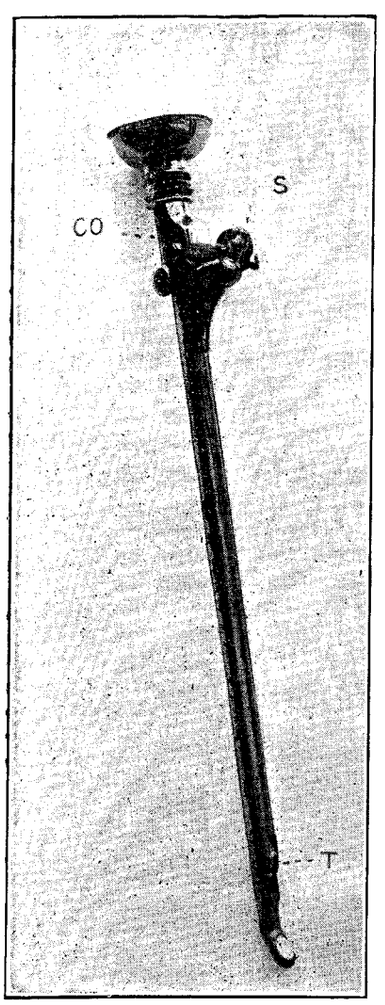
very characteristic manner: if the pylorus is ring-shaped, infiltrated, and contracted a stiff gaping ring through which a glimpse into the duodenum is obtained is observable; should half of the pyloric ring be infiltrated it assumes the shape of a half moon, the soft mucous membrane of the healthy portion curving into the stiff half of the ring. Any ulcers at the pylorus itself are easily discernible but the folds of the mucous membrane round the pylorus require a closer observation. In the one case where Rovsing had an opportunity of examining an abnormal cardiac orifice the gastroscope gave an exceedingly fine and clear picture of the tap-shaped ulcer projecting into the stomach and the adjoining portion of the mucosa ulcerated.

In cases of ulcer and carcinoma where the diagnosis is clear gastroscopy is of importance because it shows accurately the limits of the disease. It is also useful in clearing up conditions which diaphanoscopy could not—e.g., in several of Rovsing's cases what after other examination was thought to be a simple ulcer, by gastroscopy showed knotty tumour formation in the mucous membrane, and no doubt was then entertained as to the malignant nature of the infiltration. But very important also is the fact that gastroscopy is able to show the presence of mucous ulcers which are not discernible by any other method.

FIG. 2.



Gastroscope for introduction of œsophageal bougie or catheter through the cardiac orifice of the stomach. S, Screw. T, Tongue. C. O., Catheter opening.

The instrument shown in Fig. 2 is oval in contour and in addition to the air-inflating tube contains a tube for the insertion of an œsophageal catheter or bougie. It is fitted like the Albarran ureter-cystoscope with a tongue which by means of a screw can be raised or lowered to direct the bougie or catheter into the cardiac orifice. By means of this instrument a retrograde insertion of a bougie can be made with the greatest ease and under ocular control for the dilatation of œsophageal strictures which are impermeable from above. Being oval, this œsophagus gastroscope requires a purse-string suture round it so that the edges of the stomach incision are air-tight.

Rovsing relates 26 cases in which he has been able to examine the stomach by diaphanoscopy and gastroscopy and afterwards proceed with the operation he then found to be necessary. The use of "cold" lamps in the gastroscope excludes any risk of burning the mucous membrane and a careful inflation of the stomach appears to be harmless. The risk of infection of the wound is overcome by sterilising the whole instrument—gastroscope, wires, tube, bellows—for 36 hours in a formalin steriliser.

Having had an opportunity of seeing the instrument in use it appears to me that Rovsing has placed in the hands of surgeons an instrument of the greatest diagnostic utility and for this reason I am sending these notes to THE LANCET.

Sunderland.

A CASE IN WHICH OCCLUSION OF THE ABDOMINAL AORTA TOOK PLACE.

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COMPLETE occlusion of the abdominal aorta, whether caused by embolus or thrombus, is an event of sufficiently rare occurrence to make the following case worthy of record.

The patient was a man, aged 39 years, who was admitted to the Nottingham General Hospital on May 6th, 1907, complaining of palpitation, shortness of breath, and pain in the region of the heart. These symptoms had been present for 11 weeks. There was no history of rheumatic fever. The patient had had influenza three years ago. His work was very heavy, in an iron-foundry. He was a moderate beer-drinker, and he smoked four ounces of tobacco a week. When he came to the hospital he was of fairly healthy appearance, without obvious cyanosis; the mucous membranes were of good colour, the tongue was clean, and the pulse was 80 and irregular in force and rhythm. The heart's apex was in the fifth interspace, half an inch beyond the nipple line; the impulse was slapping in character. To the right the cardiac dulness corresponded with the right border of the sternum. There was a well-marked presystolic murmur, limited to the region of the heart's impulse, followed by a short first sound. The pulmonary second sound was accentuated. Nothing abnormal was heard in the lungs. The liver and kidneys were normal. There was no œdema of the legs or of other parts.

The patient was kept in bed and he continued to be at absolute rest during the whole of his stay in hospital. A mixture was given containing digitalis and strychnine but the pulse still remained very irregular. The patient complained of some cardiac pain for which a belladonna plaster was applied. His condition was fairly satisfactory until June 17th, when he complained of pain and tenderness in the right iliac region. The temperature rose to 101° F. No swelling could be felt at the seat of pain and in about three days the symptoms had all subsided. On the 23rd the patient complained of pain in the lumbar spine, which during the following night became so intense as to require a hypodermic injection of morphine Soon after the onset of the pain the patient found that he could not move either leg. When seen on the 24th both lower limbs were found to be completely paralysed in their whole extent. There were absolute anæsthesia and analgesia in front from the lower third of the thighs downwards and behind below the fold of the nates. The knee-jerks were absent. The cremasteric reflex was present. There were scattered patches of dusky mottling on the inner aspect of the thighs, the rest of the limbs being strikingly pale and cold. There was complete absence of pulsation in the femorals, the posterior tibials, and the dorsalis pedis. A trace of albumin was found in the urine. The bladder acted normally. On the 25th the mottled lividity of the skin had increased and the anæsthetic area had extended. The urine was dark-red, containing a large quantity of blood, showing interference with the renal circulation. On the 26th there were constant hiccough and profuse sweating, death occurring at about 6 P.M. No post-mortem examination was obtained.

The diagnosis of so little-expected an accident as occlusion of the abdominal aorta rested on the absence of pulsation in the arteries of the lower limbs and on their condition of coldness and anæmia with patches of livid mottling. Unfortunately, there was no post-mortem examination but I think there can be no doubt that the diagnosis was correct. Occlusion of the abdominal aorta is fortunately an event which very rarely happens. The author of the article on the

condition in Allbutt's "System of Medicine"[1] was able to collect reports of 59 cases, all of which excepting three were fatal. Considerable doubt is permissible as to whether the arrest of the circulation is caused by embolism or by thrombosis. Valvular disease of the heart, especially mitral stenosis, is a fruitful source of embolism, hence it is natural to suppose that embolism of the aorta should occur in the same circumstances as embolism of smaller arteries. The large size of the aorta raises the doubt whether any embolus could be sufficiently large to completely plug it. But an embolus frequently grows in size by the formation of thrombus around it and therefore an embolus arrested at the bifurcation of the aorta might be enlarged in this manner until it filled the lumen of the vessel and extended into both iliacs. The attack of pain in the right iliac region which this patient experienced a few days before the final attack may have been due to a similar cause, whether embolism or thrombosis. The occlusion in this instance cannot have been complete as the symptoms associated with it abated, yet it seems not improbable that an embolus was carried into the right internal iliac, still allowing the circulation to be carried on for a time, and that by gradually extending upwards it eventually caused the obstruction of the aorta. In 34 per cent. of the cases collected by Welch[2] mitral stenosis was present. Mitral stenosis not only provides a possible source of embolus but also often leads to very low arterial blood pressure, which itself is a cause of spontaneous clotting in the vessels. In my patient compensation had quite broken down and it was found impossible by means of rest and cardiac tonics to restore regularity to the pulse or tone to the heart. Hence the circulation was inefficiently maintained, the propulsive force being weak and intermittent. Under these conditions thrombi might very readily be formed in the left cavities of the heart and be the source of an embolus, or it may be that owing to comparative stasis of the circulation primary thrombosis of the aorta or internal iliac occurred. Sometimes the thrombosis is due to extensive atheroma, as in the case reported by the late Mr. W. H. Brown of Leeds.[3]

Whatever the exact pathology of the case the occlusion was evidently complete. The clot probably reached as high as the renal arteries, and this grave interference with the circulation, together with the co-existent cardiac disease, was sufficient to bring about a very rapid termination. But death does not always occur so quickly as in this case. It may be deferred days, weeks, or even months, and be due to gangrene, sepsis, or general exhaustion.

The paraplegia which attends occlusion of the abdominal aorta is doubtless due to the shutting off of the blood-supply. But whether it depends on anæmia of the spinal cord or of the peripheral nerves and muscles is not decided. It is important, therefore, that careful examination of the cord should be made whenever possible.

Nottingham.

THE TREATMENT OF GANGRENE IN STRANGULATED HERNIÆ AT ST. THOMAS'S HOSPITAL, 1901–1905.

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IN the St. Thomas's Hospital Reports of 1900 I published a paper[4] in which was set forth the condition of the bowel found in the strangulated herniæ admitted to the hospital during the ten years 1891–1900. In the present note I wish to direct attention to but one part of the subject of this original communication—the treatment of necrosis of the bowel in strangulated herniæ. Since 1900 there have been far more instances of necrosis of the bowel recognised in these cases, giving therefore a better estimate of the present-day treatment than was the case in my original communication. The occurrence of an infective necrosis of the bowel[5] has now been recognised and has led to the more frequent recognition and treatment of the damaged bowel found in strangulated herniæ. In the five years from 1901–1905 necrosis of the bowel has been recognised and treated 30 times, as compared with 42 in the ten preceding years.

Resection and immediate anastomosis.—The balance of the treatment adopted has been in favour of resection and anastomosis of the bowel whenever possible. 18 of such cases have been done with eight recoveries, a recovery rate of 45 per cent. and a mortality of 55 per cent. Thus a great advance has been made on the condition of affairs at the time of the publication of my paper in 1900, when the mortality for the resection of the bowel and anastomosis in gangrenous strangulated herniæ was 80 per cent. It is on account of this very great improvement that I decided to publish this note now, after five years, rather than await the lapse of a decade. There are several reasons which have contributed to this improvement. Firstly, instances of early gangrene or necrosis have been recognised and treated. Secondly, cases where the bowel was only "doubtful" may have been excised, though this must have been infrequent. Thirdly, there are the improvements of modern technique, such as the removal of the bowel widely above the obstruction. A further point of interest is that those cases where the resection of the bowel has been followed by an end-to-end anastomosis, circular enterorrhaphy, have done better than when a lateral anastomosis has been employed.

Resection and enterostomy.—In the same period, 1901–1905, there have been ten cases in which the resection was followed by the making of an artificial anus, an enterostomy, from which there has been only one recovery; recovery rate 10 per cent., mortality 90 per cent.—a result which agrees very closely with the previous finding in 1900, when the mortality was 88·9 per cent. There is certainly one great contributory factor in producing this more or less stationary condition of affairs, which is that the treatment by resection and enterostomy has been reserved only for the very worst cases. Yet in spite of modern advances there has been no improvement in the results. During the same period there has been a diminution by 35 per cent. in the mortality of those cases treated by resection and anastomosis of the bowel. There can be no doubt along which line of treatment modern surgery will progress—resection and anastomosis.

From a surgical and philosophic point of view this is very remarkable, because there is hardly any point upon which abdominal surgeons are so unanimous as that it is far safer to do an anastomosis on healthy bowel than on bowel distended with septic fluid such as it is in intestinal obstruction, an enterostomy at the time and a subsequent anastomosis yielding far better results. Yet in the case of strangulated herniæ the trend of modern opinion is in the opposite direction. There should be a reason for this and I would urge that there probably is a difference in the septicity of the bowel and its contents in cases of intestinal obstruction which have been acute from the beginning, as in the strangulation of a hernia, and when the acute obstruction has merely been imposed on a chronic, as when due to carcinoma of the sigmoid. In the former case the septicity is localised to the vicinity of the obstruction, so that if the resection is done freely more or less healthy tissues will be sutured and success will be attained. And in the latter case the septicity extends further afield and all plastic operations, like anastomoses, are done in a septic area and end in disaster. Then the surgeon, in order to make a successful anastomosis, must either resect so extremely widely that the magnitude of the operation will probably kill a patient, who is already ill, in order to get away from septic bowel and contents, or he must do an enterostomy and having waited for the bowel to have become cleansed and all "endo-enteritis" to have subsided, perform his anastomosis on healthy tissues. This may be the explanation for the very different clinical results obtained by anastomoses made in varieties of intestinal obstruction.

Invagination.—Besides resection with anastomosis or enterostomy two cases have been treated by the invagination of the gangrenous or doubtful area. Both patients recovered and the cases were most successful. The method is obviously applicable only to small areas of necrotic bowel, and in practice will be mainly useful for secluding "doubtful" bowel. But these two cases show that its judicious application has a useful, if not a large, field in the treatment of necrosis of the bowel in hernia. It may be suggested that it is useful at times at the place where the bowel has been "nipped" and also for the patchy gangrene sometimes found at the apex of the strangulated loop. But

[1] Vol. vi., p. 273.
[2] Loc. cit.
[3] Transactions of the Clinical Society of London, 1893.
[4] Gangrene in Strangulated Herniæ, &c., St. Thomas's Hospital Reports, 1900.
[5] Clinical Pathological Observations on Acute Abdominal Disease. Constable and Co. 1905.