well; she has, however, not put on flesh, and occasionally has pains in the abdomen, but they have not been bad enough to induce her to seek advice.

This case is of interest, in the first place, because there are only some 70 cases of carcinoma of the whole small intestine below the papilla available in the literature. From the point of view of diagnosis, moreover, it presents noteworthy features. The characters of the vomitus were suggestive of dilatation of the stomach, but unfortunately they were not specially tested for bile. The character of the stools is difficult to account for; no evidence of disease in the pancreas was forthcoming, yet it is improbable that the adhesions around the gall bladder, extensive as they were, modified to any extent the amount of bile reaching the intestine. At the first operation the ascending colon was greatly distended, whilst the transverse was collapsed beyond the adhesions. The stomach was not as much dilated as was anticipated, and, although the whole abdomen was explored manually, the little tumour, subsequently found, was not then discovered. Two facts may be pleaded in extenuation of this failure. First, the adhesions formed such an obstruction to the pyloric region of the duodenum and to the colon as seemed adequate to account for the symptoms; and, secondly, the great care which had been expended upon clearing out the intestines deprived one of the help afforded by contrast of dilated and contracted small intestine. At the second operation this feature led one at once to the site of the mischief.

The growth, as will be seen from the photograph, closely resembles in its macroscopic appearance the ordinary annular carcinoma of the colon, and microscopically proves to be a columnar or cylinder-celled cancer. A gland from the mesentery showed no evidence of metastasis. Inspection of the site of the previous operation showed that the adhesions had not re-formed, and that the colon was almost completely free from constriction where previously compressed.

REMARKS ON THYROIDECTOMY :

WITH ILLUSTRATIVE CASES.

By F. P. STURM, CH.B. ABERD.,
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THIS paper is based upon 100 cases of the various varieties of goitre. Twenty-six of these cases underwent operation at the hands of the writer, with one death, giving a mortality at the rate of a little less than 4 per cent. It is submitted that this is not a high mortality, since no patient has been operated on who was not suffering from symptoms of thyro-toxaemia which had defied medical treatment, or from some other condition of the thyroid injurious to life or health. The operation when performed in any of these circumstances may be a comparatively straightforward procedure, or it may be, and frequently is, one of the most difficult operations in surgery.

The chief difficulties are from haemorrhage, shock, and adhesions. Haemorrhage and shock are mostly to be feared when dealing with the subjects of Graves's disease. The condition of so-called "acute thyroidism," said to have been responsible for so many deaths in the early days of the operation, is mentioned only to be doubted, and any such problematic danger is efficiently met by drainage during the first twenty-four hours. Adhesions, on the other hand, are a very real difficulty, and are apt to be particularly firm and numerous in old-standing cystic tumours of the thyroid, where they give rise to difficulties which are often almost insuperable. Shock frequently follows these operations, and though it is often called "acute thyroidism" it is not different from ordinary surgical shock. Danger from sepsis can practically be ignored in these days.

INDICATIONS FOR OPERATION.

It is my practice to refuse to operate in all cases of soft parenchymatous goitre in young girls, no matter how large the goitre may be, provided there are neither urgent pressure symptoms nor symptoms of hyperthyroidism. Many such cases have been sent to a medical colleague, and have got quite well without operation. If there is any apparent connexion between the enlargement in the neck and the menstrual functions, then some preparation

of thyroid material seems to have done most good. In the majority of such cases the enlargement of the gland is a sign of thyroid inadequacy, not of hyperthyroidism.

No case of Graves's disease is operated on until adequate medical treatment has failed to bring about any amelioration. By adequate medical treatment is meant six weeks in bed and a course of belladonna and strophanthus, or, better still, ammonium picrate. My attention was first drawn to the latter drug by Dr. F. E. Wynne, of Leigh; and the only case in this practice that ever recovered without operation did so after two months upon ammonium picrate. If there are no signs of improvement at the end of six or eight weeks the more vascular lobe is removed through a modified Kocher's incision, always under local anaesthesia, with the occasional addition of scopolamine-morphine in very restive subjects. If both lobes are greatly enlarged both are removed, particular care being taken to preserve the isthmus with an efficient blood supply. I have removed both lobes for adenomatous disease upon six occasions, and have seen no ill results.

All cystic goitres should be removed as early as possible, for they never improve under medical treatment, and are apt to give great trouble after middle life; as also goitres of whatever variety having retro-sternal or retro-clavicular outgrowths, or giving rise to dyspnoea from tracheal stenosis, as all these are apt to cause sudden death.

A rapidly growing goitre in any person over 30, especially if there is neither high temperature pointing to acute thyroiditis, nor rapid pulse suggesting Graves's disease, should be removed *en bloc*, as it is probably malignant. Fortunately such cases are extremely rare.

I feel some doubt about ever again performing thyroidectomy upon the subject of breast disease. In order to relieve pressure upon the brachial plexus and tracheal stenosis, I removed a large goitre weighing over 2 lb. from a patient of Dr. E. A. Doyle, now of Colne. The wound healed under one dressing, and the patient, a woman of 48, was up on the seventh day. Six weeks later it was discovered that a long-standing adenoma of the breast had become actively malignant. A radical operation was at once performed, and so far, fourteen months later, there is no sign of recurrence. The connexion may be merely coincidental, but it cannot be ignored. That there is some relation between the thyroid and the functions peculiar to women is a matter of common observation. In another case, also a patient of Dr. E. A. Doyle, the removal of a diseased ovary was followed by the disappearance of a soft goitre which had been for months associated with symptoms of moderate hyperthyroidism.

HAEMORRHAGE.

Trouble from haemorrhage is most often met with when operating upon the subjects of Graves's disease. Here one has to deal with enormous plexuses of enlarged, baggy veins, or rather sinuses, very easily torn. When confidence has been gained by frequent performance of the operation the wisest plan is to waste no time in clamping veins, but to control haemorrhage by packing in strips of sterile gauze, and then to isolate and ligature the superior thyroid artery as rapidly as possible, when the severest venous haemorrhage usually stops.

In dislocating the tumour forwards the superior thyroid artery is put very severely upon the stretch, with the result that when the artery is divided it retracts into the depths, and can hardly be found again. If the ligature happens to slip the resultant rush of blood is likely to disquiet the coolest operator. This accident happened to me about a year ago while operating upon a patient sent by Dr. Wynne. The deep cervical fascia had been split in the mid-line and the tumour was being freed from its numerous adhesions when copious haemorrhage took place from the deep accessory veins. This was controlled by gauze strips, and the superior thyroid artery found, ligatured with a single thickness of No. 2 chromic gut, and divided. Upon removing the plug the venous haemorrhage did not cease, as it usually does, but became so vehement that the neck muscles in front, as well as the sternomastoid, had to be divided and dissected back in order to find and clamp the torn vessels. The tumour was then removed, the inferior thyroid artery being secured without difficulty, but no sooner was this accomplished than the ligature upon the superior thyroid gave way, and such

violent arterial haemorrhage took place that the patient collapsed. The bleeding artery had retracted far up behind the angle of the jaw, and spouting into the enormous cavity left by the removal of the tumour, filled it with a churn of blood and foam. Dr. Sackville Martin, who was assisting, managed to secure the vessel, but not before the patient was practically bloodless. The wound was then closed and drained and the patient given large quantities of isotonic saline by the rectum. She made an uninterrupted recovery.

ADHESIONS.

During the time that a thyroid tumour is undergoing cystic degeneration two changes are concurrently taking place in the cyst wall. 1. Scaly deposits of calcareous material gradually line the inside of the cavity, which may be filled with a clear or light brown fluid, perhaps containing oily globules, or with a sterile substance in appearance like oily pus, or more rarely with a gluey fluid, which is probably changed colloid. These deposits render the walls rigid, and difficult to manipulate. 2. The cyst wall, stimulated to a slow inflammatory activity by this deposit of insoluble and irritating salts, begins gradually to form adhesions with surrounding structures. As the tumour grows the muscles of the neck are stretched out in thin layers upon its surface, to which they adhere, gradually becoming part of the cyst wall. The great vessels of the neck, especially the internal jugular, also become adherent, and before long the vein, if not actually calcareous, becomes so brittle that any attempt to dissect it away from the tumour almost certainly results in a tear. In time the oesophagus, trachea, vertebrae, and even the dome of the pleura, also suffer. The following case very adequately illustrates these difficulties:

A gentleman, aged 52, a patient of Dr. Sephton, of Culcheth, was operated on in January, 1909. Eighteen months previously a left-sided thyroid tumour of twenty-five years' standing had begun rapidly to enlarge, giving rise to very warrantable suspicions of malignancy. The patient had been advised against operation, for he was stout and plethoric, with intermittent action of the heart, but the pain became so constant and the pressure symptoms of dyspnoea and dysphagia so urgent that surgical interference was a matter of necessity. Under eucaine-morphine-adrenalin anaesthesia the growth was exposed by a long incision from the mastoid process to the sterno-clavicular joint. The muscles were indistinguishable one from another and cut like raw ham, which they much resembled in texture and appearance. No sooner had the deep aspect of the cyst been reached by an exploring finger than it burst, flooding the wound with about a pint of curdy yellow fluid mixed with drops of oil. The patient then vomited a quantity of the same material through an opening into the oesophagus. This opening was closed by a single suture of chromic gut. The cyst wall was adherent to the vertebrae, the oesophagus, the trachea, the angle of the jaw, and the clavicle. It was dissected away piecemeal amid much haemorrhage, which fortunately was easily controlled by Dr. Auden, who was assisting. A portion of the wall, deep behind the clavicle, had to be left. It was probably adherent to the dome of the pleura, as it rose and fell with respiration. Four long-handled artery forceps had to be left on vessels situated too deeply behind the sternum to be ligatured. These were removed in forty-eight hours. The patient made an excellent recovery, and is now in the best of health.

TECHNIQUE.

Certain practical points may briefly be touched upon. Kocher's "collar incision," while excellent in many ways and giving good cosmetic results, does not allow of a sufficiently wide field of manipulation in difficult cases. I find it useful to prolong the ends of the incision upwards for a couple of inches towards the angle of the jaw, thus permitting the all-important superior thyroid vessels to be secured at an early stage.

The material chosen for a ligature is a matter of personal predilection. Kocher uses and recommends silk for all aseptic surgical work, and especially for thyroidectomy; English and American surgeons prefer catgut; but ordinary Irish linen thread, well boiled and stored in an alcoholic solution of phenol, provides a cheap and trustworthy ligature. I have used linen thread very extensively in general surgical work, and have had no reason to regret the choice. For the radical cure of hernia it is, I may mention in passing, perhaps the ideal material.

The question of anaesthesia has been settled by the almost unanimous preference of surgeons for local infiltration methods. The use of the weak eucaine-adrenalin solution recommended by Mr. Barker gives perfect results

from the point of view of the surgeon, and, if preceded by an injection of scopolamine-morphine, from the point of view of the patient also. I have never seen post-operative vomiting in cases in which scopolamine-morphine had been used either alone or together with a local or general anaesthetic.

The preparation of the field of operation is a matter of the utmost importance. The skin of patients with bronchocele is usually so tender that irritating lotions and dressings must be rigidly eschewed. Mercurial preparations in particular are to be avoided. A boric fomentation the night before operation, another in the morning, and a light washing of the skin with 1 in 40 alcoholic solution of phenol immediately before the incision is made will be found to give the best aseptic results. The wound is dressed with sterile xeroform or iodoform gauze. Cases so treated and not requiring drainage have invariably healed under one dressing.

ON THE CAUSES DETERMINING THE PRODUCTION AND DISTRIBUTION OF THE ERUPTION IN TYPHOID FEVER.

By J. P. H. GREENHALGH, M.D., CH.B.MANCH.,
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ACCORDING to Jenner,¹ the eruption in typhoid fever "is due apparently to an increased flow of blood only to detached points, and rupture of the vessels at these points never occurs." The typhoid bacillus has been demonstrated in the spots since the above was written, but there is little else to add.

In the eruptive fevers which are primarily infections of the blood, the eruption is distributed over the whole or greater part of the body. In typhoid fever, which is not primarily an infection of the blood, but has definite anatomical lesions, the eruption is confined with conspicuous regularity to that area of skin which is in direct communication, by means of nerve fibres, with the foci of infection—namely, the small intestine and its lymphatic glands, and the spleen.

The small intestine is innervated by branches from the superior mesenteric, and the spleen by branches from the coeliac plexuses, both of which are direct continuations of the solar plexus. The solar plexus receives the great splanchnic nerves, which take origin from the thoracic ganglia of the sympathetic included between the sixth and the tenth; and the coeliac plexus receives the lesser splanchnic nerves, which take origin from the tenth and eleventh thoracic ganglia, and a portion of the smallest splanchnic nerve, which takes origin from the twelfth thoracic ganglion. The great and lesser splanchnic nerves also have intercommunicating fibres in the thorax.

The thoracic ganglia giving origin to the splanchnic nerves communicate, by means of both afferent and efferent fibres, with the sixth to the twelfth dorsal spinal nerves; and these spinal nerves supply a segment of the body bounded above by a quasi-horizontal line encircling the chest a little below the level of the nipples, and below by a similar line a little above the level of the brim of the false pelvis. The area enclosed by these two lines represents the area to which the eruption in typhoid is, as a rule, confined.

Dr. W. H. Gaskell² has shown that the outflow of visceral nerves from the central nervous system into the sympathetic system takes place by means of the white rami communicantes. Each white ramus contains also the afferent fibres for impulses passing from the viscera by way of the sympathetic.³ The late Professor Ross,⁴ Drs. Head,⁵ Mackenzie,⁶ and others have shown that afferent impulses arising from disordered viscera excite sensations which are referred to the sensory terminations of the spinal nerve or nerves directly in relation with the spinal cells receiving such impulses; and Dr. Head has mapped out the cutaneous areas in which referred pain is felt, by means of a study of cases of herpes zoster. The skin areas in which the herpetic eruption appeared were found by him to coincide with the areas which have increased sensibility to pain in visceral disease.

The cutaneous area which Dr. Head found was associated with disorder of the intestines is that supplied by