BRITISH MEDICAL JOURNAL

LONDON: SATURDAY, OCTOBER 27th, 1934

BAD SURGICAL RISKS*

BY

G. GORDON-TAYLOR, O.B.E., M.A., M.S., B.Sc., F.R.C.S.

SURGEON TO THE MIDDLESEX HOSPITAL, ETC.

Apart from the technical competence of the operator, the organization of his theatre, and the environment in which he works, there are many factors which combine to determine the success or failure of a surgical operation, and which contribute towards promoting a glorious result or compassing a fatal ending. The title of the subject for this discussion might appear literally to indicate surgical undertakings which, by reason of their magnitude, by reason of the condition of the patient, or possibly because of both these causes co-operating, seem fraught with grave but justifiable hazard; or the reader perusing the wording of this theme might contemplate a morning spent on listening to a veritable catalogue of perils to which patients have been quite unwarrantably exposed by operators, whose conduct is tacitly implied to have been reprehensible in this respect. The parlance of insurance has, however, invested the term "bad surgical risk" with a rather different connotation: it is the operated, and not the operation, that is envisaged, and the *bad surgical risk* has been defined by Basil Rooke¹ as "*a type of patient whose prospect of recovery from active surgical treatment of his condition falls much below the average.*"

It is not, therefore, intended to discuss in these columns surgical enterprises formidable in magnitude and no less forbidding in their prospective mortality, such as the total extirpation of the thoracic oesophagus for cancer and its reconstitution by some form of oesophagoplasty, a surgical triumph gained in this country only by Grey Turner² of Newcastle in that *annus mirabilis* of oesophageal surgery, 1933, and more recently abroad by Gibrandt of Berlin.³ We are not to consider the ablation of large hepatic tumours, whether these be primary hepatic adenomata or the direct extension of a colonic cancer. Interpelvi-abdominal amputations⁴ claim no attention in this discussion, although they are still associated with an operative anxiety sufficient to designate their performance as a risky procedure. Dramatic and heroic extractions of emboli from the pulmonary artery, although bad surgical risks in the literal sense, are to make no claim on our notice, nor are the marvellous encroachments of war surgeons into operative fields hitherto unexplored, than which there has been no greater hazard and no more glorious attainment than Pierre Duval's extraction of a bullet from the intrapericardiac portion of the inferior vena cava.⁶ In this discussion it is *upon the patient himself rather than upon the operation* that attention is to be focused.

Various causal agencies are operative in determining a patient a "bad surgical risk": (a) aetiological factors—for example, race, sex, heredity, age, etc.; (b) bodily conformation—fat, colour of hair, etc.; (c) previous

habits and mode of life; (d) antecedent or intercurrent disease, and the state of the cardiovascular, respiratory, urinary, and nervous system; (e) the psychology, etc., of the patient; (f) the pathological condition for which surgery is contemplated, the severity of that condition, and the existence of secondary phenomena affecting the sufferer prejudicially; and (g) the type of operation proposed.

This discussion would assuredly be judged incomplete, and would fail in its object, if one were content with delineating and portraying these "bad surgical risks," and did not adumbrate the therapeutic measures whereby these patients might be made safe, or safer, for surgery.

General Aetiological Factors

Race.—It would be difficult to controvert the accepted view that members of the Jewish faith are notoriously "bad surgical risks"; and in the case of operation the simplest measures are to be preferred: safety must be put before thoroughness and the highest efficiency. It is easier for "a camel to go through the eye of a needle" than for a Jew to recover from an abdomino-perineal excision of the rectum; a perineal ablation must suffice. Moreover, although a Jew may recover from a gastrectomy for ulcer, it is rare for recovery to take place when the pathological condition demanding an extensive removal of the stomach is a malignant growth. I have, nevertheless, a Jewish patient alive five years after a gastro-colic resection for a carcinoma involving the stomach and the whole of the right side of the colon; this is, however, a very exceptional case, which goes to "prove the rule." The Welsh and Irish[†] have also been impugned as relatively bad risks. The Chinese stand operation well; but my experience of war surgery among those who came "from India's coral strand" convinced me that they were extremely "bad risks."

Mr. Green-Armytage⁷ kindly informs me that the operative risk in natives is related in no small degree to such considerations as blood count, calcium index, blood pressure, which are all lower than those of the "Westerner"; their diet, whether they be meat-eaters or vegetarians, is always defective in vitamin A, with the result that their resistance to infection is below normal, and a merely moderate degree of infection of thorax or abdomen proves fatal. Considerations of diet may also be responsible for the frequency of post-operative ileus after abdominal operations, and for the alarming acetonaemia which may supervene after surgery. On the other hand, the increasing desire of the native to get out of bed at the earliest moment after operation, and the good

* Read in opening a discussion in the Section of Surgery at the Annual Meeting of the British Medical Association, Bournemouth, 1934.

† A lengthy experience of surgery behind the 16th South Irish Division during the war does not confirm but rather refutes this opinion.

musculature of the abdomen, make post-operative thrombosis rare.

Sex.—It is well known that certain operations, such as the extirpation of the rectum by the combined method, are better borne by women than by men, but on the other hand I am confident that gastrectomy is an operation far more frequently followed by anaemia in females than in men,⁸ and therefore to be performed in the former sex more reluctantly. Operations are badly borne during menstruation, pregnancy, and parturition. The sinister effect of the menstrual period upon a radical breast operation is perhaps not sufficiently well known; such an undertaking at that epoch may well prove calamitous.

Heredity.—A long-lived ancestry is a precious possession and an asset of no mean worth, if surgery be contemplated. There are at present no means of altering for the better the proclivity of this or that race to react badly to surgery; we cannot in the twinkling of an eye transform ancestral inheritance or racial characteristics, any more than can "the leopard change his spots or the Ethiopian his skin."

Age.—It is obvious that surgery must be safest during those years when the individual is in his prime, and that operations performed at the extremes of life must carry with them a greater risk than those carried out during the intermediate decades. Nevertheless, it is a remarkable fact that surgery undertaken in the first three months of infant life by skilled and experienced operators is extremely well borne.

Mr. Tyrrell-Gray,⁹ whose considered opinion, based on a vast experience of children's surgery, is an authoritative one, has courteously informed me of the

"absolute safety of Rammstedt's operation for pyloric stenosis; the absolute safety of herniotomy, even double herniotomy, in these early months, if this operation has to be done on account of large size, obstruction, or strangulation, or because it cannot be controlled by any form of truss; likewise the safety of hare-lip operations (although he himself prefers waiting)."

The great anxieties naturally associated with emergency operations during the first few days of life are concerned not so much with the paucity of the hours of separate extrauterine existence as with the actual pathological condition demanding surgery. Fortunately, congenital intestinal atresia is rare, as is also congenital volvulus but all cases, except the simplest malformation of the hindgut, are extremely "bad surgical risks." Nevertheless, Mr. Gabriel has successfully closed a colostomy performed for some congenital hindgut malformation as an emergency operation in the first few days of life.¹⁰ Apart from gangrenous changes demanding resection of bowel, the prognosis in intussusception is excellent, despite the fact that 50 per cent. of the cases occur between the fifth and ninth months of infant life. Early diagnosis, prompt surgery, and the method of anaesthesia have all conduced to the attainment of this low mortality. Gas and oxygen would appear to be the anaesthetic of choice in these cases, but in my own hands spinal anaesthesia has given me a mortality of only 2 per cent., my one fatal case being one demanding an excision for gangrene of the bowel. The occasional publication in medical journals of successful cases of intestinal resection for gangrenous intussusception in early infancy bespeaks the fatality of the procedure: the continuity of the bowel must be re-established at all costs; a time-saving but chicken-hearted enterostomy after resection is always fatal in these cases.

The aged are naturally "bad risks" in cases of injury, and where any operation of severity is contemplated. The adage that "a man is as old as his arteries" must be constantly kept in mind if any complicated surgical incursion

is under consideration. In the very old, local anaesthesia is probably the method of choice, and with its aid I have successfully performed a colostomy for a woman of 98 years with a cancerous rectum, who survived a year; and, in the case of a male nonagenarian, I anastomosed the ileum to the pelvic portion of the rectum for a large obstructing carcinoma of the sigmoid: the patient survived two years, and died of uraemia. It is only fair, however, to record that the oldest patient successfully operated on had general anaesthesia administered; she was a woman of 107 years with a strangulated femoral hernia, and was alive a year after without sign of recurrence. I have, under light general and local anaesthesia, resected a carcinoma of the transverse colon in a gentleman of 85, who is alive six years after.

Bodily Conformity

Those whose stature and form are abnormal are "abnormal surgical risks." The microscopical woman of a few stones in weight may finally disappoint the operator just as easily as the giant or the Hercules.

Fat is well known as a surgical handicap, and where there is no necessity for special haste time may be well spent in reducing weight and improving the musculature of the heart and body under the guidance of a skilled physician and the co-operation of a biochemist. Apart from the mechanical difficulties of operation in the obese, the depth of the wound, the friability of the tissues, the less secure ligature of vessels by reason of greasy gloves, the obscuration of the serous coat of the large intestine by enormous appendices epiploicae and the fatty tissue on the bowel, it must be remembered that there is probably the same amount of fat round the heart and in the heart itself; it is this type of person who perhaps appears more prone to thrombosis and embolism, and who certainly resists infection less well than his neighbour of more spare frame. Any operation for a ventral hernia in a fat woman, where much of the contents of the abdomen have been long outside the coelom and are now replaced, is almost always disastrous.

The general condition of tissues is also important. Prolonged confinement to bed tends to produce deterioration of the tissues of the body, a poor cardiac musculature, and a general inability to respond to any severe surgical procedure. On the other hand, confinement to bed for a few days before operation may be a most salutary preliminary measure: this simple measure may make an easy operation of one which promised to be difficult, and less pain is experienced by the patient than if he had had his abdomen opened "the morning after the night before." The auburn-haired, especially children, are liable to occasion anxiety during and after operation, and their scars have a tendency to become keloid in character: a keloid condition resulting from a circumcision is a terrible sequel to the commonest operation in the world.

Habits

It is obvious that those addicted to excess in the matter of alcohol, tobacco, drugs, etc., must be "worse surgical risks" than their fellow creatures. The liability of the alcoholic to develop delirium tremens after operation or injury is well known: the mortality of any post-operative chest complication is far higher, but if he is already the possessor of a cirrhotic liver, the chances of his recovery from any really severe operation are remote.

Antecedent or Intercurrent Disease

This must obviously prejudice the patient's chances of a successful operation, and this is the more true of cases in which disease is latent and unexpected, and when some urgent operation is required. How often has *pulmonary*

tuberculosis flared up—perhaps disastrously—in a patient making a good recovery from a perforated gastric ulcer. Where the thoracic condition is known beforehand, the use of an appropriate anaesthetic may minimize the risk.

Cardiovascular disease and degeneration must obviously load the balance against the patient: arteriosclerosis and calcification of vessels will obviously be a matter of greater moment in some varieties of operation than in others. When vascular disease is combined with fat in a Jewish patient with a growth in the colon, the surgeon will be prudent who avails himself of the Paul-Mikulicz type of exsection. The co-operation of a good physician—not necessarily a cardiologist—is of great help in the pre-operative treatment of those with a heart and a blood pressure deviating from normality, who are awaiting a severe operation. Sometimes, in spite of cardiovascular degeneration, "bad surgical risks" will recover from very severe surgery, and I have saved a hind-quarter amputation in a man of 63 with marked calcification of all his arteries, demonstrable in radiograms. Again, four years ago I extirpated a cancerous rectum for a patient of 75 years with auricular fibrillation who still survives. Vascular disease carries other risks more remotely connected with the operation, such as cerebral haemorrhage, cerebral thromboses, intraocular haemorrhage, etc., but usually those with a high blood pressure are found to stand operation extremely well. A low blood pressure is a more serious handicap for severe surgery than is hypertension.

The development of post-operative thrombosis and embolism is one of the tragedies of surgery. George Bankoff,¹¹ employing a thyroxine test, was able to group patients into two classes: (a) thyroxine-sensitive, and (b) thyroxine-resistant; he further found that it is only in the thyroxine-resistant cases that thrombosis occurs. He claims that the complication can be prevented by three hypodermic injections of atropine 1/100 grain and ephedrine 1/4 grain; these are commenced on the first day after operation, and repeated on the third and fifth days.

The odds must be desperately against survival from any but the simplest operation in those with *Addison's disease**; my only case of appendectomy in such a case died. I have had no personal experience of eucortone in this rare disease, and in an emergency there is little time for premedication.

In *diabetes* the risks and dangers of surgery are now negligible since insulin and glucose therapy have been employed pre-operatively. The cause of death in fatal cases is senility, not the glycaemic condition. The only anxiety is post-operative vomiting, especially if the patient is unable to take glucose. *Renal disease* obviously constitutes an added risk: renal breakdown will be referred to when genito-urinary operations are under consideration.

Antecedent infections constitute an added risk in surgical procedure. Those who have suffered from *erysipelas* in the past may develop it again during the aftermath of an operation, and those who have had *tetanus* in connexion with a wound years before may have a recrudescence of the infection if the part be re-operated on; the fresh outburst may indeed prove fatal. I have known an alarming recrudescence of a *pyogenic infection* in the case of a man with a diaphragmatic hernia resulting from an old abdomino-thoracic gunshot wound: the hernia was operated upon by the transthoracic route ten years after his original wound. In these matters the bacteriologist may afford most valuable aid. Those who have recently suffered from some *systemic infection*, such as pneumonia, influenza, etc., are bad risks. Where opportunity arises, operation should be deferred as long as

possible. The performance of herniotomy soon after a bad cold or an attack of influenza has been followed on more than one occasion by thrombosis and by recurrent embolism, and it is my practice to defer these operations until the summer, especially in the case of those who are approaching, or who have reached, middle age. The *syphilitic* who has been well treated for his disease usually bears operation well, but the onset of a gastric crisis or some other type of crisis may occasion some anxiety during convalescence. The presence of a syphilitic history will modify the type of operation envisaged. The onset of general paralysis may be precipitated by an accident in those who have had syphilis.

Second operations, following hard on the heels of the primary surgical attack, are apt to be followed by thrombosis of lung or limb; but in these cases the operation is almost always of an urgent character, and the surgeon cannot choose his own time.

Psychological Factors

Any surgeon of experience will have convinced himself that "the psychological undesirables," considered from an operative viewpoint, constitute as numerous and motley a collection as the Gilbertian list in *The Mikado*. That surgeon will be wise who refrains from any operation of convenience upon those who require much persuasion or over-persuasion: he should beware of the apprehensive patient; and he will also regard with anxiety the man with huge piles of books on the tables at each side of his bed; the man with the rapid pulse and the stack of French novels around him; and likewise the individual who is reading his paper upside-down!

An eventful recovery, or worse, may be confidently predicted for those who change their religion the night before an operation, and for the politician or potentate who keeps the theatre waiting while the final lines of his autobiography are completed. These types may well be regarded as "bad risks" before operation, but the appearance of these eccentricities or unusual whims in a patient after surgery are signposts of ominous portent. Unfortunately, this attitude of mental unrest often develops only after an operation, and the operator may be taken unawares. It is commonplace experience that clergymen, doctors, nurses, actors, and those of an artistic temperament are "poor surgical risks"; and garrulous loquacity, pre-operative or post-operative, whether it be an individual trait or a transient phenomenon, is a danger signal that should not pass unnoticed: it so often heralds surgical disaster.

Pathological Conditions Demanding Surgery

There are certain anatomical regions of the body which appear to tolerate surgical incursion and attack far better than others; in this respect the gynaecological surgeon is at a great advantage: the invulnerability of the pelvis is a surgical adage. No matter what the pathological condition present, no matter how derelict the patient, a good result may be almost confidently predicted. *The pelvis is indeed the surgeon's fairyland*: there are few or no "bad surgical risks" in this area of the body.

Surgery of Thyrotoxicosis

To my mind the greatest advance in surgery during the last quarter of a century has been the extraordinary increase in the safety of operations for this condition. Whereas operations for this type of case were at one time fraught with grave anxiety and associated with a heavy mortality, save in the hands of a few with great experience and special knowledge of the disease, it has now become one of the safest of the operations of surgery.

* Carl Greene, Walters, etc.,¹² report a successful orchidectomy for tuberculosis in a patient with Addison's disease.

Pre-operative medication with iodine, and the repeated investigation of the basal metabolic rate during the pre-operative period of rest in bed, has made these cases *almost safe* for surgery. The surgeon has become almost a mere carpenter in the hands of the physician and biochemist, who indicate the exact time for surgery with an accuracy akin to that of the astronomer. The work of our Courtauld Institute of Biochemistry at the Middlesex Hospital has enabled us to reduce the mortality of the operations for toxic goitre to an almost infinitesimal figure: the larger number of cases have been operated upon by my colleague and assistant surgeon R. Vaughan Hudson, but the results of all the cases operated upon by all the surgeons in Middlesex Hospital yield a mortality rate of under 1 per cent. For my own part I prefer regional anaesthesia, but the combined results of eight surgeons, employing almost every variety of anaesthesia, would appear to discount the value of my personal predilection. Increased knowledge has given even those whose goitre operations are not yet to be numbered in thousands rules by which dangerous surgery may be avoided in this class of patient.

Operation is contraindicated and dangerous in the following circumstances: (a) If the patient has been dosed with iodine indiscriminately for months or years previous to seeing the surgeon with a view to operation, at which time the basal metabolic rate is above 40, and tachycardia is present, along with marked loss of weight. (b) If, when put on iodine by the surgeon preparatory to operation, the patient gets *clinically worse* and the basal metabolic rate rises. (c) If operation is delayed too long after iodine has been prescribed; the iodine loses its action, and the basal metabolic rate rises even on iodine. (d) In the presence of an "acute" infection, such as tonsillitis. (e) If the patient is maniacal or mental. (f) If the patient shows an idiosyncrasy to iodides, as is seen by coryza, nasal discharge, skin eruption, and bronchitis. These risks can be overcome by the following measures: (a) Only giving iodine immediately prior to operation. (b) Operating only if the response of the patient to iodine is favourable—that is, the basal metabolic rate falls to constant low level. (c) Not operating if iodine makes the patient worse: the iodine should be stopped for about two months and then restarted in an effort to obtain a favourable response: *this invariably happens*. (d) Operation should not be delayed too long after iodine has been started—that is, more than twenty-eight days. In spite of current belief, the following are not contraindications: (a) heart failure, congestive or anginal; (b) auricular fibrillation or flutter; (c) hypertension; (d) extreme youth or old age.

Surgery of the Tongue and Mouth

Increased knowledge and experience of radium therapy has given us an alternative method of treatment for those who are, on general grounds, or because of the extent of the growth, considered "bad surgical risks." Whatever views may be held as to the best form of treatment for cases of cancer of the anterior half of the tongue, which are "good surgical risks"—and each such case must be considered strictly from every point of view—there can be no doubt that the final results of radium therapy are at least as good as, and probably much better than, those of surgical extirpation, where the growth involves the posterior portion: and the mortality of the procedure is but a fraction of that involved in the more drastic measure.

"Block-dissections" of the neck for the extirpation of the cervical glands are usually well borne even by the aged, but in the case of bad risks, and for recurrence, the various methods of radiation therapy are available.

Surgery of Peptic Ulcer

Ill-advised, ill-timed, or inappropriate surgery may convert into a "bad risk" one which seemed to promise well. There is no single form of operative procedure universally applicable to every case of peptic ulcer. Apart from those general considerations, outlined in the introductory paragraphs, which combine to constitute a patient a "good" or "bad" risk, there is perhaps no factor which so cogently determines in which class the sufferer shall find himself during and after a gastric operation as the judgement of the surgeon under whose care he is placed. By surgical judgement, or the lack of it, the patient's cause may be won or lost.

The immediate result of surgical incursion will be undoubtedly influenced by the particular technique employed: it is manifest that for the patient who is admittedly a bad risk the most simple, the most gentle, the most *rapid* procedure is the *method of election*. The position of the ulcer, its size and fixity, any suspicious characters suggestive of malignancy, the results of fractional gastric analysis, are all points worthy of careful consideration in the "good risk" candidate for a gastric operation; or in one whose previously poor and debilitated condition has been improved by preliminary treatment to approximate normality. Although these data, amassed and collected by radiological and biochemical methods, will assuredly influence and determine the type of operation in the "good risk" patient, in the "poor surgical risk" they must not be unduly stressed: a gastro-jejunostomy, or even a jejunostomy, performed under a local anaesthetic may be the wisest procedure, and at worst the patient's condition may be improved and ameliorated, so that more drastic surgery may be considered later, if by any chance symptoms should reappear, or should that full measure of health which surgery can confer not have been attained by the minor procedure.

The dangers of post-operative complications in "the bad surgical risk," as indeed in all those who undergo upper abdominal surgery, may be greatly reduced by the employment of regional and splanchnic anaesthesia: this may be combined with very light general anaesthesia. Light ether, or even ether and chloroform anaesthesia in combination with the methods of infiltration, has, in the last dozen years, practically abolished thoracic complications in my upper abdominal operations. With such a technique the mortality of gastrectomy for ulcer is under 4 per cent.

High spinal anaesthesia, with the great fall of blood pressure induced, has not in my hands been found to help the "bad surgical risk"; but the surgeon will, of course, utilize that technique with which he has made himself familiar, and which has always given him the best results.

Gastric and Duodenal Haemorrhage from Ulcer¹³

A patient with a chronic peptic ulcer may be made a "bad surgical risk" by ill-judged and indiscriminate surgery, but he is already and at once a "bad risk" when he has bled from that chronic ulcer. Furthermore, if such a patient is a "bad surgical risk," he is no less a "bad medical risk," although the truth of this latter statement may not have always been appreciated. The mortality from bleeding among cases of chronic ulcer of the stomach and duodenum treated by non-operative measures at Middlesex Hospital from 1924 to 1933 amounted to 24 per cent.—a percentage mortality almost identical with that obtained by A. M. Cooke from the St. Thomas's figures; in the Middlesex Hospital cases a second large haemorrhage produced a mortality rate of 78 per cent., and with each succeeding haemorrhage the risk became greater and

greater. It would therefore appear that in these cases operation is required before a second haemorrhage takes place, and that for such patients, and at the particular stage in the course of their illness, surgery is the only logical measure of safety. The surgical risk would appear to be least bad, and the moment for intervention most opportune, not longer than forty-eight hours after the bleeding has ceased.

Finsterer of Vienna,¹⁴ however, regards bleeding from a chronic ulcer as an imperative indication to operate at once. Early operation in his hands is associated with an extraordinarily low mortality. After twenty-four to thirty-six hours they become bad surgical risks, and the mortality rapidly rises. My own figures for operations performed for acute haematemesis from 1919 to 1926 show a mortality of 19 per cent., so that the risk is not inconsiderable. Closer co-operation between physician and surgeon will show us which are the cases that should be attacked by surgical intervention; but if surgery be required operation should be performed early under local anaesthesia, and in certain cases a caecostomy may be advantageous.

The possessor of an anastomotic ulcer is a "bad risk," and to quote the words of Garnett Wright,¹⁵ "The Angel of Death is hovering near, and the fluttering of his wings can be almost heard." The patient, worn out with pain, is in many cases little able to stand the prolonged and complicated surgical operation which is required to relieve his symptoms and to prevent a recurrence of his malady. Increasing experience of the operative surgery of this condition, which is in itself becoming more frequently encountered, will doubtless lower its mortality in the hands of those who most frequently have to treat these cases. A gastro-jejunal or a jejunal ulcer may be a severe burden to bear, but an added communication with the colon increases the duration of the operation to cure it, and a complicating haemorrhage makes the risk more desperate than ever.*

Gastric Cancer

All gastric cancers are "bad surgical risks," and I am in the habit of teaching that, whereas a gastrectomy for ulcer will always try to live, a gastrectomy for cancer will always die if he can. Nor am I alone in regarding the condition and its operative surgery as a "bad risk," for Bastianelli,¹⁶ whose enterprise and whose sympathy enable him to resect no less than 44 per cent. of his cases, admits a mortality of 28 per cent. Even excluding three cases of total gastrectomy and twelve stomach-colon resections—which, of course, tended to increase the death rate—his mortality rate from operation was 25.4 per cent.

Finsterer,¹⁷ however, employing local anaesthesia, had only twelve deaths in 202 operations—6 per cent. In the advanced cases where pancreas, colon, or liver are involved, resection carries, of course, a much heavier mortality. In those cases of cancer of the stomach associated with stenosis at the pyloric extremity, protracted vomiting, dehydration, toxæmia, etc., may make a single-stage operation a tax on the patient's resisting and recuperative powers that he is incapable of bearing. In these cases, therefore, a preliminary drainage operation and a subsequent resection may turn the "bad risk" into a "good" one.

According to the condition of the patient, the procedure may take the form of an ordinary anterior or posterior

gastro-jejunostomy and a later resection; or the stomach may be cut across above the growth and an anastomosis performed between the proximal end and the small intestine. The upper end of the distal segment is sutured over, and the suture line reinforced by omentum. The operative technique of the operation is improved and facilitated by a clamp of the von Petz type. It is almost imperative in every case of gastrectomy for cancer to make use of the transfusion of blood.

Surgery of the Spleen

There are certain forms of splenic pathology where operation is associated with severe risk. The danger of post-operative thrombosis in cases of splenic anaemia with a high initial blood platelet count is perhaps not always sufficiently appreciated: R. E. Kelly¹⁸ of Liverpool has, amongst others, drawn attention to it. The services of a competent haematologist are of the greatest importance when splenectomy is contemplated for this disease. Splenectomy for thrombocytopenia has, in my experience, been a most dramatic and a safe operation, but the mortality has been affirmed to be 80 per cent. when the operation is done in an acute phase. The risk of transfusion in cases of acholuric jaundice is not inconsiderable.

Cancer of the Colon and Rectum

It will naturally depend upon that percentage-mortality which is regarded as fair and justifiable for an operation, to designate the surgical adventure as a "good" or "bad risk." By reason of the operative mortality of colectomy for cancer of the colon, it would seem that most of these cases are to be regarded as "unfavourable risks." Sistrunk,¹⁹ in 1928, while affirming that surgery offers the only cure for malignant disease of the colon, deplored the high mortality of colectomy. "Except for operation in certain serious emergency cases," he wrote, "the mortality following operation for cancer of the colon is perhaps higher than in any other type of intra-abdominal operation."

Grey Turner in 1929²⁰ admitted an operative mortality of 12.28 per cent., but many of his cases were most complicated resections. He appears to think that a mortality of 5 per cent. would represent the acme of surgical judgement and the perfection of operative technique. The mortality of the procedure may be reduced, and the risk improved, by drainage of the bowel, preliminary or simultaneous, the employment of exteriorization methods of the Paul-Mikulicz type, lateral incisions over the growth where possible, the provision for drainage of the abdomen at the site of anastomosis, the employment of blood transfusion, and possibly preliminary immunization. The mortality of operations of the Paul-Mikulicz type in my hands is in the neighbourhood of 1 or 2 per cent., and these should be used more frequently.

In the case of cancer of the rectum there are many types of operation, but the most important factor in the management of the case is the judgement of the surgeon. In forming a judicious estimate of his patient he will take into consideration the age, the sex, and the cardiovascular system; the urinary tract and the bodily configuration of the invalid will also demand attention. A preliminary microscopical section of the tumour may be possible, and may help in forming an opinion as to the malignancy of the particular cancer. The surgeon may utilize the Moots-McKesson test of operability by employing what is termed the "pressure-ratio percentage"; the pulse pressure over the diastolic pressure is calculated in percentages, the normal being about 50 per cent. If the pressure-ratio is high or low there is reason to apprehend danger. If below 25 per cent. or above 75 per cent. the case is inoperable. Close attention to these points and a wise and judicious decision will make a "risk" a good or fair one.

* Mr. A. J. Walton has operated on seventy-nine of these cases, and out of his last twenty cases has had the amazingly low mortality of only one death (*Lancet*, April 28th, 1934). My own results (G. G.-T.) are: fifty-four anastomotic ulcers treated by resection, with ten deaths. Excluding ten cases in which there was a communication with the colon, and of which four died, there were six deaths in the remaining forty-four cases—that is, 13.6 per cent. mortality.

The Surgery of the Biliary Tract

In contrast to the extraordinary safety of operations on the gall-bladder the surgery of the common bile duct is associated with a much heavier risk to life. To make these cases of jaundice safer for surgery operation should be deferred until the jaundice begins to subside. Blood transfusion is better than intravenous calcium chloride as a means of diminishing or preventing the tendency to haemorrhage, and is especially valuable where the bilirubin curve tends to rise. It is also important to administer large quantities of water and of glucose before and after operation—by the rectum or by intravenous infusion. In the worst cases of jaundice nothing more than drainage should at first be essayed.

Genito-Urinary Surgery

A candidate for the operation of prostatectomy is a "bad surgical risk" if the operation is performed when the blood urea is over 60 mg. per 100 c.cm.; and if there is evidence of moderate renal impairment, even in spite of a normal blood urea estimation. Eric Riches and Douglas Robertson²¹ regard it as dangerous to operate radically if the urea-clearance test of van Slyke for estimation of renal function is below 60 per cent. of normal, no matter how normal may be the blood-urea estimation.

Secondary nephrectomy for any condition is always an anxious operation, and two or three transfusions and infusions may be required to carry the patient through his convalescence from what may be a carnivorous type of surgery.

Conclusion

It requires no superlative enthusiasm of mine, no unwarranted optimism, to foresee and foretell that, as the "bad surgical risk" of a decade or two ago is now a "normal or good risk," so will the "despairs" of to-day be the "certainties" of the morrow. The craftsmanship of surgery is not yet finished and perfected as an art—fresh techniques will be evolved, fresh avenues of approach will be explored, fresh territories will assuredly be conquered. More accurate and certain knowledge of the causation and cure of disease, and methods and forms of therapy still undreamt of, will in future days cheat and rob Death of those victims that, in this twilight of our surgical wisdom, appear to us now beyond all mortal aid.

REFERENCES

- ¹ Rooke, Basil: *Practitioner*, April, 1933, p. 564.
- ² Turner, G. Grey: *Lancet*, December 9th, 1933, p. 315.
- ³ Idem: *Proc. Roy. Soc. Med.* (Sect. Surg.), June, 1923, xvi, 8, p. 43.
- ⁴ Pringle, J. Hogarth: *Brit. Journ. Surg.*, 1916, p. 283.
- ⁵ Gordon-Taylor, G., and Wiles, Philip: In the press.
- ⁶ Duval, Pierre: *Soc. de Chir. de Paris*, June, 1928.
- ⁷ Green-Armytage, V. B.: Personal communication.
- ⁸ Gordon-Taylor, Hudson, Whitby, Dodds, and Warner: *Brit. Journ. Surg.*, 1929.
- ⁹ Tyrrell-Gray, H.: Personal communication.
- ¹⁰ Gabriel, W. B.: *Proc. Roy. Soc. Med.*, May, 1931, xxiv, 5, p. 102.
- ¹¹ Bankoff, George: *British Medical Journal*, 1934, i, 189.
- ¹² Greene, C. Walters, et al.: *Ann. of Surg.*, December, 1933.
- ¹³ Gordon-Taylor, G., Abrahams, A., Bennett, T. Izod, Morley, J., et al.: *Lancet*, 1934, i, 572.
- ¹⁴ Finsterer, Hans: *British Medical Journal*, 1932, ii, 399.
- ¹⁵ Wright, Garnett: Association of Surgeons meeting, Birmingham, May, 1934.
- ¹⁶ Bastianelli, Raffaele: *Rep. Internat. Confer. Cancer*, 1928, p. 352.
- ¹⁷ Finsterer, Hans: *Ibid.*, p. 344.
- ¹⁸ Kelly, R. E.: *Proc. Roy. Soc. Med.*, September, 1929, xxii, 1, 1514.
- ¹⁹ Sistrunk, W. E.: *Collected Papers of the Mayo Clinic*, 1928.
- ²⁰ Turner, G. Grey: Annual Oration, Medical Society of London. *Trans. Med. Soc. Lond.*, 1928-9, lii, 301.
- ²¹ Riches, Eric, and Robertson, Douglas: Personal communication.

RETROVERSION OF THE UTERUS*

BY

S. GORDON LUKER, M.D.CAMB., F.C.O.G.

BOURNEMOUTH

The usual position of the uterus is one of ante flexion and anteversion in the middle of the pelvis, the axis of the uterus being very nearly horizontal. When the exact opposite of this occurs the uterus is retroverted and retroflexed. In between these two extremes any position of the uterus may be found. It is usual to describe a uterus as retroverted when the cervix is pointing downwards or forwards and the axis of the body of the uterus is directed backwards. The retroverted uterus is often retroflexed as well.

The normal position of the uterus is maintained by the structures which are attached round the supravaginal portion of the cervix. These are the pelvic fascia, the bases of the broad ligaments, and the utero-sacral ligaments.

There is a wide divergence of opinion as to the symptoms which result from retroversion of the uterus and the treatment required. Some confusion has arisen from grouping all cases together and not separating those of congenital origin from those acquired after pregnancy and labour. It is my intention, therefore, to make as clear as possible the different groups of cases.

Classification

1. The group of those women who are single and have congenital retroversion. It is a fact that many of them are unconscious of the condition and have no symptoms; these, of course, require no treatment. There are others, however, in whom symptoms begin to appear as they get older. This may be due to increase in degree of the condition, with increasing retroflexion, giving rise to venous congestion and symptoms of backache, increasing dysmenorrhoea, pelvic discomfort, or pain for which no other cause can be found.

2. The group of married women who have a congenital retroversion which gives rise to symptoms, on or after marriage, of which the commonest is dyspareunia; or they may seek advice for sterility; or, if they become pregnant, miscarriage may result. These patients require investigation and treatment.

3. The group of those who are found to have retroversion acquired after miscarriage or labour. This is a large and important group, as is shown by the record of two hundred consecutive confinements. Post-natal examination one month after delivery showed that of the primiparae 13 per cent. had retroversion; of the multiparae 3.5 per cent. had retroversion. These patients had received the advantage of skilled nursing and postural preventive treatment, so that the percentages are probably higher among the greater number of women attended in their own homes. These require treatment in order to prevent subinvolution after labour; the position of the uterus must be corrected in order to prevent the development of symptoms of pelvic discomfort, backache, congestive dysmenorrhoea, leucorrhoea, and dyspareunia. Further, if a retroverted uterus is left uncorrected after labour it will be a factor leading to future prolapse.

The pelvic discomfort is generally of a dull aching nature, aggravated by activity and fatigue. It may have a bearing-down character or may give rise to a sensation of fullness or pressure on the rectum. The backache is generally dull and constant, increased by fatigue and relieved by rest. It is generally felt posteriorly over the sacrum, but may radiate towards the iliac fossae or the thighs.

* Read in the Section of Obstetrics and Gynaecology at the Annual Meeting of the British Medical Association, Bournemouth, 1934.