ounces were passed in twelve hours on the ninth day. There was retention on the fourth day in a single case. In another patient an increased quantity of indican was reported on the eighth day. In all the other cases there was either no record of its condition or the flow was reported as free or as abundant.

The seat of the twist is shown in the following table.

Seat.	Number of Cases.	Percent.
Sigmoid flexure.....	19.....	49
Ileo-cæcal region in 6 }	11.....	29
Cæcum in 5 }	5.....	13
Small intestine.....	2.....	5
Ascending colon.....	1.....	2
Colon.....	1.....	2
Descending colon.....	1.....	2
	39.....	100

It is thus evident that about one-half of the cases of twist took place at the sigmoid flexure, and that nearly one-third of them were present in the ileo-cæcal region. It is further evident that, for all practical purposes, 87% of the cases occurred in the large intestine.

An absolute diagnosis of volvulus is only to be made by abdominal section, either before or after death. Death is, therefore, to be regarded as the probable result of this lesion unless the surgeon affords relief. This statement is made despite the fact that in five of the cases there was the previous history of a similar attack.

Death occurred as follows in cases not treated surgically:—

Date.	Number of cases.
1st day.....	1
3rd ".....	2
5th ".....	2
7th ".....	3
8th ".....	2
9th ".....	1
12th ".....	1
Not given.....	3
	15

The date and result of operative interference is given in the following table:—

Date of operation.	Number of cases.	Death.	Recovery.
3rd day.....	2.....	1.....	1.....
4th ".....	1.....	1.....	0.....
5th ".....	3.....	2.....	1.....
6th ".....	2.....	2.....	0.....
7th ".....	1.....	1.....	0.....
9th ".....	6.....	5.....	1.....
10th ".....	1.....	1.....	0.....
11th ".....	1.....	1.....	0.....
16th ".....	1.....	0.....	1.....
26th ".....	1.....	0.....	1.....
Not given.....	6.....	6.....	0.....
	25.....	20.....	5.....

It is apparent from the above tables that all of the cases not treated surgically died, and that of those thus treated one-fifth recovered.

Since, of known dates of death, at least one-half took place before the eighth day, it is obvious that medical treatment should cease before this date. Furthermore, since, of the cases treated by the surgeon from the third to the sixth day only one-third recovered, it is suggested that medical treatment should cease at the former date.

—The death of Prof. Bamberger is reported from Vienna. He will be a serious loss to the department of clinical medicine in the medical school and general hospital.

ABDOMINAL SURGERY AT THE MASSACHUSETTS GENERAL HOSPITAL.

SERVICE OF J. C. WARREN, M.D., AND M. H. RICHARDSON, M.D.

REPORTED BY HOMER GAGE, A. M., M. D.

The following cases occurred during a service as senior surgical house pupil at the Massachusetts General Hospital, and are a fair illustration of the amount and character of work in abdominal surgery done at that hospital. The operations were all performed in the large operating theatre¹ of the hospital, under full antiseptic precautions, and the patient was in each case returned to a private room. On the day before the operation the patient was given a thorough sponge bath with soap and corrosive sublimate. The abdomen was scrubbed with a brush, carefully dried, and then covered with an antiseptic dressing of salicylated cotton and carbolic gauze, retained in position by a tight swathe. The bowels were moved the morning of the operation, and the patient catheterized immediately before etherization. All instruments were thoroughly washed, and then placed in a 2½% solution of carbolic acid. The silk used for tying the pedicle, and suturing the abdominal wound, had been previously boiled, and kept in 50% alcohol, and, with the catgut, was allowed to soak for several hours in corrosive sublimate, 1-2000. The only sponges used were those devised by Dr. J. W. Elliot, prepared from Germantown wool, boiled for several hours, and kept in bichloride until wanted. The abdomen of the patient was surrounded on all sides by warm towels wrung out in a sublimate solution, and the hands of the operator and assistants were thoroughly scrubbed and cleansed.

After the operation, the wound was freely dusted with iodoform, and a dressing applied which consisted of successive layers of iodoform gauze, salicylic cotton, and carbolic gauze. Over all was tightly drawn a broad plaster swathe. Absolute rest was maintained for the first forty-eight hours, and all nourishment withheld. Morphine was given only as required for the relief of pain, while the distressing thirst which often followed these operations was relieved by the free administration of cracked ice. In but two of these cases, to which reference will again be made, was there any discomfort from nausea or vomiting. At the end of forty-eight hours, or even earlier, if the temperature and general condition of the patient were satisfactory, or particularly if there had been a free discharge of flatus from the bowels, liquid nourishment, in the form of milk and meat broths, was given, and by the tenth day the patient was expected to be on full diet.

EXPLORATORY INCISION.

Case 1. Female, nineteen years of age, abdominal enlargement for three months. Operation by Dr. Richardson revealed cirrhosis of liver with ascites. Death on third day, apparently from exhaustion. No rise of temperature, no abdominal distention or tenderness, no nausea or vomiting.

Case 2. Male, forty-six years old, abdominal tumor for two months. Operation by Dr. Richardson disclosed cancer of liver. The wound healed

¹ They were for the most part done on other than public operating days, and before a selected number of students.

rapidly, and he was taken from the hospital by his friends on the ninth day.

Both of these cases had been under observation for some time, and in neither had a reasonably positive diagnosis been made. Both were losing ground rapidly, and the operation was proposed as a last resort to get at the exact cause of the trouble, and, if possible, to remove it.

INGUINAL COLOTOMY.

Case 3. Female, forty-two years old. Cancer of rectum for four years. Operation by Dr. Richardson.

Case 4. Male, twenty-five years of age. Cancer of rectum for seven months. Operation by Dr. Warren.

In these cases, an incision about four inches long was made parallel to and one finger's-breadth removed from Poupart's ligament. On opening the peritoneal cavity, the sigmoid flexure was in each case directly under the incision, readily recognizable from its mesentery and the longitudinal striæ of its walls.

In the first of these cases, there had been almost complete obstruction for one week, associated with intense pain. The bowel was first stitched to the wound, and at the end of four days opened. The relief following the establishment of the artificial anus was complete, and at the end of four weeks the patient's general condition and comfort had very much improved.

In No. 4, the patient's youth suggested a specific origin, but no specific history could be obtained, nor was there any change in the local condition after a prolonged course of specific treatment. At the operation, the posterior wall of the bowel was drawn well forward, so that when the opening was made on the third day the bowel below the artificial anus was completely shut off. The almost constant muco-purulent bloody discharge which had existed for several weeks prior to the operation ceased within a short time, and when he left the hospital, at the end of one month, his general appearance was very much improved. He reported June 13th later, having gained twenty pounds, and been perfectly free from pain. On examination of the rectum, the anus was found puckering in and contracting, the hard nodular mass still present, but with no extension or ulceration. He was having a truss made to support and occlude the opening.

MEDIAN COLOTOMY.

Case 5. Male, forty-six years old. Cancer of ascending colon, two years' duration. Exploratory incision. Median colotomy. Recovery.

This case presented a tumor as large as a hen's egg midway between the anterior superior spine and the lower margin of the ribs on the right side, of irregular outline, freely movable, and the seat of constant pain. Although believed to be malignant, its mobility seemed to offer a reasonable chance for removal. The tumor was disclosed through a median incision, and proved to be a cancer of the ascending colon, with coils of small intestine adherent. There was also a cancerous infiltration of the mesenteric glands. Its removal being out of the question, and the calibre of the bowel having been already considerably narrowed, an artificial anus

was established by stitching a portion of the bowel between the cæcum and the tumor to the incision in the median line. The patient left the hospital four weeks after the operation very much stronger, and entirely free from pain.

OVARIOTOMY.

Case 6. Married, twenty-eight years old. Several miscarriages, no children; painful, irregular, and profuse menstruation for several months. Removal of parovarian cyst by Dr. Warren. Recovery.

Case 7. Married, twenty-two years old. No children; miscarried at fifth month two years ago. Tumor in left iliac region for three months. Cyst of left ovary. Removal by Dr. Warren. Recovery.

Case 8. Unmarried, thirty years old. Tumor in right iliac region for six weeks. History of a recent attack of local peritonitis, from which she had just recovered. Cyst of right ovary removed by Dr. Richardson. Recovery.

These were small cysts, all of short duration. Case 6 had a small abscess about one stitch hole, but otherwise made an uninterrupted recovery. She reported three months later, entirely free from the catamenial irregularity which had been present before the operation, but still suffering from incontinence of urine. The latter trouble was due to a urethro-vesical fistula, resulting from an operation in Sweden. She was advised to postpone any further operation for its relief.

In Case 7 menstruation had been scanty, irregular, and painful for two years. The tumor was as large as a cocoanut, and contained about a pint of thick chocolate-colored fluid. The patient seemed perfectly well until the fourth day, when she began to complain of some abdominal pain and slight nausea, which continued at intervals for several days. At the end of a week, all the stitches were removed, and the wound found to have closed by first intention. There was slight tenderness in the right iliac region, and some diarrhœa. From the seventh to the fourteenth day there was a gradual rise of temperature without any apparent cause, and on consultation it had been decided to reopen the wound. On the evening before the day appointed for the operation, the patient had a large movement of the bowels following an enema, and the temperature on the next morning was normal. There was no subsequent rise, and convalescence was uninterrupted. Just what pathological change gave rise to the unfavorable symptoms in this case must be largely a matter of conjecture. Of one thing, however, we are sure—that it was entirely relieved by a free movement of the bowels. Speaking of peritonitis following an operation, Greig Smith says that "a case seen with distention, sickness, and restlessness has a Seidlitz powder prescribed, to be followed by a hot water or turpentine enema; and it is almost taken for granted that at the visit next day the patient will have a flat abdomen, the sickness will have disappeared, and she will express herself as feeling infinitely better." In his experiments on intestinal suture in dogs, Dr. Warren found, on reopening the abdominal wound from three to eight days after the operation, that the sutured point was in each case more or less concealed by the matting together of mesentery and intestines about the resected spot. Although the

passage of fluid through these coils was in nowise interfered with, there was probably a certain amount of paralysis from the local inflammation. The breaking up of these adhesions by the free peristalsis set up by an enema or saline cathartic, may have the same beneficial effect as when the adhesions are forcibly broken up in cases of laparotomy for suppurative peritonitis.

Case 9. Widow, fifty-nine years old; two children, menopause eight years ago. Multilocular cyst of right ovary, duration one year. Removed by Dr. Warren. Recovery.

At the operation, a small subserous fibroid was found attached to the anterior wall of the uterus, undergoing calcareous degeneration. Its removal was not attempted. During her convalescence she had an attack of facial erysipelas, without, however, any implication of the wound, and she was discharged well in twenty-four days. One month later she was reported to be in excellent health.

Case 10. Married, fifty-two years old. Youngest child fourteen years old; climacteric seven years ago. Dermoid cyst of right ovary, five years' duration. Removed by Dr. Richardson. Recovery.

The tumor was very firmly adherent, especially over the anterior surface. Its contents, which were at first supposed to be pus, proved to be a pure yellow fat, that solidified completely on cooling. There was a mass of black hair as large as two fists within the cyst, and, on its walls, two rudimentary teeth.

Case 11. Married, fifty years old. Ventral hernia for three years. Symptoms of incarceration for one week. Radical cure by Dr. Richardson. Recovery.

Ovariectomy had been performed on this patient four years previously, and the hernia had developed in twelve months. The incision was made parallel to but a little to the left of the scar, the opening enlarged, and the peritoneal surfaces approximated as in a primary laparotomy.

Case 12. Widow, thirty-two years old. Chronic suppurative salpingitis. Removal of tube and ovary by Dr. Richardson. Recovery.

This patient gave a history of several artificially induced abortions; the last nine months before her admission to the hospital. Since then her catamenia had been irregular and increasingly painful. She had suffered also from a severe and almost constant pain across the lower abdomen, following the course of the right sciatic nerve, increased by exercise, and preventing her from attending to ordinary household duties. During this same time she has noticed a slight enlargement in right side of abdomen. The uterus was deflected to the left, two and three-fourth inches deep, while to the right of, and intimately connected with, the uterus was an indurated mass as large as an orange. Exploratory puncture through the posterior vaginal wall revealed the presence of pus. The tumor was exposed by a median incision, and found to be intimately adherent, not only to the uterus but also to the floor and sides of the pelvis and to the intestines. There was no capsule or pedicle, and the fallopian tube, ovary, and broad ligament were indistinguishable. Twelve ounces of thick pus were evacuated, and the mass finally removed with great difficulty. During the operation some very large vessels were ligated and cut, and considerable

pus escaped into the pelvis from rupture of the cyst. A glass drainage tube was introduced into Douglas's pouch, which projected through the main dressing, and from which the accumulated fluid was withdrawn twice a day by means of a catheter. The tube was removed on the fifth day, and the patient was up and about three weeks after the operation. She has gained thirty pounds, is now free from pain, well, and strong. Dr. R. H. Fitz examined the tumor, and reported that it was a "cyst with dense fibrous walls; its inner surface, rough, red, and easily scraped away. In the immediate vicinity and intimately adherent was a dilated tube nearly as large as the little finger, the wall of which was thickened and fibrous, and the inner surface lined with a membrane resembling that of the cyst. Diagnosis — chronic salpingitis with probable cystic degeneration."

No. 13. Fibroid of uterus with umbilical hernia. Herniotomy by Dr. Warren for strangulation of hernia. Recovery. Hysterectomy for sloughing fibroid by Dr. Warren. Death.

This case presented many features of peculiar interest. A single woman, thirty-eight years old, had first noticed a tumor seven years ago in the lower left side of the abdomen. It had grown with especial rapidity during the past year, and with its growth there had developed an umbilical hernia as large as two fists. This had been irreducible for three months, but gave rise to no discomfort until three days ago, when she began to have frequent attacks of abdominal pain, with nausea and vomiting. There had been no movement of the bowels and no passage of flatus for forty-eight hours. The hernial protrusion was tense, tender, and moderately painful. The skin was generally reddened and acutely inflamed at the summit, where there was a dry black slough as large as a fifty-cent piece. It was tympanitic, with a doubtful impulse; gurgling on pressure. The abdomen was enlarged to the size of pregnancy at term, and was tympanitic, except on the left side, where there was a large dull area in the hypogastric, inguinal and lumbar regions. These were occupied by a slightly movable tumor of distinct outline. The symptoms of strangulation continuing, on November 12th the hernial sac was opened, and found to consist of four pouches separated by thick, fibrous walls, each communicating with the other through a small opening. Two of these pouches contained three to four ounces each of dark serum, while the two on the left of the median line contained a loop of intestine, three inches long, dark-colored and lustreless, with no omentum. At the middle of this loop was a constriction so tight that the calibre of the bowel was diminished one half. The muscular and mucous coats were cut and had retracted, leaving a white glistening ring around the bowel one quarter inch wide. The contents of the bowel could however be readily passed through without leaking. After enlarging the opening the intestine was replaced, and the wound closed tightly by a double row of braced sutures. The patient had several large loose dejections on the third day, and improved steadily until the ninth day, when she had a chill, with severe abdominal pain, nausea, and vomiting. During the next two weeks she had six chills at irregular intervals, all associated with the same evidences of abdominal

distress. The pain and tenderness were referred chiefly to the region of the tumor. This tumor had grown very slowly without causing any local or constitutional disturbance. It was hard when first examined, easily movable, and intimately connected with the uterus. Vaginal examination threw no light on its origin. After the operation on the hernia it seemed to grow softer, and, over the lower part of the anterior surface, distinctly fluctuating. That the abdominal symptoms could be in anywise referable to the previous strangulation of the bowel seemed unlikely in view of the absence of constipation and the free passage of flatus. The possibilities of a pyelitis from pressure, of a suppurating cyst of the ovary, and of a sloughing fibroid of the uterus were all directly suggested, with the chances rather in favor of the latter condition. At all events it was evident that she was failing rapidly as the result of some inflammatory change within or about the tumor, and Dr. Warren, after consultation, decided upon its immediate removal. With the greatest difficulty the mass was delivered through a median incision reaching from above the umbilicus almost to the symphysis. It was found to occupy the entire left side of the abdomen and to extend above the lower margin of the ribs. It was mainly solid, very friable, and presented on section the appearance of a fibro-myoma. In several places, notably on the anterior surface, it had undergone cystic degeneration, and the resulting cavities were filled with a thick purulent fluid in which were floating bits of sloughing tissue. On the left side were to be seen the left broad ligament with ovary and tube. No trace of these structures could be found on the right. The body of the uterus was completely lost in the tumor. A Koeberle's ecraseur was adjusted as low down as possible, and the mass cut off even with the abdominal walls. A glass drainage tube was placed in the posterior cul-de-sac, the stumps dressed with iodoform and iodoform gauze, and the wound closed about it. The patient improved slightly during the first forty-eight hours, but died on the fifth day.

An autopsy was made by Dr. R. H. Fitz, who reported as follows:—

"Intestines adherent to the peritoneum by recent adhesions throughout the greater part of the lower half of the abdomen. Douglas' fossa was filled with adherent coils of intestine, and contained two ounces of thin, dirty, red fluid. Peritoneal surface at seat of adhesions thickened, moderately opaque, with numerous patches of friable false membrane.

Left kidney one-fourth larger than right, soft, capsule adherent, cortex opaque yellowish gray, tubular regions indistinct. Right kidney normal in size, with similar gross appearances. The pelvis and ureter were diminished in volume. The mucous membrane spotted with patches of a pale red, granular material, resembling fine grains of seed.

The uterus was represented by a stump. The remains of the canal were two inches long, its anterior part intimately connected with a dirty gray, soft fibroid mass as large as a small lemon, apparently subperitoneal. On the right side of the canal, also subperitoneal, were two fibrous nodules, size of English walnuts. No ovaries or fallopian tubes seen. Left ovarian vein contained a dark red thrombus adherent in places.

Intestines: Two feet above the ilio-cæcal valve was a loop of ilium six inches long, distended, of a dirty gray color. On its peritoneal surface occasional fibrous patches; also a fibrous band, easily torn, forming a bridge between the root of the mesentery and the peritoneal portion of the intestine. On section the mucous membrane thin, especially at the lower part of the loop, where the muscular coat was also thin in places. At the lower part of the pigmented loop was an annular ulcer one-quarter inch wide, with a slight constriction. The ulcer extended through the mucous and muscular coats over the greater part of its surface. Near the mesenteric insertion was a pouch as big as a pea, extending from the ulcer into the mesentery. The mesenteric lymph glands in the immediate vicinity of this loop were enlarged to the size of beans, moist, reddish gray. Near root of mesentery a nodule as big as end of thumb. On section it showed a tough fibrous wall and soft putty like contents.

Diagnosis—laparotomy: acute peritonitis; hysterectomy: annular ulcer of intestine; hyperplastic spleen; granular degeneration kidneys and liver.

REPORT PROGRESS—ORTHOPEDIC SURGERY.

BY E. H. BRADFORD AND E. W. LOVETT.

POTTS' DISEASE—PARALYSIS.

DR. ELLIOT has made a most careful pathological and experimental study of the pressure paralysis of Potts' disease, and has reached the following conclusions: that the lesion begins as a simple mechanical pressure on the cord in the form of abscess products, thickened dura, or bone, that the inflammatory process in the dura is a limited one, and that the medullary surface of the dura is almost always normal. As there is no tendency of the cord to be involved by the specific carious process going on in the bone, the cord lesion is purely the result of pressure.

That the presence of sclerotic tissue at the site of the cord lesion in cases of long standing is not an evidence that the process was originally an inflammatory one, and experimental physiology gives no evidence of an inflammatory lesion following experimental compression of the cord. And pathological findings in recent cases reveal but few instances where the original lesion seems to have been inflammatory. In short, his research would lead to the conclusion that the original cord lesion is not, as a rule, inflammatory.¹

Mr. Wright has recently attacked a case of dorsal Potts' disease by operation in the hope of relieving a severe and progressive paralysis. The disease was in the mid-dorsal region and an incision was made over the spines along the angular prominence. Three laminae on each side were divided, and with their spinous processes were removed, exposing the cord, which was found surrounded with a buff-colored, tough, leathery substance. This was cut away with scissors, and the muscles and skin were brought together over the wound. The wound healed by first intention, and slight improvement followed, which was only temporary, however, and the condition gradually fell back to what it was before operation, where it remained stationary.²

¹ N. Y. Medical Journal, June 2, 1888, p. 599.

² Lancet, July 14, 1888, p. 64.