S. Clogg, for their kind permission to publish them. Also to Dr. Russell Reynolds and Dr. S. Cochrane Shanks for their willing co-operation in the radiological examination, and to Mr. Jocelyn Patterson for the test meal results.

METHOD OF TREATING ASTHMA BY RADIATION. (Preliminary Note.)

BY

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THE amount of medical literature on the subject of asthma, and the number of methods of cure advocated from time to time, illustrate the humiliating fact that little is known of its pathology, and that no satisfactory line of treatment has been discovered. There are patients who pin their faith to one pet drug, which they hold in reserve, as they have found from experience that it gives some temporary relief of their distressing symptoms; others ever ready to try any new remedy; and lastly, those who have given up all remedies and simply "grin and bear it."

Let me state at once that I have no new theories as to the causation of asthma, but the results obtained from the

method about to be described lead me to believe that the primary cause will eventually be found to be metabolic, with or without some local irritation reflex.

As treatment by radiation is not based on any theory, it may be asked how the beneficial effects came to light. My attention was accidentally drawn to them some years ago while treating patients for carcinoma of the breast by a new method of application of x rays. Realizing that in malignant disease, unless efforts were made to prevent the formation of metastases, the patient would reap little benefit by concentrating on destruction of the primary growth, the question arose whether the patient could stand an efficient radiation over a large area, for the whole trunk at least would have to be covered. I therefore devised an apparatus, which was installed at the London Hospital, by means of which it was possible to subject the patient to what was, practically speaking, an x -ray bath. It was found that the dose could be administered up to certain limits without bad effects. Full details of this method were published in the *BRITISH MEDICAL JOURNAL* in 1921 (vol. i, p. 771). To explain its application to the treatment of asthma it will suffice to say that its essential details are a radiation field large enough to embrace the whole trunk, and the use of one tube in front and one at the back, both energized at the same time, followed by radiation in the same way from side to side. The results obtained in cases of breast carcinoma have been very gratifying, but do not concern me here. I intend to publish a report on them shortly.

Among the patients being treated in this way for malignant disease were some suffering from chronic bronchitis. Many of them volunteered the information that the treatment eased their breathing. Little notice of this was taken until one day a female patient became very profuse in her thanks, and insisted that the treatment had completely cured her asthma, to which she had been a martyr for some fifteen years. This aroused my interest, and I set about getting together some true asthmatic patients in order to test the method; this was slow work, but it was evident after the first few cases that radiation possessed some very definite influence on the disease. Beneficial results were experienced within a few hours of the first treatment—increased expectoration and decrease in the "tightness" of the chest.

So many organs and tissues are included in the radiation field by this method that it was impossible to suggest off-hand which organ or tissue was directly affected; radiation might be influencing the secretion of the ductless glands, or it might be setting up some complex influence on the spleen.

I have said enough to make it clear that I believe the influence of radiation on asthma to be complex, that it is not a direct influence on lung tissue, but some profound indirect or secondary change affecting the whole body. The patient, however, is naturally more interested in the practical results than with theories about them.

Technique.

Technique has been slightly modified from time to time. Experience with increasing numbers, however, has established certain factors.

(a) *Small Dosage.*—Originally the dose administered was the same as that for carcinoma of the breast—that is, 20 X through 4 mm. of aluminium measured on the skin, with 25 mm. spark-gap. This was found to be the maximum or tolerance dose. A certain amount of nausea and sickness usually followed, but this I considered unavoidable when patients were undergoing treatment for so serious a disease as cancer; but the question arose whether this disturbance was necessary in asthma. I reduced the dose gradually, and was surprised to find that half that originally used—namely, 10 X through 3 mm. aluminium—gave as good results in asthma, and did not cause any general disturbance.

(b) *Low Voltage.*—The large radiation area necessary, the general upset and risk of damage to deep structures, rendered high voltage undesirable.

(c) *Large Radiation Field.*—The necessity for the field to include practically the whole trunk must be emphasized, for I have demonstrated that radiation of the thorax alone does not give the results. I am not yet certain that there

is any special benefit in radiating with two tubes at once—one in front and one at the back—but it certainly saves time.

This dual dose of 10 X through 3 mm. of aluminium measured on the skin is administered once a week to the average case—twice a week if the case is severe. After the fourth dose an interval of two weeks is allowed, then it is repeated once a month for four months; after that the patient is instructed to come up as soon as any wheezing or "tightness" of the chest is noticed, when a further dose is given.

A general history of the case should be taken, and should embrace the family history; asthma is frequently found in other members. The type of patient and type of chest are noted, and a general radiological examination of the thorax made. Practically all cases so far examined have had a definite fibrosis of the roots of the lungs, but whether this is the cause or effect is doubtful.

Immediate Effects.

The immediate effects are experienced within a few hours of the treatment. The patients state that relief of the "tightness of the chest" is the first thing they notice. This is followed in twenty-four hours by an increase in phlegm. With the small dosage now used no nausea is experienced. So far all patients treated have obtained very definite relief and no bad attacks have occurred, but no doubt failures will occur as the numbers increase. No blood changes have been noted. A general improvement in the patient's condition is apparent. A definite increase in weight in most cases is an interesting secondary effect noted. A few of the earlier cases—those receiving the heavier dosage—developed what they described as attacks of acute bronchitis after the first course of treatment, but without any signs of asthma. I do not know whether this is to be looked upon as mere chance, or whether the heavier radiation was in some way responsible for the attacks. High voltage radiation is known to give rise occasionally to some form of fibrosis of the lung, but this is usually a gradual process, and not acute as in these cases. The fact that the later patients—those on the reduced dosage—have not experienced this complication rather strengthens the supposition that radiation had something to do with its production.

Later Results.

Of the twenty-one cases of chronic asthma of various types so far treated by radiation over a period of two and a half years, all except the two youngest had tried every form of treatment with little or no effect, and had given up all. As previously mentioned, all obtained relief of their symptoms, although the number of treatments necessary to get rid of the wheezing varied. The nearest approach to failure was with a patient of great size—he weighed about 19 st.—with a thorax like a barrel. I have heard from him recently that his asthma has greatly improved.

The youngest patient, aged 4 years, responded to an even smaller dose than that already mentioned.

Two sisters—martyrs to asthma for twenty and twenty-two years respectively—who had given up all work for many years as they expected to be in bed six to eight months in the year, made an immediate response. They have put on weight rapidly, and have once again resumed normal life.

A few weeks ago an ex-police constable was sent to the London Hospital. He had been discharged from the force as incurable. Cyanosed, painfully dyspnoeic, he presented a pitiful spectacle. His appearance a week after the first radiation was remarkable, for his colour and breathing were to all appearance normal. He is still under treatment, and it is hoped eventually to get him well enough to resume his duties.

A boy, aged 12, subject to hay fever, which apparently acted as the irritant factor to his asthma, had undergone various forms of treatment with no benefit. His worst time was during the summer months. He has so far had no attacks of hay fever or asthma, but as treatment was only commenced at the end of last summer the efficiency of radiation has yet to be put to the test.

These cases have been quoted to give some idea of the type so far treated.

It has been possible to keep in touch with practically all those treated up to date, as the majority of them are so afraid of becoming chronic invalids again that they readily carry out instructions and report themselves regularly.

I wish it to be clearly understood that what I have here written is but a brief summary of beneficial effects so far obtained in asthma by means of radiation applied in a manner not usually adopted. The number of cases so far treated (21) is too small and the time too short for any statement as to the permanency or true efficiency of the method to be made. It is hoped, however, that those who have access to a larger number of patients will give it a trial, so that a true valuation may be reached.

So far radiation applied as described has proved a valuable palliative agent; time will indicate its true curative value. Radiation attacks this distressing complaint from an entirely new angle, and while at present it is not based on any theory more light may be thrown on the cause if we eventually find out what influence small radiation doses over a large body area have on general metabolism.

Radiation, of course, has been tried before in asthma, and the results reported have on the whole been disappointing. Ramirez and Cole come to the conclusion that radiation offers no particular advantage over other methods, but that definite effects noted in some of their cases would indicate that a modification of technique might yield a more encouraging result. I believe the fault in the methods so far tried lies in the limited radiation field—that is, the lungs alone are looked upon as the site of the trouble. This, combined with overdosage, accounts for the poor results.

This preliminary note may encourage others to give the method a trial, but careful attention to essential details is necessary.

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HAEMATOMA IN THE ABDOMINAL WALL SIMULATING PELVIC NEW GROWTH.*

BY

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HAEMATOMATA in the lower part of the abdominal wall sometimes present such close resemblances to tumours of pelvic origin that very nice diagnostic problems may arise. Cuthbertson¹ has recently collected forty-one cases in women of which no fewer than twelve were diagnosed as ovarian cysts and ectopic gestation. In only three of the forty-one cases was the haematoma recognized before operation, while in two others it was suspected. Thus the recognition of this condition is clearly a matter of some difficulty, and one which has points of special interest for those who deal with the diseases of women. This is illustrated by a recent case.

A lady, aged 57, was quite well until she had a day of severe abdominal pain. She sent for Dr. Bennett of Hyde, who found a considerable swelling rising above the pubes on the right side. The pain subsided under treatment; but, two days later, diffuse black bruises appeared upon the surface of the lower abdomen. When I saw her during the following week there was a discoloured area, measuring about eight inches by four, containing many patches of subcutaneous haemorrhage. There was a rounded swelling above the pubes, mainly to the right of the mid-line. It resembled a four and a half months pregnant uterus in shape and size, but was more like a fibroid in consistency. The cervix was pushed forward by a cystic swelling, which could be felt in the pouch of Douglas. Thus the physical signs suggested the presence of a fibroid above and an ovarian cyst below. But when the patient was asked to sit up, and so brought the recti into contraction, the swelling above the pubes could still be felt, and it became quite fixed. This showed that it was really in the abdominal wall. The sudden onset of pain accompanied by the appearance of the lump and followed by the extravasation of

blood under the skin indicated that rupture of some fibres of the right rectus had occurred. The diagnosis, therefore, was haematoma of the abdominal wall, together with ovarian cyst in the pouch of Douglas.

The abdomen was opened through blood-stained tissues to the left of the swelling, the linea alba being displaced towards that side. A simple cyst of the left ovary was then removed. The uterus and right tube and ovary were normal. The appendix was removed, as it was involved with a portion of omentum, which was adherent near the internal abdominal ring. The haematoma lay within the right rectus, with a thick layer of muscle over it. The mass of blood clot projected into the abdominal cavity, with a thin layer of muscle and the peritoneum under it. The clot was turned out through a cut in the edge of the muscle. The wound was then closed in the usual way, a strip of gauze being left in the cavity of the haematoma for one day. Healing occurred quickly.

I once saw a case in which someone had diagnosed ovarian tumour in the absence of the patient's usual medical adviser, Dr. Robertson, then of Rawtenstall.

The patient was a stout, healthy woman, past the menopause, and she told us that the pain and swelling dated from a fall over a clothes-basket, which hurt her very much, but did not prevent her from finishing her washing. The right lower abdomen was quite dull and solid, as if the right iliac fossa was filled by a mass which rose above the umbilicus and crossed the middle line. The mass could still be felt, and became fixed when the patient sat up, and this sign, with the history of the fall, gave the diagnosis of haematoma. Expectant treatment was employed.

Later there was some constitutional disturbance, and the mass became softer. When I saw the patient again the physical signs were those of a large cyst adherent to the abdominal wall, and it was clear that the blood-clot had become infected and liquefied. An incision through the right rectus liberated a great quantity of chocolate-coloured pus mixed with blood-clot which had been distending a cavity walled in front by the rectus and separated from the abdominal cavity by peritoneum below and by peritoneum and the sheath of the rectus above.

I subsequently saw a similar case, and, in the light of previous experience, recognized it as an infected and liquefied haematoma, and arranged for the patient's admission to hospital. When she came in the lapse of time had introduced a new and disconcerting feature which rather shook the diagnosis, for the swelling, previously cystic, was now tympanitic. I remember the horror of some of those present when I incised this resonant area, and their relief when a blast of foul gas was followed by a gush of chocolate-pudding pus.

I once watched an operation after a very sporting diagnosis had been made—namely, myoma of the round ligament. The outcome was that the surgeon struck pus before he had cut through the abdominal wall. No doubt when he examined the patient the mass felt solid and closely resembled a fibroid. Infection and liquefaction must have occurred in the time that elapsed between the making of the diagnosis and the operation.

Infection does not always occur. Dr. J. W. Stenhouse had a patient, a healthy elderly lady, with a firm fixed swelling above Poupart's ligament which appeared suddenly with pain. We concluded that this was a haematoma, and it disappeared entirely in the course of a few weeks. When I was house-surgeon to the late Sir A. R. Simpson two students brought their old landlady to see him in the Buchanan ward of the Edinburgh Royal Infirmary. She thought she had strained herself while leaning out to clean a window. There was a lateral solid mass which seemed to rise out of the left iliac fossa and to be attached to the iliac bone. Simpson did not consider it suitable for operative treatment. He told us to strap her well up with strips of belladonna plaster. This gave her much comfort, and after a time she came back saying the plaster was too loose. It was renewed, and this happened two or three times. In the end the lump disappeared. These two cases stand out in my memory as the only disappearances of considerable lumps other than inflammatory deposits which I have personally observed. I believe they were both haematomas, though this was not proved by incision in either case.

As to the general aspects of the condition but little has been written; it is hardly mentioned in some textbooks and is treated briefly in others. Numerous cases have been recorded in the medical journals, most of which would seem to be the results of strains and accidents in men of active habits—cavalry soldiers, acrobats, and others whose occupation or sport demands violent effort. In women, on the other hand, the lesion occurs, apart from obvious

* Read before the North of England Obstetrical and Gynaecological Society, April 16th, 1926.