CHRONIC ABDOMINAL PAIN.*

BY

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DISEASE and pain are synonymous. Morbid states and disturbances of functions of a grave kind may exist without pain, but to the patient nothing is so imperative and convincing as pain, and nothing so readily induces him to seek medical advice. To determine the cause of pain is, therefore, one of the first and commonest tasks of every doctor. It is also one of the most difficult. Even where pain is most definitely localized and referred to a particular part of the surface of the body or limbs it is not always easy to determine where and why the painful stimulus arises. In the case of the viscera it is still more difficult. In spite of all that we have learnt from the physiologists as to the innervation of the internal organs and the manner in which painful impressions arising within them are referred to definite skin areas supplied by corresponding somatic nerves, it must be admitted we are far from being able to assign to a definite organ many of the various internal pains for which patients seek explanation and relief. We have for the present to fall back on clinical experience and circumstantial evidence. This is particularly the case with the pains which are referred more or less vaguely to the abdomen. We know that in a state of health we are quite unconscious of our abdominal organs, and we must assume that every time we become uncomfortably or painfully aware of an internal disturbance there must be some trivial or serious, momentary or prolonged, derangement of normal function in some particular part of the visceral system. When this disturbance takes the form of pain it is generally more or less definitely localized to some region of the abdomen—sometimes small and precise enough to be indicated by the finger, at others only to be vaguely indicated as in the upper or lower abdomen, in the centre or on the right or left side.

When the pain is of sudden onset and of considerable intensity it is generally called "acute," and is then sometimes contrasted with "chronic" pains. This classification is ambiguous and misleading, because it confuses intensity with duration. Very intense pain is usually of limited duration, but the word chronic should be used without reference to intensity, and applied to all cases in which the pain complained of occurs frequently or constantly, over a period measured by weeks or months. It is in this sense that the term chronic abdominal pain will be used here.

TYPES OF PAIN DUE TO THE SEVERAL ORGANS.

Clinical observation and experience have given us reasons for assigning various abdominal pains to particular organs; reasons derived partly from the patient's description of the character and location of the pain, partly from concurrent disturbances of function. When the various symptoms elicited from the patient point to a particular organ, and when they are corroborated by the results of physical examination there is no difficulty as a rule in reaching a definite diagnosis. Definite facts, indeed, ascertainable by physical examination, are so much more conclusive than subjective symptoms described by the patient that many physicians and surgeons are apt to underrate the importance of the evidence to be derived from intelligent interrogation, and to evade the difficulties of diagnosis by handing the patient over to the radiographer, the pathologist, or some other expert practitioner of a particular method of examination. In this attitude they have the hearty support of most patients, who are even more eager for short cuts to knowledge than their doctors.

Every new method of physical examination which science has placed, or may in future place, in our hands should be turned to its utmost use, and no patient should be denied its advantages when procurable; but this does not excuse any neglect of the invaluable information which can be obtained from a precise and accurate clinical history and careful physical examination by ordinary means. It is particularly important to obtain an accurate account of the time and circumstances in which the pain complained

of was first noticed, the duration and severity of the pain; whether constant or intermittent; how affected by exertion, posture, or other circumstances; its relation to food; if accompanied by disturbances of function; whether becoming increasingly severe or less severe with lapse of time; in fact, every circumstance which can be elicited likely to throw light on the origin and progress of the complaint. Great skill and experience are required in obtaining accurate data of this kind, especially with uneducated and unintelligent patients. Care must be taken to avoid leading questions and to make the patient understand clearly whether he is describing his present symptoms or those with which a particular attack began. Only those who have patiently practised the art of clinical interrogation, and have also been familiar with the efforts of inexperienced clinical clerks and house-surgeons, realize how misleading a patient's history may be made, and what patience and skill are required to elicit an exact account. Most of us, too, have met with cases in which absurd blunders have been committed by pathologists, radiographers, and other skilled investigators, when they neglected clinical data or accepted them at second-hand from an unreliable source.

Excluding for present purposes pains due to direct irritation of somatic nerves or nerve roots, and referred to some part of the abdomen, such as those caused, for instance, by spinal abscesses and growths or by abdominal aneurysms; excluding also pains associated with some obvious cause, such as a hernia or tumour of the abdominal wall, and confining consideration to those arising in some morbid state of the abdominal viscera, it may be said that the seat of the pain as described by the patient corresponds more or less closely to the anatomical position of the organs affected. Thus, pains referred to the epigastrium and left hypochondrium are suggestive of gastric origin, those in the right hypogastrium of the gall bladder, in the loins the kidney, in the lower abdomen the bladder or large intestine; or, in the female, of the pelvic organs, and so on. When the localization of the pain is definite, and when a simple examination of the abdomen or of the rectum or vagina discloses some obvious fact, such as a localized mass or tumour corresponding to the seat of the pain, further investigation is usually comparatively simple and conclusive.

But these cases are the minority. More commonly the patient's localization of the pain is vague and the abdomen presents no abnormality which can be detected by ordinary clinical examination. It is in these cases that a searching interrogation of the patient is of such great importance, for by this means alone are we likely to find a clue to guide us in our further investigation. We want to know what the pain is like, and we must get the patient if possible to describe it in his own words. Is the pain constantly present or only at certain times, and if so when? Is the pain made worse or better by exertion or movement? Is it affected by food or the absence of food? Are some kinds of food more prone to excite the pain than others? The severity of the pain is very important. Is it dull and aching or throbbing, or is it unbearable or even agonizing? As ability to bear pain varies so enormously in individuals we must seek for some objective test such as the extent to which the pain complained of interferes with the patient's ordinary life and habits. Does it prevent sleep? Does its onset waken him if already asleep? Is it variable in severity, and, if subject to exacerbations, what is the duration of these periods, and is there any regular periodicity? With unintelligent patients it is often difficult to get satisfactory answers to such questions; they have no idea of logical sequence, or fail to grasp the exact question unless put in the simplest language. One must remember also that the cross-examination of a patient by the doctor must not be conducted as if he were a prisoner at the Old Bailey or a hostile witness from whom counsel is endeavouring to obtain damaging admissions. The doctor's object is to obtain a true account of the symptoms uncoloured either by preconceived notions of the examiner or by the tendency of some patients to minimize, of others to exaggerate, the significance of their statements. For this purpose correct information may sometimes be obtained by indirect means. Many patients who refuse to admit that what they eat makes any difference to their pain when asked if they habitually eat meat will admit that they have not done so for months. In estimating the value of statements made as to the severity

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of the pain suffered, note must be taken of the patient's type of character, and of the visible traces which really severe pain of long duration or very frequent occurrence infallibly stamps on the features and whole aspect of the patient.

METHODS OF DIAGNOSIS.

It is a misfortune that almost all systematic textbooks of medicine are deductive in their methods and arrangement. Diseases of systems or organs are described in an orderly manner, beginning with etiology and causation and ending with their morbid anatomy. All the necessary facts are given, but not in the form in which the clinical observer requires them, for all his methods are inductive—the finding out and piecing together of facts, the value and significance of which have to be estimated in the light of clinical experience. Moreover, the whole symptomatology of abdominal visceral diseases requires to be rewritten and brought up to date in the light of modern surgical and radiological experience, which has completely revolutionized our knowledge. Sir Berkeley Moynihan,¹ in a valuable contribution which should be attentively read by every physician and surgeon, makes this abundantly clear as regards the diagnosis of chronic gastric ulcer. He shows conclusively how little reliance can be placed on the generally accepted rules which we find in the textbooks for the recognition of this disease. His statement that "gastric ulcer is a disease of comparative rarity; its diagnosis from the clinical evidence alone is difficult; its mimicry by other diseases extremely frequent," will be borne out by the experience of every progressive surgeon and physician. In my own considerable experience it is not too much to say that more than half the cases operated on for symptoms pointing to gastric disease prove to have the seat of disease in some other abdominal organ, and that in some the exact cause of the symptoms cannot be determined with certainty even by a complete exploration of the abdomen.

Time does not permit me to discuss at length the clinical significance of all abdominal pains and the assignment of them to the organs in which they originate, nor to illustrate the subject by actual cases, but a few generalizations, gathered from the study of the clinical histories and operative findings of cases dealt with in my own practice during the last fifteen years, may be useful to others. Firstly, I have found that in cases in which gastric or duodenal ulcer is verified by operation, the clinical history and symptoms have almost always enabled a correct diagnosis to be made beforehand. On the other hand, many cases with symptoms apparently pointing clearly to ulcer, such as a definite time relation between pain and food, and even haematemesis actually observed, were found at the operation to have no demonstrable ulcer either in the stomach or duodenum. In other words where the ulcer existed it was nearly always diagnosed, but many were diagnosed without being found. Another observation which has impressed me strongly is that in every case in which I have operated in which there was a definitely observed chronic melaena, I have found a duodenal or pyloric ulcer. I do not include in this observation cases of profuse haematemesis where blood has also passed downwards, for I have known such cases to show no demonstrable lesion of stomach or duodenum in spite of the copious bleeding.

Another impression gathered is that the clinical history of cases diagnosed or suspected of ulcer but disproved by operation, though sometimes resembling very closely the history of a true ulcer, when scrutinized fails in one or more important features. The symptoms are apt to be more vague; the time relation between pain and food is less precise than usual. Haematemesis is almost always absent—a point of some significance even if we admit, as we must, that it is absent also in at least half the cases of true ulcer.

Some useful inferences may be made from the patient's localization of chronic abdominal pain. In the upper abdomen pain is seldom purely central. In most cases it is felt also under the right or left ribs. Of all organic causes of chronic pain referred to the left upper abdomen or the left hypochondrium and verified by operation, gastric ulcer has been in my experience by far the commonest. Only twice have I found the cause of such a pain in an inflamed and adherent spleen. I have known of a case of chronic left hypochondriac pain actually treated by an

exploration of the left kidney from behind, and subsequently found to be due to chronic gastric ulcer.

On the right side of the abdomen, on the other hand, the possible causes are more numerous. The pylorus and duodenum, the gall bladder, the caecum and appendix, as well as the kidney and ureter, may all refer their troubles to the right hypochondriac and right iliac regions. For this reason right-sided chronic abdominal pains are vastly more common than left, and the task of localizing the cause correctly is much more difficult.

Something may be learnt from a close study of the character of visceral pains. In all muscular hollow viscera there is a clear distinction between the pain caused by the irritation of exposed nerves in an ulcer or by inflammation of the peritoneum, and the more or less violent cramp-like pains due to over-action of the muscular wall in the presence of some obstruction of the gut. In their more severe form these pains are generally described as colics, and a consideration of their distribution and character is often a valuable guide to the seat of mischief. An acute attack of biliary or renal colic can almost always be recognized, but minor degrees of visceral cramp are less easily distinguished from each other. In the intestine and in the stomach colicky pains cannot be recognized with certainty unless accompanied by recognizable peristalsis.

If a searching clinical investigation and a complete physical examination fail to reveal the cause of a chronic pain, then any other method of investigation likely to throw light should be adopted. This means that every case of pain possibly referable to the kidney, ureter, or bladder should be examined cystoscopically and by the x rays. Every doubtful case of gastric ulcer should have the benefit of microscopic chemical and radiographic examination; and the same rule applies to obscure intestinal cases. Of all these methods radiography in gastric and intestinal cases is by far the most valuable. Special experience and skill, as well as command of the best apparatus, are, however, indispensable for abdominal work. Methods and skill sufficient for foreign bodies and fractured bones are quite inadequate for this purpose.

By radiography the position and shape of most parts of the alimentary tract can be revealed with great precision. The movements of the stomach, the rate and manner in which it empties its contents, the existence in it of ulcers and growths, if not too small, can be clearly demonstrated. Ulcers and strictures of the large intestine are equally demonstrable. Organic abnormalities of the small intestines are much less often and less clearly definable. Gall stones are with difficulty demonstrated, and only in a minority of cases. Their absence cannot be asserted. The rays offer us little help in diseases of the pancreas and spleen. Stones in the kidney can be confidently asserted to be present or absent, but other surgical abnormalities of the kidney are not demonstrable by radiography without the addition of opaque injections into the renal chamber and ducts, a procedure not without a risk equalling or exceeding direct surgical exploration. Radiography cannot even demonstrate with certainty ulcers of the stomach or duodenum in their earlier and smaller stages. In fact, the evidence of radiography is most convincing in those cases in which clinical history and ordinary examination make diagnosis most certain, and least helpful just in those more obscure cases of visceral pain in which we should most welcome its aid.

It is the experience of every general surgeon frequently to be consulted for the relief of chronic abdominal pain by patients in whom neither ordinary physical examination nor radiography can find any definite cause. The symptoms complained of may suggest gastric ulcer, or gall stones, stricture or other partial obstruction of some part of the bowel, or an affection of one kidney or ureter. Leaving on one side all localized affections of the urinary tract, and also most organic diseases of the female pelvic organs—for these can usually be detected by direct methods of examination, including cystoscopic and allied methods—the diagnosis usually resolves itself into a weighing of the evidence of history and symptoms between gastric ulcer, gall stones, and an affection of some part of the intestines. Failing any signs of the two former, the guilt is often attributed to the appendix; innumerable cases in which chronic pain is more or less definitely located in the right side of the abdomen have been summarily treated by removal of an appendix. In a large proportion of such

cases—perhaps the majority—the appendix shows no visible abnormality. It is not surprising if the patient afterwards shows no visible improvement.

APPENDICITIS.

It is not, in fact, safe to diagnose chronic disease in the appendix unless the history includes at some time or other the clinical syndrome of an acute attack of inflammation of the appendix, followed by similar attacks more or less severe. This syndrome has very marked and constant features. The onset of the first attack is always sudden, and pain is always the first symptom of the illness. The pain is sometimes severe but never agonizing or unbearable like renal or biliary colic, or perforation of a gastric ulcer. Also in contrast to these it is usually some hours before it reaches its maximum intensity. Vomiting usually occurs in the first few hours of the attack and then ceases, unlike the vomiting of biliary or renal colic, which is often repeated at frequent intervals for twenty-four hours or more. In the later stages, after the third day, vomiting may become incessant from generalized peritonitis, but it is very seldom a marked feature during the first two days when the acute inflammation is confined to the appendix and its immediate neighbourhood. Again, a definite attack of acute appendicitis, however mild, practically always causes a sufficient amount of pain, malaise, and rise of temperature to keep the patient in bed for at least twenty-four hours. A clinical history in which careful interrogation brings out no history of an attack such as this should be regarded as excluding inflammatory disease of the appendix. Nor should an appendix which after removal shows no signs of having ever been acutely inflamed be regarded as a satisfactory explanation of chronic abdominal pain; for if it be admitted that an appendix may have recovered so completely from an acute infection as to show no traces of its effects, which is possible, then it cannot be reasonably regarded as a continuing source of pain.

As a matter of experience, in few cases in which there is a well-marked clinical history of acute appendicitis will the appendix fail to show traces of former inflammation, such as peritoneal adhesions, opacity, thickening of some part of the wall, stricture, or other well-marked effects of a truly inflammatory process, even when removed months or years after the first illness. There is, on the other hand, no evidence whatever that inflammation of the appendix may be chronic and insidious in its origin, unattended by acute clinical symptoms. Nor is there any better ground for attributing single or recurrent attacks of severe abdominal pain to the presence of faecal concretions or foreign bodies in the appendix, and giving them the name of appendicular colic. Faecal concretions may often be found in appendices examined deliberately or casually in the course of any abdominal operation, and are hardly to be regarded as even abnormal. Actual perforation of the appendix by a foreign body swallowed in the food, or by living worms, is, of course, a different matter, but there is no evidence that appendicular colic or any symptoms whatever are caused unless perforation or infection occurs.

The surgeon who removes an appendix for the relief of chronic pain or other abdominal symptoms, when there has been no definite indication of appendicitis in the past, commits a blunder, not in operating, but in operating wrongly. Chronic pain is itself a disease, perhaps sufficient to disable or to render life miserable. It must be assumed to have a definite and discoverable cause, and if that cause cannot be ascertained by the fullest investigation by every other possible means, it is not only justifiable but obligatory to make a surgical exploration. It was once objected to a surgeon that he habitually resorted to exploration on evidence on which he would not hang a dog. The objector forgot that the surgeon's object was not to hang anybody but to discover and relieve a troublesome condition, and that the direct seeing and handling of the internal organs may be the only final and conclusive means of discovery and cure in the present state of knowledge. In acute abdominal diseases the surgeon must act on reasonably grounded suspicion and not wait for *post-mortem* verification of his fears. In chronic cases he should equally not hesitate to cut Gordian knots by direct action. But an exploration should be as complete and thorough as possible. Through a small incision over

the appendix it is not possible to make more than a very limited examination. For this reason in every case of chronic abdominal pain, wherever located, if there are no definite objective signs, the incision should be made in a position which commands the whole abdomen. The best for the purpose is an incision in or near the middle line extending as much above and below the umbilicus as may be required. Through such an incision it is possible to inspect and palpate every organ of the abdomen, and to carry out almost any operation subsequently required. In cases of special difficulty an additional incision more directly over the seat of disease may be required, but there is no difficulty in performing operations on the gall bladder, stomach, intestines, and pelvic organs through a sufficient median incision. The advantage of the complete possible exploration of all the abdominal organs in obscure cases is self-evident, since it not only minimizes the risk of overlooking the real cause of trouble, but gives us negative evidence which may be of the greatest value.

The exclusion of gastric ulcer, for example, enables us at once to abandon the restricted diet which we are compelled to adopt so long as there is reason to suspect its presence. Every surgeon must be familiar with patients who have been treated for months or years for a gastric ulcer which operation has eventually shown to have had no existence. On the other hand, it is common to find that organic disease, which eventually comes into the hands of the surgeon in an advanced or inoperable condition, has been previously labelled with such names as gastritis, gastralgia, mucous colitis, enteritis, colic, and so on, and treated "expectantly"—that is to say, by waiting for something to turn up. An earlier and more frequent resort to surgical exploration would obviate many errors of this kind.

VISCEROPTOSIS: INTESTINAL STASIS.

Every surgeon who accepts the general principle of making a complete exploration in every case of obscure abdominal pain seriously affecting health and physical capacity, and who records the operative findings of a series of such cases, will find in a certain proportion of them some definite organic trouble which accounts for the pain and is relieved by appropriate treatment. In a large proportion of similar cases he may at first record his findings after a complete search as entirely negative, and he may be content to call the pain functional, neurotic, hysterical, or some other question-begging epithet. If, however, he reads the surgical literature of this and other countries he will note the increasingly frequent publication during the last ten years of observations on abnormal looseness of the chief abdominal organs, and of certain abnormalities of the peritoneum connected with this condition which are now quite familiar under the name of general visceroptosis.

The relation of this condition to obscure abdominal pain is of the greatest interest and importance, but much further observation is required before the obscurity surrounding it can be cleared up. The actually observed facts are quite simple, and easily verified by every surgeon whose ordinary practice includes a large number of abdominal sections, if he will only make a practice of looking for them. The position of the lower border of the stomach and the transverse colon, even when the patient is lying on the operating table, is unusually low; that of the former at or below the navel, that of the latter lower still, its centre sometimes almost in the pelvis. The whole colon may be much less closely attached to the back and sides of the abdomen than usual, so that the caecum may hang down into the pelvis, and the whole of the right side of the large intestine may be brought completely outside through a central abdominal incision, including the caecum, ascending colon, hepatic flexure, and transverse colon as far as the splenic flexure. The sigmoid flexure is also unusually long and loose, but the splenic flexure and descending colon remain deeply fixed, and cannot be mobilized without dividing their outer peritoneal reflections. No abnormal changes are noted in the muscular wall of the stomach or large bowel, but some or all of the following abnormalities are found in the peritoneum: About the outlet of the stomach certain more or less thick and opaque bands passing from the pylorus or duodenum to the gall bladder, liver, and the hepatic angle of the colon; a similar band

passing from the upper end of the ascending colon to the centre aspect of the caecum, causing a sharp bend of the colon outwards. Occasionally this band is replaced by a thin membranous veil concealing the anterior aspect of the caecum. A few inches from the termination of the ileum a radiating fan-shaped thickening of the mesentery passes downwards towards the pelvic brim and fixes the small intestine in this position, sometimes causing a sharp angulation. This condition is now tolerably familiar to all under the name of Lane's kink. To Lane, indeed, is due the credit, if not of noting these peritoneal abnormalities for the first time, at any rate of calling surgical attention to their frequency and possible significance.

It is curious that the whole subject of visceroptosis and its significance has been approached piecemeal from different sides by observers whose attention was directed at the time to particular organs. For a time much attention was directed to excessive mobility of the kidneys, a condition both common and easily demonstrable by clinical examination. Closer investigation has proved, first, that deviations from the normal, or what had hitherto been regarded as the normal, mobility of the kidneys were exceedingly common in persons presenting no obvious inconvenience or ill health; and, secondly, that abnormal mobility of the kidneys is frequently, if not always, associated with abnormal mobility of other abdominal viscera, particularly of the stomach and colon. The reality of this condition, conveniently described as "visceroptosis," is easily demonstrable during an abdominal section when the patient is horizontal. It is even more marked when patients are examined radioscopically in the erect posture, even after making full allowance for considerable variations from the normal standard within the limits of health.

These observations provide a clue to the curious fact that while some surgeons were treating a group of obscure abdominal symptoms by fixing the kidneys, other surgeons were treating cases not unlike them with equal success by excision or short-circuiting of the colon. No doubt the similarity of cases so differently treated may be denied, but it cannot be denied that the one indisputable and demonstrable anatomical condition common to both is visceroptosis and the accompanying peritoneal changes. Sir Arbuthnot Lane attributes chief importance to an obstruction or slowing of the intestinal stream caused by the various kinks and bands already described. He ascribes visceroptosis to the prolonged effect of gravity in the erect posture, and regards the various thickened bands of peritoneum as a physiological response at points of greatest strain. Lane's ileal kinks, Jackson's membrane, and other peritoneal thickenings are, however, found in a large proportion of babies and young children who show no evidence of having suffered from intestinal stasis. Their origin is probably always due to congenital abnormalities of development, but they may, of course, be capable of progressive intensification. Against the theory that visceroptosis is due to gravity and the erect posture is the observation, which will be confirmed by many surgeons who perform many abdominal sections, that typical cases of general visceroptosis are quite common, both in hard-working men with highly developed abdominal muscles and in young muscular women who have never had children. These are, in fact, the cases in which chronic abdominal pains simulating gastric ulcer most typically occur.

My own experience is opposed to the view of Sir Arbuthnot Lane that the evil effects of visceroptosis are attributable mainly or entirely to chronic constipation or intestinal stasis. The evil effects of constipation are greatly exaggerated both by the public and by many doctors. Many people are so obsessed by the idea that the daily evacuation of the bowels is essential to health that they purge themselves daily, by some form of aperient drug. The result is that a considerable portion of their nutritive intake is lost, and they suffer from constant malnutrition. In the case of men who eat and drink heartily and lead sedentary lives, this may be of no account, but many women eat habitually less than is sufficient for full health and vigour, and to these the daily subtraction of a purge is positively injurious. When visceroptosis is associated, as it very commonly is, with chronic abdominal pain, the intake of food is always insufficient and purgation increases the insufficiency.

Many of these cases closely simulate chronic gastric disease and are carefully dieted, which generally means insufficiently fed.

That too much importance has been attributed to the effects of angulation and peritoneal bands in delaying the intestinal stream is suggested by the small amount of disturbance which may exist when the intestines are matted together, and often very sharply kinked in cases of chronic tuberculous peritonitis or after recovery from severe peritoneal suppuration. Symptoms of intestinal stasis in a most aggravated form would be expected to occur in cases of this kind, but so far as I know are never seen. Actual obstruction, chronic or acute, from such conditions is, of course, common, but then there is no similarity whatever between the symptoms of actual mechanical obstruction and "intestinal stasis," a name with hypothetical implications from which the older term of constipation is free.

EXPLORATORY OPERATION.

Although for these reasons it is difficult to regard the various bands and kinks of the colon, ileum, and jejunum as seriously delaying the onward passage of the contents of the bowels, they may well be the sites of origin of the chronic pains for which no other cause can be found on abdominal exploration. Almost all such pains are referred to the epigastrium or the right iliac fossa, but, so far as I am aware, there are no definite data for assigning a pain in one place or another to a definitely situated peritoneal band. Such a pain might arise from a dragging or tension at one or other of the spots where the thickened peritoneal bands are constantly found, or from a momentary or temporary constriction of the colon or ileum in a particular posture or phase of movement. Acting on this hypothesis, I have in every case of visceroptosis explored by operation made a point of freely dividing every abnormal peritoneal fold or membrane in such a way as to give the utmost mobility of the part of the bowel concerned, for hardly any two cases are precisely alike. In some cases every sort of thickened band will be found from the duodenum and gall bladder to the beginning of the ileum. In others there may be a well-marked ileal kink and no other. Others have bands confined to some part of the colon. In addition to dividing the bands I have always removed the appendix, which in the great majority of cases presents no sign of ever having been inflamed, though it may be sharply kinked or fixed to the pelvic brim or caecum by transparent membranous adhesions differing entirely in appearance and character from those of inflammatory origin, and resembling the peritoneal bands of visceroptosis.

In order to examine the caecum and colon thoroughly it is necessary to divide the whole of the peritoneal reflection to the outer abdominal wall on the right side until the caecum and ileum can be brought out of the wound, together with the hepatic flexure and transverse colon. Any fixed kinks and adventitious membranes can then be thoroughly removed. The left side of the colon is examined without bringing it outside, and as a rule no bands have been found in this part requiring removal.

The result of this operation has been in many cases to relieve completely and permanently the pain and disability previously suffered. In almost all there was improvement in health, but in a considerable number, after temporary improvement, complaint was again made of pain. The ultimate result, then, depends partly on the temperament of the patient and partly on the influence of the surgeon. Every effort should be made to induce him or her to eat heartily and lead an active and vigorous life. The patient should on no account be encouraged or allowed to wear abdominal belts. A surgeon who makes a routine practice of ordering a belt to every case in which he has performed abdominal section for fear of ventral hernia does not know how to close his incision properly. Vigorous use of the abdominal muscles is undoubtedly essential to good health and is incompatible with the wearing of a surgical belt.

As soon as the patient can be induced to eat a normal diet he gains weight, constipation ceases, and the abdominal pains and discomforts become less insistent. If he begins again for any reason to take insufficient food, pain and constipation return, followed by loss of weight. If he can then be persuaded to eat normally and to

disregard the pain and discomfort he can be confidently assured of recovery. The ability to give this advice with confidence, with the certain knowledge that we can exclude gastric or duodenal ulcer, is one of the strongest arguments for exploring every doubtful case of chronic abdominal pain.

REFERENCE.

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X RAYS AND THE APPENDIX.*

BY

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IN examining the alimentary canal by the help of opaque meals the observer is apt sometimes to overlook the fact that he is not dealing with organs under normal conditions, but with organs placed in circumstances entirely novel and unwonted and, indeed, reacting under the stimulus of a foreign body.

Before we allow ourselves to draw conclusions from the pictures seen on the screen or in the plate, we are bound to consider what unusual effect the presence of a large mass of barium sulphate may have upon the behaviour of the stomach or the duodenum, or, for that matter, upon any portion of the alimentary canal. So, when the peristalsis of the stomach is noted on the screen, it becomes a nice point to ascribe the proper proportion of movement to the ordinary gastric activity and to make the necessary allowance for an organ faced with an unusual problem and doing its possibly exaggerated best to pass on an unwonted foreign body.

Again, there may come a time in the progress of every bismuth meal when all, or nearly all, the salt may be collected in a narrow segment of the transverse colon. Weight for weight the metal is heavier than a collection of faecal matter of equal bulk, and it may be that the extra weight is sufficient to cause a notable dropping of the bowel and so induce the observer to believe that there is a real ptosis of the colon, whereas, under natural conditions, the intestine is kept by its supports in the proper position.

As for the appendix, claims are made that 75 or more appendices out of 100 may be demonstrated by opaque meals of one kind or another; but putting aside for a moment the actual value of a picture of the appendix, the means sometimes adopted to separate the organ from its surrounding coils of intestine introduce an element of violence to which the parts are never exposed during the process of ordinary digestion. I refer to the massage of the caecal region by the hand, or by some instrument, for convenience sake transparent to the rays—a wooden spoon, for example.

Considerable importance is attached by some observers to the medium in which the opaque salt is given; one recommends gruel, another buttermilk, and a third will obtain his best results with some proprietary mixture such as that sold by Burroughs and Wellcome. Trials made with 6 oz. of barium sulphate in 20 oz. of various fluids showed that all or nearly all the salt separated from the various fluids in a comparatively short time: from water in ten minutes, from milk in thirty minutes, from thin gruel in two and a half hours; it may therefore be assumed that whatever the medium used in an opaque meal the nature of the suspension will have greatly altered long before any of it has reached, let us say, the ileo-caecal region. It seems more reasonable to give the opaque salt under natural conditions—spread over the various foods that make up the patient's usual breakfast; the result is not so unpleasant as it sounds, and though the salt is more diffused, and the shadow thrown by it less dense, the proceeding has no practical disadvantage, and at least avoids the unnatural act of swallowing a large quantity of foreign material in a mass. Lastly, there should be no preparation of the patient by purging, at least within twenty-four hours of the examination; the only object of the investigation should be to watch the alimentary canal as nearly as possible under normal conditions, not when it has recently been a prey to more or less violent emotions.

Screen Examinations and Skiagrams.

No doubt a series of good skiagrams of a bismuth meal is of some use as a record, but its value is insignificant in comparison with the report on a series of screen observations; moreover, the interpretation of skiagrams will vary with the reader, and no one is really competent to give an opinion on the constantly changing picture presented by a bismuth meal except the radiographer who watches it. The last word on this subject is found in a sentence of Sir Arbuthnot Lane:

The utility of a complete report on the passage of a bismuth meal by a competent radiographer who is experienced in this work cannot be exaggerated . . . it is futile to expect the surgeon to obtain much useful information from a series of radiograms, however good, taken at intervals. By far the most valuable portion of the information afforded by the skilled radiographer is obtained by means of screen work. . . .

And, indeed, some of the published radiograms of diseased conditions in the ileo-caecal region are unconvincing. One sees a mass of ileum and caecum, and, indistinguishable save by the eye of faith, a narrow band is marked by a confident arrow and labelled "kinked and adherent appendix." Such a picture can be of no use in diagnosis, and tends to discredit the whole science; it would be invidious to point to examples, but there is scarcely a work on radiography which is not disfigured by imaginative efforts of this kind.

In the series of 50 consecutive opaque meals given for one purpose or another, but always having in view the behaviour of the parts in the ileo-caecal region, the appendix was definitely recognized in a much smaller percentage of cases than might have been expected; no massage of the abdominal wall or other interference was permitted, and whether the patient was screened from the front, or the back, or the side, in only 45 per cent. could one be sure that what one was looking at was really the appendix. Of the appendices seen (22) 20 were found diseased at the subsequent operation, 2 were apparently normal. Of the remaining 28 in the series—the 28 in which the appendix was not identified on the screen—15 were diseased, 13 were normal; of the 15 the lumen was obliterated in 3, and in 12 the organ was so bound down to the side or back of the caecum that even with a patent lumen full of barium, it would have been impossible to differentiate its shadow from that of the surrounding coils of intestine.

Visible appendices, 22—

Diseased	...	...	...	...	20
Normal	...	...	...	...	2

Invisible appendices, 28—

Diseased	...	...	...	...	15
Normal	...	...	...	...	13

The numbers are no doubt small to draw any very definite conclusions from them, but if they prove nothing they at least suggest that the barium does not tend to enter the normal appendix at all. Not that this assumption helps us very much; even if we could say definitely that the barium enters a diseased appendix and does not enter a normal one, we cannot say that an invisible appendix is a normal one because, for the reasons given above, a proportion of diseased organs will be invisible too.

Pursuing this question, preparations were made of the bowel in the ileo-caecal region from 15 consecutive *post-mortem* examinations; the last 12 inches of the ileum, the caecum and appendix, and the first part of the ascending colon, were removed, the distal end of the preparation was clamped, and through the cut ileum a barium suspension was poured into the segment of gut. Among the 15 specimens there were 4 in which there was obvious disease of the appendix; in these the barium entered the caecum, filled it and the ascending colon, and, at the same time, overflowed into the appendix. In 7 of the remaining 11 normal appendices this overflow did not occur; it required a certain amount of manipulation and squeezing of the caecum to overcome the resistance offered to the progress of the fluid; in the other four normal preparations the barium entered as freely as it did the diseased specimens.

Skiagrams of two of these preparations are reproduced. Fig. 1 shows a long-standing inflammation with plentiful adhesions; Fig. 2 a normal appendix. The examples were chosen for the sake of contrast, and emphasize the difficulty of drawing useful conclusions from the inspection of a bismuth-filled appendix.

* Read at the South-Western Branch of the British Medical Association, March, 1920.