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THE DEFINITION OF INOPERABILITY OF CANCER*

GEORGE T. PACK, M.D.

FROM THE MEMORIAL HOSPITAL FOR CANCER AND ALLIED DISEASES
NEW YORK, N. Y.

THE GREATEST MARGIN FOR ERROR in reporting the end-results of treatment for cancer may be found in the classification by the reporter of a regional or histologic type of cancer as operable or inoperable. The difficulty in correcting this fault is apparent when one realizes that three variable factors interplay in the pronouncement of a given cancer as non-resectable by any surgeon, namely: first, the condition of the patient as regards his age, the co-existence of degenerative diseases and the complications attendant on the presence of the cancer; second, the extent of the disease, meaning the degree of local or organic involvement, the specific organ or tissue implicated, the extension to and incorporation of neighboring viscera by the cancer and metastases to regional and distant sites; and third, the surgical philosophy, moral point of view, courage, and experience of the surgeon. In a large group of patients with generalized bone metastases, or diffuse involvement of lungs or liver, or peritoneal carcinosis or melanomatosis, the recognition and acceptance of inoperability is obvious to any physician. But there are too numerous other instances in which the definition of inoperability may be subjected to careful evaluation, criticism, and even condemnation.

THE POINT OF VIEW OF THE SURGEON

It is not the purpose of the writer to formulate a set of rules governing the behavior of the surgeon in a given circumstance, but rather to present certain arguments for extending the scope of operability for cancer. The very nature of this disease, the infirm and often aged patients in whom it so frequently develops, and the radical character of the numerous operations designed to combat it, all conspire to make the surgical treatment of cancer a hazardous venture for the patient and often an ordeal for the surgeon. With the knowledge of the inevitability of death from cancer that is not treated, it seems unnecessary to state that no surgeon would refuse a patient the slightest chance for cure or

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even relief because of a fear of criticism for failure or an unnatural pride in low figures for operative mortality. Nor should any surgeon attempt to play God and decide arbitrarily that a certain cancer patient had lived a sufficiently long life or that he had so few remaining years of even normal life expectancy that operation at best would hardly be worth while. We must take care in our weighty decisions concerning the denial or offering of a chance for life to a patient, that in our desire not to be the executioner, we achieve the same end-result by acting as an immoral judge. For example, if called upon to operate for a ruptured duodenal ulcer on a condemned criminal awaiting electrocution in the death row, the surgeon by his calling and in keeping with the Hippocratic Oath, operates with the same skill and renders just as meticulous postoperative care as if his patient were to live forever.

INOPERABILITY AND INCURABILITY

Many operations designed for the cure of cancer achieve in too many instances only a palliative end-result. If inoperability were an absolute state, and not a variable one, dependent in some cases on the criteria of the surgeon, the term would be synonymous with incurability. The unpredictable behavior of cancers and the immeasurable host resistance of organs and tissues to the growth of cancer combine in creating many intangible factors that make the early cancer occasionably incurable and the advanced cancer sometimes controllable. Assuming that a given cancer is not suitable for radiation therapy, operative removal becomes the only recourse. At the time of laparotomy, for example, a surgeon may be compelled to render judgment absolutely governing the life of the individual, the decision necessitating a matter of a few minutes as compared to days and weeks of courtroom deliberation by judge and jury. The closure of an abdominal wound on a cancer that is obviously hopeless is always done reluctantly, but the abandonment of an operation that is of questionable accomplishment must plague the conscientious surgeon for many sleepless hours and is one of the many reasons why he remains forever humble. He must worry whether his definition of inoperability is in his state of mind or moral courage or in the actual stage of the cancer. An aggressive attack on cancers presenting almost insuperable technical difficulties will sometimes result in palliative relief and occasionally in cures, but with mounting operative fatalities. Under these conditions, no one would impugn the good intent of the operator.

THE AGE OF THE CANCER PATIENT

One cannot become reconciled to the perverted point of view of some surgeons who are reluctant to operate on aged patients for major forms of cancer. Minor cancers that run a chronic course may not endanger the life of the patient, but a major cancer should be removed regardless of the age of the patient, providing it is technically possible and his physical state is not too precarious. The anatomic and physiologic age of the subject are infinitely more important than the chronologic age. At times, it would seem wiser to leave the actual age off the chart or for the patient conveniently to forget the

number of years he has lived if the knowledge of age alone unfavorably influences the surgeon; the fitness for the surgical ordeal would then be rightly determined by the true condition of the patient as judged by physical examination and laboratory tests. As examples, we have successfully performed hemi-colectomy for cancer of the cecum in two patients more than 80 years of age, in one of whom the operation was done under local anesthesia because of intussusception of long duration. A 92-year-old physician was cured of cancer about which he was genuinely concerned. The proverbial three score years and ten, however collectively applied, do not concern us when we reach that age, because most of us, including patients, live from day to day and year to year as if we were immortal. Some aged patients continue to possess a zest for life, and they merit every opportunity for cure or relief from otherwise fatal diseases that accidentally befall them; this is their privilege and their right regardless of advanced years just as their rights of franchise, speech and worship continue. Rather than refuse to operate, the surgeon may justifiably modify or simplify the character of the operation, for example, do a simple mastectomy under local anesthesia for cancers of the breast that have apparently not metastasized to the axilla.

THE CONDITION OF THE PATIENT

For every argument advanced against the decision to operate on any given patient, the irrefutable defense or rebuttal is the inevitable fatality from the untreated cancer. What would the surgeon do if confronted with an acute surgical emergency in the same patient, e. g., a ruptured duodenal ulcer or gangrenous extremity? A patient with cancer, who is gravely ill from the conjoined effects of the cancer and intercurrent diseases, of course would receive medical consultation, careful deliberation concerning the choice of anesthesia and meticulous preoperative preparation. The family should jointly assume with the surgeon the responsibility of undertaking to remove a major cancer in a patient who is a serious operative risk.

One illustrative case is that of an elderly woman, bedridden and almost helpless for years due to amyotrophic sclerosis, on whom a radical mastectomy was done. This chronic invalid was a most cheerful individual and the nucleus of a happy home with husband and children even more affectionate and concerned about her recovery and cure than is ordinarily the case. A 70 year old woman, seriously handicapped by heart disease, underwent an almost total gastrectomy for a huge leiomyosarcoma of the stomach. The jejunum was anastomosed to only a rim of stomach below the cardia. After a stormy convalescence, she recovered and now, 12 years later and 82 years old, is living and well except for the necessity of supportive treatment for her heart. An elderly woman entered the Memorial Hospital with a leiomyosarcoma of the uterus so large that it filled the entire abdomen and extended up as far as the epigastrium. She was in severe heart failure, did not respond to medical treatment, and was classified as inoperable by cardiologists who warned us not to attempt any surgical procedure. On the other hand, she

was experiencing hemorrhages of increasing severity. Because she could not lie recumbent, the operation was done in a modified Fowler's position; and under local anesthesia, an incision was made from the pubis almost to the ensiform cartilage. A pan-hysterectomy was done under local anesthesia including a liberal vaginal cuff. She was discharged from the hospital two weeks later with greatly improved cardiac compensation due, we thought, to the removal of this massive tumor.

THE STAGE AND EXTENT OF THE CANCER

The inoperability of an abdominal cancer is unquestioned in the presence of extensive hepatic metastases or peritoneal carcinosis. If a patient, on laparotomy, is found to have a few metastases in the liver without hepatic dysfunction or hard, irremovable retroperitoneal lymph nodes, one may still proceed with the removal of a cancer of the stomach, colon, or rectum, because experience has shown that gastric, colonic, or rectal resection is the best palliative measure for such cancers, though admittedly incurable. Here again, clinical judgment must influence one's decision, as nothing is gained by enabling a patient to live longer and suffer more. The measure of palliation accomplished by such resection is not necessarily the longer duration of life but the degree of freedom from distress. A lobectomy for a solitary metastasis in the lung in a patient who had experienced an amputation of an extremity for osteogenic sarcoma would have been considered meddlesome surgery a decade ago, but not in the light of the present day viewpoint. Three brief case reports will serve to illustrate an unpredictable salvage of life by surgical persistence in the face of overwhelming odds.

Case 1: D. D., a 24-year-old man, had a congenitally defective left hand, characterized by crossed fingers with contractures. For several years, a tumor had been slowly growing deep in the palmar space. An attempt at removal in another hospital was only partly successful; the specimen was reported by the pathologist as a neurosarcoma. An amputation through the forearm was done, followed in 17 months by recurrence in the stump; the arm was then amputated through the mid-humerus well above any clinical and microscopical evidence of the tumor. Within a year, another recurrence was observed and was treated by a disarticulation of the humerus. There was no evidence in the specimen of upward extension of the neurosarcoma. Subsequently, a mass was palpated in the axilla; aspiration biopsy was positive for sarcoma. The patient consented to an interscapulothoracic amputation which was performed on February 25, 1935. Surely, we reasoned, this will control or eradicate any possibility of recurrence of the sarcoma, but a few months later, another mass, somewhat fixed, was palpated in the lower neck. With determination but not with optimism, we performed a difficult dissection of this sarcoma from the brachial nerve plexus which it involved; the operation was terminated by inserting gold radon seeds in the wound. This last desperate surgical attempt (the sixth) was done 12 years ago. Since that time, the patient has gone to college, married, fathered two children, and become a successful teacher in a normal school. There has been no evidence of metastasis and no evidence of local recurrence of the neurosarcoma.

Case 2: N. H., a 30-year-old male, was referred to the Memorial Hospital in 1932 with a clinical diagnosis of melanoma of the skin of the chest. A bluish-black ulcerating tumor 2 cm. in diameter was seen in the pectoral region; there were large firm nodes in the corresponding axilla. The primary melanoma was surgically removed

and the axilla was dissected; the lymph nodes contained metastatic melanoma. Several months later, a rapidly-growing black, fungating tumor was observed on his bald scalp. It was removed and microscopically proved to be a malignant melanoma. In the course of the next year, numerous other bluish-black, rapidly-growing nodules 0.5 to 2 cm. in diameter appeared on his trunk, back, and arms. The clinical picture was typically that of disseminated melanoma in the skin, so much so that our professional colleagues in consultation commented on the futility of further surgical efforts. Nevertheless, we persisted in removing these tumors as they appeared, our only encouragement derived from the opinion of our pathologists, Dr. James Ewing and Dr. Fred Stewart, that these malignant melanomas had the peculiar features of new, independent, or primary growths rather than metastatic foci. The condition was further complicated at this time by the appearance of metastases in the opposite axillary lymph nodes, which were treated by radical axillary dissection. A total of 14 primary malignant melanomas were removed and both axillas were dissected for proved metastatic melanoma. It has been over ten years since the last operation, and the patient is well, without evidence of recurrence in this long interval. The satisfactory end-result is not due to any major surgical feat, but rather to the determined philosophy of treating cancer wherever it may be found.

Case 3: D. B., an 11-year-old southern schoolgirl, had a small nodule in the thyroid gland of which her parents had long been aware. Within two months after the somewhat precocious onset of menstruation, this nodule grew with alarming rapidity. A local surgeon was consulted and one of many palpable lymph nodes in the neck was removed for biopsy. It contained metastatic thyroid cancer. When we examined her, the thyroid cancer was infiltrative, fixed, and inoperable. Innumerable firm lymph nodes, involved by the disease, were felt throughout both cervical chains. Inasmuch as the cancer was inoperable, intensive treatment was given with the four gram radium element pack, supplemented by the interstitial deposition of gold radon seeds in measured tissue doses in the thyroid gland and remaining palpable lymph nodes. The dose was epidermicidal but effective in causing satisfactory regression of the cancer. Just before she was scheduled to return to her home in Alabama, she complained of headache, vomiting, and blurring of vision. Ophthalmoscopy revealed bilateral choked discs. A presumptive diagnosis of metastatic thyroid cancer to the brain was made. A ventriculogram showed the presence of a tumor encroaching on the lateral ventricle. At this time, the parents obtained conflicting advice, some physicians defining her condition as hopeless. Motivated by the same policy of continuing the treatment of cancer wherever found and influenced by the remote and even unlikely possibility of the intracranial tumor being unrelated, I urged craniotomy and surgical removal. This point of view was identical with that of the neurosurgeon, Dr. Byron Stookey, who performed the operation and removed the tumor which was situated in the choroid plexus of the lateral ventricle. To our dismay, but without surprise, the histologic study revealed metastatic thyroid cancer. This little girl matured gracefully, completed her academic and collegiate education, married, and became the mother of two children. She is now living and well 15 years after her treatment was completed.

INVOLVEMENT OF MULTIPLE ORGANS

One of the outstanding achievements in the surgical treatment of gastrointestinal cancer is the unexpected good result which frequently follows the removal of cancers that have become adherent to adjacent organs and are at first examination seemingly inoperable. The explanation lies in the fact that cancers of the stomach, colon, and rectum, which are papillary or polypoid in character, often become grossly infected and, as a consequence, the organ becomes adherent to adjacent viscera or structures. These tumors appear

technically irremovable and give the false impression of extension of the cancer beyond the confines of the organ primarily involved. By perseverance and meticulous dissection, associated at times with the sacrifice of a portion or the whole of the adjacent organ, the surgeon can often remove this growth successfully. The subsequent pathologic report, in many instances, will reveal that the cancer itself had not extended to involve the neighboring organ, and that the adhesions were of inflammatory character; in fact, the cancer itself may be classified as of relatively low-grade malignancy. I have known of numerous instances in which complications of this character were found, and yet no regional metastases to nodes were discovered on careful microscopical survey. These facts encourage one to attempt by every means possible the removal of cancers which are adherent to any structures that may be sacrificed by excision and continuity with the organ involved.

A. STOMACH

Although total gastrectomy had been attempted within a few years after Billroth's initial partial gastrectomy for cancer, the operation did not find popular acceptance by gastric surgeons until the past decade. It is now known that the entire stomach can be safely removed and the individual live thereafter without too great inconvenience and without too disturbing metabolic changes. On the Gastric Service of the Memorial Hospital, we have performed approximately 50 total gastrectomies for cancer and approximately 50 transthoracic resections of the lower esophagus and upper end of the stomach for cancers of the proximal gastric segment. In past years, the very location of the cancer, justaposed to the cardia, was sufficient to pronounce it inoperable in many hospitals, in consequence of which 8 to 10 per cent of all patients with gastric cancer were denied surgical intervention merely because of the accidental location of the cancer near the region of the cardiac orifice. The extension of the cancer to involve the esophagus, both below and above the diaphragm, called for a popularization of the operation of transthoracic, transdiaphragmatic esophago-gastrectomy. This procedure has now been well established. The end-results of this operation and the preoperative and postoperative management are so improved that these cancers can no longer be classified as inoperable because of location only. In these 100 cases of extremely radical surgery removal of gastric cancers, we have found many occasions to remove adjacent organs in whole or in part. Segments of the diaphragm, the entire spleen, variable portions of the pancreas, part of the left lobe of the liver adherent to or invaded by the cancer, and large segments of the transverse colon have all been removed in continuity with the entire stomach on numerous occasions. In the earlier years of gastric surgery, any one of these complications, i. e., the adherence of such organs to the stomach, would have constituted an excuse for classifying the cancer in that particular patient as irremovable.

B. DUODENUM AND PANCREAS

Successful operations for malignant tumors of the duodenum, in years

past, were limited to the rare occasions when a transduodenal resection of an early polypoid tumor of the ampulla of Vater could be done. All other cancers of the duodenum and pancreas were considered inoperable because surgical ingenuity had not devised a method of removing the duodenum and pancreas with re-establishment of biliary flow and gastro-intestinal continuity until Allen O. Whipple and his co-workers conceived of the principles now well established in the operation known as duodenopancreatectomy. Even with general employment of this operation, it is safe to assert that the great majority of patients with technically resectable cancers of the head of the pancreas and the duodenum are denied an opportunity for life because of the lack of surgical experience on the part of surgeons to whom they are entrusted, or the reluctance of these surgeons to undertake an operation of this magnitude. As an example of our own failure to think clearly, I would like to cite the following case history.

Case 4: C. F., a woman of 50 years, had hematuria due to a clear-celled papillary adenocarcinoma of the right kidney. The usual nephrectomy was done in the Memorial Hospital, from which she convalesced without complications. Several months later, she left for a vacation in Europe, and while there, her family noticed a progressively increasing jaundice. By the time she returned to the Memorial Hospital, she had become emaciated due to an extremely rapid weight loss, was vomiting incessantly, had become deeply jaundiced, and a mass could be felt in the right hypochondrium. Barium feeding and roentgen-ray studies revealed an obstruction in the second part of the duodenum. Because of the recent history of right nephrectomy and the location of the present mass, a presumptive diagnosis of recurrent renal cancer was made with secondary involvement of the liver, duodenum, and pancreas. The condition was deemed inoperable and laparotomy was therefore not attempted. The patient died in the hospital, and a postmortem examination was secured. There was no evidence of recurrence of the renal cancer. A papillary carcinoma of the ampulla of Vater was found, causing practically complete obstruction of the bile ducts and almost complete obstruction of the duodenum. There was no evidence of metastasis from this second cancer, and it would have been a technically easy feat to have removed it by the classical Whipple operation. In this instance, the diagnosis of inoperability was in error, due to a biased opinion based on the previous history of a recent cancer of the kidney, and the failure on our part to consider the symptoms and physical findings as typical of an ampullary cancer.

C. COLON

We now know that the colon may be removed in its entirety, as is done in those patients with multiple or diffuse polyposis of the bowel or in those with multiple colonic cancers. Many cancers of the colon, particularly of the papillary type which are commonly infected, are adherent to adjacent organs. This does not constitute a state of inoperability because in the majority of cases, these neighboring viscera may be removed safely with the colon. For example, there have been numerous instances in which we have resected a large segment of the colon, combined with hysterectomy in the female, or a wide segment of the pelvic colon with partial cystectomy in the male, or the splenic flexure with an adherent spleen. In one instance, a right hemicolectomy was done with a resection of two loops of adjacent ileum to include large nodes in the adjacent mesentery; the pathologic diagnosis was reticulum cell

lymphosarcoma. Multiple anastomoses were performed in a single-stage operation and the patient was living and well for eight years until she died of a heart attack. A cancer of the transverse colon with an external fistula of six months' duration was resected with a large segment of the abdominal wall without difficulty. There have been several cases in our series with the transverse colon adherent to the stomach, and in some instances, with perforation and fistula formation so that colectomy was combined with subtotal gastrectomy in order to remove the cancer in toto.

D. RECTUM

Many errors are made in diagnosing a rectal cancer as technically inoperable because of fixation as judged by digital examination of the cancer through the rectum. Many cancers which appear to be firmly adherent in the hollow of the sacrum or to the lateral wall of the pelvis when felt by combined recto-abdominal palpation can be successfully removed at the time of laparotomy. Unless the cancer is completely fixed to cause the so-called frozen pelvis, and providing the patient does not have evidence of distant metastases in the liver or in signal nodes, these patients profitably may be explored. This sometimes results in the happy discovery that the adherence of the cancer is a pseudo-fixation that can readily be relieved by dissection. Cancers of the rectum, because of their tendency to infection and extension through the wall of the bowel, become adherent to adjacent pelvic viscera such as the urinary bladder or the uterus. Under these circumstances, these organs should be removed in part or in whole, depending upon the extent and particular site of involvement. Three brief case histories are appended here to illustrate the plan of procedure under these conditions.

Case 1: K. D., a 71-year-old woman, had a bulky adenocarcinoma of the rectum filling almost the entire ampulla and invading the rectovaginal septum. It had perforated into the vagina, which was filled with a fungating sphacelate tumor. The entire perineum and perineal body were infiltrated by cancer. We performed an abdomino-perineal rectal resection associated with a vaginectomy. The vaginal mucosa overlying the base of the bladder was left intact, but the remainder of the vagina was removed with the rectum. Convalescence was uneventful. This same operation of rectal resection and vaginectomy, sometimes with an associated hysterectomy, has been done at least five or six times.

Case 2: B. K., a woman 56 years of age, had a carcinoma of the rectosigmoid. A previous supracervical hysterectomy had been performed. The cancer had become adherent to and invaded the urinary bladder. A superior segmental resection of the carcinoma was performed, together with a subtotal cystectomy. The operation was completed by an end-to-end anastomosis of colon and rectum. Convalescence was uneventful.

Case 3: M. S., a woman 54 years of age, was admitted to the hospital in a state of shock due to recent multiple hemorrhages which had been almost exsanguinating. A huge tumor was found to occupy the rectum, involving the rectovaginal septum, the posterior fornix and adherent to the cervix and uterine isthmus. A biopsy was reported as leiomyosarcoma. The terminal portion of the rectum was uninvolved by the tumor. An abdomino-perineal rectal resection was performed, together with a radical pan-hysterectomy and vaginectomy. The rectal sphincter was preserved, and the entire rectum was removed by reaming out the mucosa from the sphincter, after which the sigmoid

colon was brought down through the pelvis and hollow of the sacrum to protrude through the dilated sphincter. Healing occurred by primary union, and the patient was discharged from the hospital within two and one-half weeks. The function of the sphincter soon returned, and she was able to have normal bowel movements by rectum.

E. VAGINA

General surgeons and gastro-intestinal surgeons operating on cancers of the rectum have, on many occasions, performed a partial vaginectomy, together with an abdomino-perineal rectal resection for those rectal cancers that involve the rectovaginal septum. This has been an accepted mode of procedure. Gynecologists, on the other hand, and almost without exception, have been prone to classify all vaginal cancers as inoperable. The case of inoperability has even been listed on the patient's chart as due to invasion of the rectovaginal septum, with the statement that vaginectomy could not be done without entering the rectum. From the patient's point of view, a death from cancer of the vagina is just as bad as death from rectal cancer, and a permanent terminal abdominal colostomy for cancer of the vagina should be just as acceptable as it is for cancer of the rectum. On two occasions in which vaginal cancers were involving the posterior vaginal wall and posterior fornix, we have performed the operation of abdomino-perineal rectal resection with vaginectomy. If these vaginal cancers are infiltrating, and many of them are, there should be no hesitation in removing the rectum, even though it entails a permanent colostomy.

F. PROSTATE

The radical operation for cancer of the prostate as originated by Dr. Hugh Young has found some acceptance for those prostatic cancers that are removable. Total cystectomy for cancers of the urinary bladder is being done much more frequently in conjunction with bilateral uretero-sigmoidostomy. An example of the extension of radical surgery for cancer ordinarily classified as inoperable may be given in the following case report:

S. L., a Greek-American, 58 years of age, had been in excellent health without complaints until only two months prior to hospital admission. Since that time, he had had some frequency and urgency of urination, but the chief complaint was progressive constipation and later the passage of mucus and blood in his stools. At the time of admission, he had complete rectal obstruction with great abdominal distention. On digital examination, the ampullary portion of the rectum was completely obstructed by a firm mass, a biopsy of which revealed adenocarcinoma of undetermined histogenesis. The blood urea nitrogen was 87 mg. percent, and the patient was in a state of uremia. The situation was critical, but an immediate transverse colostomy was performed in order to relieve the intestinal obstruction. This was followed in a few days by a bilateral external ureterostomy by Dr. Archie Dean. After the blood urea nitrogen had returned to normal and the patient's condition had been greatly improved by blood transfusions and the institution of proper diet, a third operation was performed, which was of radical character. The terminal segments of the ureter, the entire urinary bladder, the prostate, the pelvic colon, the rectum, and the perineum were removed in continuity and entirely. The operation practically consisted of an exenteration of the true pelvis. So much peritoneum was removed with the specimen that the pelvic floor could not be reconstructed, so the principle of a Coffey dam with packing below was employed. The cancer was found to be primary in the prostate, and it practically replaced the entire organ.

The cancer had extended secondarily to involve the adjacent rectum and completely occlude it. It also infiltrated into the base of the urinary bladder and involved the entire bladder with bilateral obstruction of the ureteral orifices. The convalescence was protracted, due to the huge space left after ablation of these organs, but no serious complications occurred, and he was discharged from the hospital in good health.

G. TUMORS PRIMARY IN OR ADHERENT TO THE BONY PELVIS

The involvement of the os innominatum, with the exception of the iliac crest, by a primary malignant tumor of bone had in the past almost invariably been considered as inoperable. Furthermore, cancers primary on the lower extremities, such as synoviomas, malignant melanomas, and epitheliomas, after metastasis to the groin and extension into the iliac nodes with adherence, were deemed inoperable because of the extent of the disease. Primary malignant bone tumors of the pelvic bone and tumors in the region of the buttock, such as sarcomas of the soft somatic tissues that are adherent, and metastasizing melanomas and epitheliomas that involve the iliac nodes with adherence, are now being treated by such a radical procedure as hemipelvectomy, or the so-called interilio-abdominal amputation. We have performed a series of ten hemipelvectomies at the Memorial Hospital, based on these indications, without an operative death.

H. MALIGNANT TUMORS OF THE ORAL CAVITY AND ADJACENT SINUSES

The same principle of radical surgery is now being applied for the treatment of cancers that develop in the head and neck, particularly those involving the mucous membranes. Examples of the surgical treatment of cancers previously deemed inoperable are cited in the two following case reports.

Case 1: A. S., a 19-year-old boy, came to the Lendrim Tumor Clinic of the Paterson General Hospital with a huge osteochondrosarcoma involving the left maxillary antrum. The tumor had extended into the orbit with destruction of the orbital plate and caused protrusion of the eyeball with diplopia. It had eroded away the medial wall of the antrum and was fungating with obstruction into the left nasal chamber. It spread through the external wall with marked extrusion of the cheek. It had destroyed the floor of the antrum and the roof of the mouth and was perforating into the mouth, through the hard palate, and the left superior gingivo-buccal gutter. After bilateral ligation of the external carotid arteries, the classical Hautant-Monod exposure was obtained by incising through the philtrum of the upper lip and along the naso-malar fold and the margin of the left lower eyelid with retraction of the skin and subcutaneous flaps laterally. The entire left superior maxilla with the major portion of the roof of the mouth, the zygoma, the floor of the orbit, and the lateral aspect of the nasal chamber were then surgically completely removed. The tumor proved to be an osteochondrosarcoma. His convalescence was uncomplicated, and the defect in the roof of his mouth was corrected by an obturator attached to a superior dental plate. The floor of the orbit was replaced by a temporal muscle transplant to serve as a hammock. The eyeball resumed its normal position and vision was undisturbed. Fourteen years have elapsed since the operation. The patient is living and well, has graduated from college, and is a religious teacher.

Case 2: A. T., a Hindu, came from Bombay in a very weakened condition due to extreme pain and inanition secondary to an advanced cancer of the tongue. This carcinoma involved the entire left side of the tongue, extending from the tip to the vallecula, and infiltrating deeply to the middle of the tongue. The carcinoma involved the entire left side of the floor of the mouth and was adherent to and invading the horizontal

ramus of the left mandible. It extended onto the region of the left tonsil and tonsillar pillars and caused trismus so great that the jaw could not be opened. Firm lymph nodes in the left submaxillary region were replaced by metastatic carcinoma and were inseparably adherent to the under surface of the mandibular ramus. Other lymph nodes were present in the left digastric group. He was admitted to the Doctors Hospital, where under intratracheal anesthesia, the left lip was bisected and the skin flaps turned widely back in continuity with a Bastianelli incision for radical neck dissection. The dissection of the left neck was accompanied by ligation of the external carotid artery. The lymph nodes in the left submaxillary region were so firmly adherent to the mandible and to the underlying muscles that all of the structures of the submaxillary triangle were removed, together with the hyoid bone to which the carcinomatous nodes were adherent. The mandible was severed through the mental process. The left side of the mandible, together with the entire floor of the mouth and the left lateral two-thirds of the tongue, was then completely severed in the anterior posterior direction. The mandible was then disarticulated at the temporomandibular joint, and the base of the tongue, together with the tonsil and tonsillar pillars and the left side of the oral pharynx, were dissected down to the pterygoid fossa. The mucous membrane of the left cheek along the gingivo-buccal gutter was then approximated to the lateral aspect of the severed tongue, and the skin flaps were also approximated by a plastic procedure. The operation was terminated by a tracheostomy. The patient was out of bed 24 hours after the operation and was fed for two weeks by means of a nasal catheter. At the time the tracheostomy tube was removed, he was able to swallow food by mouth; the mouth was fairly well healed; and his voice was quite satisfactory except for lingual sounds.

SUCCESSFUL SECONDARY OPERATIONS FOR CANCER

The surgeon is frequently confronted with patients and their relatives who relate the story of exploratory laparotomy followed by a pronouncement of inoperability and, in consequence, incurability of the cancer. They usually importune the next surgeon seen, and perhaps many others, to intervene again, not being willing to accept the opinion and judgment of the initial surgeon, who had an opportunity to study the extent of the cancer at the time of laparotomy. Physical examination of such patients, after their discharge from other hospitals, may often permit the later surgical consultant to agree in the obvious diagnosis of inoperability. However, in the absence of physical signs of inoperability, one is sometimes justified in sending a note of inquiry to the surgeon, requesting a copy of the operative findings. If the reasons for not resecting the cancer were given as distant metastases, for example, in the liver, or diffuse peritoneal carcinosis, then the indications of inoperability must be considered absolute. But if the operative findings are listed, indicating that the decision not to remove the cancer was based on technical difficulties, there may exist a suitable excuse for a second attempt at removal. It may seem presumptuous to attempt an operation in the face of a previous failure by one who has had an opportunity to inspect the cancer and its extent at the time of laparotomy, but in some of the following case reports, the wisdom of this decision seems apparent. Such secondary operations should be taken with a full understanding by the family that it might not be possible to complete the operation successfully.

1. *Stomach. Interval before Secondary Resection—27 months*—R. B., a 39 year-old man, came to the Gastric Clinic of the Memorial Hospital with the story that two years

and three months before, he had been subjected to a laparotomy for a gastric cancer, which was found to be inoperable. The story seemed incredible because, in our experience, the average patient with inoperable gastric cancer is dead within a year after the date of the diagnosis. A letter was dispatched to the hospital for a loan of the slide of the biopsy. The slide revealed an adenocarcinoma, and the date of the biopsy was two years and three months previous, agreeing with the patient's statement. The surgeon's report classified the cancer as inoperable because it originated in the fundus of the stomach and was extending into the esophagus above the level of the diaphragm. Because careful physical examination did not reveal any evidence of distant dissemination of the cancer and because the patient seemed to be in good health, he was accepted for treatment in the Clinic. Gastro-intestinal roentgenogram studies revealed a huge tumor occupying the fundus and cardiac end of the stomach with extension for several centimeters into the esophagus well above the level of the diaphragm. A preliminary laparotomy was done for purposes of exploration. There were no metastases in the liver; the tumor although bulky was movable; and it was therefore possible to remove it by the combined thoracic and abdominal approach. The exploratory operation was terminated by a jejunostomy for feeding purposes. Two weeks later, a thoracotomy was performed and the diaphragm severed. The distal segment of the esophagus was removed and the major portion of the stomach. There was not sufficient stomach left for esophago-gastrostomy. Since the remnant of esophagus was high under the aortic arch, one could not bring up a loop of jejunum to construct an intra-thoracic esophago-jejunostomy, particularly because a jejunostomy had been performed, and the operation had to be completed quickly. The esophagus was then brought out through the neck and onto the chest wall to construct an anterior thoracic esophagostomy. At a later date, the remnant of the stomach was brought to the anterior wall for a gastrostomy opening. The patient convalesced from these operations without complications. The significance of this case record is that it was still possible, by the transthoracic approach, successfully to resect the lower portion of the esophagus and the major part of the stomach for a cancer which had been diagnosed as inoperable in another hospital two years and three months prior to this date.

2. *Stomach. Interval Before Secondary Resection—3 months*—J. Z., a 58-year-old janitor, was operated on at the Memorial Hospital for cancer involving the distal sement of the stomach. Because the cancer had perforated through the serosa and because of its fixation to the pancreas, it was classified as inoperable and a gastro-jejunostomy was performed. When the attending surgeon left for a protracted European vacation three months later, the resident surgeon who had participated in the operation and disagreed in the opinion of inoperability, readmitted this clinic patient and then performed a gastric resection, removing the distal segment of the stomach below the site of the original gastro-jejunostomy. This patient is now living and well 16 years after the gastric resection. The gastric resection was done three months after the attending surgeon had classified the cancer as inoperable.

3. *Cecum. Interval Before Secondary Resection—9 months*—R. K., a man 42 years of age, had a laparotomy nine months before for cancer of the cecum. The cancer was diagnosed as inoperable because of apparent metastases involving lymph nodes in the mesocolon; these lymph nodes were said to be quite large and firm, but none was removed for microscopical study. The surgeon also observed numerous white nodules on the peritoneum in the mesentery of the small bowel and adjacent to the cecum and large intestine; these were interpreted as representing nodules of metastatic cancer. No microscopical study or confirmation of the diagnosis was made. Inasmuch as the patient, nine months later, did not have ascites nor an enlarged liver and was not greatly worse except for a progressive anemia, he was brought to New York City. At the Memorial Hospital, a second laparotomy was performed, and it was found possible to perform a right hemicolectomy with an anastomosis between the terminal ileum and transverse colon. The white peritoneal nodules previously described were no longer apparent and the enlarged

lymph nodes had subsided, which would lead one to infer that they were involved by inflammatory lymphadenitis, rather than by metastatic cancer.

4. *Duodenum. Interval Before Secondary Resection—7 months*—S. H., a young Naval officer, vomited a huge quantity of blood while in the Pacific Zone. A diagnosis of duodenal ulcer was made, and he was placed on a hospital ship and later returned to the United States. Several episodes of hematemesis occurred. Roentgen-ray studies were made on two occasions with a diagnosis of duodenal ulcer. Finally, four months after the onset of symptoms, and because of the occurrence of jaundice, a laparotomy was performed. A tumor was palpated in the region of the head of the pancreas, and a diagnosis of inoperable cancer was made; the operation was terminated by a cholecystojejunostomy.

Seven months after this operation had been performed, during which time the patient had not been informed as to the character of his illness, he was admitted to the Memorial Hospital. The early roentgen-ray films were obtained and they clearly showed the presence of a tumor in the second part of the duodenum. The diagnosis of carcinoma of the ampulla of Vater was made and a second laparotomy advised. After exploration, the classical pancreaticoduodenectomy was performed. The cholecystojejunostomy was left intact, but the common bile duct was also used to perform a choledochojejunostomy. The distal end of the severed stomach was implanted in the descending jejunal loop. The patient had an uneventful convalescence. The tumor proved to be a papillary adenocarcinoma of the ampulla of Vater.

5. *Duodenum. Interval Before Secondary Resection—30 months*—J. C., a man 45 years of age, came to the Memorial Hospital two and one-half years after he had been operated upon in another institution where a diagnosis of inoperable cancer of the pancreas was made. At the time of the first laparotomy, a cholecystgastrostomy was done. This relieved his jaundice, and he was in comparative comfort for more than a year. The cholecystgastrostomy stoma apparently did not function well, so after a second laparotomy a cholecystojejunostomy was done. One year later, due to obstruction of the duodenum by cancer, a third laparotomy was performed, at which time a gastro-jejunostomy was done. At this last operation the surgeon, who was not the one previously engaged, made a thorough exploration of the abdomen and observed that the cancer had not metastasized to the liver and that it was movable, though bulky. As a result of his findings, he advocated a fourth laparotomy which was done on the Gastric Service of the Memorial Hospital. We were able to perform the usual pancreaticoduodenectomy and completed the operation by imbedding the common bile duct in the jejunum for a choledochojejunostomy. The carcinoma was an infiltrating cancer involving the ampulla of Vater and the head of the pancreas. Convalescence was uneventful. The patient is now living and well two years after the successful resection. The unusual feature of this case report lies in the fact that the first actual attempt at resection of this cancer was on the occasion of the fourth laparotomy.

6. *Rectum. Interval Before Secondary Resection—4 months*—A. W., a 41-year-old woman, entered the hospital with a large carcinoma of the rectum which appeared moderately fixed on recto-abdominal palpation. Four months before, a laparotomy had been performed at another hospital, at which time the cancer was considered inoperable because of local technical difficulties. The operative notes at that time indicated that there was no evidence of distant dissemination and no evidence of metastasis in the liver. Two months later, the patient entered another hospital where a second laparotomy was performed by another surgeon. He also classified the rectal cancer as inoperable and performed a simple loop colostomy. When we examined the patient, we found a functioning sigmoid colostomy. There was a large carcinoma completely encircling the lumen of the bowel in the upper rectal ampulla; it was moderately fixed to the pelvic wall. As there was no palpable enlargement of the liver, we decided to attempt a resection. Accordingly, a laparotomy was done and it was found possible to perform an abdomino-perineal rectal resection. The patient convalesced from this operation without complications. The state-

ments of the two previous surgeons concerning the inoperability of the cancer were based, therefore, solely on technical difficulties, rather than on the actual stage of the disease.

7. *Retroperitoneal Sarcoma. Interval Before Secondary Resection—6 weeks*—R. L., a 5 months old infant, was admitted to the Children's Ward of the Memorial Hospital with a huge tumor in the left iliac quadrant. Six weeks before, an operation had been performed in another institution, at which time the location of the tumor was thought to be retroperitoneal and beneath the mesentery of the colon. It was considered inoperable and a biopsy only was obtained, which was reported as a sarcoma. We subjected the child to a laparotomy and after careful dissection, were able to remove the retroperitoneal sarcoma and preserve the integrity of the overlying intestines. It was diagnosed as a rhabdomyosarcoma of embryonal type. There was no evidence of metastasis of this sarcoma. Again, in this instance, the diagnosis of inoperability was based solely on technical difficulty, and the dissection was not attempted because of this fact, although it was obvious that the child would die of the sarcoma.

SUMMARY

The definition of inoperability of cancer has an important influence on end results. The point of view of the surgeon plays a significant role in determining whether or not a given patient should be subjected to operation and attempt at surgical removal of the cancer. A distinction should be made between *absolute* inoperability due to distant dissemination of the cancer and obvious incurability, and *relative* inoperability due to local technical difficulties. No surgeon should perform an exploratory operation unless he is qualified to proceed with the actual removal of the tumor if encountered. Excisional surgery should be available for cancer patients of advanced age if they can be prepared for such an ordeal, as old age alone is not a sufficient excuse to deny these patients the only opportunity to overcome an otherwise fatal disease. The condition of the patient may present seemingly serious hazards from the surgeon's viewpoint, but with the current improvement in preoperative and postoperative management, the dangers are often reduced to the point where major surgical procedures may be safely performed. The stage and extent of the cancer complicate the judgment of the surgeon, but if the cancer is removed whenever technically possible, occasional cures are surprisingly obtained. Palliative resections of the stomach, colon, and rectum afford a great deal of relief to many patients even though small metastatic foci are detected in the liver. Involvement of multiple organs by cancer has been given as a reason for inoperability, but one should attempt by every means possible to remove such cancers which are adherent to any adjacent structures or viscera that may be sacrificed by excision in continuity with the organ involved. Some patients who have had exploratory laparotomy for cancer with abandonment of the operation and pronouncement of incurability are entitled to another chance or effort by a different surgeon if the former surgeon classified the cancer as inoperable because of technical difficulties. Case reports are inserted to illustrate the arguments throughout this thesis.