An Address ON HAEMORRHOIDS.

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DURING last year the subject of haemorrhoids excited some controversy in the columns of the BRITISH MEDICAL JOURNAL, and was left, as I have always felt, in a very unsatisfactory state. Whilst we, the contributors to that discussion, each expressed our own views in a very decided manner, we gave little or no reason for the faith that was in us, and the divergence of opinion was very great—quite sufficient to puzzle those who, perhaps, had not paid special attention to the subject. It might very well confuse younger operators, and lead to a vague impression that the choice of methods was a matter of no importance and depended chiefly upon personal fancy or the accident of the particular school in which the operator was educated, whereas I hope to be able to show that the final decision should be based upon important and easily demonstrated factors.

In that discussion were to be found men of high surgical attainments and of undoubted authority in operative work, not merely expressing a preference for the ligature or clamp and cautery methods in the treatment of haemorrhoids—methods which must depend for their freedom from relapse upon the personality of the operator and his own personal judgement, but declaring that the Whitehead operation—the only one which entirely removes the dilated and dilatable structures, thus ensuring future immunity—was the worst possible operation, associated at the time with great and unnecessary loss of blood and very liable to be followed by incurable organic stricture of the anus, a condition which, if incurable, is, without doubt, a miserable result.

I wish to examine especially this latter statement, for upon its truth or error will probably depend essentially the course which operators are likely to take in the future. Is the Whitehead operation one which, if properly performed, should leave the patient exposed to such a result, and, if such a result should unfortunately occur as a consequence of imperfect technique, is it incurable?

I presume it may be taken for granted that all are agreed that, other things being equal and the dangers of unpleasant after-effects being eliminated, the method which is most certain to ensure complete return to health without danger of relapse is the method of choice.

When men differ, it is frequently possible to show that the difference has arisen either through some misconception of the meaning of a word or some difference in the point of view of the constituent factors of the condition upon which dispute has arisen; when once this has been made clear the difficulty disappears.

Some such explanation, I believe, may be found in a possibly different conception of the anatomical factors present in this condition.

To begin with, we may at once exclude from consideration the (so-called) arterial pile, which is really a naevus, and which differs entirely in causation, almost entirely in symptoms, and greatly in treatment. This condition is entirely outside the scope of our subject.

Venous haemorrhoids (common piles) are varicose dilations of the veins composing the internal haemorrhoidal plexus, a network of intercommunicating veins which lies beneath the membrane lining the anal canal and the rectum; this plexus occupies a potential space bounded by the white line at the anal margin below, this membrane within, the muscular wall without, and a line above at which efferent veins pass through the rectal wall to join the superior haemorrhoidal veins. This level is nowhere clearly defined, some authorities placing it higher, some lower. Fortunately this is of no importance, since though such a description may be anatomically

correct, surgically it does not accurately define the position.

This internal haemorrhoidal plexus is very clearly divisible into two distinct parts, the lower extending from the anal margin to the level of Morgagni's valves; this is the *portion périneale* of Testut and Jacob. The veins entering into its formation communicate much more freely with each other than in the segment above, forming a closely-meshed network, and emptying themselves almost completely into the inferior haemorrhoidal vein through branches which pass below, through, and immediately above the external sphincter, those at its upper extremity perforating the internal sphincter directly between the external sphincter and the attachment of the levator ani (see schema).

The upper part of this plexus, widely meshed, and with but few intercommunications, lies above the level of Morgagni's valves and ends above in more or less straight veins, the "terminal" veins which empty, as I have said, into the superior haemorrhoidal veins and so into the portal system; with this upper portion, although it is of great importance when the question of causation is under consideration, the surgeon has but little to do when discussing methods of treatment.

It is the lower segment, the *portion périneale*, upon which it is necessary to concentrate our attention.

The lining membrane of this lower segment is not formed from the hypoblastic layer which develops into the primitive gut; it is primarily an epiblastic structure, and formed out of tissues which elsewhere develop into skin and subcutaneous tissue; these two originally distinct formations, the proctodeum and primitive gut, come into contact and fuse together about the end of the fifth week, when the anal plate, which is gut on one side and skin on the other, becomes absorbed and disappears. The level of this plate in after-life is marked by the pectinate line, the line of Morgagni's valves, the line of the upper border of the *portion périneale* of the haemorrhoidal plexus.

We are all, if we think about it at all, apt to consider the lining membrane above the white line at the edge of the anal opening as mucous membrane—to look upon it as the same in structure as the mucosa above the pectinate line;

After Testut and Jacob, modified to show pectinate line.

little, if any, stress is laid upon the difference in anatomical books, still less upon the possible effect that this may have upon surgical work in this region, whilst in most writings dealing with operations the authors distinctly speak of it as "mucous membrane," yet it is evident that there must be an essential difference, a difference not only in the internal membrane itself, but in that immediately underlying it, the layer in which this perineal portion of the internal plexus lies, in which it dilates, and from which it has to be removed. Are these two layers extending through two-thirds of the anal canal, from the white line below to the pectinate line above, mucosa and submucosa or modified skin and subcutaneous tissue?

At first sight this inquiry may seem unimportant, but the characters of the two sets of tissues differ widely; throughout the whole intestine down to the pectinate line the submucosal coat is the most resistant of all; it is from this in animals that the tough resistant catgut is made; it is through this coat that all sutures must pass upon which the surgeon may rely for anything like firm union between divided gut or for security against leakage after such operations as lateral anastomosis or gastro-enterostomy; or perhaps with most likeness to the operation under discussion, as gastrostomy, an operation in which union is sought between skin and internal intestinal wall. Sutures carried merely through mucosa will cut through at once, sutures carried through muscular or serous coats will tear out as soon as or quickly after peristalsis is started; it is only if they grip the submucosa that they can be depended upon to maintain the divided intestinal wall in firm apposition either with itself or with the skin. The characters of subcutaneous tissue are almost the very reverse. This tissue is loose, easily torn, easily distensible; in its loose meshes vessels can easily dilate, whilst it cannot in the least be depended upon to hold sutures.

But it may be said that union between the two occurs so early in development that fusion between them is so complete as to result in a perfect transformation of these tissues down to the white line which marks the junction of what has now become skin and (apparent) mucosa. Is that so? Can we obtain any justification for such a view from any other pathological change which affects this region? I believe that we cannot; on the contrary, if carcinoma starts in the lining membrane below the pectinate line it has all the characters of cutaneous carcinoma with squamous cells; if above, those of intestinal with columnar cells. So that from the embryological, developmental, and pathological points of view the pectinate line would appear to be of supreme importance.

Fortunately we can appeal also to more direct evidence. Vertical sections of the rectum and anal canal show that the lining membrane of the anal canal up to the pectinate line is an atrophied and modified skin without hair follicles or glands, but still a true skin with stunted papillae, thin fibrous layer, and a squamous epithelium, essentially different to the mucous layer seen above this line. But it is extremely thin, very undeveloped, and as a tissue capable of holding sutures it is almost as unreliable as the subcutaneous tissue below it.

There are one or two other anatomical features which are worth a moment's consideration:

First, it will be noticed that the veins lying below the pectinate line empty through efferent veins, which are peculiarly liable to pressure; thus the lower efferent veins pass between the skin and the lower edge of the external sphincter. In the sitting position, the one in which many men and women pass a great deal of their time, this pressure may easily become important, especially when the normal amount of fat about the part becomes absorbed, and we know in fact that piles are more common in those who pursue a sedentary occupation, in cyclists, horsemen, and clerks, and in these more often after than before middle life. The middle efferent veins pass directly through the external sphincter muscle, any extreme contraction of which must have some effect in delaying the venous flow, and this contraction, if persistently repeated, will prove a very efficient factor. The upper efferent veins pass through the internal sphincter, and then are liable to be compressed between the external sphincter lying below and the levator ani fibres lying above them. Both these must be especially effective in that form of chronic constipation associated with a loaded and distended rectum,

and, as a matter of fact, we find piles most frequent under such conditions.

At the level of the pectinate line, moreover, the venules which lie along the upper edge of the perineal portion are normally distended into small pouches—"ampoules," as Testut calls them; "glomeruli," as they are termed by Bergmann—which form, says Testut, a sort of irregular crown around this part of the inner wall of the intestine, and it has been suggested that they are frequently the starting points for haemorrhoids. But it may be said that all this is well known and that if in operative works it is not mentioned it is because it is so well known as to be taken for granted. Possibly that may be so, but is full weight given to that knowledge in the directions of the author or in the action of the operator? If so, how is it that authors still advise the ligature method or the clamp and cautery, the principles underlying which simply ignore or contravene these facts? Or is it that there has been, as Maeterlinck says, a failure to connect, a sort of blind spot in the mental retina of those who advocate these methods and denounce the more radical one?

This "failure to connect" is a very curious phenomenon; we are all liable to it. It is very probable that even in this very address I may have overlooked some equally obvious connexion, but that does not invalidate the importance of the one which it has been my object here to render clear.

From what has already been said, it will be evident that not much importance is attached to the classification of piles into internal, external, and mixed, since the actual position of a pile at any particular time is merely a question of development. All haemorrhoids lie originally above the level of the external anal edge, though in one case the veins first affected may be in the upper, in another in the lower part of the perineal portion; if in the lower, they will the sooner make their appearance outside; if in the upper, they may cause much discomfort before they are seen so long as the sphincter is closed, but they are all varicose dilatations at various points of the same network, produced in the same way, and amenable to the same treatment.

It is not necessary to say anything as to the diagnosis of piles; that is only too fatally easy—so easy, indeed, that every layman considers himself able to make it—but it is even yet, perhaps, wise to repeat the old warning against accepting such a diagnosis. It is a curious fact that in the last dozen cases sent to me for operation, in 2 there was inoperable cancer of the cervix, which had spread into the broad ligament; in 1 there was rectal cancer, whilst in another there was an impacted subperitoneal pedunculated uterine fibroid, without the removal of which any mere removal of the piles so produced would have been useless. In all cases one must repeat the old advice that, prior to any operation, careful rectal—and, in a woman, vaginal—exploration by a finger should be made, aided, in case of any doubt, by the dilating speculum or proctoscope.

But, the diagnosis made, how do the previous statements affect the whole question of haemorrhoids?

In the first place, they explain the great readiness with which the dilating vessels expand—the layer in which they lie being connective tissue, which supports them but feebly, and yields far more easily to their distensile force than would have been the case were it true submucosa.

Secondly, they emphasize the necessity for the removal of the whole perineal portion of the internal haemorrhoidal plexus up to and beyond the level of the pectinate line; the removal or obliteration of individual members of this network by ligature or cautery cannot be considered likely to prevent recurrence, as all the other portions of this segment of the plexus remain under the same conditions as those which permitted the original dilatations; it is otherwise with the upper segment of the plexus, because that is supported by the tough true submucosal layer.

Thirdly, they emphasize the necessity for freely loosening and bringing down the submucosa above the pectinate line.

Those who object to the entire removal of this segment of the venous plexus do so because in the cases they have seen the sutures uniting the inner membrane, this membrane which we have seen is atrophied skin and subcutaneous tissue, with the more developed and therefore more resistant skin outside, have torn through the former;

the remains of the inner membrane have retracted and exposed a ring more or less broad of raw subcutaneous connective tissue. This ring has necessarily healed by granulation and the formation of a wide area of scar tissue which has naturally contracted during the later stages; and so the so-called incurable anal stenosis has been produced.

The whole later process is due to the tearing through of the sutures applied; such tearing through depends on the material through which the sutures pass; if that material is atrophied or non-developed skin or subcutaneous tissue, nothing else can be expected, but if the true submucosal coat above the pectinate line is loosened and brought down, a structure is obtained which may be depended upon to hold sutures for a sufficient time and with sufficient firmness to obtain direct union and to eliminate any possibility of a raw area.

Incidentally it may be interesting to note that the "sentinel" pile which marks the lower point of a "fissure" is the torn-down end of one of these Morgagni's valves, and that the reason of the acute pain felt in this condition is also to be found in the conformation of the anal canal, which has been described; the torn-down valve exposes not submucous tissue supplied by the sympathetic system of nerves, but subcutaneous tissue in which are systemic nerves of sensation, the ends of which will be exposed by the dragging down of the valve, and in consequence the rational treatment is not simple division with a knife as is usually advised, which opens up fresh planes of raw, absorbent connective tissue, but division with a small electric cautery knife, which seals all lymph spaces as it divides them and at the same time kills any nerve end which may be exposed.

I shall not discuss the details of the operation, but there are one or two points on which it may be worth while to spend a few moments.

First, it is doubtful if sufficient stress is laid upon the preliminary dilatation of the sphincter, which is necessary in order to secure free evacuation afterwards. For this purpose I find a modification of Allingham's instrument the most convenient. The long levers which I have added permit the actual dilatation to be made by the muscles of the surgeon's own hand, which can thus accurately gauge the amount of force under which the sphincter will yield but not tear. The ratchet and screw which I have also added permits of the retention of any given amount of dilatation whilst the surgeon's hand is resting. This part of the appliance must, however, never be used to produce dilatation, but only to maintain it.

Secondly, as the dilated venous loops cling most closely to the inner lining membrane they are easily cleared away from the loose subcutaneous tissue around the sphincter. All loops which have insinuated themselves between the outer skin and sphincter muscle must be removed, and the entire sphincter should be clearly defined before any attempt at transverse section of the collar so isolated is made.

Thirdly, there must be no attempt to lock up the bowels after these operations. Faeces will have to be passed sooner or later. Which is the wisest, to secure the regular passage of small quantities which are soft and easily moulded, or to wait until these amounts have accumulated into large, hard, irregularly shaped masses, certain when they once come within the sphincteric grip to be forced through with all the reckless force which one knows will then be exerted? Which is the most likely to tear through the soft uniting line and to leave the raw surface which must cicatrize?

It is true that such an authority as Sir Charles Ball, in his recent work on *The Rectum*, still advises that "the bowels should be confined until the fourth day," and that Bergmann, in his *System of Surgery*, one of the latest published, directs that "no action of the bowels should take place for eight to ten days, in order to prevent infection." Surely anyone who gives such advice can feel no sense of security as to his mode of union, no certainty that his uniting tissues cover and may be trusted to continue to cover the whole area of possible raw absorbing surface. Looking back over what has already been said, it is easy to see how this may be; if the sutures are passed through this unreliable tissue they are almost certain to tear through and raw patches become exposed, but the true Whitehead operation properly carried out

ensures that all round the anus tough submucosa will be united to skin, opposing an impervious barrier to any infective particles which are likely to come in contact with it. It is not infection, but injury, against which we have to guard in the post-operative treatment.

It is easy to keep this uniting line clean by warm mildly antiseptic douches after any passage of faeces; much easier than to protect the line of union of an enterorrhaphy or gastro-jejunostomy from the equally infective material which must pass over them, and remain in contact with them immediately after those operations, yet to the surgeon, secure in his knowledge that the submucosa on all sides is firmly gripped by his sutures, no anxiety on this score seems ever to have occurred.

The action of the bowels should therefore be ensured from the first by the giving of some mild laxative such as confection of senna, liquorice powder, or a saline.

Of simple haemorrhoids operated upon by Whitehead's method, I have had 127 cases—78 males and 49 females; the first of which I have any notes occurred fifteen years ago, though there must have been earlier ones. There has, of course, been no mortality; one can hardly conceive of death following such an operation at the present time in any suitable case. With one exception I have never seen any organic stricture following one of my own cases. I have, however, noticed in some seven cases about the third week a thin contraction like a fine thread at the line of union. This is dilatable with great ease if detected at once, and once dilated does not return. It appears to be due to some idiosyncrasy on the part of the individual, since in 120 cases it never occurred. It is a matter of no moment, since it is so easily remedied.

The case in which organic stricture did follow was one simply due to faulty technique on my part. The patient was a man with old endocardial mischief; the anaesthetist was not very experienced, and during the operation it became evident that he was in difficulty and extremely anxious; the latter part of the work was consequently hurried; the skin and submucosa were not well united; a month later the patient returned with a tight anus; the mucosa had evidently retracted and there was a well-marked ring of scar tissue around the lower end of the anal canal, a very typical example of the so-called "incurable organic stricture." Fortunately my patient believed in me in spite of my bad work, and this time my anaesthetist was one who had had a large experience; the necessary time being thus secured, the scar tissue was dissected out, leaving the sphincter and skin intact, after which the mucosa, of which there is always plenty, was freely loosened, brought down, and firmly fixed by sutures, which, passing through the tough submucosa, held it securely until healing was complete. This time the result was all that could be wished, and no sign of relapse has since been seen; the anus has functionated perfectly. The last operation was eight months since. Since this case I have operated upon another, the primary operation having been done by another surgeon, in the same way with the same result.

This, then, is the reply to the "incurable stricture" indictment. It is, of course, possible that, in consequence of some incredibly bad technique, a condition might be produced which might be beyond remedy, but such a result could not fairly be attributed to the Whitehead operation, whilst in most cases the removal of scar tissue, the free loosening of mucosa, and especially of submucosa, and its careful union with the skin below will ensure success.

As to results, I have never, with this one exception, been asked to repeat the operation on the same patient, though frequently to perform the same upon some friend or relation; I cannot recall a case in which any further relapse has occurred, except one in which I had not entirely removed the whole perineal portion, and therefore had not carried out the principles now advocated; it was one of my earlier performances, and I did not then realize their importance. But every one knows that an operator sees the bad results of other men, and that other men see his, so I requested Mr. Braham, my house-surgeon, to ascertain, if possible, the present condition of some half-dozen hospital patients, taken indifferently, who had undergone this operation more than three years ago; whilst, at the same time, I wrote myself to a similar number of private patients; this length of time was chosen on the one hand in order to allow sufficient time for any bad effects to show them-

solves, and on the other to get at hospital inmates who change their addresses with wonderful frequency. Unfortunately, the only one of this class from whom any response has come is from a relative of the patient, who appears to have died about a year ago, two years after operation, from some not mentioned disease. With private patients one is, of course, more fortunate.

1. Male, aged 45, who had suffered for six years. Operated February, 1907. Writes: "Never better in my life; no difficulty with the bowels since; only wish it had been done years before."

2. Female, aged 30. Operated May, 1906. Had piles for two years; commenced after second pregnancy. "Am perfectly well."

3. Male, aged 50. Operated June, 1907. Son writes: "Father died last month of pneumonia. So far as I know, he had no further trouble in that way after you operated."

4. Male, aged 63. Operated June, 1896. Had suffered for nine years and was greatly enfeebled by loss of blood. Daughter writes: "Father died in 1904, from apoplexy" (that is, eight years after operation); "but was very well and hearty until six months before death; he never had any more trouble with piles after his operation."

5. Female, aged 25. Operated June, 1905; three weeks after complained of some difficulty in defaecation; thin constriction mentioned above found and dilated. Writes: "Have had no further trouble with the bowel; have had three children, and am quite well."

6. Male, aged 22. Suffered with much pain but little haemorrhage for two years. Operated November, 1903. Father writes: "My son has gone out to Venezuela, and on last advices was doing well; so far as I know he has had no return of piles."

And so I might go on; but these are probably sufficient to show that Whitehead's operation, if properly performed, yields perfectly satisfactory results.

To sum up, the points which it is wished to emphasize are:

1. The radical method of obliterating the perineal portion of the internal haemorrhoidal plexus (Whitehead's operation) is the one method which can be relied upon to prevent any return of the condition.

2. In order to carry this out effectually the whole perineal portion of this plexus up to the pectinate line should be removed, and the submucosa beyond brought down and firmly fixed to the skin.

3. Failure to do this is at the root of organic stricture of the anus following an operation.

4. In many, at least, of the cases of organic stricture following operation, dissection out of the resulting scar tissue, freeing of the external sphincter, and bringing down of the submucosal layer to the skin will result in a cure.

THE OPERATIVE TREATMENT OF CARCINOMA RECTI.

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SOME reference must first be made to the pathological anatomy of carcinoma recti in its relation to the nature of the operation necessary for removal of the growth.

Rectal cancer, except in young subjects, does not possess a high rate of malignancy. It is much less than that of the tongue, breast, or stomach, largely because the rectum is a "self-contained" viscus. Its mucous membrane is enclosed by muscular walls of some thickness, and it is further isolated by the strong fascia propria, one of the visceral layers of the pelvic fascia. Very extensive cancerous ulceration of the rectum frequently exists without this fascia being invaded or transgressed. At its lower end where it joins the anal canal this isolation ceases, owing to the insertion of the levators, and lymphatic communication is here much freer along the intersecting muscular fibres. Hence cancer at the lower end of the rectum infiltrates the surrounding tissues more quickly, and is more likely to recur after removal, however freely this may be done. The prognosis is better in high growths than in low ones. It follows, therefore, that in low growths no attempt must be made to save the anal canal or sphincters. To save the anus may be desirable enough from the point of view of the subsequent comfort

of the patient, but it must not be allowed to endanger his safety, and should not be done if the lower edge of the growth is within 3 in. of the anus.

The arrangement of the lymphatics also helps to prevent or to delay widespread lymphatic invasion. After a very short course the primary lymph vessels end in a compact group of pre-sacral glands, and from these a definite narrow track leads upwards to the abdomen. Compare this with the tongue, where glandular metastasis occurs so very early, where there are numerous lymph vessels, anastomosing freely, leading to three groups of primary glands, which in their turn communicate freely with the glandular chains in the triangles of the neck.

Rectal cancer spreads chiefly by local infiltration of the muscular and fatty tissues immediately subjacent to the growth. Close as they are, invasion of the sacral glands is not an early occurrence, and even when enlarged glands, that look malignant, are found in an excised rectum, their infection must not be taken for granted. I have frequently found that such glands on microscopic section prove to be only irritative.

There is need of further investigation on this subject, but I think sections of all the glands from a series of rectal growths would prove that glandular invasion is not widespread in the stage early enough to be operable.

Further evidence of the spread of the growth by local infiltration is afforded by the mode of recurrence. Patients die either from local recurrence in the tissues around the scar or from metastasis in the liver. Out of six cases dying of metastasis in the present series, five recurred locally, one had both local recurrence and in the liver, and one metastasis in the liver only. I do not know of any case where the lumbar glands have been extensively infected. Emboli of cancer cells escaping from the primary growth pass much more readily into the venous blood stream than by the lymph path.

The advocates of the abdomino-perineal operation maintain that the radical scientific operation for rectal cancer demands not only the removal of the rectum and the pre-sacral fat and glands, but also the pelvic colon with its mesocolon and the secondary glands about its line of attachment. I do not think this is warranted by the evidence of the mode of spread and of recurrence in so far as they have been yet demonstrated. It rather tends to show that removal of the rectum, anatomically complete, together with the lowest portion of the mesocolon, is as likely to prove satisfactory as when the more extensive dissection is carried out. I am not satisfied that removal of the whole pelvic mesocolon is necessary. This structure has a V-shaped attachment, the upper limb of which passes horizontally along the left lateral wall of the pelvic brim, over the iliac vessels inwards to the middle line to the sacral promontory. The attachment then turns vertically downwards along the front of the sacrum as far as its third segment, constituting the lower limb of the V. It is this portion which contains the emissary lymphatics of the rectum, and these, at the apex of the V, continue upwards into the retro-peritoneal tissue of the posterior abdominal wall around the bifurcation of the aorta, where complete removal is impracticable. The upper portion of the mesocolon does not contain the rectal lymphatics, and the good results following its complete removal would appear to be due rather to the absence of invasion than to more radical extirpation attained thereby.

The rectal growth tends to spread round the circumference of the gut, rather than upwards or downwards to any great extent. In low cases the anal canal and skin of the anus occasionally become involved, and I have seen a secondary growth in the skin of the perineum $1\frac{1}{2}$ in. from the anal margin. Unlike rectum proper, ulceration of the anal canal is likely to be quickly followed by glandular infection—in this case, of course, the inguinal glands.

Of greater importance is the zone above the upper edge of the growth, and it is essential that a wide margin of apparently healthy tissue above the growth should be removed. This means that never less than 8 in., and in many cases 12 or 14 in., of bowel must be excised. Most operators would, I think, consider this sufficient in the case of the ordinary ampullary cancer, but some of them doubt whether this can be done and the pelvic colon brought freely down except by the combined method of