and soda the two previous days. He stated that his health had been good till January, 1900, when pain came on after food at a regular interval of three hours, relieved by the next meal and also on the occasions he was sick. He also had acid eructations. On one night in October, 1900, the pain was severe. He vomited a large quantity of blood, had some loose black motions, and was a patient in a London hospital for three weeks.

From this date till June, 1904, every three months his symptoms would increase, the pain would be worse, he was constipated, had anorexia and loss of appetite, followed by vomiting, and relief with subsequent tarry motions. The vomit was sometimes black as well, but never alone.

From June to October, 1904, he could keep very little down; he consulted a physician, who told him he had a dilated stomach, and ordered him a special diet and lavage, which he had carried out up to the present. He remained in good health, exercising care in diet, till June, 1908, when he had a relapse of sickness and melaena, and also another in November, 1908.

When seen by me the patient was on his back; his expression was a little anxious and alert, the face pale and the tongue moist and slightly furred; he had a full pulse of 96 and the temperature was 99° F. There was no distension of the abdomen and the respiratory movements were present but their excursion diminished. There was some resistance over the upper part of the right rectus as well as tenderness (A) which extended downwards towards the appendix region. The liver dullness was diminished. The respirations were not hurried and there was normal vesicular breathing at the right base. On rectal examination no swelling or tenderness in Douglas's pouch was detected.

A diagnosis of perforation of a duodenal ulcer was made and an operation advised, consent to which was withheld till the next day.

Operation.

He was removed to the York Nursing Home, where, at 9.30 p.m., January 5th, a laparotomy was done, forty-two hours after perforation.

Under ether a vertical incision (B), 3½ in. long, was made through the upper part of the right rectus.

On opening the peritoneal cavity, a hissing escape of gas took place. Fluid, at first slightly turbid, with a few flakes of lymph, and then quite clear, welled up, and after mopping this up a cavity (shaded in figure) was exposed; it was lined with lymph, bounded above by the under surface of the liver and gall bladder and leading downwards and to the right as far as the appendix region. Separation of some adhesions between the commencement of the duodenum and the under surface of the liver revealed close to the pylorus a circular patch of lymph, the size of a sixpence, with a perforation ½ in. in diameter in its centre, situated on the upper and anterior surface of the first part of the duodenum. By retracting the liver and pylorus from one another, with some difficulty the perforation was infolded in a longitudinal direction with two rows of a continuous Lembert suture of celluloid thread. The stomach was filled with gas.

A posterior gastro-enterostomy was then performed, with the opening into the stomach made vertical, and the anastomosis with the jejunum as close to the duodeno-jejunal junction as possible, leaving no loop. The anastomosis was effected with two rows of celluloid thread, an inner one taking in all the coats of the stomach and jejunum, and an outer including the sero-muscular coats only.

The opening in the transverse mesocolon was sutured to the jejunum. Drainage was effected through a stab wound in the loin, and at the upper angle of the abdominal incision. Chromic catgut brought together the abdominal wall in layers, peritoneal musculo-aponeurotic, with additional supporting ones tied beneath the skin, and the skin edges with Michel's clips.

After-History.

The drainage tube and gauze were removed after thirty-six hours, and the clips on the fourth day. For the first twelve hours rectal salines were given, and after this feeding by mouth commenced. The pulse after the operation was 140; it fell to 100 the night after, and on the second night to 68. The bowels acted after an enema; physostigmine sulphate ⅛ grain was given hypodermically every two hours for four doses. There was no vomiting after the operation. In a month the patient left the home, having made an uninterrupted recovery.

As to his further progress, in answer to a letter of mine he wrote: "I have never had any pain or any sickness since I returned home from York. I can eat and drink practically anything now. My weight in overcoat was 10 st. 4 lb. about the middle of December last; now it is 11 st. 4 lb. in the same clothes. Every one tells me how well I look. After my past experience I can only say the sudden illness at York was really a great blessing in disguise."

In this case there was a nine years' history of ulcer; commencing with pain three hours after a meal, relieved

by the next meal, acid eructations, later haemorrhages, dilatation, intervals of good health under medical treatment, relapses, and finally perforation. Such a case may terminate in cancer, as a goodly percentage do.

Cases are on record where a duodenal ulcer and appendicitis have coexisted. The pain over the appendix in perforated duodenal ulcer can be explained on anatomical grounds. Maynard Smith¹ has shown experimentally that fluid escaping into the abdominal cavity, through a perforation of the duodenum first fills up a cavity beneath the right lobe of the liver (the right kidney pouch), and then overflows, coursing downwards along the outer side of the ascending colon to the caecum. Hence the pain in this region.

Paterson² recommends gastro-enterostomy in all these cases if the patient can stand it, because it improves the after condition, lessens the risk where there is a second ulcer whether it has perforated or no, diminishes the risk of haemorrhage after operation, allows more efficient infolding of the ulcer, promotes more rapid and certain healing of the line of suture and so lessens the risk of further leakage, permits earlier feeding and earlier administration and more rapid action of purgatives, and so secures more efficient drainage of the peritoneal cavity.

The mortality depends mainly on three things: (1) Whether there is food in the stomach at the time of perforation; (2) the size of the perforation; (3) the time that has elapsed between perforation and operation.

In the case I record the stomach was empty, the perforation small (½ in.), and forty-two hours had elapsed between perforation and operation.

REFERENCES.

¹ Maynard Smith, *Lancet*, March 31st, 1906. ² Paterson, *Hunterian Lecture III*, 1906.

PERFORATED GASTRIC AND DUODENAL ULCERS TREATED SUCCESSFULLY WITHOUT SUTURE OF THE PERFORATION.

BY

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We bring forward these two cases because they both had simple convalescence, and in neither case was there any escape of food debris or any sign of gastric or duodenal fistula.

Both cases behaved as though the ulcers had been closed successfully—although this was not done—and, indeed, did just as well as successful cases in which we have sutured the ulcer. So much so, that it would seem that the time spent on unsuccessful attempts to suture a perforation may be wasted and militate against the patient's recovery—for speed of operating is undoubtedly one of the great essentials in bringing the treatment of peritoneal catastrophes to a successful conclusion. Every surgeon knows how often the stitches, inserted to close a perforation, cut through wholly or in part. If this occurs under his eyes, how often does it occur after the operation is finished? Indeed, many a case, treated successfully, in which the stitches closing the ulcers are thought to be secure, may be merely an example of what we have found—namely, if a perforation is merely "curtained" by omentum, recovery may ensue with no more troublesome convalescence than when the ulcer is closed.

The recovery after the non-suture of an ulcer shows how great a tendency there is in the material passing through a tube to flow along the tube, and not out of its sides. This is observable in the old method of performing colostomy when a lateral opening was made and the bowel not divided. In our cases there was no escape of digestive fluids although the perforation was merely "curtained." To prove that such a result does not always occur, even when the patients recover, it is merely necessary to quote:

the case recorded by Mr. Roper, of Exeter, whose patient recovered with a gastric fistula and underwent some observations similar to those made in the famous case of Alexis St. Martin.¹

We would submit that our cases suggest that—

1. If stitches cut through at the operation, no further time should be wasted in trying to close a perforation.
2. That such a perforation be covered by omentum, anchored in place by one or two sutures.
3. That a gauze drain be conducted to the perforation and removed under an anaesthetic in forty-eight hours.
4. That the chance of recovery under this treatment is unlikely to be less than if the ulcer is sutured.
5. That the remote results of these cases, as regards pyloric obstruction, are no worse than when the ulcer is closed.
6. That in these, as in many other cases, a primary gastro-enterostomy is unnecessary for the recovery of the majority of cases.

CASE I.

G., female, single, aged 35, a patient of Dr. W. B. Winston of Bowes Park. History (September, 1906) of fourteen days' pain and tenderness in epigastrium, followed by signs of perforation; operation fifteen hours after perforation. A large perforation was found on the anterior wall of the stomach near the pyloric end and the lesser curvature. The surrounding stomach wall was thickened, sodden, and inflamed, rendering it impossible to sew up the perforation, as stitches would not hold. A tag of omentum was drawn over the perforation and anchored in position by two stitches. A gauze plug was arranged around. The peritoneal cavity was dry sponged through epigastric and suprapubic incisions and drainage tubes left in. At the end of forty-eight hours the plug was removed under chloroform by Dr. Winston. There was no escape of gastric contents. No food was given by mouth for twenty-four hours. At the end of twenty-four hours water was given for two days, and milk at the end of three days. The patient made an uninterrupted convalescence, and is very much better as a result of operation, at the end of two years showing no indication of any pyloric obstruction.

CASE II.

J. S., male, aged 29. Admitted to St. Thomas's Hospital August 6th, 1908; discharged September 9th. History of four months' pain after food, with vomiting. No haematemesis or melaena. A more than usually acute attack, lasting for five days, preceded the perforation. Operation fourteen hours after perforation. A large circular perforation, the size of a shilling, found at junction of first and second parts of duodenum, which it was impossible to close. A piece of omentum was anchored by two stitches over the perforation. A gauze drain was inserted. The peritoneal cavity, which contained a very large quantity of fluid and food contents, including some dozen or so French beans in a totally undigested condition, was dry sponged. When rendered as clean as possible by this method the peritoneal cavity was thoroughly washed out with hot normal saline. The operation was performed with all possible speed, and drainage used in both the epigastric and the suprapubic incisions. The gauze drains were removed in forty-eight hours under chloroform anaesthesia. Saline was administered per rectum for the first twenty-four hours. Water was given by mouth at the end of twenty-four hours. On the second day a rectal feed was given, and also saline per rectum, at six-hourly intervals. At the end of three days milk was given by the mouth in gradually increasing quantities, and on the sixth day a light diet containing custard, etc. August 17th: Signs were found at the left base indicating possibly a left subphrenic abscess. A transpleural exploration performed; no abscess found.

But for the rise of temperature and cough about this time the patient made an uninterrupted recovery, and was sent to a convalescent home on September 9th. He remains quite well, not suffering from indigestion or gastric trouble.

REFERENCE.

- ¹ BRITISH MEDICAL JOURNAL, 1908.

A CASE OF TRAUMATIC RUPTURE OF THE SIGMOID COLON: OPERATION: RECOVERY.

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Cases of traumatic rupture of the intestine are not common in the records of any one hospital. Series of cases collected by different observers afford much information about the condition. A recent paper by Berry and Giuseppi in the *Proceedings of the Royal Society of Medicine* for November, 1908, relates a case of recovery after operation, and gives an analysis of 132 cases which have occurred in ten London hospitals during the fifteen years, 1892-1907. This list is of more value than the lists of other authors

who have abstracted their cases from current literature, because cases of death and recovery are equally reported. I have drawn freely upon this paper in compiling the commentary which follows.

James R., aged 55, donkeyman, was admitted to the Royal Hamadryad Seamen's Hospital, Cardiff, on November 9th, 1908, at 9.30 p.m.

On the same day at 5 p.m. while moving at a rapid walk along the engine-room on board ship, he knocked the left side of his abdomen against the stationary handle of a reversing wheel. He had considerable pain for the moment, which passed off, and he continued his work for half an hour until he was relieved from duty. As he was going on deck he fainted, and the pain returned with great severity. Between 7 and 7.30 p.m. the bowels acted twice, but he does not remember passing any wind. A doctor saw him and advised his removal to hospital, where he was carried on a stretcher.

Condition on Admission.

The resident medical superintendent, Dr. J. H. Whelan, found that the pulse was 73 and the temperature 98.8° F.; the whole abdomen was tender on pressure, and its wall very hard. There was no distension, the wall being if anything slightly drawn in. There was considerable general abdominal pain of a gripping character and tenderness and swelling over the right inguinal canal; 8 oz. of normal urine were drawn off. Sips of hot water and a hypodermic injection of morphine and atropine were ordered. He passed a good night, and next morning the abdomen seemed slightly softer; he had vomited several times—at first bile, then brownish non-odorous fluid. A little hot milk was ordered.

Operation.

On November 11th at noon I first saw the patient. The abdomen was exceedingly rigid all over, not distended, generally tender, and the seat of considerable general gripping pain. Over the left inguinal canal was a hard, tender swelling with some bruising. Sickness was frequent, the vomit being brown and non-odorous. No faeces or flatus had been passed since admission. The tongue was moist, the temperature normal, and the pulse good—96. The left lower part of the abdomen was indicated as the point where he had received the blow.

I operated immediately at 12.30 p.m., 4½ hours after the injury. Dr. Cyril Lewis gave the anaesthetic and Dr. Whelan assisted. An incision was first made over the left inguinal canal, disclosing considerable effusion of blood and serum around the cord. This wound was closed. The abdomen was then opened in the middle line below the umbilicus. On opening the peritoneum, a small quantity of faecal-smelling, turbid fluid escaped, and there was universal acute peritonitis. Search for some time failed to reveal the cause of this, and the intestines had to be eviscerated under hot towels before a ragged-edged round hole about ½ in. in diameter was found in the sigmoid flexure, where it occupies the hollow of the iliac bone; particles of faecal matter were exuding through the hole. The hole was closed by a purse-string suture with a continuous Lambert suture over it, the abdomen was mopped out and irrigated with saline, and a faecal fistula established in the small intestine about 9 in. above the ileo-caecal valve, a large rubber tube being sewn into the bowel and anchored in the upper part of the wound. The rest of the wound was closed in layers, with catgut for the deeper parts and silkworm gut for the skin.

After-History.

The operation lasted rather over an hour, and the man's condition was bad at the end. He rallied somewhat under ordinary methods of stimulation, but vomiting and hiccough were frequent during the first twenty-four hours. He was given calomel (1 grain) hourly for five hours. During the night about half a drachm of liquid faeces came through the tube. The next day he was better, with normal temperature and pulse 98. The abdomen was flatter and softer. He occasionally vomited dark green fluid. The calomel was repeated. On November 14th the bowels acted for the first time, five motions being passed per rectum. On the next day the bowels acted again both through the fistula and through the rectum. Subsequently the general condition improved, and with aperients the bowels acted both ways. On November 19th it was found that the faecal matter from the fistula had burrowed, and the skin portion of the wound had to be laid open and plugged with iodoform gauze. Subsequently there was slow progress to recovery. When the wound had granulated secondary sutures were put in, which held. The fistula did not close, motions coming both ways.

When the main line of the wound was healed and the skin got into as healthy a condition as possible I operated (February 15th), freeing the fistula, closing it transversely to the long axis of the bowel, returning the bowel into the abdomen and freshening and closing in layers the upper part of the abdominal wound. There was some pain, vomiting, and flatulent distension after this operation. Flatus was passed on February 17th, and on February 23rd the bowels moved freely after a simple enema. The abdominal wound healed well, considering its unavoidable exposure to infection, only two or three sutures working out.

The patient left the hospital on March 15th. He has got much fatter, and I showed him to the Cardiff Medical Society on April 20th, well. The abdominal scar shows no signs of weakness, but as a precaution he is wearing a belt.