A Lecture

ON THE

SURGICAL TREATMENT OF ULCER OF THE STOMACH AND OF ITS COMPLICATIONS.

Delivered at the Medical Graduates' College and Polyclinic.

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GENTLEMEN,—The subject upon which I am to lecture to-day is the Surgical Treatment of Ulcer of the Stomach and of its Complications. I propose to consider the various conditions which may arise in the following order:

1. The perforation of gastric or duodenal ulcer.
2. The occurrence of haemorrhage in gastric or duodenal ulcer.
3. Chronic ulcer.
4. Hourglass stomach.

THE PERFORATION OF GASTRIC AND DUODENAL ULCERS.

There are few catastrophes so awful in their suddenness and in their intensity as the perforation of a gastric or duodenal ulcer. The extreme urgency of the condition is such that, unless surgical aid is speedily forthcoming, the patient hastens almost inevitably to her end. It is, therefore, of the first importance that there should be early recognition of the condition, and instant treatment of it if the patient's life is to be saved.

Perforation of the stomach is usually described as being of two varieties, acute and chronic; but there is, as I first pointed out, an intermediate class of case, not embraced by either of these terms, which is best described as subacute.

The distinction between these various forms is as follows:

In *acute perforation*, the ulcer gives way suddenly and completely. A larger or smaller hole results, and through this the stomach contents are free to escape at once into the general cavity of the peritoneum.

In *subacute perforation* the ulcer probably gives way almost as quickly as in the acute form, but owing to the small size of the ulcer, or to the emptiness of the stomach, or to the instant plugging of the opening by an omental flap or tag, or to the speedy formation of lymph, which forms, as it were, a cork or lid for the ulcer, the escape of fluid from the stomach is small in quantity and the damage inflicted thereby is less considerable. The symptoms at their onset may be as grave as those in acute perforation, but on opening the abdomen the ulcer may be seen to be sealed over, and no further escape of fluid is occurring.

In the subacute form of perforation I have found that there is always a complaint of greater discomfort for several days preceding the rupture. Vague general or localized pains have been felt in the abdomen, or a sharp spasm or "stitch" when the patient turned quickly or attempted to laugh. One girl, a housemaid, felt the pain down her left side, especially when reaching up to her work; another said it hurt her to bend, as her side felt stiff. These premonitory symptoms are important, and, if recognized, they should enable us to take measure to prevent the occurrence of perforation. They doubtless have their origin in a localized peritonitis, and the stiffness is due to the unconscious protection of an inflamed area by a muscular splint.

In *chronic perforation*, the ulcer has slowly eaten its way through the stomach coats, and a protective peritonitis has had time to develop at the base. The escape of stomach contents is therefore local merely; barriers of lymph confine the fluid to a restricted area, and a perigastric abscess forms. A chronic perforation occurs more frequently on the posterior surface of the stomach, and the perigastric abscess occasioned thereby is recognized as "subphrenic." The acute and subacute forms of perforating ulcer are more common on the anterior surface.

It has been shown by the operative experience of many surgeons that recovery from all these forms of perforation is possible under medical treatment alone. It is probable that the acute form is almost invariably fatal, and that the cases that recover are confined, perhaps exclusively, to the subacute or the chronic forms. In these cases, however, surgical treatment is called for in a later stage, perhaps because the stomach is inextricably bound in a mesh of adhesions and its

freedom of action hampered, perhaps because it is so constricted that an hourglass stomach or a trifold stomach may be formed. The after-history of cases that recover is, I have found, the best argument in favour of instant operative treatment when the perforation occurs. For "recovery" does not mean return to health, but the changing of an acute and desperate illness into a prolonged and painful invalidism, escape from which can only be effected by surgical means.

During the last few years I have operated upon 22 cases of perforating gastric or duodenal ulcer. The following is an analysis of these:

Summary of Cases.

Since April 30th, 1897, the date of my first operation, I have had under my care 22 cases of perforating ulcer of the stomach or duodenum. In these 22 cases there were 14 recoveries—63.6 per cent., and 8 deaths—36.4 per cent. There were 7 cases in which a duodenal ulcer had perforated, 15 in which a gastric ulcer had perforated. In the first 10 cases there were 6 deaths; in the last 12 cases there were 2 deaths. My first case recovered, and then in succession were 5 unsuccessful cases.

The ages of the patients varied from 17 to 44. The cases of gastric ulcer were 15 in number; of these, 3 were males, aged 23 and 24; 12 females, of average age 26 years 1 month. The cases of duodenal ulcer were 7 in number; of these, 4 were males, aged 44, 25, 22, and 40; 3 females, aged 17, 17, 25.

An inquiry into the previous history of the cases of gastric ulcer showed that in every case with one exception—and in that no record of inquiry is made—the patient had suffered from symptoms referable to the ulcer for periods varying from a few weeks to several years. Of the 12 patients, 6 had been under treatment within a year of the occurrence of the perforation for indigestion, vomiting, or haematemesis and anaemia.

Similarly in every case of perforated duodenal ulcer previous symptoms had been observed, and 4 of the 7 patients had recently been under treatment. In none of these cases had relief been afforded.

In the majority of the patients there had been no increase in the severity of the symptoms during the few days preceding perforation. In 3 of the 22 cases, however, a distinct and notable exacerbation is recorded. The time which elapsed between the perforation of the ulcer and operation varied from three hours and fifty minutes to four days. In 3 cases the perforation was of the type I have described under the term "subacute." In one of these the operation was performed twenty-eight hours after the rupture. The patient died in the fourth week from a subphrenic abscess, with multiple points of suppuration within the abdomen.

The second case was one of perforated duodenal ulcer, which was operated upon four days after perforation. The ulcer was closed, and a second posterior incision was made to afford drainage; the patient recovered.

In the third case the ulcer was on the posterior surface, and a collection had formed in the lesser sac; the general peritoneum was also involved. An anterior and posterior incision were made in this case also. Recovery was most satisfactory.

In cases of subacute perforation it is most necessary to cleanse as thoroughly as possible, for the amount of lymph deposited is greatly in excess of that seen in the acute cases. The perforation was found on the anterior surface of the stomach in 13 cases, on the posterior surface in 2 cases. As a rule the perforation was near the lesser curvature, and nearer the cardiac end. In one case two perforations were found, both on the anterior surface, about 1½ in. apart. In one case the perforation occurred in the centre of an hourglass stomach, and gastroplasty had to be performed. In the 7 duodenal cases the perforation was found in the first portion 6 times, in the beginning of the second portion once. In 3 cases, in the whole series, gastro-enterostomy was performed immediately after the closure of the perforation, in 2 cases recovery followed. In 2 cases the subsequent performance of gastro-enterostomy has been necessary owing to the persistence of symptoms due to the ulcer, or to the scar left by it. There were, therefore, 14 cases of recovery from the perforation, in 2 of these gastro-enterostomy had been performed, and in 1 gastroplasty for an hourglass stomach; of the remaining 11, 2 suffered to such a degree as to necessitate the performance of a second operation, gastro-enterostomy, and 1 will probably have gastro-enterostomy performed shortly. In the 22 cases there were, therefore, 6 in which an immediate or a subsequent operation for the adjustment of the mechanical conditions of the stomach was necessary. Two of the

patients suffered from perforation while they were waiting for operation, one in the hospital, one in a nursing home. Both had complained for years of indigestion and vomiting, both had dilated and hypertrophied stomachs for which a gastro-enterostomy was to be performed. In one a duodenal ulcer, in the other an ulcer at the pylorus, had perforated. In both the ulcer was closed and an immediate gastro-enterostomy performed. Both patients recovered, and remain perfectly well.

The cause of death in 6 cases was shock or a want of recovery from the condition of collapse, often profound, which existed before operation. In one case death resulted from empyema, and in one case from subphrenic abscess and suppuration at several points within the abdomen.

None of the patients who recovered suffered from any chest affection, from parotitis, thrombosis of veins, or from hæmatemesis during the time they were under treatment after the operation. In one of the fatal cases there was slight hæmatemesis. The question of drainage was determined entirely by the needs of each individual case. There was no rule in one's mind that had necessarily to be followed; what seemed appropriate to the case was adopted. As a rule, the earlier the case was seen the less was the need for drainage. Lavage was only adopted when the case was of long duration. When the stomach was found distended with fluids, it was emptied by the stomach tube during the operation. In all, drainage of the abdomen was adopted in 12 cases; in two of these posterior drainage, as well as anterior, was necessary, and in two others suprapubic drainage, as well as drainage through the wound, was established.

HAEMORRHAGE.

The questions as to the propriety of surgical treatment in cases of hæmorrhage from gastric or duodenal ulcers, and as to the best means of dealing with the conditions found at the time of operation have been much discussed during the last few years. The circumstances to be taken into account have presented themselves differently to different observers, and though in many points there is now substantial agreement, in many there is still a wide divergence of opinion.

I have elsewhere discussed in detail the various forms in which bleeding from gastric or duodenal ulcers may become manifest. I can, therefore, be brief in my present summary of this most important subject.

In some cases hæmorrhage is the earliest and perhaps for a time the only symptom of gastric disturbance; in others it is the last expression in a long and tedious course of symptoms. In other words, the hæmorrhage may occur from an acute or from a chronic ulcer of the stomach or duodenum. It will be found when the clinical history of a series of cases is examined, that whereas in the latter the bleeding varies within the widest limits both as regards quantity and frequency, in the former the clinical history is repeated in case after case in a most remarkable manner.

An inquiry into a series of cases will show that the characteristics of hæmorrhage from an acute gastric ulcer are spontaneity, abruptness of onset, the rapid loss of a large quantity of blood, the marked tendency to spontaneous cessation, the infrequency of a repetition of the hæmorrhage in anything but trivial quantity, and the transience of the resulting anaemia.

The bleeding from a chronic ulcer of the stomach or duodenum may vary within the widest limits both of frequency and of quantity. For convenience of description I should arrange the cases in four groups:

1. The hæmorrhage is latent or concealed, is always trivial and often inconspicuous.
2. The hæmorrhage is intermittent, but in moderate quantity, occurring spontaneously and with apparent caprice at infrequent intervals. The life of the patient is never in jeopardy from loss of blood, though anaemia is a persisting symptom.
3. The hæmorrhage occurs generally, but not always, after a warning exacerbation of chronic symptoms. It is rapidly repeated, is always abundant, its persistence and excess cause grave peril, and will, if unchecked, be the determining cause of the patient's death.
4. The hæmorrhage is instant, overwhelming, and lethal.

It has been advised by a distinguished authority that surgical measures should be adopted in all cases of hæmorrhage from a gastric ulcer when the amount of blood lost exceeds half a litre. This is the very extremity of surgical impetuosity, to be found in my experience only in a physician.

The one character that the hæmorrhage should possess to warrant the performance of an operation is recurrence; recurrence, too, at intervals which, becoming gradually curtailed, do not allow the patient to make up in the interval the ground which he loses in the attack.

In acute ulceration operation is, therefore, very rarely necessary; in chronic ulceration operation, for the particular purpose of arresting hæmorrhage, is demanded in those cases which are grouped in the third class mentioned above.

In dealing with hæmorrhage from the stomach or duodenum, two plans may be followed: By the first the surgeon makes a search for the ulcer or ulcers, and deals with them directly by excision, ligature, cauterization, or otherwise; by the second he deals with the hæmorrhage indirectly by performing gastro-enterostomy as speedily as possible. By this operation the stomach is emptied, and allowed to contract, and opportunity is thus given to the ulcer to heal.

With regard to the former method—the method of search for, and direct treatment of, the ulcer—it must be acknowledged that it is the more desirable. When a vessel is bleeding the surgical indication is to secure it with a ligature, or in some other direct method to effect its closure. In many cases this is possible. The ulcer can be felt when the stomach is gripped between the fingers, and it can then be easily excised. This I have done in 4 cases. In other instances, however, the ulcer may be found adherent to the pancreas, or to the liver, or even to be excavating these organs; or, as in one case of my own, a large mass of induration may be found about the ulcer, and innumerable dense adhesions may also be present; or more ulcers than one may be found—one ulcer may be felt in the stomach and one in the duodenum; or finally, the most deliberate search of the whole stomach may fail to disclose any sign of ulcer. In all these circumstances the excision of the ulcer or the direct treatment of the bleeding point may be impossible, and recourse would then of necessity be had to the indirect method, the performance of gastro-enterostomy.

An inquiry into the records of cases which have been dealt with by the direct method shows that the bleeding point may be impossible to discover; that although blood can be seen to well up from the stomach wall, no single point can be recognized as its source. The whole surface seems to be weeping blood. Furthermore, when a definite excavation or erosion or ulcer has been recognized, and has been treated directly by ligature, cautery, excision, or curettage, and the stomach closed, the hæmorrhage has continued as freely as before, and has proved fatal. At the *post-mortem* examination of such cases, a second ulcer or multiple ulcers may be found, or it may happen that no obvious source of the bleeding is discoverable. Local treatment of the supposed source of the hæmorrhage has, therefore, not always met with adequate success.

For these reasons many surgeons, including myself, have felt that, at any rate in the earlier cases treated, surgical methods have missed their mark. Painsstaking investigation of the mucosa has proved futile, and ligature of the actual or supposed source of the blood has not achieved its purpose. The belief was, therefore, expressed and acted upon, that in many cases local treatment was unnecessary, in many it was impossible, in all the desired end—the arrest of hæmorrhage—could be secured at least as well by other and safer methods.

Gastro-enterostomy, it was found, led in all my cases to an instant cessation of the bleeding, and to the speedy and complete healing of the ulcer. The explanation of this was, it seemed to me, as follows: In all cases of hæmatemesis or melaena the tendency to spontaneous cessation is known to be remarkable, the cause of the continuance of the hæmorrhage in certain instances, I concluded, after an examination of several cases during operation, must be distension of the stomach. In certain cases the stomach was so tightly inflated that manipulation of it was difficult. In one the distension was so marked that I had to puncture the stomach before beginning the anastomosis with the jejunum. The operation of gastro-enterostomy could be seen to result at once in an emptying of the stomach into the jejunum. In cases of hæmorrhage, therefore, I advocated the performance of gastro-enterostomy as the safest, and speediest, and surest method of checking the outpouring of blood. My own practice has justified my advocacy of this method; in no case have I found reason to regret having adopted it. In all, the arrest of the hæmorrhage has been complete and permanent.

This, however, has not been the experience of others. Many cases are recorded where hæmorrhage continued after gastro-enterostomy had been performed, and proved fatal. Kocher, Quénu and Petersen all have met with this experience. In other recorded cases I am disposed to blame, not the gastro-enterostomy for failing to arrest the hæmorrhage, but a Murphy button which had passed into the stomach, for causing its continuance.

It is, therefore, clear that both the direct and the indirect methods of dealing with the ulcers have at times proved unavailing. The safest course to pursue, whenever it is possible, is to secure first of all the bleeding point, if it can be determined with certainty, and subsequently to perform gastro-enterostomy. If no definite source of the haemorrhage is discoverable, gastro-enterostomy should be performed.

Summary of Cases.

I find that I have operated upon 22 patients, for the purpose of arresting haemorrhage which, so far as could be judged, was likely soon to prove fatal. Three patients have died, 19 patients recovered.

Excision of the ulcer alone was performed in one case, the patient dying suddenly on the eighth day, when apparently doing well.

Excision of the ulcer, followed by gastro-enterostomy, has been performed in 3 cases; 2 patients recovered and 1 died.

In the remaining 18 cases gastro-enterostomy alone had been performed; 17 patients recovered and one died.

In no case has there been haemorrhage after the operation in the patients who recovered; in those who died there was no evidence of any bleeding having occurred after the operation, though blood was, of course, found in the small and large intestines. In one patient who died, the only condition discoverable as a possible source of haemorrhage was a dilatation of the gastric veins.

CHRONIC ULCER OF THE STOMACH.

The symptoms which are caused by chronic ulceration of the stomach are of great variety. It is now becoming more widely recognized that "dyspepsia" or "chronic indigestion" is due, certainly in a majority of cases, to some mechanical change in the stomach as the result of chronic ulceration. Much depends upon the position that the ulcer occupies in the stomach. If it be close to the cardiac end it may, as in one case of my own, cause symptoms suggestive of oesophageal obstruction. If it be close to the pylorus, the narrowing there produced leads to a dilatation of the stomach. If the ulcer lie in the body of the organ, it may in its contraction give rise to an hourglass stomach. Wherever placed it may become adherent—to the liver, for example, to the pancreas, both of which may be deeply eroded, or to the abdominal wall.

The most favourable cases for surgical treatment are those in which the ulcer is placed at or near the pyloric orifice, when a considerable degree of dilatation of the stomach and much hypertrophy have resulted from the long-enduring obstacle to the proper emptying of the stomach. In these instances the operation of gastro-enterostomy affords an amount of relief that is always remarkable. Indeed, I do not think that the after-results of any operation in surgery can compare with these. I have two patients who within three years have doubled their weight, and not a few of my patients of the gentler sex have increased in girth considerably beyond their desires. It is certain that in not a few instances of pyloric obstruction due to chronic ulceration and induration a mistaken diagnosis has been made. In the early days of stomach surgery many surgeons, myself included, performed gastro-enterostomy upon patients whom we believed to be subjects of undoubted malignant disease; yet the lapse of years has shown that a mistake had been made. Tumours visible and palpable have gradually melted away, and patients emaciated almost to the last degree have daily added to their weight. As the hollows of the face and body slowly fill up a remarkable change occurs in the appearance of such patients. Two medical men upon whom I have operated have expressed their satisfaction on being constantly told that they "looked years younger."

When an ulcer lies close to the cardiac orifice of the stomach it causes, as I have said, symptoms which resemble those due to oesophageal obstruction low down. In two cases I have excised ulcers from the cardiac end of the stomach; in one the ulcer almost invaded the oesophagus, and was adherent to the under-surface of the liver; in the other the beginning of the lesser curvature was involved. In both, the mechanical difficulties of the operation were not inconsiderable.

It is important to bear in mind a fact to which I have frequently drawn attention, one which an increased experience only confirms; namely, that chronic ulcer, and indeed acute ulcer also, is rarely solitary. Ulceration of the stomach is associated not seldom with ulceration in the duodenum, and in approximately one-half of the cases there are more ulcers than one in the stomach. This multiplicity of ulcers,

the fact of which does not seem to receive adequate recognition, is one which makes the treatment by excision one of great—it may be of insuperable—difficulty. It is one, moreover, which, being unrecognized, has done much to obscure the exact diagnosis of the nature and position of the ulcers. The diagnosis of duodenal ulcer—often said to be impossible, or a matter only of shrewd guess-work, is in reality a perfectly simple matter in many cases. For example, in a case of duodenal ulcer the characteristic pain is that which I have described as the "hunger pain," a pain which comes two to four hours after the completion of a meal. If, however, a gastric ulcer, say near the cardia, is also present, the pain may be experienced within a few minutes of the completion of the meal to be followed after an interval of comparative freedom, by the pain due to the duodenal ulcer. It is not accurate in such a case to say that in duodenal ulcer the pain may come early and may come late, and that, therefore, no reliance can be placed upon the time of the onset of pain as a diagnostic measure. I am satisfied, from a long and careful examination of these cases, that the time of the onset of pain after ingestion is a reasonably accurate guide as to the position of the ulcer. The researches of Professor Birmingham upon the anatomy of the stomach make it easy to appreciate the explanation of these facts. The indications for the surgical treatment of chronic ulcers of the stomach should be widened. An old-standing ulcer of the stomach with a greatly thickened base, which is perhaps adherent to the liver or pancreas or abdominal wall, does not strike one as being an object for successful treatment by medical means. It is true that a patient possessed of such an ulcer may be relieved for a time by rest in bed, rectal feeding, and so forth; but, as soon as ordinary diet is resumed, symptoms break out afresh, and existence can then only be rendered tolerable by such a curtailment of the diet that all enjoyment in the taking of food is abandoned. It may be confidently asserted that all forms of chronic ulceration of the stomach, in which the symptoms are those of "recurring dyspepsia" or "chronic indigestion," are suitable for treatment by surgical means. Medical means bring temporary relief, and afford an opportunity to the ulcer to display its powers of bleeding, or to perforate, or in the end to develop a malignant change. But, if the patient is to be cured, the means to that end lie in surgery alone. A diffidence in advising surgical treatment, even in the most rebellious cases, was both natural and proper in the days when the attentions of the surgeon involved a serious risk to life. In skilled hands nowadays, gastro-enterostomy, the operation of choice in at least nine cases out of ten, does not possess a death-rate of 5 per cent., in spite of the fact that many of the patients are very seriously ill, and that all of them are more or less wasted and enfeebled.

The operation that is required in the great majority of cases, then, is gastro-enterostomy. The surgical indication is to afford a wider and freer outlet to the stomach, at or near its most dependent part, in order that the stasis of food may be prevented. In the cases of long-standing ulcer of the stomach there is always some deficiency in the power of the organ to empty itself; to relieve this is the purpose of the operation.

For the condition of things found almost without exception in operations performed for chronic ulcer of the stomach, gastro-enterostomy is the most successful operation. But it is not improbable that with a clearer recognition of the essentially surgical nature of these cases, other operations may prove equally, perhaps even more, satisfactory than this. Finney's operation of gastro-duodenostomy has met with success at the hands of many surgeons, and I have obtained a good result in two cases. When the ulcer which is the cause of the operation is solitary it will probably be the best practice to excise it if possible. In cases of multiple ulcer near the pylorus, Rodman's operation—the excision of the ulcer-bearing area—may be necessary. The operation of pyloroplasty is speedily falling into disuse.

Summary of Cases.

For chronic ulcer of the stomach or duodenum, or both, excluding the cases of acute haemorrhage and of perforation previously considered, I have performed gastro-enterostomy in 153 cases, with 2 deaths. The total number of operations of all kinds is as follows: In 1 case gastroplication was performed; seven years later the patient was worse than before, and gastro-enterostomy was performed, with complete relief to all symptoms. In 3 cases pyloroplasty was performed; in two of these gastro-enterostomy has since been necessary. In

2 cases Finney's operation was performed; both patients recovered. In 153 cases gastro-enterostomy was performed; 151 patients recovered, 2 patients died.

Secondary operations have been necessary in 2 cases; in one, an early case, on account of regurgitant vomiting, an entero-anastomosis being performed; in the other vomiting began a few weeks after the operation, and persisted in spite of lavage; at the operation a hernia of the small intestine through the opening in the transverse mesocolon was found. Both these conditions—regurgitant vomiting and hernia through the opening in the mesocolon into the lesser sac—are impossible with the two slight modifications I have adopted during the last twelve months. Regurgitant vomiting is prevented by making the anastomosis as high as possible in the jejunum, and hernia is prevented by suturing the margins of the opening in the mesocolon to the jejunum near the line of stitches between it and the stomach.

HOURLASS STOMACH.

One of the late results of chronic ulceration occurring in the body of the stomach is the constriction of the organ at or near its middle; a condition of what is appropriately termed "hourglass stomach" is then seen.

Hourglass stomach is far commoner than was at one time supposed, and its existence was formerly attributed to a congenital fault in development. I have elsewhere shown that the condition is always acquired, and is the result of chronic ulceration or of malignant disease which is probably secondary to ulceration. The diagnosis of an hourglass stomach can generally be made with confidence if attention be paid to certain signs. These are:

1. If the stomach tube be passed, and the stomach washed out with a known quantity of fluid, the loss of a certain quantity will be observed when the return fluid is measured. Wölfler, who called attention to this sign, said that some of the fluid seemed to disappear "as though it had flowed through a large hole," as indeed it has in passing from the cardiac to the pyloric pouch (Wölfler's "first sign").
2. If the stomach be washed out until the fluid returns clear, a sudden rush of foul, evil-smelling fluid may occur; or, if the stomach be washed clean, the tube withdrawn and passed again, in a few minutes several ounces of dirty offensive fluid may escape. The fluid has regurgitated through the connecting channel between the pyloric and cardiac pouches (Wölfler's "second sign").
3. Paradoxical dilatation—if the stomach be palpated and a succussion splash obtained, the stomach tube passed and the stomach apparently emptied, palpation will still elicit a distinct splashing sound. This is due to the fact that only the cardiac pouch is drained; the contents of the pyloric remain undisturbed and cause the splashing sound on palpation. For this phenomenon Jaworski has suggested the appropriate name "paradoxical dilatation." Jaboulay has pointed out that if the cardiac loculus be filled with water, a splashing sound can still be obtained by palpation over the pyloric pouch. The sign of paradoxical dilatation is best elicited after washing out the stomach in the ordinary manner. When the abdomen is examined at the completion of the washing and when the stomach has been apparently drained quite dry, a splashing sound is readily obtained, for some of the fluid used has escaped into the pyloric pouch through the connecting channel.
4. Von Eiselsberg observed in one of his cases that on distending the stomach a bulging of the left side of the epigastrium was produced; after a few moments this gradually subsided and concomitantly there was a gradual filling up and bulging of the right side.
5. Von Eiselsberg also called attention to the bubbling, forcing, "sizzling" sound which can be heard when the stethoscope is applied over the stomach after distension with CO₂. If the two halves of a Seidlitz powder are separately given and the stomach be normal or dilated, no loud sound is heard anywhere except at the pylorus; if a constriction is present in the stomach, a loud, forcible, gushing sound can be easily distinguished at a point two or three inches to the left of the middle line.
6. I first called attention four years ago to a sign which I have since found of great service in establishing a diagnosis of hourglass stomach. The abdomen is carefully examined, and the stomach resonance percussed. A Seidlitz powder in two halves is then administered. On percussing after about twenty or thirty seconds, an enormous increase in the resonance of the upper part of the stomach can be found, while the lower part remains unaltered. If the pyloric pouch can be felt or seen to be clearly demarcated, the diagnosis is inevitable, for the increase in resonance must be in a distended cardiac segment. If the abdomen be watched for a few minutes the pyloric pouch may sometimes be seen gradually to fill and become prominent.
7. Schmidt-Monard and Eichhorst have seen a distinct sulcus between the two pouches inflated with CO₂. This condition I have twice seen very distinctly.

Summary of Cases.

I have operated upon 20 cases of hourglass stomach due to simple disease, with three deaths. There may be great difficulty in successfully dealing with this deformity, owing to the fact that there are two pouches in the stomach, both of which must be drained, and to the fact that in a certain number of cases a constriction in the body of the stomach is

associated with one at the pylorus. The operations performed in my cases were as follows:

- Gastroplasty in 7.
- Gastro-enterostomy alone in 6.
- Gastroplasty and gastro-enterostomy in 2.
- Gastro-gastrostomy alone in 1.
- Gastro-gastrostomy and gastro-enterostomy in 3.
- Dilatation of stenosis in 1.

CASES ILLUSTRATING ALTERNATIVE OPERATIONS FOR INTESTINAL OBSTRUCTION.

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AMONG the large number of cases of intestinal obstruction which fall to the lot of most active surgeons, there are many, probably the majority, in which the line to be adopted seems quite obvious—as, for instance, in simple external herniae, which with few exceptions—one of which will be illustrated lower down—are plain sailing. But there are besides, and perhaps always will be, a large proportion in which the course which ought to be taken is not immediately clear even when the abdomen has been opened, and which consequently tax the surgeon's judgement even more than his skill, though both may be equal to many other emergencies. He may be familiar with the best method of performing colostomy, caecostomy, and enterectomy; he may have had success in "short-circuiting" in various directions and in enterectomy, and yet he is from time to time confronted with cases in which he must feel considerable doubt as to which of these procedures he is called upon to adopt, and where he is only too keenly conscious that an error in judgement or delay in decision may cost the patient his life, or, if the latter is saved, render it one of great suffering both to mind and body; and the more experience he has the more fully will he recognize the need of mature judgement and prompt decision.

A series of cases recently under my care have suggested these reflections, and that a very brief survey of them, with a short commentary on each, may be profitable for guidance to others, and even encouraging, in a very serious class of cases.

In the group to be related it will be noticed that there are instances both of obstruction in the large and small intestine due either to growth or inflammatory constriction; but stoppage from rectal carcinoma is not included, as the question of excision *versus* colostomy would carry us too far. There was a time, not long since, when the only alternative to non-interference in cases of obstruction of large or small bowel was the formation of an artificial anus, with or without excision of the growth if present. But ever since we have learned how to "short-circuit" the intestine round a growth or firm inflammatory obstacle, we have often where this has been done been perhaps inclined to be despondent as to the prognosis, and have not fully realized the resources of surgery.

Out of a large number of cases illustrating the alternative procedures at our disposal, the following are taken as examples. The first two show the advantages of "short-circuiting" as a preliminary to subsequent removal of the obstructing growth.

CASE I.

A young man, aged 30, was admitted into hospital with aggravated symptoms of obstruction. These had been for some weeks gradual, and then rapidly increased. The abdomen was moderately distended, but very hard; the general condition was good, but pulse and temperature were rising. No tumour could be felt anywhere in the tense abdomen, and the only guides to the situation of the obstruction were the gradual onset of the symptoms, and the relatively late appearance in particular of the vomiting, which all pointed to a stoppage low down.

On May 7th, 1899, I opened the abdomen in the middle line, and found the small intestine hugely distended to over 3 in. in diameter, and greatly hypertrophied. It was hopeless to explore the abdominal cavity manually under these circumstances, and a coil was allowed to force itself out of the incision, and was at once slit open, giving exit to about five pints of horribly offensive contents and a large quantity of gas. The hand could now be introduced, and a growth was discovered in the caecum. The ileum, about 2 ft. above the ileo-caecal valve, was now anastomosed laterally to the transverse colon by suture, then the first relief opening in the gut was closed by suture, and the abdominal wound stitched up without drainage. Recovery from this operation was soon complete, with only some slight abscesses. At the end of six weeks I again opened the abdomen in the right flank, and, finding everything quiet, excised the caecum and ascending colon, and about 6 in. of the ileum below the point of anastomosis, turning in and