Cases which attended regularly and had a full course of treatment showed in general a steady fall in units to a stable negative reaction, but cases which attended regularly and had an incomplete course of treatment were liable to become resistant to arsenic, the number of units often remaining stationary when treatment was resumed.

3. As regards the effect of treatment in the tertiary stage:

Only 3 out of 106 cases became negative; at the beginning of observation these cases had a low number of units, and had received much previous treatment. Of the remaining cases the units fell in about one-fifth of the cases, fell and then remained unchanged in one-third of the cases, and remained unchanged throughout in one-third.

In 3 cases a rise of units was observed, and in 2 of these cases the rise was associated with a visible increased activity of the disease.

It is probable that in the majority of tertiary cases the Sigma units fall to a certain level as a result of treatment and that it is difficult to cause a further fall in units. This level is usually between 2 and 15 Sigma units.

The most effective dose of N.A.B. was 0.9 gram. No substantial effect was observed in the number of units, if the injections of N.A.B. were given at intervals of three weeks or longer.

Intravenous injections of mercuric perchloride were given to 24 stationary cases, and produced a fall in units in about 50 per cent. of these, but no case became negative.

About 90 per cent. of cases showed no change in their unitage during rest or during oral treatment following courses of N.A.B. The remaining 10 per cent. showed a rise and fall of units in equal proportions.

The number of units in the blood corresponds to a certain degree with the visible extent of the activity of the disease. In 43 per cent. of cases a fall of units was associated with clinical improvement, but in 15.6 per cent. the units remained unchanged although there was improvement clinically.

I desire to express my grateful acknowledgement for the kindly assistance that has made possible this work, and my great appreciation to Professor Georges Dreyer and Dr. H. K. Ward of the Department of Pathology, University of Oxford, for much assistance and advice.

I wish to thank for their great kindness and most substantial help Dr. J. H. Sequeira and Dr. W. J. O'Donovan of the London Hospital, who supplied me with a large amount of material; also Dr. P. Fildes of the London Hospital for the Wassermann results on this material; also Dr. A. G. Gibson, Mr. H. A. B. Whitelocke, and Dr. W. T. Collier, jun., all of the Radcliffe Infirmary, Oxford, for the use of their clinical material and records.

My particular thanks are due to Dr. F. G. Hobson of the Radcliffe Infirmary, Oxford, for the use of his clinical material and great co-operation in prosecuting the research.

My special thanks are due to Miss J. Jorgensen and Dr. A. D. Gardner of the Department of Pathology, University of Oxford, for their generous help in many points of the work.

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CARCINOMA OF THE RECTUM COMPLICATED BY PREGNANCY.

TWO CASES TREATED BY EXCISION.*

BY

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DURING the past three years I have had the uncommon experience of operating upon two patients for the removal of carcinoma of the rectum during the period of gestation.

CASE I.

Mrs. B., aged 27, was admitted to Mercer's Hospital on January 4th, 1922. She had one child, aged 12 months, and stated that during the past five months she had had pain when the bowels moved; the pain had been much worse recently and sometimes she lost a quantity of blood; her weight had declined considerably.

A ring-like stricture of the rectum was found about the level of the cervix uteri; it was extremely painful, but with care the index finger could be passed through its lumen. The sensation given to the examining finger was that of a malignant growth. Upon bimanual examination of the pelvis the growth appeared to be freely movable, but the disconcerting fact was discovered that the uterus corresponded, in size and consistency, to a pregnancy of between three and four months' duration. No proctoscopic examination was made, as the parts were extremely tender and the diagnosis was obvious. The facts were fully explained to the patient and to her husband, and radical operation was decided upon.

Owing to the difficulty of clearing the bowels it was decided to perform a preliminary colostomy. On January 10th an incision, about four and a half inches long, was made through the left rectus muscle, at the junction of the middle and outer thirds, the pelvis and abdominal cavity were manually explored to exclude secondary growths, and a permanent colostomy opening was made, taking care to leave plenty of colon below the point of fixation. The protruding knuckle of gut was opened and trimmed before the patient left the operation table. Three weeks later, when she felt and looked much stronger, the coccyx and last segment of the sacrum were removed and the entire rectum and anus, together with the sphincters and the greater part of the levatores ani, were excised in one piece. The cut end of the pelvic colon was then closed by suture, invaginated, and fixed extraperitoneally. The wound was closed in two layers, a drainage tube being inserted rather posterior to the site of the original anal opening. There was very little loss of blood and no shock. The drainage tube was removed on the third day, sutures were removed on the eighth day, and the patient was allowed up on the twentieth day after operation. The pathologist's report was: "Columnar-celled carcinoma of the rectum."

The pregnancy progressed along normal lines, and in the following June the patient entered the Rotunda Hospital. I am much indebted to Dr. J. Quinn, one of the assistants to the Master of the Rotunda, for the following particulars:

"Mrs. B., aged 27, was delivered, on June 28th, 1922, of a healthy male child, 18 in. long and 6½ lb. in weight. Labour lasted sixteen hours, placental stage thirty-five minutes. No instruments were used. There was a very slight laceration of the perineum, which was repaired immediately by one stitch. The chief feature of the case was the absolutely normal manner in which labour progressed and terminated."

Shortly afterwards Mrs. B. and her family went to live in England, and I have lost sight of her.

The second case was diagnosed accurately and sent to me by Dr. B. H. Farrell of Castlecomer on January 14th, 1924.

CASE II.

Mrs. K., aged 38, had had nine living children, and on the date mentioned thought that she was three months pregnant. For the past seven months she had been very constipated, and an increasing amount of mucus and blood had come from the bowel, until the discharge was almost continuous. She had very little pain, and did not think that she had lost much weight, but was very depressed. On examination a friable fungating mass was felt surrounding the lumen of the rectum just above the level of the cervix uteri. Bimanual examination revealed a three months' pregnancy and almost certain involvement of the cervix, as the growth and cervix appeared to move together. At first I refused radical operation, and a colostomy did not appear necessary; but the absolutely miserable and hopeless condition of the patient made me alter my opinion, and I told her that I would, if necessary, remove the rectum and uterus.

I wrote a very full account of the risks and of the almost hopeless prognosis to Dr. Farrell, so that he might explain matters to the patient's husband, who gave me a free hand to do anything which might relieve her wretched condition.

On January 22nd, assisted by the house-surgeon, Dr. Mervyn Abrahamson, I opened the abdomen in the middle line below the umbilicus, examined the liver and iliac glands, etc.; then, having tilted the table into the full Trendelenburg position, I drew the uterus out of the pelvis and found, to my great relief, that it

* Paper read before the Royal Academy of Medicine in Ireland, November 14th, 1924.

was not involved in the growth, but was adherent to the rectum and could be separated from it by sponging with a gauze pad. The iliac colon was then divided, the proximal end brought out through an incision in the left rectus, and a Paul's tube tied in. The pelvic colon and rectum were then separated from the pelvis, along with all glands and areolar tissue, packed to the bottom of the pelvis under a covering of peritoneum, and were subsequently removed, along with the anus and muscles, by the perineal route. The only points in which this operation differed from that described by many surgeons is that, owing to the encroachment of the pregnant uterus, I could not divide the middle haemorrhoidal arteries and lateral ligaments of the rectum by the abdominal route, and had to leave them to be dealt with during the perineal portion of the operation. During the perineal dissection I removed a portion of the posterior fornix of the vagina where it lay in close proximity to the tumour. The loss of blood was small and shock so slight that it did not need any special treatment. Convalescence was uneventful, and the patient was allowed up on the sixteenth day after operation, as she was still very depressed, and lying in bed seemed to make her worse. The pathologist's report was: "Columnar-celled carcinoma of the rectum."

On November 8th Dr. Farrell very kindly sent me the following note:

"Mrs. K. returned home about a month after operation. She had gradually got back strength and every day improved in health. On June 30th she slipped and fell in her kitchen. About half an hour after the fall signs of labour set in and lasted for twelve hours without result, when she was given an injection of pituitary extract which, almost immediately, resulted in the birth of a small living male child. There was no trouble with the placenta. This is her tenth baby and he is still alive. Mrs. K. is now doing well, says she never felt better in her life, is increasing in weight, and has a good appetite. The artificial anus is doing splendidly. She thinks that she is pregnant again."

The anaesthetic used in both these cases was ether, administered from a wide-bore Clover's inhaler.

As is well known to most surgeons, there are two "schools" of rectal surgery. One advocates the perineal route for excision, the other despises anything except the combined abdominal and perineal operation.

In the first case I made use of the perineal route, with preliminary exploration and colostomy, because I had no reason to suspect involvement of the uterus, etc., and I considered that the two-stage operation would be less severe on the patient.

In the second case I made use of the combined method, because I meant to remove the uterus and appendages, if necessary, and also because, owing to the depressed state of the patient's mind, I did not think she would consent to a two-stage operation. One cannot expect to operate upon a sufficient number of such cases to enable one to draw up statistics, but the lesson which I have learnt from these two cases is that the two-stage operation is much easier, and I think it should be the method chosen in cases where pregnancy is a complication, unless there is some special reason for the one-stage operation.

Before passing on to more problematical subjects, I would like to state my personal opinion that the incision through the left rectus is the best for colostomy, either with or without a median incision for the exploration. There is no need to defer opening and trimming the knuckle of gut, as there is no fear of infecting the wound or wounds if a covering of bismuth and iodoform paste is applied under a separate dressing. In the one-stage operation it is obvious that a Paul's tube can be tied in.

With regard to the treatment of carcinoma of the rectum in general, I sometimes use the combined method, and more often the perineal, with removal of the coccyx and the last segment of the sacrum, a thorough exploration and a colostomy opening having been made some days previously.

I am convinced that the mortality of the combined method is very much greater than that of the two-stage operation, and I am not convinced that the percentage of "cures" is much more by one method than by the other, provided a preliminary exploration is insisted upon in every case. To put the matter shortly, in order to elicit discussion, I may state the teaching which I give to students. When the growth is in the portion of the bowel which has no mesentery, remove it by the two-stage method, unless there are glands high up which one has to remove. When the growth is situated higher up it is better to remove it by the combined method. I will not describe the steps of the operation performed, but for combined operation will refer to the beautifully illustrated description by the late Edward H. Taylor in his *Operative Surgery* (1914), and for the perineal method I cannot improve upon the

technique described by Mr. J. P. Lockhart-Mummery in the *Medical Annual* for 1924. In the latter method I find that working from the anal region upwards is much easier than the older method of freeing the rectum above before excising the anus.

The question—whether it is ever advisable to preserve the anal sphincters—remains. I have been much struck by the following paragraph in E. H. Taylor's book already mentioned, which shows the opinion he held before 1914. "The radical measures which are employed in the treatment of rectal cancer have as their object the complete removal of the disease and the re-establishment of normal sphincteric control." In 1924 the majority of surgeons appear to favour a permanent colostomy and sacrifice the sphincters in every case. Whether this is right or wrong I have not yet had sufficient experience to decide, but I feel that to eradicate the disease is the main thing, and that striving after sphincteric control may lead to inefficient operations.

HAEMOLYTIC STREPTOCOCCAL INFECTION: RECOVERY.

BY

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IN view of the fact that in both medical and lay circles conversation often ranges upon the utter failure or tremendous success of dental extractions in certain systemic infections, this case, carefully followed by a number of observers, should be of interest. As a problem in diagnosis it exercised many, and its happy termination does not prevent one from thinking over the possibility of better methods of treatment, and, above all, earlier diagnosis in similar cases of pyrexia of unknown origin.

On November 6th, 1921, Michael R., aged 19, a student of medicine at Cambridge, complained of malaise and anorexia and fever, followed twelve days later by jaundice and gradual recovery. On November 28th he had a rigor, with violent headache, a temperature of 105°, and profuse sweating simulating malaria. He resumed his studies, and nine days later had his third attack.

On December 19th the patient came under my observation with a further rigor, high temperature, etc., and pains in the hepatic region. Blood examination excluded malaria, and showed a leucocytosis of 15,000 per c.mm.—polymorphs 84 per cent., lymphocytes 12 per cent., hyalines 4 per cent. After two further attacks of a similar type, showing almost identical differential leucocytosis, he was seen by Sir Humphry Rolleston. Cholecystitis was diagnosed, and hexamine and salicylates prescribed, with dieting. A fortnight later the seventh attack showed an increased leucocytosis and the polymorphs rose to 87 per cent. of the total.

Specimens of urine and faeces were examined by Dr. P. J. Cammidge on February 1st, 1922, and found fairly normal, though the latter contained coliforms and streptococci; he diagnosed catarrh of upper intestine, with secondary cholangitis and pancreatitis. The next attack was accompanied by more marked hepatic pain and an easily palpable spleen, and Sir Humphry Rolleston again saw the case; he found a submucosal haematoma, half an inch in diameter, on the pharyngeal wall. During the apyrexial interval following the blood was again examined: Total leucocytes 6,000 per c.mm.—polymorphs 46 per cent., lymphocytes 50 per cent., hyalines 4 per cent. A catheter specimen of urine was sterile.

The patient was seen again on March 5th. He had been looking seedy for some days, and on this day the right side of the face was slightly swollen, but there was not the slightest pain in face or teeth. It was suggested that there might be a septic focus in connexion with the teeth or accessory air sinuses; his mouth appeared to be in perfect repair, and had been recently overhauled by the dentist. Shortly after midday the ninth attack commenced, with hepatic pain, high temperature, and rigor; the spleen was still palpable and tender. A blood film showed nothing abnormal; leucocyte count 11,400; differential not done. Blood cultures were taken during this attack; both plates and broth remained sterile.

On March 16th an x-ray examination by Dr. Charles A. Clark showed both antra quite clear, but the second right upper premolar was a dead tooth with much swollen periodontal membrane and bone destruction at apex, indicating a chronic abscess. Twelve days later the tenth rigor occurred with hepatic pain and sweating; there was slight fullness of the right side of the face, but no pain in the teeth. It was decided to remove the suspected upper premolar as a likely focus of sepsis.

On March 30th the tooth was very carefully removed under nitrous oxide and from the injected root cultures were taken on agar and blood serum. The former remained sterile; the latter gave "almost pure culture of haemolytic streptococci." On April 10th and 14th an autogenous vaccine (streptococcal) was given in 2 and