the operations were successful except one in which the patient died on the fourteenth day with fever.

In conclusion, it would seem from this analysis that this disease develops mostly at the age of puberty, that nothing short of removal is of avail, and that only one case in sixteen died.

THE TREATMENT OF GANGRENOUS HERNIA.[1]

BY GEORGE W. GAY, M.D.,
Surgeon to the Boston City Hospital.

The cases of gangrenous hernia which will receive attention in this paper illustrate four modes of treatment, to wit: The expectant, or do-nothing method, a very good one in its place; returning the bowel, and closing or leaving the wound open; making an artificial anus; and resection of the intestine. Which of these, or of other methods, shall be selected in any given instance depends upon many circumstances, such as the kind and condition of the hernia, the age and state of the patient, and various other matters, which need not detain us at present. What to do with a bowel of doubtful vitality is one of those difficult questions which the surgeon is not infrequently called upon to decide at short notice. Individual judgment must determine whether it shall be returned to the abdominal cavity, or left in the ring, or excised; whether the wound shall be left open or closed. Written directions upon this subject are not quite satisfactory. Actual experience is the great teacher. The black, roughened, ash-colored, or ulcerated bowel of undoubted gangrene, is readily recognized. The very dark brown, or mahogany-colored ruptures are the doubtful ones. In cases of doubt it is good practice to reduce the hernia and keep the wound open with gauze, or some form of drainage, thus giving a ready exit to the intestinal contents, should one be required.

Time, and handling of the bowels, are very important elements in these operations, and are to be borne in mind, when deciding whether to make an artificial anus, or to resect the sphacelated structures. Most surgeons will require from forty-five to ninety minutes to excise the intestine, while an artificial anus can be established in a few moments. The ultimate result of the former method is infinitely preferable to the latter, but the immediate risk is greater. If the patient be *in extremis*, it would probably be better to save time by making an artificial anus, and trusting to the future for a closure of the same by nature or art.

The cases suitable for the expectant or let-alone treatment are limited to those, who are in the last stages of collapse. A patient with a cold, clammy, dusky skin; feeble, flickering pulse, or none at all; dull or stupid intellect, will hardly survive any operative treatment. While crossing the ocean some years ago the writer was asked by the ship's surgeon to see a man, who had a strangulated femoral hernia of several days' duration.

To look at the man one would not think that there was much the matter with him. He was quiet, conscious and comfortable. No pain, nor vomiting. All active symptoms had ceased. But he had no pulse at the wrists, and his extremities were cold. In other words, he was in a fatal collapse. Herniotomy was done and a recent, gangrenous knuckle of small intestine was found imbedded in a mass of old, thickened, adherent omentum. Death took place in a few hours.

Several years since I was called out of town to see a man, who had a large, irreducible, scrotal hernia of many years' standing, which had become strangulated three days before. The lower part of the tumor was purple and cold, indicating that mortification had set in. Vomiting and pain had ceased, and the pulse was weak. He was calm, conscious and desired an operation. It was decided to make an effort to relieve the strangulation. The patient took the ether slowly and quietly, but before he was fully under its influence the bronchial tubes filled with mucus or serum from a rapid œdema, and death took place at once.

It cannot be questioned that the fatal result in both of these instances was hastened by the operation, and that it would have been better to let them alone, as was done in the following case. An old woman was admitted to the City Hospital last year in a state of collapse from a gangrenous umbilical hernia of two days' duration. Vomiting, pain, delirium, dusky, clammy skin, followed by death in thirteen hours. It did not seem possible for any treatment to do her any good.

It is difficult to indicate upon paper, or even to determine at the bedside, in all cases, the degree of collapse that precludes an operation. My own experience would incline me to take pretty large risks under these circumstances. Much, very much, depends upon the manner in which these patients are managed. Time, animal heat, blood, the anæsthetic, moving the patient, and manipulating the parts involved are important factors in the treatment. Briefly, it may be said that the patient should be warmly covered, moved as little as possible, in fact, when practicable, it is better that the operation should be done in bed. Only sufficient anæsthetic should be given to deaden, rather than entirely remove sensibility to pain. The operation should be done as quickly as possible. Stimulants are to be given by the skin and rectum unless the stomach can be relied upon, which is seldom the fact during shock, however quiet it may seem to be. Absorption and assimilation are slow and unsatisfactory. Experience justifies the assertion, that, managed in this way, many desperate cases can be carried through an operation in safety. The following instance illustrates the fact.

Mrs. M., aged forty-seven, was admitted to the City Hospital in May, 1891. She was a large, fat woman with an umbilical hernia of five years' duration. Symptoms of strangulation had existed for sixty hours. Skin cold and clammy; pulse rapid and weak. She was restless, respiration was sighing, in short the collapse was very marked. The tumor was black at the apex and as large as the fist. A few whiffs of ether were given, and an incision was made directly into the bowel. The ring was enlarged, and the intestine secured *in situ* by sutures. The patient rallied fairly well, and although she had an attack of acute nephritis, yet she was much relieved by the operation, and lived seventeen days. She died from inanition, apparently due to the high location of the opening in the small intestine. About eight inches of the gut were gangrenous. At no time did the patient's condition justify any attempt at resection of the diseased tissues.

About a year ago I operated upon an old lady, a

[1] Read before the Surgical Section of the Suffolk District Medical Society, January 6, 1892.

patient of Dr. Edson's, who had a gangrenous inguinal hernia. She was extremely weak, vomiting, dusky skin, and feeble pulse. The bowel was laid open by a free incision, the constriction divided, and a poultice applied. She died in a few hours from shock.

Another woman, aged forty-five, was operated upon at the hospital last summer for a very large strangulated umbilical hernia consisting of omentum and intestine. The bowel was in a doubtful condition, but was finally returned. The omentum was cut off, and the ring closed by sutures. The patient only partially rallied, and died apparently from suppression of the urine, in forty hours. No autopsy was made, but there were no signs of extravasation or peritonitis.

Another case of doubtful condition of the intestine terminated more favorably. A woman, aged fifty-five, was admitted to the hospital in April, 1888, with a strangulated inguinal hernia of three days' duration; the rupture was a recent one. On opening the sac the bowel was very dark, but glistened, except in three or four small patches, which were ashy in color and very thin, as though all the coats, but the serous, were perforated. The bowel was finally replaced, as it was thought that the risk to her life would be less thereby, than from a resection of the gut. She was an extremely fat woman, and apparently had feeble powers of resistance. The wound in the sac was left open as well as the external one.

At the end of ten days, fæces appeared in the wound and continued to be discharged for about a week. The wound was soundly healed in a month. The provision of a free outlet for the intestinal contents probably saved the patient's life.

The good effects of an operation under the most unpromising circumstances are well shown in a case recently treated at the hospital. A man, aged sixty-eight, was seen at the end of five days' suffering from a gangrenous inguinal hernia. Vomiting, hiccough, pain, delirium, dusky skin, weak, intermittent pulse were the symptoms. The rupture had only existed a week. The patient was not removed from the bed, but was surrounded with heaters, stimulated by skin and rectum. A very little ether was given, and an opening rapidly made into the intestine. No efforts were made to separate the gut from the sac, but a herniotome was passed into the bowel, the constriction was cut and the wound lightly packed with gauze. The operation occupied but a short time, and the patient suffered no additional shock thereby. The hiccough persisted for a week. In five weeks two-thirds of the fæces came through the rectum. He was discharged from the hospital in very good general condition at the end of forty-one days. A little thin watery fluid came from the wound for some time after he went home. He returned to his business as a printer, although not able to do much work. The sinus has not yet healed, it being over four months since the operation was done, but he is able to be out and about. As a rule, the sinus does not give him very much trouble.

Two cases of resection of the bowel have come under my care; one recovered and one died. A woman, aged sixty, entered the hospital last June suffering from a large umbilical hernia, which had existed fifteen years. It was gangrenous and had been strangulated twenty hours. Sac contained a large mass of more or less adherent omentum, in the midst of which, was a knuckle of black intestine. The former was tied in sections and cut off. Five and a half inches of the bowel were cut away with its accompanying omentum, the ring having first been freely divided to allow the bowel to be brought out into easy reach. The vessels having been tied, the mesentery was adjusted with a continuous silk suture. The bowel was closed by two rows of continuous silk sutures, one including the muscular coat, the other, a Lembert, involving only the serous layer. External wound closed.

Patient had some pain after operation. Bowels moved the next day, and also on the following day. Temperature rose gradually till the third day, when it was 103°. Some distension; delirium, pain, restlessness and prostration. Wound quiet; no abdominal tenderness. Sank and died on the fifth day.

An autopsy showed fæcal extravasation at the junction of the intestine and mesentery, as is to be seen in the specimen here presented. It will be noticed that union seems to be firm and complete everywhere, except for about half an inch, as indicated above. Perhaps this patient would have done better had the wound been left open and packed with aseptic gauze.

The next case operated upon in precisely the same manner, so far as the intestines was concerned, made a good recovery.

Mrs. K., aged fifty-five, entered the City Hospital October 16, 1891. She rode upon the front seat of the ambulance with the driver, although she had a large, gangrenous umbilical hernia of about two days' duration. She was pale, haggard, weak, pulse irregular and feeble. Vomited after admission. An enema of brandy and strong black coffee having been given, also a hypodermic injection of morphia, she was partially etherized, and the sac laid open. The inside of the sac was dark colored and contained about six inches of small intestine, which was black and mottled with grayish spots, indicating sphacelus. All of the intestine seen was covered with a layer of lymph. The destructive process extended about half way to the root of the mesentery.

The gangrenous tissues were removed with knife, and the bowel and mesentery united as described in the last case. Wound closed after approximating the ring with two strong silk sutures.

Notwithstanding the fact that this woman had a fibrous tumor as large as a child's head, and a considerable amount of ascitic fluid in the peritoneal cavity, she made a speedy recovery from the operation. The wound healed by first intention. The bowels moved spontaneously on the third day, and regularly afterwards. She had little or no pain, required very little medicine of any kind, soon regained and kept a good appetite. She left the hospital in five weeks in a most satisfactory condition. The wound was firmly healed, there was no protrusion at the navel, and the functions of the bowels were in a natural state. In other words, so far as concerned the hernia, she was well.

Patients in profound collapse from gangrenous hernia had better be let alone. If the prostration be too severe to allow a prolonged operation, an artificial anus may be established for a time, the closure of the orifice being left to future efforts of nature or art. If the condition of the strangulated parts be doubtful, they may be replaced, and the wound packed with sterilized gauze. Under all circumstances the constriction must be relieved, and a free outlet provided for all obnoxious matters.