of the appendix, not only because of the shortness of the history, but because the boy's aspect was good—particularly good. But we were all agreed that it was a case for operation. On opening the peritoneum there was an abundant escape of odourless yellow serum. The end of the appendix was as large as one's little finger, and there was perforation in it (near a concretion) from which fluid was running freely. The appendix was removed, and the peritoneum of the caecum was sewn over its stump. There were no adhesions. On passing the finger towards the pelvis a considerable rush of serum took place, so a large drainage tube was introduced deeply and there left. Next day the odour of the discharge gave clear evidence of coli-bacillary infection. The boy made a rapid recovery.

What is the sign by which the surgeon may be made aware of the need for operation? In my experience there is none: or, to put it more forcibly, there may be urgent need for immediate operation in any case and yet no danger signal may have been hoisted. The temperature certainly cannot be depended upon as a guide. Indeed, if the absorption of poison has been considerable, the chart may be tracking above the normal line or even below it.

The pulse, as a rule, gives some help in the case of pain in the abdomen; but it must be remembered that it takes very little to send up the pulse rate in children. And it sometimes happens that in a case in which the surgeon has discovered a mortified appendix there has been no marked quickening of the pulse. So the pulse cannot be depended upon any more than the temperature.

The aspect of the patient I for some time considered as the most trustworthy guide to the condition of the appendix, but having seen certain patients smiling and of good colour whose appendix had already given way, I have ceased to pay much heed to the aspect as a sign. In this case the good aspect of the boy was particularly misleading.

The history—Well, no surgeon of experience pays much regard to history; and in this case the shortness of the history certainly helped to mislead.

Local signs are also apt to be misleading. There may be no pain and not much tenderness in the region, even with advanced appendicular disease; and rigidity of the abdominal muscles in the right inguinal region, though generally present, and most helpful as a guiding sign, may be wanting though disease of the appendix is far advanced.

Generally, however, the most wilful cases show one sign of danger, in rigidity, tenderness, aspect, pulse or temperature. It is, surely, an unreasonable or very young practitioner who would expect all the danger signals, as described in books, to be hoisted at the same time.

As regards operation in appendicitis—what about that waiting until adhesions have formed? Does any body now wait for such protection? When an appendix has perforated, and the serous fluid which bountiful Nature pours out has become infected with the colon bacilli, as in this case, it is impossible that a limiting barrier can form. And if there had been delay in sending this boy into the Hospital, or delay in operating, he would probably have died without a trace of that "walling-off" of the affected region by adhesive peritonitis of which so much used to be said.

The more that I see of appendicitis the more convinced am I that the greatest safety lies in the quickness with which the radical operation is undertaken. "But," says some one, "so prodigal a surgeon is likely to be found operating on cases in which the appendix was very slightly—if at all—affected. Surely it is better to wait a bit until there is no doubt about the appendix being at fault?"

To him I would reply that there is, of course, the possibility of such an error, but that, after all, this is a small matter compared with the risk of letting an uncertain case of appendicitis drift on either until "adhesions may have formed," or until the dangerous nature of the disease had been rendered abundantly clear by the appearance of signs which had hitherto been absent. I suppose that every operating surgeon has at times been regretfully compelled by the well-meaning advice of other persons connected with the case to hold his hand, till in the end he has been brought into the unhappy state of the submissive Job, who mourned that when he looked for good evil came upon him, and that when he waited for light there came darkness.

ON RETROPERITONEAL PERFORATION OF THE DUODENUM,

WITH A SUGGESTION FOR TREATMENT.

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DURING the last few years there has been much progress in the surgical treatment of those gastric and duodenal ulcers which have perforated into the peritoneal sac. We have learnt to know the symptoms of this catastrophe more clearly, to appreciate the significance of a rigid abdominal wall, and to recognize the interval of apparent well-being, which, coming after the first shock of the perforation, flatters to deceive. The results of operations on these cases have shared in the improvement which has followed a more general recognition of the principle that early operation is the dominant factor in the surgery of the acute abdomen, and these results would appear to have been further improved by the practice of gastro-enterostomy in addition to the closure of the perforation. It is, however, scarcely possible to claim a parallel improvement in the treatment of those ulcers of the duodenum which have perforated into the retroperitoneal cellular tissue. The surgeon rarely sees these cases before the consequent abscess has given unmistakable signs of its presence, and by this time the damage is often beyond repair. From this point onwards there is a singular likeness in the histories of cases of retroperitoneal perforation. The abscess is incised at some convenient point; the bulk of the food, together with large quantities of bile and pancreatic juice, continue to pour through the opening, and before many days the patient is dead.

In considering any scheme for the better treatment of these rare but most fatal accidents the following facts must be taken into account.

The second part of the duodenum is entirely devoid of peritoneal covering on its posterior surface where it is in contact by areolar tissue with the right kidney and inferior vena cava. A small portion of the first part of the duodenum near its termination, together with the beginning of the third part also, have no peritoneum on their posterior aspects. If ulcers perforate in these districts they must perforate into areolar tissue and not into the peritoneal sac. The accident of retroperitoneal perforation must at any time be a rare one, since ulceration of the second stage of the duodenum is uncommon as compared with ulceration of the first stage. Fenwick states that 6 per cent. of perforated ulcers occur in the second stage. The figures of Perry and Shaw, which are often quoted in this connexion, show that in 149 instances of duodenal ulcer the distribution was as follows: First stage, 123; second stage, 16; third stage, 2; and fourth stage, 8.

The great majority of duodenal ulcers are situated close to the pylorus, and when these perforate they will perforate into the general peritoneal sac, but of these ulcers in the first stage it is possible that an occasional one situated near the end of the first portion of the duodenum may perforate into retroperitoneal tissue. Of the ulcers situated in the second or descending portion a certain number will be found in that area uncovered by peritoneum and may consequently perforate into areolar tissue. The chances of retroperitoneal perforation thus limited by the natural distribution of the ulcers are further much reduced by the plastic conservative efforts of Nature to seal off the opening—efforts which, while often futile on a free, mobile, peritoneal surface, are likely to be attended with success under the favourable conditions of the second stage, where the gut is fixed in a bed of connective tissue. There can be no doubt that many of these ulcers are sealed off in this way, since duodenal ulcers adherent to the posterior abdominal wall and adjacent viscera, especially pancreas, are common. Fenwick states that 42 per cent. of his cases of duodenal ulcer showed adhesions to neighbouring organs, and most of these adherent ulcers were on the posterior wall of the gut.

We have not been able to find any figures bearing on the frequency of cases of retroperitoneal perforation which have come to operation. We can personally recall only three of these cases during the last ten years.

The course taken by the extravasated contents of the gut is not invariably the same. The collection is first formed around the right kidney, producing the clinical signs of a perinephritic abscess. If left unopened at this stage the extravasated fluid, together with its associated inflammatory exudate, will track downwards behind the ascending colon, and will appear in the right iliac fossa, where it will simulate closely an appendicular abscess. During this course the collection has been known to open into the colon itself. Abscesses resulting from retroperitoneal perforation of the duodenum have also been recorded as pointing through the lower right ribs, and in one remarkable case the abscess was opened at the root of the neck.

The clinical signs during the earlier stages of the perforation are not likely to be characteristic. There is sudden onset of sharp pain, with rigidity over the upper half of the abdomen, especially marked on the right side. The patient does not show the signs of "peritonism" to the same extent as is seen in the more generalized perforations. If the case is treated on expectant lines, the pain continues, and there will be vomiting and a raised temperature. The symptoms are now those of a localized abscess. The patient has usually been under treatment for "indigestion," and may have shown those symptoms which are now regarded as pathognomonic of duodenal ulcer. A previous history of severe haematemesis or melaena is suggestive, since it probably indicates a deep ulceration towards the posterior aspect of the gut.

Within a few days the presence of a tender swelling covered by oedematous skin leaves no doubt as to the existence of an abscess, but even now the exact source of the collection may be difficult to determine until it is made plain by the escape of foodstuffs and bile from the opening.

The treatment of these cases is usually a free incision into the abscess; a tube is inserted, and the contents of the gut pour through the opening until the patient sinks and dies from starvation. This would appear to be the almost inevitable termination of those cases which are treated by expectant methods. Here and there a case, probably one of minute perforation, survives with a chronic sinus, and may ultimately recover by the spontaneous closure of the track or the timely performance of a gastro-enterostomy.

In the light of such results we cannot pretend to rest content with our present modes of treatment. Berg has suggested the performance of a gastro-enterostomy with closure of the pylorus, and has carried out his suggestion in two cases. This method, although a distinct improvement on simple incision, can hardly be regarded as complete, since it fails to deal with the perforation itself, and cannot influence the leakage of bile and pancreatic juice. A case which happened to us recently is of interest in this connexion, since, although the case had a fatal termination, we were able to show that a duodenal ulcer which had perforated in the retroperitoneal area of the second stage could be reached with ease and closed by sutures. We have not been able to trace a report of any case in which this method has been adopted as a set operation, and therefore, although dealing with a single and possibly exceptional case, we think it worth while to place the facts on record.

L. J., male, aged 43, was admitted to the Manchester Royal Infirmary on February 3rd, 1912. He gave a history of many years of "indigestion," and had been acutely ill for ten days. His illness began with severe pain in the upper half of the abdomen, and was followed by vomiting. The pain and vomiting had continued without remission since the onset. He was a spare man of good facies. His temperature was 100° and pulse 120. There was a large and obviously inflammatory mass in the right iliac fossa, extending for some distance upwards into the loin. The rest of the abdomen was flat and loose. The case was regarded as one of appendicular abscess, and operation was done at once. An incision was made over the swelling close to the anterior superior spine. The deeper layers of the abdominal wall were much infiltrated by inflammatory products, and their identity was obscured. A large collection of thin brown pus was opened. There was neither gas nor odour. It was then seen that the inner wall of the abscess was formed by the postero-external surface of the ascending colon and

caecum, and on this aspect of the caecum there was a greenish slough the size of a florin. The appendix was found inflamed, but showed no sign of disease arising from within. It was removed and a tube inserted in the abscess cavity.

There was a profuse discharge of bile from the tube on the following day, and it was then apparent that the case was one of retroperitoneal abscess from perforation of a duodenal ulcer. During the next five days attempts were made to improve the patient's condition by rectal feeding, but these attempts were futile by reason of an uncontrollable diarrhoea, which was no doubt due to colitis of the ascending colon. On the fifth day after admission it was evident that unless further treatment was attempted death was inevitable. Although his condition was grave and his pulse 120 and weak, we decided to open the abdomen and endeavour to reach the ulcer, and if successful in closing the perforation to attempt a gastro-enterostomy and to occlude the pylorus. Under "open" ether anaesthesia the abdomen was opened by a long incision through the right rectus; the peritoneal cavity was normal and no ulcer was seen on the anterior surface of the duodenum. A large gauze packing was inserted, and with good retraction it was a quite easy matter to expose the second stage of the duodenum. A vertical incision was made through the peritoneum immediately to the outer side of and parallel to the descending portion of the gut. There escaped at once a large quantity of fluid of the same nature as that obtained from the drainage tube. The duodenum thus "mobilized" was quite easily turned forwards and to the left, when the perforation was at once apparent. The opening was in the centre of the posterior wall of the descending portion 1 in. from its beginning. The perforation admitted the tip of the index finger and there was hardly any induration of its edges. It was an easy matter to close it by four Lembert sutures, and in fact it was closed more readily than is possible in many cases of intraperitoneal perforation. A posterior gastro-enterostomy was quickly done and the pylorus closed by a ligature. The whole operation occupied less than half an hour. After the operation there was a distinct rally, probably due to the ether, but during the afternoon the signs of collapse were apparent, and the patient died at noon of the following day.

Our object in reporting this case is to indicate the possibility of treating future cases by the only method which has a rational basis—that is, the attack on the perforation itself. Although in our case we were fortunate to have a spare subject and an ulcer remarkably free from adhesions, the discovery and suture of the ulcer was so simple that the operation should certainly be attempted in similar cases, especially in view of the lamentable mortality of expectant methods. Here, as in other branches of abdominal work, operation must be early if it is to be of any use; an operation of this nature is hardly likely to succeed if it is done in a patient already *in extremis* from sepsis and starvation.

Although in the present state of knowledge it may not be possible to diagnose a retroperitoneal perforation with precision, yet it would appear to be the wisest course to operate at once in all cases presenting in any degree signs which suggest that an ulcer may have perforated. There is, unfortunately, a tendency to regard these cases which show less fulminant signs as instances of "leaking" ulcers, and to wait for further indications before operating. It is not easy to realize what is meant by a "leaking" ulcer; an ulcer either has or has not perforated, and if it has perforated it should be operated upon. In any patient known to have had signs of gastric or duodenal ulceration in whom symptoms of increased pain with rigidity develop it will be the safest course to operate at once and to attempt the closure of the ulcer, whether intraperitoneal or extraperitoneal, although the classical signs of a generalized perforation are not present.

THE *Bulletin* for February of the Yellow Fever Bureau states that the outbreak of yellow fever in Yucatán has not completely ended, although lately few typical cases have occurred. At the present time parasitological and other investigations are being carried out on the spot by the scientific secretary of the bureau, Dr. Seidelin. A difference of opinion prevails amongst various observers as to the origin of this epidemic. Dr. Licéaga points out that it would seem strange that no typical cases should occur for a considerable length of time in the large foreign population always present in the capital, Mérida, if the infection were continually existent in the form of mild cases in natives. He therefore suggests that there may be, besides the blood of infected individuals, another source of infection as yet unknown. On the other hand, Dr. Lebreto is satisfied that the infection is, and has been for a long time, endemic in Yucatán, and more especially in Mérida, which would explain without difficulty the occurrence of typical cases.