TRANSACTIONS

OF THE

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AND OF THE

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DR. EUGENE H. POOL in the Chair

SYMPTOMS AND LATE RESULTS IN NEOPLASMS OF THE SPINAL CORD

DR. CHARLES A. ELSBERG read a paper with the above title, for which see p. 1057, ANNALS OF SURGERY, vol. lxxxi.

In illustration of his paper Doctor Elsberg presented a number of patients as follows:

CASE I.—A young man upon whom he had twice operated for an extramedullary spinal cord tumor at the sixth cervical segment. A well-encapsulated tumor was removed which was reported by the laboratory as a fibroma. Two years later he returned to the hospital with a recurrence of his symptoms and at the second operation, performed in 1921, a second well-encapsulated growth, together with a small piece of dura, was removed. Convalescence from the second operation was satisfactory, and the report from the laboratory was that the tumor was a spindle-cell sarcoma.

CASE II.—A man from whom he had removed an extramedullary leiomyoma at the second and third cervical segments. When he was admitted to the Neurological Institute, the symptoms and signs pointed to a tumor at the second cervical segment. At the laminectomy an extramedullary tumor was removed from the level of the second cervical segment. It had a process extending through the dura and through an intervertebral foramen. The tumor was a leiomyoma which contained a large number of blood-vessels. Improvement was noted by the patient as soon as he awoke from the anæsthesia and there was a steady and rapid return of power in all four limbs. He has completely recovered.

CASE III.—A patient from whom he had removed an extramedullary spinal cord tumor from the level of the seventh segment in 1921. The tumor lay in front of the cord and had caused a slightly marked spastic paraplegia with sensory disturbances that were more like those of a growth within the substance of the cord. The patient suffered also from gastric distress after meals and on account of the gastric symptoms had been operated upon in another institution for suspected gastric ulcer which was not found. This patient demonstrated that abdominal symptoms of spinal root origin may be mistaken for symptoms of intra-abdominal disease.

CASE IV.—A woman, twenty-five years of age, from whom in 1923 he had removed an extramedullary tumor from the left and posterior surface of the cord at the eleventh to twelfth thoracic segments. The patient had a positive Wassermann reaction and gave a five months' history of numbness in the toes of the left foot which had gradually spread up to the left leg. Ten

weeks before the operation the right limb became affected and soon walking became impossible.

Upon physical examination, it was found that the left lower extremity was weaker than the right. There were marked sensory disturbances which involved dermatoes only up to the fifth lumbar, and muscle and joint senses were markedly impaired in the lower limbs.

The unusual features of the case were the rapid onset of the symptoms in the presence of a positive Wassermann reaction and the very rapid return of function after the removal of the tumor, so that within a few weeks all of her motor and sensory disturbances had disappeared.

CASE V.—A woman, with a history of four years' duration, from whom he had removed an extramedullary tumor from in front of the cord at the level of the fourth cervical segment. The physical signs presented by the patient were mostly those of a right hæmiparesis, and it was of interest that tactile sensibility was normal all over the body, while pain and temperature sensibility were only slightly disturbed. The manometric tests failed to show any distinct interference with the circulation of spinal fluid. The patient recovered satisfactorily from the operation and left the hospital twenty days after the surgical interference. She has steadily improved since that time.

DR. JAMES H. KENYON presented a woman, thirty years of age, whose symptoms began in 1922 with pain in both shoulders, but mostly in the left. A few months later the legs seemed to be weaker, the pain had extended down the left side, also across the lower abdomen, and there were various sensations of heat or of pins and needles in the soles of the feet, particularly the right.

By October, 1923, about one and a half years after the onset, she could not walk at all, had a tight band-like sensation at the nipple line, breasts were very tender, so that she could scarcely touch them. Breathing became difficult and a deep-seated pain appeared in the centre of the chest. Two months later she could not stand, could scarcely sit up, and was uncomfortable all the time. Urination became frequent and scanty and the bladder never felt empty.

March 14, 1924, she entered the Neurological Institute; unable to stand or walk, could not even sit up, could not pass any urine, had to be catheterized. The band-like sensation around the nipple line was worse, paræsthesia of legs and feet more pronounced, especially on the right side.

With a diagnosis of tumor of the spinal cord, extra-medullary, but inside the dura at the level of first thoracic vertebra, on March 29, 1924, he removed the spines and laminæ of the seventh cervical and first thoracic vertebræ. Color and contour of dura normal, rather tight, no pulsation. Some increased resistance felt on palpating dura under the seventh lamina. Dura opened, very little fluid, tumor exposed, an elliptical incision in the adherent dura overlying it was made. By slight traction on this piece of dura and gentle manipulation with a separator the tumor was easily removed without any trauma to the cord. During this manipulation the usual amount of clear fluid escaped, showing that there had been a partial block of the spinal canal. The tumor was molded around the posterior surface of the cord at the level of the lamina of the seventh cervical vertebra. It measured 2.5 by 2 by 0.5 cm.; it was not adherent to the cord or nerve roots.

Pathological Examination.—Endothelioma.

Post-operative Course.—The patient could move her legs on the third day; was out of bed on the twelfth day and on the thirteenth day walked the length of the hall, something she had not done for five months. She left the hospital on the twenty-eighth day. At the present moment, February 25, 1925, the patient is normal in every way; all tests are normal. She walks perfectly. The bladder function is all right.

DR. CHARLES H. FRAZIER (Philadelphia) reviewed the last forty cases of presumptive spinal cord tumors, covering his experience in the last few years, in which a laminectomy had been performed. He regarded the most difficult problem in spinal cord tumors to be the diagnosis rather than the localization, differing in this respect from brain tumors in which the reverse is true. One learns more, perhaps, from reviewing one's mistakes than displaying one's successes, so the speaker had selected the eight of these forty cases in which he had failed to find a tumor, cases in which the diagnosis had been inaccurate. These cases proved to be multiple sclerosis, amyoptrophic lateral sclerosis, transverse myelitis and various syphilitic lesions.

These diagnoses had been confirmed by the subsequent course of events and by the development of symptoms not apparent before the laminectomy was performed. Of these eight cases in which a mistake in the diagnosis had been made, six had been referred to him by competent neurologists as spinal cord tumors.

In the matter of diagnosis, Doctor Frazier thought it perhaps not so important what these eight cases presented as what they did not present. In these failures there was in none a typical tumor history and especially notable was the absence of pain. In the majority of cases, in 90 per cent. of his own series of verified spinal cord tumors, there was a definite, typica spinal cord tumor history, that begins with pain and months' duration, sometimes years, and always and continuously referred to the same region. Pain is the most important and essential feature not only in the diagnosis, but often in the localization of spinal cord tumors. As they begin with pain, there follow paræsthesias and almost always after these the motor disturbances, atrophies, paresis or paralyses. *In only 10 per cent. of his series was there a painless history* and in every one of these the tumor proved to be extradural. These percentages may differ from those of Doctor Elsberg's series; if so, this can be explained by the difference in the point of origin of the tumors.

In the majority of mistaken diagnoses difficulty was experienced in the attempted segmental localization. In the verified tumor there is invariably one or more of the following suggestive features; a precise sensory level, definite pain distribution, sympathetic phenomena, loss of a single reflex, muscle atrophy, involvement of the diaphragm. Except in lesions of the cauda equina the pelvic viscera were not involved until comparatively late. One of the outstanding points in differential diagnosis is this; the findings must be definite, not vague; they should be clear cut, not difficult of interpretation. He usually found when he had made a mistake that the history was atypical, the physical findings were not sharp and clearly defined. In one of his series which proved later to be a case of multiple sclerosis, the objective symptoms were vague and the history by no means typical. In one case of amyotrophic lateral sclerosis, while the early history was suggestive, there was no well-defined sensory level. In one case of transverse myelitis the course was rapid, pain was not a prominent factor, incontinence developed

early. Hind sight is better than foresight, but the true nature of the lesion did not reveal itself in these mistaken diagnoses until some time after the exploration.

Too much emphasis, the speaker thought, had been laid upon the presence of a spinal block. It is not a matter of vital importance. It is gratifying of course to know if the patient has a spinal block, but one's judgment should not be overinfluenced by it. If in cases without evidence of spinal block an exploratory laminectomy is not performed, many tumors will be overlooked, and per contra there may be cases of spinal block in which the block is not due to tumor, but to some other lesion, a pachmeningitis or a meningomyelitis. For these reasons one should place a reservation on the importance of spinal block.

Among the verified tumors there was only one in which the tumor was not uncovered at the first operation; in this case the segmental localization was higher than the lesion. As a rule, if an error has been made the lesion is higher rather than lower than the anticipated level, and it becomes necessary to remove one or two laminæ above the contemplated exposure, but in this case the reverse was the case. Eleven per cent. were extra-dural; in one the tumor was both intra-spinal and intra-cranial; in 10 per cent. the tumor was intramedullary and in 4 per cent. caudal.

As to the end results of operation: In two of the speaker's series in which the tumor was found and removed, there was no recovery of function, the duration of the lesion being two and six years. In all but these two there was recovery of function both motor and sensory and the patients became ambulant. In some cases recovery of function is surprisingly slow, when the disturbance of function must be the result of pressure and not of degeneration. In only one case was there a recurrence. An average of twenty-three months had elapsed before the tumor was removed.

The chief and foremost concern, therefore, in tumors of the spinal cord is diagnosis and segmental localization. The tumors are of such a character that they present few if any technical difficulties, except when they have gotten beyond the confines of the spinal canal. Perhaps the most important point to be emphasized is the excision of that portion of the spinal membranes from which the tumor takes its origin.

Dr. J. Stewart Rodman (Philadelphia) said as to the matter of pain, this is one symptom that could be relied on more than others in the diagnosis of spinal cord lesions. However, it may be absent at times, and it may not always be characteristic, and so, therefore, it may lead one astray, except in the presence of other pathognomonic symptoms. The presence or absence of pain has much to do with pressure on the posterior roots. He had been disappointed after removing extra-medullary tumors and then having the symptoms of spinal cord pressure continue. How long it takes for irreparable spinal cord damage to come about he did not know. He recently operated on a case of fibro-lipoma beautifully located by neurological findings of lipiodal, but post-operatively the symptoms continued and the patient is no

better now than before the operation. He emphasized, again, that one should look to the early neurological diagnosis as still being the most reliable diagnostic help in tumors of the spinal cord.

DOCTOR ELSBERG, in closing the discussion, said that of course errors in diagnosis were being made, tumors not being found as expected, but this much could be said, namely, that the knowledge gained from lumbar puncture and the manometric tests had been of no little help in these doubtful cases which he classed as B or C. Class A are the typical cases; Class B not so much so, and Class C includes those which are probably not tumors. In Class B the manometric tests have helped in the correct diagnosis of not a few cases. Where spinal block exists, it may be caused by a number of different diseases, and in the group of doubtful cases undoubtedly the manometric test will help one in a certain proportion of cases to gain an increased amount of information.

CARCINOMA OF RECTUM. REPORT OF OPERATIONS AND PRESENTATION OF CASES

DR. JOSEPH A. BLAKE (New York) read a paper with the above title, for which see p. 177, ANNALS OF SURGERY, vol. lxxxii.

DR. CHARLES H. PECK (New York) presented two cases, one well after seventeen years and one at about three years. One other case, entirely well after six years, failed to come, but reported by letter that she was entirely well. The first two were both perineal resections without laparotomy. The last one was a combined one-stage operation with the proximal end brought down to the anal sphincter. He also has a case well and free from recurrence with a permanent inguinal colostomy after five years. His personal cases since 1915, a working period of about eight years, total 44, of these 22 cases were radical resections with 7 deaths.

The method of operation included combined operations in one and two stages, and a few perineal operations without laparotomy. He is inclined to favor the two-stage combined operation as the most ideal, although his best late results chance to be cases in which the perineal operation was done.

DR. FRANK S. MATHEWS (New York) presented a woman who had been operated on at the age of forty-two for carcinoma of the rectum, eleven and a half years ago, the growth being an annular one felt through the vaginal fornix in the cul-de-sac, but not palpable through the rectum. By an abdominal incision, the growth was removed, the division of the gut beyond the growth being at the floor of the pelvis, so that the distal segment had only a partial peritoneal covering. The proximal segment was inverted about a tube and sutured to it. It was then drawn through the distal segment and, by traction on the tube from below, the upper segment was partly invaginated into the lower. The tube came out in eight days, bowels moved on the ninth, and patient left the hospital in two and a half weeks. The growth infiltrated all the coats of the rectum, but the nodes examined were not involved.

He always precedes a perineal operation by an abdominal exploration to determine the condition of the liver and the regional lymph-nodes, and making a left colostomy which permits one to maintain a cleaner perineal wound and which could be closed later if conditions permitted.

DR. ALLEN O. WHIPPLE (New York) presented a woman, who was forty-one years of age when she came to the Presbyterian Hospital on March

16, 1916, complaining of pain in back on evacuation of bowels, loss of weight and strength, diarrhœa of five months' duration. The onset had been gradual with pain in back and pelvis while at stool and feeling of not having completed evacuation of bowels. Began having frequent stools containing blood for two and a half months, four to eight stools a day, considerable blood and mucus. Examination revealed a nodular mass in the rectum ten centimetres above the anus. It was freely movable. The rectum was excised March 27, 1916, by Dr. George E. Brewer.

Dr. George Woolsey (New York) reported the history of a man, who, September 4, 1901, being then forty-three years of age, was admitted to the Presbyterian Hospital on account of bloody discharges from the rectum with pain on defecation. Examination showed just inside the internal anal sphincter an uneven villous-like growth encircling the rectum, more prominent on the right side. It seems continuous with the prostate, which is enlarged. especially the right lobe, which feels nodular and firm. The growth feels hard, the base is infiltrated and irregular, and it is painless on pressure.

September 6, 1901, Doctor Woolsey operated as follows: Left inguinal colostomy.

Five days later, September 11, 1901, a Kraske resection of the rectum was done under gas and ether. The growth was found to extend to about five inches above the anus. Above this point the rectum, after dissecting off the peritoneum, was cut away from the gut above and removed, with the pelvic fat and glands behind it. The upper free end of the gut was then brought down and its mucosa sutured to the free margin of the anal portion, while its outer layers were sutured to the external sphincter to relieve any tension on the mucosal suture. There was practically no tension on the rectum. The wound was lightly packed with gauze, after suturing the upper half of the skin incision. A gauze pad was introduced through the colostomy opening into the distal segment to prevent fæcal matter entering the lower part of the bowel All stools were passed through the colostomy until the sixth day, when the pad was removed. Two weeks after operation the lower end of the gut had separated from the anus by about two inches and fæcal matter passed mostly through the granulating wound, partly through the colostomy. The complete granulation and closure of the posterior wound was a slow process. Four months after operation there was still a small sinus through which part of the fæcal matter was passed. The colostomy was not completely closed.

The *pathological report* was malignant adenoma, invading all tissues. A lymph-node examined showed no invasion by the growth.

About a month ago he was asked by Doctor Whipple to see this man upon whom he had operated twenty-three years ago, who was again under treatment in the hospital on account of a large mass on the left side of the neck, and a smaller one on the right side. Microscopic examination of a specimen from the neck showed Hodgkin's disease. On examining the rectum there was a slight constriction at the level of the internal sphincter, but no sign of recurrence on digital or proctoscopic examination. The colostomy had never been undone and it formed a hernial protrusion, on which, from time to time, a small spot, corresponding to the stoma, would open up and form a very small discharging sinus. He had good control of the bowels, except when they were very loose. He was in the hospital being treated for Hodgkin's disease, when, February 17, he died suddenly from an intestinal hemorrhage, which was shown by autopsy to come from a duodenal ulcer, that had given no symptoms and was not suspected. As a result of the autopsy and the microscopic examination,

Doctor Von Glahn, Pathologist of the Presbyterian Hospital, reports that there is no trace of any recurrence of the new growth, but extensive lesions of Hodgkin's disease.

DR. JOHN H. GIBBON (Philadelphia) said that notwithstanding the excellent late results following operation for cancer of the rectum in some cases which had been exhibited, this condition remains one of the unsatisfactory fields of surgery. If one is able to remove a rectum fairly early for carcinoma, the ultimate results are remarkably good. The one thing of primary importance in deciding an operability in these cases is the question of metastasis. The size and extent of the growth is not all one wants to know, especially in young people. He had been so astonished to find early metastasis to the liver in people of thirty to forty years of age without any evidence of it that he determined long ago never to do an operation on the rectum without opening the abdomen. This eliminates the posterior operations unless preceded by this earlier exploration. An anterior colostomy is more comfortable than a posterior and, as far as function is concerned, is much better. Many of the far-advanced cases live as long without operation as with it. No case with metastasis should be subjected to a radical operation. His experience in trying to preserve the sphincter had been very unsatisfactory; these resulted in either stricture or incontinence.

DR. DAMON B. PFEIFFER (Philadelphia) said that one of the chief reasons why this subject is in the chaotic state it is, is because of the extraordinary variation in pathology and clinical behavior of different growths in different individuals. Carcinoma varies quite as much as any disease. He recalled a woman operated on sixteen years ago for a small carcinoma of the rectum above the internal sphincter, who is alive to-day and free from recurrence. Four years ago he had in the same hospital and at the same time two patients, a man and a woman, who each had a growth, which had been apparent for one year, completely encircling the bowel. The growths were small and freely movable and the outcome seemed favorable. The same operation was done on both. The man developed large metastases and died in six months. The woman showed no metastasis and is alive to-day. That factor of variability of pathology should always be borne in mind in considering which operation will fit the case. Many recoveries are on record from different sorts of operations and the factor of malignancy has been disregarded. There is a definite etiological picture connected with malignancy. It exists primarily whether it can be recognized microscopically or not, and it has to be taken into consideration when deciding which operation will give the best results. In spite of the recorded successes of the different operations, it has become clear that if one is to have notable successes that can be expressed in terms of percentages rather than in terms of results, one must achieve it the same as with carcinoma in other fields; one must consider the zones of spread, the natural path of metastasis. He was very pleased to hear that anyone could report ten successful cases of combined abdominal and perineal excision. Fifteen years ago this number of cases without mortality would have been astonish-

ing. Miles, the chief exponent of this combined operation, has confessed to 20 per cent. mortality and in general hands the mortality would be higher than that. The work on cancer of Francis Miles, of England, the Mayos, and of Doctor Jones, of Boston, is spreading the gospel of complete operation. A two-stage operation can sometimes be done where one cannot be attempted in the average hands. One must remember that many of these patients are in a state of impaired vitality. One should remember that many such patients cannot stand successfully a complete operation in one stage. Finally, one must remember that the technic of the combined operation must be thoroughly learned before it is applied, to avoid loss of time, loss of blood, shock and infection and control of the spread of infection. The speaker's own failures had been due to his not applying these underlying principles. On the other hand, he had been fortunate enough not to lose cases where he had not transgressed any of these principles. He believed the aim of those devoting their time to surgery of the rectum should be to secure mortality rates which would compare favorably with surgery in other conditions, such as gastric carcinoma.

DR. DANIEL F. JONES (of Boston) said that he had been an advocate of the combined abdomino-perineal operation for carcinoma of the rectum for many years. The combined abdomino-perineal operation in one stage is, he believes, the ideal operation, but it is true that the operation is not suitable for every patient, and if one wishes to operate upon the highest possible percentage of the patients seen, one must choose a suitable operation for each patient.

As many patients are too old or too feeble to stand the one-stage combined abdomino-perineal, he has developed a two-stage combined abdomino-perineal operation which may be used in a certain number of those who cannot stand the operation in one stage. There are some too old or too feeble to stand the operation in two stages; then a colostomy is done and some weeks later amputation by the perineal route as recently advocated by Lockart-Mummery.

There are a few cases in which the growth is sufficiently high to use the operation suggested by W. J. Mayo, in which the dissection is carried down below the growth by the abdominal route, the bowel sectioned below the growth, and the proximal end brought out, after removal of the growth, for a permanent colostomy, and the distal end closed.

Radium must be considered in the treatment of carcinoma of the rectum, but it should be confined to those too old, too feeble, or too fat for operation, and to the inoperable cases. In these the sphincter is removed, except in a very few carefully selected cases. If it is left it may be so weakened as to be valueless and a stricture may result, or a sinus may remain. The patient is more uncomfortable with a sphincter that does not control, or a fistula, than he would be with a good colostomy, but the chief reasons for doing a permanent colostomy is that in leaving the sphincter one is always tempted to section the bowel too close to the growth, either above or below. Another reason is

that the recurrence is frequently in the pelvis and this may involve the bowel and cause obstruction a second time.

Some one has said that these patients frequently live for years without operation and implied that it might not be necessary to operate. Because they do live so long and are so uncomfortable while they do live is one of the chief reasons for operating.

Removal of the growth should be undertaken even though it is evidently nothing more than a palliative operation. Colostomy alone does not give the comfort that excision of the growth does. The combined abdomino-perineal operation has been done in the presence of small nodules in the liver. These patients usually live a year or more and six months of comfort repays one for going through the operation.

The speaker has for several years been looking for statistics on various operations for cancer of the rectum and felt fortunate in getting the statistics for the perineal operation at St. Mark's Hospital, London, as presented by Gabriel in the January, 1925, issue of the British Journal of Surgery, to compare with the statistics in the combined abdomino-perineal operation. The figures without brackets in the tables are the figures from St. Mark's Hospital, London, as given by Gabriel for the perineal operation, while those in brackets are for the combined abdomino-perineal operation by the speaker.

TABLE I

Cases Grouped According to the Length of Time which has Elapsed Since Operation

	Less than 3 years after operation	Between 3 & 5 years after operation	More than 5 years after operation	Totals
Number of cases	58 (19)	22 (16)	63 (22)	143 (57)
Immediate mortality	7 (1)	6 (0)	9 (3)	22 (4)
Subsequent mortality	8 (3)	9 (6)	27 (7)	44 (16)
Untraced	1 (0)	1 (0)	11 (1)	13 (1)
Alive with recurrence	3 (1)	1 (1)	1 (0)	5 (2)
Alive and well	39 (14)	5 (9)	15 (11)	59 (34)

TABLE II

A Comparison of Immediate Mortalities. Perineal and Abdomino-perineal Operations

	Number of cases	Operability rate	Mortality
Perineal	143	44%	15.4%
Abdomino-perineal	(57)	(60%)	(7%)

TABLE III

Comparison of Perineal and Abdomino-perineal Operations as to Percentage of Cures

Descriptions	3 year cases	5 year cases
(*a*) Figures based on total numbers submitted to operation	23.5% (44%)	24% (41%)
(*b*) Figures based on survivals from operation	28.5% (50%)	28% (52%)

DR. WILLIAM C. LUSK (of New York) said he would like to say a friendly word in favor of saving the sphincters in suitable cases, and doing the ideal operation of resection of the rectum in which the sigmoid flexure is liberated by the abdominal route, and brought down and united by circular interrupted sutures to the distal rectal segment above the internal sphincter by the posterior route. The cases for which this operation might be suitable seemed to him to be those of early carcinomata which were situated sufficiently high above the internal sphincter. He operated on such a case in June, 1910, and the wound healed without any stricture of the rectum and with perfect function of the sphincters. This man was alive and well to-day. (See "Resection of the male rectum for cancer by the combined method in two stages; first stage under Spinal Anæsthesia," ANNALS OF SURGERY, December, 1910.) He had illustrated this operation. ("A Technic of Resection of the Male Rectum"; *Surgery, Gynecology and Obstetrics,* November, 1909.)

DOCTOR LUSK said that Doctor Whipple's experience with cæcostomy and appendicostomy, as preliminary operations before rectal excision, had corresponded with his own experience with what he called the left subcostal colonic vent, which was a tube-sinus established in the descending colon just below the tip of the left eleventh rib, in advance of the operation for removal of the rectum. This site for the fistula was well apart from the lower abdominal wounds. He showed pictures illustrating the construction of the vent. (Technic: Through an incision half an inch below and parallel to the left eleventh rib, the peritoneum is opened opposite the tip of the eleventh rib, and the opening enlarged backward to the site of reflection of the peritoneum onto the descending colon. The lower edge of the peritoneum is then drawn outward over the entire thickness of the cut muscles of the lower lip of the wound in the abdominal wall and fixed in this position with sutures. A cone-shaped fold of the descending colon, caught up by a thread, is then pulled outward over the everted lower peritoneal flap, to which latter its base and margins are sutured so as to maintain its protrusion. The upper edge of the peritoneal opening is first sewed to the deep margin of the transversalis muscle, and then below to the base of the cone-shaped protrusion of the bowel along the line of its emergence from the peritoneal cavity, and beyond the bowel protrusion, to the lower flap of the peritoneum. Two loops of Pagenstecher thread are inserted into the exposed surface of gut to locate the site for subsequent puncture. The angles of the wound may be drawn together. Gauze is inserted to prevent adhesions from taking place over the exposed bowel surface.).

The advantages of this fistulous opening are the following: Before the operation for removal of the rectum, (1) the portion of the bowel above the tumor could be washed out, and also (2) gas from the intestines would escape, leaving the belly flat. In one case of rectal extirpation which he had operated upon with this preliminary device, the intestines were so flat, that when he sutured together the abdominal wound, an air space was left

within the peritoneal cavity. At the operation, in the presence of this vent, (3) an artificial anus could be sewed up tight without opening for several days, while the wounds were healing; (4) when the artificial anus was then opened, the size of the aperture could be regulated. Following the operation, a most important feature was that (5) as soon as the patient was put to bed, water could be introduced into the bowel, and (6) post-operative intestinal distention was prevented. During convalescence (7) the lower bowel was handily cleansed by enemas given through this vent. Thus the vent gave much comfort to the patient, lessened the dangers of the operation, and as well lessened the anxiety of the operating surgeon.

He said one problem he wished to mention was the existence with comparative frequency of a narrow pelvic cavity, which latter could be so narrow that it was impossible to get the knuckles within it through the posterior route, where the sacrum was cut across through the fifth sacral vertebra. Johae (*Beiträge f. klin. Chir.*, vol. x, 1893, p. 755) had determined a relationship between the distance between the posterior superior spines of the ilium and the size of the pelvic cavity. Doctor Lusk said that he had confirmed the truth of this relationship by anatomical study on cadavers, he having found that if the distance between the inner surfaces of the posterior superior iliac spines was as great as 2¾ inches, then in the cadavers in the absence of any tumor of the rectum, the superior hemorrhoidal vessels could be reached and tied through the posterior route; but when this distance was as small as 2½ inches, that then one attempting to tie the superior hemorrhoidal vessels through the posterior route was sure to have trouble from lack of room. He regarded that the narrow pelvic cavity was a big problem in rectal extirpation. To in part meet the difficulties in the presence of this condition, he thought that at least the superior hemorrhoidal vessels should be tied, and the lateral pelvi-rectal fascial attachments isolated and cut downward as far as possible, and the peritoneum all around the rectal segment severed, if possible, by the abdominal route, to facilitate removal from below. In an extreme case, the possibility of a resort to symphysiotomy had occurred to him. He had once bisected the sacrum up to the level of the third sacral foramina, fracturing the sacrum across at the latter level and reflecting the two halves outward, without gaining workable space.

LATE RESULTS OF RESECTION OF THE ŒSOPHAGUS FOR CARCINOMA

Dr. Franz Torek (New York) said that in discussing the late results of resection of the œsophagus for carcinoma he would confine his remarks to the resection of the thoracic portion of the œsophagus. When one considers the late results of this procedure one is interested in the length of time the patient has lived after operation, the degree of comfort or discomfort since operation, the influence on the patient's general health, the question of complications caused by the operation, and the question of recurrence of the disease. He presented a patient, who was operated on March 14, 1913, so that in two and a

half weeks from to-day, twelve years will have elapsed; therefore, on the first point mentioned, the length of life after operation, her presence to-day renders favorable testimony.

To consider intelligently the other points in this presentation, it will be necessary to outline in a few words what the operation consists in. The thoracic cavity is opened on the left side by an incision through almost the entire length of the seventh intercostal space and the division of four ribs from the seventh up to near the spinal column. This gives ample room for access. The œsophagus is liberated from the diaphragm to the neck and divided between two ligatures beneath the tumor. The lower end is invaginated by one or two purse-string sutures, the upper part, inclusive of the tumor, is exenterated through an incision at the anterior border of the left sterno-cleido-mastoid muscle. Then that portion of the œsophagus above the tumor which is to be retained, is placed antethoracically under the skin, the cut end being sutured to an incision in the skin of the thorax. Anything that is swallowed therefore passes down the œsophagus and out through the incision in the skin, to which the cut end was sutured. To lead the food into the stomach a rubber tube is employed, which bridges the gap from the œsophageal fistula to a gastrostomy opening. The case was described in *Surgery, Gynecology and Obstetrics;*[1] a more extensive article appeared in ANNALS OF SURGERY,[2] and a follow-up report in *Archives of Surgery.*[3]

Now, as to the question of comfort, the presence of the foreign material, the rubber tube, causes her neither pain nor discomfort. She eats all kinds of food; it glides down readily after thorough chewing. She is not subjected to the passage of bougies, one of the unpleasant accompaniments of attempts at plastic restoration of the œsophagus; nor is she exposed to the necessity for reoperations, which almost always arises in œsophagoplasties owing to strictures that result in spite of frequent passage of bougies. All she has to do is to replace the rubber tube by a new one once a month and to cleanse it every four or five days.

The third point, the effect on the general health, if judged by this patient, leaves nothing to be desired. She has all these years been about as well as a person of her age can be expected to be. Her digestion is satisfactory, and, as compared with that of a person fed through a gastrostomy tube and funnel, it is only natural that her digestion should be better, as she gets the benefit of the admixture of her saliva with the food. In fact, as she has to chew more thoroughly than an ordinary person, the salivary digestion is apt to be even better than the average.

[1] Torek, Franz: The First Successful Case of Resection of the Thoracic Portion of the Œsophagus for Carcinoma. Surgery, Gynecology and Obstetrics, June, 1913.

[2] Torek, Franz: The Operative Treatment of Carcinoma of the Œsophagus, ANNALS OF SURGERY, April, 1915.

[3] Torek, Franz: Carcinoma of the Thoracic Portion of the Œsophagus. Report of a Case in which Operation was Done Eleven Years Ago. Archives of Surgery, vol. x, No. 1, Part 2.

As regards possible complications due to the operation, we might expect some pulmonary or pleural affection owing to the extensive opening of the chest and the manipulation within it.

Lastly, as to the question of recurrence. This depends on two conditions, first, the degree of malignancy of the new growth; secondly, the thoroughness of its surgical removal. In carcinoma of the œsophagus the degree of malignancy of the lesion on the mucosa, pathologically studied, is low, the most frequent form being acanthoma, the type being embryonal, with prickle cells often missing. The adeno-carcinomatous type is less frequent. Clinically, the malignancy becomes greater as the lesion extends; in the later stages metastases occur, and when the carcinoma has extended through all the coats of the œsophagus, involvement of the mediastinum, the pleuræ, and the lungs will drag the patient down rapidly. Therefore, to avail one's self of the comparative benignity of the lesion, it is necessary to attack it early. The other condition for securing freedom from recurrence, the thoroughness of surgical removal, requires that the operation be so planned as to secure good access and proper exposure. The transpleural route described secures that access and exposure to a greater degree of certainty than any other, as it exposes the entire thoracic œsophagus. The full extent of the lesion cannot always be definitely determined by our diagnostic methods, including röntgenographic study, therefore a previously planned limited exposure of the new growth may turn out to be insufficient. In Lilienthal's case of extrapleural resection the interpretation of the X-ray picture led to an insufficient exposure of the carcinoma and consequent scant resection at one end of the tumor. But for this slight error in estimating the necessary extent of exposure Doctor Lilienthal's patient would not have had a recurrence and would be alive now.

The late results, as far as recurrence is concerned, therefore, will be good if the new growth is attacked before it becomes clinically malignant, and if the operation is so planned as to permit resection with a good margin.

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