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ON SURGICAL DIAGNOSIS *

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Many of the higher examinations in medicine and surgery include a session devoted to the consideration of a single "long" case, which the student is instructed to discuss on paper under the following headings: history, symptoms, signs, diagnosis, differential diagnosis, prognosis, and treatment—seven divisions, of which diagnosis is the central one. From whatever aspect we view the matter diagnosis occupies the dominant position—the keystone of the arch, the summit of the pass. On one side lies investigation, on the other treatment. For the patient diagnosis is the plateau to which he climbs from the valley of the shadow, plodding behind the guide, following him round what may appear unnecessary bends in the rocky track, deceived from time to time by summits which are not the real one; on the plateau he rests while his guide consults map, studies the weather, and plans the route by which they shall go together down the slopes of treatment. Even more for the doctor is diagnosis a culminating point. It is preceded by the collection of a great number of facts whose mutual relevance may not be apparent; it involves a decision, based on these facts, upon the aetiology and pathological nature of a clinical problem; upon the decision follows action.

The Consultant's Part

Patients often say that doctors are interested in diagnosis only, and those concerned with medical education complain that too much time is spent in attachment of labels and in hair-splitting distinctions between minor subdivisions of processes essentially alike. But while it should never be too much in evidence, diagnosis must remain of cardinal importance in medical training and practice, for it presents the acme of professional skill. On the one hand may lie arid science, on the other rule-of-thumb therapeutics; but in the central point, diagnosis, the doctor is called upon to exercise all his critical faculties, his practical experience, his wisdom born of years of consideration of similar problems, his power of clear decision. In diagnosis he is *Homo Sapiens*, not *Homo Quaerens* or *Homo Agens*. The two sides of the watershed may call for knowledge, technical skill, and hard work, but wisdom alone will avail him on the summit.

In many highly organized foreign clinics the whole of the processes preliminary and subsequent to diagnosis are handed over to juniors, or at any rate to executive workers. A case is placed provisionally in a general category by someone of intermediate status and then passed along a chain of -ologists and laboratory workers, who pile up a dossier of encyclopaedic completeness. When diagnosed it is turned over to the remarkably efficient treatment machine of the institution and dosed or pruned upon lines that have been worked out in detail. But the analysis of the dossier, the inter-

pretation and correlation of all the facts it contains, and the establishment of the diagnosis is the work of chief or chiefs in consultation. Hence the justification and the need for that vanishing type of wise and learned man whom we call the consultant, as distinct from the specialist. The specialist may thrive on knowledge and skill; without wisdom the consultant is useless. The specialist provides the detailed information. He is the permanent expert, the head of a civil service department, while the consultant is the cabinet minister who, guided and helped by the experts, must decide policy.

Is there anything special about surgical diagnosis? Surgery, broadly defined, is a method of treatment by manual processes. Its territory is very largely on the sunny side of the watershed, with smaller provinces on the summit and beyond. Surgery does not, like medicine, look upon diagnosis as the chief expression of its art, nor, like neurology, as an end in itself, but rather as a means to an end. A correct decision concerning the cause and pathology of a symptom-complex is of great importance, but only in so far as it points the way to correct treatment. And decision is more important than correctness, because very often in surgery treatment must be immediate to be effective, and that ultimate solvent of diagnostic difficulties, the lapse of time, is apt to lead to the final court of pathological exactitude—the post-mortem room.

The surgeon who is considering a difficult and puzzling case confronts two separate questions. First, "What is the probable nature and cause of this trouble?" He must answer this for his own sake and that of his students, and if he answers it definitely, whether that answer be ultimately right or wrong, both he and they will have learned something. Secondly, "Which of the possible alternatives is the most urgent and the most dangerous, even if it be not the most likely?" His answer to this is of vital importance to the patient, and upon it he must plan his line of action.

Sudden Abdominal Upsets

The need for immediate action, which in surgery very often means operation, is most apparent in those sudden abdominal upsets which we class provisionally as the acute abdomen. Here the problem before the surgeon is, in its simplest form, the following: "While the exact diagnosis is by no means clear, and for the present lies between A, B, and C, to what extent is the trouble likely to assume more serious form in the next twenty-four hours; is the case one that can be watched at home or as an out-patient, or should it be admitted to a hospital or a nursing home?"

The commonest example of such a difficulty is the case of possible acute or subacute appendicitis, one that when we first see it may very well be a true inflammatory lesion

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in its early stages, or some upset in the mechanical category such as food poisoning or caecal distension due to constipation. I am presuming that doubt still remains after a very careful analysis of the history and a thorough search for physical signs, which will always include a rectal examination. I must apologize for alluding to such a hackneyed subject as the necessity for rectal examination in every case, but it is depressing to find how often this precaution is omitted and how often the omission has serious or even fatal consequences. Inflammation in the pelvic appendix is not appendicitis as the textbooks describe it and the student learns it; there is no right iliac fossa pain, no abdominal tenderness, no muscle guarding. It starts with the initial stages of colic and vomiting, symptoms which it shares with every insult to the viscera, from tinned salmon to strangulated hernia; it passes through the stages from inflammation to abscess, guarded from all discovery except by a finger in the rectum, and only betrayed by a general appearance of illness; and it only reappears in the abdomen as a large abscess or a general peritonitis.

Decision to Operate

The case, then, presents no obvious physical signs. If we make it a rule to wait till the diagnosis is clear we shall very often be too late for a clean operation without tubes, or a safe one with a mortality under 1/2 per cent. If we admit every one we soon render our hospitals unmanageable and earn a reputation with our private patients for needless expense. The decision will be guided by many things: by the distance and nature of the patient's home, by the intelligence of his relatives, and by the time of day—in general, by the time that is likely to elapse before we can re-examine him or receive a reliable report on his condition. But above all it will depend upon our personal assessment of the probable course of events in the next few hours—that is, upon our clinical instinct or sense built up from accumulated experience of similar cases, and independent to a large extent of the intellectual process of reasoning. When we cannot decide, our only safe course is to place the patient in surroundings where his temperature and pulse can be recorded at regular intervals, where tests such as the diagnostic enema can be applied as they are needed, and where he is constantly under the observation of a trained assistant. We take this step early rather than late, bearing in mind that should he get worse and require operation he will then be less able to stand transport, and that the risk of operation will be increased by an immediately precedent journey. As experience accumulates the number of cases in which we defer judgement will decrease, but to "watch under hospital conditions" is always a safe decision.

Another difficulty arises, particularly in children, at a later stage of similar cases, when it has become clear that there is an inflammatory lesion in the abdomen but not certain whether this is an infected appendix or possibly a group of tuberculous glands with secondary invasion by septic organisms, or a pneumococcal peritonitis. It is not my purpose here to discuss the differential diagnosis of these conditions; in the great majority they can be differentiated, and the last two are preferably treated by means other than operation. But when doubt remains we have to balance the relative risk of exposing a group of inflamed glands or draining a pneumococcal peritonitis on the one hand or of leaving a gangrenous appendix or an early septic peritonitis on the other. There is no need to state the answer; where this is the alternative we must operate.

Recognition of Early Intestinal Obstruction

A problem of far greater difficulty in my opinion is the distinction between an early intestinal obstruction and other conditions giving rise to colic and vomiting, without localized pain or tenderness, abdominal rigidity, or any alteration in temperature or pulse rate. I will presume that any additional evidence pointing to the likelihood of obstruction such as a tender swelling in a hernial orifice, the scar of a previous operation, or a history of tuberculous peritonitis is absent. In such a case the chief things we have to exclude are intestinal colic due to swallowed irritants, drugs or foods which are infected or inimical to the particular patient, and colic in some other hollow tube in the abdominal cavity, such as the cystic duct or the ureter. These non-intestinal colics when encountered in their textbook form can be recognized by the first-year student; they may, however, give rise to central abdominal pain, visceral in type but quite unlocalized, and profuse and persistent vomiting, so that even an experienced clinician may fail to appreciate their origin.

The unmistakable features of intestinal obstruction are that the vomiting persists and increases and that constipation is absolute, even to the passage of flatus. In each case there is a loophole for error. The vomiting of an obstruction is first reflex in origin, and later the result of mechanical backflow. This overflow vomiting may not appear for some hours, or even days, if nothing is put into the canal above the obstruction, and if the element of infection (that is, strangulation) is absent or walled off. Constipation is absolute only as regards material passing the site of the obstruction. Any faecal matter, and it may be large in amount, which lies below the obstructed site is voided either spontaneously or in response to an enema, and even a second but smaller evacuation may follow.

Here we are dealing with a condition which is uniformly fatal without operation and in which the operative mortality varies hardly at all with the surgeon's skill, but rather with the condition of the patient and of the intestine above the obstruction at the time of operation. Such cases, therefore, should always be admitted where the pulse rate and appearance of the patient can be under constant observation, the vomit inspected, and enemas given and repeated as required. Three rules have impressed themselves upon me as the result of long and sometimes unfortunate experience. First, always give the patient plenty to drink—water or some harmless fluid such as lemonade or weak tea: if he is going to vomit the sooner we know the better. Secondly, never decide against obstruction on the result of the first enema; give a second two hours later, and if necessary a third. If every single thing about the progress of the case—the cessation of vomiting and pain, the absence of distension, a feeling of improvement in the patient, and a dropping pulse rate—denies intestinal obstruction, but no faecal matter or flatus is passed per rectum, insist upon operation and stake your reputation upon your decision. Thirdly, if the pulse rate is steadily rising always advise laparotomy, though other features of the case suggest the safety of delay.

This subject is so important that I would cite three personal cases, in one of which I was wrong and unsuccessful, in one wrong but successful, and in the third one right. I have not chosen them as a series to illustrate the increasing wisdom brought by experience, for they came to me in the reverse order. I saw the first case, which is the least creditable to me, a year ago, and the third fifteen years ago.

Case I

I was asked to see a lady of 65 years who had been vomiting almost continuously for eight days. During the whole of this period she had no abdominal pain, no tenderness, and no distension. Her bowels were opened the first day of the attack, but she had passed nothing since, in spite of repeated enemas. She was seen in consultation on the fifth day of the attack by a physician, who was unable to find any abnormal physical sign in her abdomen, but discovered that she had a blood urea of 250 mg. per 100 c.cm. During the whole of the sixth day she did not vomit at all, and a tube passed into her stomach showed it to be empty. On the seventh day she started to vomit again, and her blood urea was now 350 mg. per 100 c.cm. I saw her the next day.

Though the physician who called me, one of the wisest men in medicine to-day, was in doubt about the diagnosis, I was prepared, with the history of persistent vomiting and negative enemas, to find a case of intestinal obstruction. When, however, I saw the lady who had vomited all these days looking well and feeling free from distress, when I could find no trace of distension or muscle guarding or of tenderness on abdominal or rectal examination, when I found the pulse and temperature normal and the vomited material quite inoffensive, and when I remembered that during this period she had ceased entirely to vomit for twenty-four hours, my conviction was shaken. I suggested that the vomiting might be either toxic in origin or due to a nearly complete pyloric stenosis, and that in any case no operation should be considered till the blood urea had been brought to a lower figure. I therefore instituted a continuous drip saline infusion into a vein in the leg. Two days later I was forced to operate by a rising pulse. I found a large gall-stone impacted in the ileum two inches above its lower end, and causing gangrene of the gut throughout its circumference. I removed the stone, resected the gangrenous portion of intestine, and drained the upper loop. The patient died three days later.

I quote this case to illustrate the dangers of too much erudition, of too little common sense. The astonishingly high blood urea was the Lorelei of science, singing the same chant as a series of surgical uraemias following pyloric stenosis which it had been my lot to encounter and treat successfully during the past year, and lulling my surgical conscience with dreams of toxic vomiting. A surgeon who can possibly allow a patient who has passed no faeces or flatus for several days in spite of repeated enemas to remain unoperated upon deserves a jolt of this nature to put him back on his true course.

Case II

I reported my second case in the *Lancet* in 1921. A young man of 23 years was admitted to Guy's with a typical history of acute intestinal obstruction of three days' duration. The illness started with a sudden agonizing pain following three days of vague abdominal discomfort. From this time onwards he had been in continual but not severe pain. He had vomited such fluids as he had taken and had passed nothing per rectum. Inquiry showed that he had vomited after food only and that the vomit had never been offensive.

He looked well and comfortable, with a clear complexion and a clean, moist tongue. His temperature was 100°, his pulse 88. The abdomen was slightly full, but moved well, and there were no distended coils or visible peristalsis; vague tenderness was found over a wide area to the left of the umbilicus. On rectal examination masses of scybala were felt, but there was no tenderness whatsoever and no ballooning. He was given an enema, and passed a large formed motion, with flatus. The pain was relieved and he went to sleep. Next morning he awoke feeling very well, and his pulse was now 68 and his temperature 98.4°. He had no pain, and only slight tenderness. He remained like this for the next two days, taking fluids without vomiting, with a normal temperature and a pulse under 80. His abdomen was, however, more distended, and though he felt comfortable he did not look so well. Operation was therefore advised.

I found moderately distended coils of small intestine and a little free blood-stained fluid in the abdomen. On passing my hand downwards I felt a band snap at the pelvic brim, and came upon a mass in the pelvis, which I brought into the wound. It consisted of several coils of intestine matted together and surrounding a loop of lower ileum about five inches long, which was gangrenous and greenish-yellow in colour. I resected twelve inches of bowel and performed a lateral anastomosis. Recovery was uneventful, and the patient was discharged well a month later.

I would quote what I wrote as a surgical registrar.

"In this case one had to decide whether to trust one's eyes or one's ears to explore the abdomen on the history alone in face of the clinical findings, or to trust the latter and mistrust the history. I wrongly chose the latter course. Three things influenced me in this decision: first, that I did not know the patient, and had no confirmation of his story from a medical man; secondly, that the passage of flatus as well as faeces is very unusual in any obstruction other than that of Richter's hernia; thirdly, that the man was a plumber, and since he had very good teeth he might be suffering from lead colic without showing the characteristic blue line on the gums."

To this comment I would add to-day that, where the history is in any way suggestive of intestinal obstruction, the negative evidence of one enema alone should not be trusted; a second should always be given.

Case III

The third case was an old lady of 80 years who was admitted to Guy's one afternoon with a history of colicky pain referred to the umbilicus, and vomiting, both of which had started during the morning. Questioned, she thought that an orange she had eaten the previous night had disagreed with her. Her tongue was clean, her abdomen not distended and not tender, her pulse 72, her appearance that of a feeble individual and a poor operative risk, but in no way toxic. She vomited some bile-stained but odourless fluid. An enema produced a large constipated motion. She was given tea, and put on an hourly pulse chart. She continued to vomit still inoffensive material. A second enema four hours later was returned with a fair amount of faecal material. At 10 p.m. her appearance and that of her abdomen was unchanged, but she was still vomiting and her pulse had risen to 90. Operation was therefore advised. A large mass was felt in the lumen of the lower ileum, squeezed up into healthy bowel, and removed. It proved to be half of a small orange, swallowed unchewed. The hemispherical shape of the obstructing body had allowed intestinal material to pass along its flat side.

Intestinal obstruction in a baby usually means intussusception. The great majority of these cases are, most fortunately, unmistakable. Difficulty arises when the baby looks too ill for the length of the history, when the characteristic intermissions appear to be absent, and when no lump can be felt. Here the rule that we must act upon the most dangerous of possible alternatives impels us to admit every case immediately. The possible causes of a similar symptom-complex are Henoch's purpura and acute intestinal toxæmia. With regard to the first, a submucous haemorrhage unaccompanied by a subcutaneous one must be so rare that we have no right to let its possibility influence our judgement at all. The second is unlikely without diarrhoea, and should be considered only if the rectal contents are faecal or tinged with bile. When any doubt remains it is wise to take the baby to the theatre, and there, prepared immediately to operate, to palpate the abdomen under anaesthesia.

But the "acute abdomen" is not the only example of the doubtful abdomen; there are many less urgent, where the surgeon, after considering all available evidence, is called upon to decide a line of action rather than to attach a label. A line of action is indeed necessary before even a label can be provided for the doubtful abdomen, the type of case in which after considering carefully the

history and the facts we have obtained by our clinical examination we are still uncertain whether there is organic disease, and, if so, whether it is a single lesion or a combination of several.

The Doubtful Abdomen

A not uncommon illustration of such a difficulty is when we suspect gall-stones, duodenal ulcer, and a chronic appendix, one, two, or all three of them. A complete investigation is a lengthy, and for a private patient an expensive business. What we really need to know is whether operation will be required; if so, all subsidiary doubts can be left to be settled by this one certain method. We therefore concentrate upon the gall-bladder, for, apart from the small body of qualified confidence men who "dissolve" or "expel" gall-stones, there is a general agreement among doctors that the treatment of stones, once they are giving serious trouble, is operative. Should we start with a barium meal and find an ulcer we must still investigate the gall-bladder and appendix. I say this because I believe, as I am sure do most of you, that the operative treatment of duodenal ulcer, as apart from that of its rarer complications, is as unsound, and should be as dead as, the medical treatment of rebellious gall-stones. If we find gall-stones we operate, look at the stomach and duodenum, and remove the appendix, healthy or unhealthy.

But in the uncertain chronic abdomen, as in the acute one, it is the appendix that comes first to mind. I do not wish to be led astray from my main thesis into an oration on the chronic appendix, a disease responsible more than any other for lazy diagnosis, slipshod pathology, and commercial surgery. The only advice I can give my registrars is never to admit its existence to students or themselves until they are 35, and never to take a fee for removing one until they are 40. Being well on the safe side of this line myself I am certain that there is such an entity. I am not considering any case that might be classed as intermittent appendicitis. Where there has been a reasonably clear history of an acute attack in the past, where the attacks are definitely intermittent, lasting about a week and separated by intervals of normal health, where the symptoms are gastric, and appendicular tenderness is first found by the physician and not by the patient, the diagnosis is reasonably clear. But there is also a condition in which attacks of mild pain, limited to the right iliac fossa, and constantly recurring, without pyrexia or vomiting, are due to the appendix. Further, the appendix may, on removal, be indistinguishable from normal, and the diagnosis is confirmed by the therapeutic test alone. After removal of such a harmless-looking tube the patients not only lose their symptoms, but they enter a new phase of health, which shows them for the first time that they were not well before. It is a considerable experience of cases of this type occurring among colleagues and personal medical friends, where they and I have discussed all possibilities and decided upon appendicectomy with hope rather than conviction, where the improvement has astounded me and delighted them, that has forced my unwilling acceptance of this dreadfully vague lesion. For I still cannot claim any certain method of distinguishing the true from the false chronic appendix.

Let us presume that we have very carefully excluded all those conditions, failure to recognize which has brought the operation of limited laparotomy into disrepute, partial obstruction of the right ureter from stone or otherwise, inflammatory changes in the right tube or ovary, caecal distension or prolapse, and that the radiologist's examination of the appendix itself has disclosed no abnormality.

The patient still complains of pain and we still find tenderness at or below McBurney's point in an area no larger than a penny. Two questions will pass through our minds: "What harm will I do if this is a chronic appendix, and I leave it alone?" and "What harm will I do if I remove a perfectly normal appendix?" To the first we must answer "No great harm." An appendix of this sort is very unlikely to flare up in an acute attack. On the other hand the symptoms will certainly persist, operation will be required, and until it is done ill-health will continue. To the second we must answer "No harm, if I operate through a planned and limited incision, unless the patient is a potential neurotic; if on the other hand I advise laparotomy, I undertake an operation with a slight but definite mortality, and other possible lesser sequelae in the way of abdominal insufficiency and adhesions." To sum up: in such a case we must take the greatest care to exclude the potential neurotic; she will certainly have her appendix removed, but, however rich she may be, we should let someone else do it and be plagued by her ever afterwards. With a sensible patient we advise a limited appendicectomy, but need not urge it unless he is going out of reach of civilization. Laparotomy is not to be encouraged.

Indications for Laparotomy

This brings me to what is one of the most important matters of policy that a surgeon has to decide: What are the indications, if any, for laparotomy? He will have to consider a purely exploratory operation for a number of different lesions, and first in these doubtful appendix cases. I have just advised you against it. In the first edition of *Recent Advances in Surgery* I stated, with the dogmatism that is rightly expected from a man ten years younger than I am to-day: "Chronic appendicitis is only diagnosed after careful investigation and the weighing of every alternative possibility, and it is only treated by laparotomy." But what will a laparotomy tell us in the type of case we are discussing, one we have investigated thoroughly and pondered at leisure? Through a reasonable incision we can see the organs in the right lower quadrant of the abdomen, all the small intestine and its mesentery, and the pelvic organs. We can feel the whole abdominal cavity, and by this means can immediately recognize stones in the gall-bladder or kidneys, cancer of the stomach or large intestine, enlargement of the liver or spleen, and gastric or duodenal ulcer. But all these lesions are unlikely in the case we are discussing, and should have been excluded by our preliminary investigation. We cannot recognize non-destructive lesions by touch alone—cholecystitis, gastritis, duodenitis, colitis—nor should we attack them surgically if we could. A really large opening will allow us to see everything; but, again referring to this particular class of case, it is very unlikely that by inspection we can establish something that our biochemical and radiological colleagues have been unable to disclose. I am now firmly convinced that the surgical treatment for a chronic appendix is operation through a very limited gridiron incision, which will allow removal of the appendix and one-finger palpation of the tubes and ovaries and no more. Such an operation has no mortality and no sequelae, and involves hardly any loss of time; it is justified, therefore, even as a means of "diagnosis by elimination." Though limited, it will tell us all that a wide laparotomy is likely to do, without its risks.

In the surgery of gastric or duodenal ulcer laparotomy has no place. If the diagnosis is not clear after a barium meal and test meal, then those complications which alone can justify surgery have not yet arisen. Organic stenosis,

repeated severe haemorrhage, extension to a size that prohibits permanent healing, early malignant change, can all be established with greater certainty by observation, radiography, and functional tests than by inspection and palpation. Operation is undertaken for treatment and not for diagnosis. Still less is the surgeon justified in advising laparotomy for symptoms suggesting gall-bladder trouble, for inspection and palpation can very rarely demonstrate disease which clinical investigation and x-ray have failed to disclose. Lipoid deposits on the mucous membrane and obscure neuro-muscular derangements of the mechanism of emptying may give rise to recurring attacks of severe pain, yet leave the shape, density, and concentrating power of the gall-bladder, those characteristics which can be examined radiologically, unchanged, and its appearance and texture apparently normal. We must decide upon the history and results of our investigation, which will often include a prolonged period of observation and a therapeutic trial of "medical drainage," whether the symptoms arise in the gall-bladder. If we have so decided we operate to remove the gall-bladder, and no apparent normality of its surface or texture can affect that decision.

Laparotomy and Carcinoma

When the possibility of carcinoma lies among the alternatives we are turning over in our minds the question "Am I likely to do more harm by delay or by laparotomy?" assumes a very different complexion. We are often told that the most sinister fact about cancer is its complete silence during the early stages, giving the victim no indication that anything is amiss till the disease is far advanced. We are frequently assured that neoplasms, at any rate when they affect the stomach and colon, can be recognized by clinical, biochemical, and radiological investigation provided the patient has symptoms and presents himself for examination. Yet it is a painful fact that the ordinary working surgeon repeatedly meets cases which have been under the care of most eminent and conscientious physicians for months as suspects, who have been repeatedly investigated and repeatedly x-rayed with negative results, who finally are somewhat grudgingly advised a laparotomy, which discloses a growth about two months too late for resection. Such, at any rate, has been my experience eight times this year. It is an aphorism in yacht racing that the man who does not cross the line before the gun one race in seven is never going to get a good start. In cancer surgery the man who does not do one unnecessary laparotomy in seven is going to lose many lives through timidity. When we find a man over 50 who has hitherto been healthy starting to lose weight and strength progressively, even though he has no pain, indigestion, or constipation, even though every test is negative, we must still feel that carcinoma is only too likely. I would always accept the positive warning of a penny weighing machine in preference to the negative assurance of a ten-guinea expert. If the weighing machine persists in this opinion after six weeks, during which the patient has been relieved of work and worries, kept strictly at rest, and carefully dieted, we must advise laparotomy and urge it with all the persuasive powers at our command. The evidence of eye and hand is the only final court of appeal. A sensible patient will readily fall in with this advice when it is put to him, and if the result is negative he will be so delighted to receive a clean bill of health that he will think nothing of his suffering or even of our fee.

Exploratory laparotomy, then, is a course which we will never advise lightheartedly, and only when we are certain that it is a lesser evil than delay. To-day the

mortality of such an operation has been practically abolished, thanks to improvements in anaesthesia and pre-operative and post-operative treatment, and adhesions to the scar have been rendered less likely by methods of suture which leave no raw surface on its abdominal aspect. Even so the risk cannot be less than one in five hundred or the incidence of adhesions less than one in fifty.

I have thus far chosen the illustrations to my thesis, the lamentably simple one that in surgery decision is often the better part of diagnosis, from the abdomen. This has been almost inevitable because so many of the structures in this dark cavity are liable to catastrophes that progress with startling rapidity from their silent onset to their fatal termination; because their topography is not constant, as in the rest of the body, but to a certain extent fluid; because their troubles are only vaguely recognized by their owner, and then referred by him to their embryological rather than their present site; and because they are entirely hidden from our eyes and very effectively screened from our hands. But exactly the same need for precocious decision is constantly arising in other parts of the body.

Subacute Arthritis of Childhood

A clinical puzzle that we encounter all too frequently is the subacute arthritis of childhood, the joint that may possibly be tuberculous. The onset of tuberculous arthritis is, as you all know, remarkably quiet. Pain, beloved of the textbook, is rarely a prominent and never an early symptom; it appears only when destruction of the joint is already far advanced. So symptomless is the onset, bringing nothing more obvious even to a solicitous parent than a disinclination to play, that we rarely see an early case. The children are brought to us with marked wasting, limitation of movement, and destruction of bone that is visible in the x-ray picture and has often produced a mensurable deformity. When the diagnosis of tuberculous can be made with certainty the time for cure is long since past; the only tuberculous joints that are cured—that is, restored to complete normality—are those in which the diagnosis is uncertain. What, then, is to be our attitude? If on the one hand we watch every doubtful case till it is no longer doubtful we will make many unnecessary cripples; if on the other hand we decide to regard every doubtful case as tuberculous we must enforce a minimum period of two years' immobilization, protection, or restricted activity—a most drastic treatment for a case that is not tuberculous. Let me give a definite example from my own recent experience.

I was asked to see a little boy of 5 because he had been limping slightly for about six weeks. I found a fair-haired, rosy-cheeked youngster who looked the picture of health. At first he would not limp; but as he played about the room I noticed that he tended to spare the right leg as he pranced around. I will not give the results of my examination in detail, but will tell you that the first and most important of the methods at our disposal, inspection, gave me the only indication of abnormality that I was able to obtain. I could see a little thickening of the tissues in the right knee-joint, apparent only in a blurring of the outline of the patella and patellar tendon when compared with the other side. When I felt the knees I was unable to appreciate any difference, to detect any fluid or synovial thickening. The measurement of both thighs and calves was equal, the movements of the hips, knees, and ankles the same. An x-ray photograph taken next day showed no abnormality, no difference between the bones of the two limbs. The child had had no previous ailments of any kind; he lived in one of London's newest and healthiest suburbs and spent most of the day in a large garden; he slept and ate well. On the other hand one parent had a strong tuberculous history.

The diagnosis in such a case would be no more than a matter of *amour propre* for the doctor did it not imply decisions upon treatment affecting in any case the next year or two of the child's life, and possibly his whole future. Children at the age of 5 are very prone to a non-specific arthritis, whose origin and causative organism is unknown. One of my colleagues held sufficiently strong views on the first question to class this group as "tonsil joints," while many would attribute them to a mild streptococcal infection. To immobilize a tonsil joint for two years would be a calamity only exceeded by that of allowing a tuberculous one to run about till a definite bone focus had become apparent. The one certain diagnostic test, arthrotomy and removal of a piece of synovial membrane for section, is fraught with far too many dangers should the condition be tuberculous to allow it to be considered.

The only decision possible to us is that we must regard every chronic or subacute arthritis appearing in a child between the ages of 3 and 12 as tuberculous until we have proved the contrary, and we can prove this only by a period of diagnostic rest. Complete immobilization, by splint or plaster-of-Paris, has no distinctive value, for it will cause any inflamed joint, tuberculous or otherwise, to settle down, and when it has settled we are in an even worse position, still doubtful whether we can risk activity with the chance of reactivating a tuberculous process, and with no physical signs to guide us or to support our cautious attitude before the parent. Mere rest in bed, on the other hand, will clear up a "tonsil joint" in six to eight weeks, but will do no more than keep a tuberculous one stationary. If at the end of this period we still find the joint swollen, with limited movements, we can proceed to a period of rigorous immobilization with the certain knowledge that it is necessary and the comforting reassurance that it is in time.

Indefinite Mammary Trouble

Yet another instance where diagnosis is a matter of faith but decision of vital importance is provided by the indefinite troubles of the breast in women of over 40. Here, as in similar troubles in the abdomen of men a decade older, the first question to be faced and answered is that of possible malignancy. But whereas in the abdomen we can, when doubt remains after prolonged consideration, decide to look and see, leaving things as before if cancer is excluded, in the breast we can only remove and see, and by this I mean remove the whole breast. When a woman has passed the age of 40 she has passed the time when any local operation on the breast is safe. I say this because one lesson which we can apply to our daily task appears to emerge from the large amount of pathological research which has been done within the last decade; that changes which occur in the female breast after the peak of the child-bearing period, be they degenerative or malignant, are prone to occur simultaneously in many parts of it, and any such change sufficiently advanced to be appreciated by our senses is not an isolated lesion but a sample of what the rest of the breast holds in a less obvious form. These breasts often contain lumps which have no single physical sign suggesting cancer. The commonest form for the lumps to take is that of irregular nodules of rubbery consistency scattered throughout the breast substance, linked up to each other by intervening strands and impalpable with the flat of the hand. For these lumps I should prefer to retain the name of chronic mastitis till pathologists have ceased to differ among themselves about the aetiology and pathological nature of the different types and have agreed to hand out a classification which we may accept and teach

our students. Chronic mastitis does not call for surgery, or even for alarm, but merely for caution. I do not suggest that any woman with such a breast can in fairness be advised to forget about it; she can be told not to worry about it, but requested in a reassuring way to come for an overhaul every few months. Chronic mastitis is so common that its relation to cancer can never be assessed numerically; but there is no doubt that a breast in which the epithelial structures are pressed upon, their nutrition impaired, and their lymphatic drainage obstructed by an increase in the interstitial fibrous tissue will be more liable than a normal one to develop malignant changes. Patients, however, rarely ask for advice about such a breast, but come because a single lump has recently attracted their attention, is growing, or has become painful. If such a lump has any single character of malignancy we must neglect all signs pointing the other way and treat it as cancer. By my qualifying introduction, however, I am suggesting that it differs from all other lumps we may find in the breast only in being palpable with the flat of the hand; it is not hard, nor is the shape, contour, or mobility of the breast in any way different from that of its fellow. Such a lump is almost certainly a cyst. The patient wants us to remove it. To agree will be easier for her and for ourselves, for it relieves her fears and establishes our position as men of decision. You must all be familiar with the patter of the lump remover.

"I feel certain, my dear Mrs. Smith, that there is no need to worry in your case, but I know that your anxiety comes from a knowledge that many lumps in the breast of women of your age, harmless at first, later undergo changes of the most serious nature. I would far rather see a patient sufficiently alive to these possibilities to be unnecessarily afraid than one who remains complacent till the chances of cure are long past. But while I feel convinced that this lump of yours is innocent in nature you will realize that that is no more than my opinion, for what it is worth, and that the only final answer is that given by the microscope. I should therefore strongly advise you to submit immediately to a small operation for its removal, an operation without risk, that can, if you wish it, be done under local anaesthesia. In this way alone will it be possible to get an unequivocal verdict and to set your mind, as well as my own, at rest."

The summing-up is excellent, the judgement wretched. The lump we feel is one of a countless host scattered throughout the breast, differing from the others only in being distended to a greater extent with fluid, but not therefore any more or less likely to show early malignant changes. To remove it is neither treatment nor diagnosis, nor is it even decision. It is akin to the policy of the president of a South American Republic who would seek to scotch a revolution by shooting the fattest of his opponents. The lump is either precancerous or it is not precancerous. If it is, the whole breast should be removed; if it is not, its excision is not only unnecessary but gives a false sense of security which will often cause the subsequent appearance of malignant change to be ignored till too late. A similar problem is presented to us by discharge, serous or blood-stained, from the nipple. Such a discharge may be due to chronic mastitis, to duct papilloma, or to duct carcinoma. If there is a lump in the lobe drained by the discharging duct we cannot say that it is papillomatous or malignant till the signs of wider involvement appear; if there is no lump any diagnosis is no more than a guess. But discharge from a duct means irritation in an epithelial-lined tube, irritation leads to proliferation, and proliferation in time assumes the characters of unrestrained growth. Discharge from the nipple calls for decision rather than diagnosis; and that decision must be between further observation and excision of the whole breast and its fascia.

Two Main Considerations

I realize that my views about the doubtful breast are drastic, but if they are right they must be accepted. Two considerations may make their acceptance easier. First, when we come to deal with the treatment of cancer we discuss various alternatives—radical surgery of different types, irradiation in one of its many forms, or a combination of the two methods—in the attempt to find that plan which carries the greatest chance of cure. But we know that in the long run our successes will seldom be more than 60 per cent., and we can never be certain that we shall succeed with any particular patient, however localized the disease may appear to be. With precancerous conditions, on the other hand, we can, by a much more limited removal, guarantee success in 100 per cent. carried to any number of decimals. Returning to my simile of the revolution—and no comparison could better fit cancer where one group of cells combines to attack the corporate body, with the probability that both whole and part will be involved in the eventual ruin—we may compare the usual method employed to deal with such uprisings—to attack the insurgents after revolution has broken out with the much more scientific prophylactic method evolved in Russia, that of exterminating (liquidating is the correct political euphemism) the whole social stratum in which discontent might arise before the first hint of trouble. This method, after all, is the only safe one; it has meant the slaughter in cold blood of some three million innocent people, but it has made Russia safe for communism.

The second consideration is that the operation which is adequate to deal with a precancerous breast is limited, slightly, and far less severe and dangerous than that which will be required when cancer has appeared. It involves the removal of all breast tissue, of the pectoralis fascia in which the main lymphatic channels lie, and preferably of the anterior axillary glands in addition, but not of the muscles or of any more skin than is necessary to fashion flaps that will clothe the chest without redundancy when the breast has been removed. It can be accomplished through a low curved incision placed horizontally, and will leave a scar that is invisible, even in the best night clubs or on the beach at Juan les Pins. We are, however, treating the patient rather than the disease, and we may be forced to local removal of a lump if we realize that she will otherwise fly to some quack remedy. But the ordinary sensible woman will accept the reasonableness of our advice and be content to report for examination at regular intervals, content in the knowledge that we shall recommend more drastic measures only when they are necessary. Should we see any danger sign, such as unilateral alteration in the shape of the breast, or of the orientation or level of the nipple, we must give this advice even though the lump itself remains unchanged.

Conclusion

I have tried to suggest a point of view rather than to lay down rules, as indeed it would be most unfitting for me to do. To us our profession is more than a trade: it is our life, an expression of our humanity. That humanity has three aspects—science, art, religion; we know, we feel, we believe. But the third, which is perhaps the most important of all, which underlies the others, is least often acknowledged. Many writers speak of the science and art of medicine, but none since Sir Thomas Browne has written of the religion of medicine. The three are necessary to a sane and balanced whole; for just as science and religion without art produce the fanatic, art and religion without science the mystic, so science and art unleavened

by faith produce the virtuoso, the technical expert. The faith of medicine is expressed in the Hippocratic oath. "The course I adopt shall be for the benefit of my patients, according to my ability and judgement." The welfare of the patient is the end we seek in surgical decision, which thus becomes the surgeon's religion, a faith that must sometimes repudiate science and transcend diagnosis.

CHRONIC MENINGITIS IN WEIL'S DISEASE

BY

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This note describes a case of Weil's disease associated with chronic meningitis, and is of interest not only because the first evidence of meningitis was observed four months from the beginning of the disease, but also because leptospira were recovered from the cerebro-spinal fluid six months and from the urine of the patient eight months after the onset of the illness. The patient was a farm labourer aged 35 years, and his illness is summarized in the following notes.

History of Illness

The patient lived in Ireland until a year ago, when he came to England to work on a farm near Lancaster; his work does not appear to have exposed him in any particular way to the risk of a leptospiral infection, but there were many rats about the farm. Until December, 1935, he had always enjoyed good health.

He was admitted to a hospital in Lancaster on December 16th, 1935, suffering from a febrile illness which had begun between one and two weeks previously. He was jaundiced, and *Leptospira icterohaemorrhagiae* were found in the urine. Within a week of admission the temperature fell to normal, but there was a further slight rise about the tenth and eleventh days, after which the patient's condition improved and the jaundice gradually disappeared. The attack was apparently typical Weil's disease, but recovery was not complete, and early in January there was a slight irregular fever. He was given an intravenous injection of 0.1 gramme of sodium potassium bismuth tartrate on January 25th, 27th, and 31st, but as this was followed by a severe fever, with a temperature of 103° F. on February 4th, and later by an itching scaly eruption all over the face, trunk, and limbs, no further injections were given. The rash slowly disappeared, but he had a moderately severe and irregular fever until the beginning of March. His temperature then became normal, and he improved sufficiently to be allowed out of bed although he still remained in hospital. Towards the end of March the fever recurred, and early in April, just over four months after the date of his admission, he began to suffer from severe headaches. The headaches were at first relieved by simple remedies and later by lumbar puncture, but finally such measures produced only slight and transient relief. The patient's vision then began to fail, and the temperature was persistently swinging each day between 99° and 101° F., the headache became intense, and the general condition was obviously becoming very serious. The cerebro-spinal fluid was examined on May 14th, and was found to be under increased pressure and to contain an excess of cells; the Lange curve was 0001221000 and the Kahn reaction negative.

The cause of the meningitic reaction was not determined, and as the patient's condition was steadily deteriorating he was transferred to the Liverpool Royal Infirmary, where he was first seen by me on May 20th.