An Address ON GENITAL DISPLACEMENTS.*

BY

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THE PELVIC FLOOR AND THE PELVIC SHELF.

SINCE the cure of all deformities and displacements must be founded on a correct understanding of the anatomy of the parts concerned, I will begin by reminding you of the structures that keep the female genital canal in position. They may be divided into three groups as follows: (1) The broad ligaments with all the structures contained within them that are attached to the body of the uterus. (2) The cardinal ligaments and pubo-cervical musculo-fascia, which collectively I call the "pelvic shelf." (3) The levatores ani and other muscles that close the outlet of the pelvis, together with the fascial layers in relation to them; the whole being named the pelvic floor.

The first of these three groups is the least important, for the broad ligaments have no great fixing power on the uterus, but merely, so to speak, steady it like the guy-ropes steady a tent pole, though its main support is the ground into which it is driven.

The second group is of far greater importance, for the cardinal ligaments not only keep the vagina in its normal position, but also hold the cervix. They spring from the sides of the vagina, from its vault down to the upper surface of the levatores ani, and it is this arrangement that makes the lateral walls so fixed. They spread out fan-shaped, to become attached to the lateral pelvic wall on each side along the so-called "white line," like the wings of a butterfly whose body is formed by the vagina and the musculo-fascias which ensheath it, the whole forming a shelf of considerable rigidity, projecting out into the pelvic cavity. On the upper and anterior surface of this shelf the bladder and ureters lie, and its posterior surface is separated in the mid-line from the rectum by a thin layer of loose cellular tissue, whilst at the sides it is separated from the lateral rectal ligaments and upper surface of the levatores ani by wads of fibro-fatty tissue. The reality of this structure which I have ventured to call the "pelvic shelf" can only be appreciated by deep dissection such as has to be undertaken in Wertheim's operation. It is of great importance, for on it the position and stability of the cervix and vagina and bladder depend. The plane in which it normally lies is roughly parallel to, though considerably below, that of the pelvic brim.

The pelvic floor, on the other hand, lies in a plane which, in the standing posture, is practically horizontal, and therefore at an angle of about 45 degrees to that of the pelvic shelf. Its function is to support and fix the lower ends of the rectum and vagina respectively, and that part which supports and fixes the vagina is not only the weaker portion, but it is much more liable to be injured in the process of childbirth. Weakness leading to yielding, either of the pelvic shelf or pelvic floor, or of both together, is the fundamental cause of uterine and vaginal displacement, and therefore, in determining the measures to be employed for their cure, it behoves us to find out in each individual case which of the two structures I have described is primarily at fault.

THE MECHANISM OF RETROVERSION.

Retroversion may come about in one of three ways. In the first the fault lies solely with the broad ligaments, which, being weak, allow the body of the uterus to be

unduly mobile. In the second there is weakness of those upper fibres of the cardinal ligaments which fix the cervix at its juncture with the vagina. The result is that the uterus is loosely set into the vagina, and in recumbency it tends to drop back towards the hollow of the sacrum. This tendency is no doubt resisted by the broad ligaments if they themselves are normal; but just as the guy-ropes would not long hold a tent pole once it had come out of the ground, so sooner or later the uterus falls back. In this class of case the uterus is not merely retroverted, but is lower in the pelvis than normal. The third way in which retroversion of the uterus can come about is by the whole pelvic shelf retroverting. This displacement of the uterus is sometimes called "retroposition," but the term seems to have been coined without understanding the processes at work, and without noticing that in these cases *the vagina is retroverted as well*. Cases of this deformity are constantly mistaken for cystocele because, on looking through the vaginal entrance, the anterior vaginal wall is seen immediately behind it, and much lower than normal. On straining it may even partially protrude, but this is not because it is bulging abnormally, but because the axis of the canal is tilted back so far that the anterior wall only requires a normal degree of bulging to reach the orifice.

THE MECHANISM OF PROLAPSE.

Prolapse in its essence is the vagina beginning to turn, or actually completely turning inside out. The uterus not only plays no active part in this performance, but actually passively resists it. In other words, the vagina can turn inside out more easily if the uterus is not there, and this is the reason why the greater degrees of prolapse are mostly seen after the climacteric, when the uterus has atrophied. For a hollow viscus to turn inside out an initial bulge inwards of some area of its wall is necessary, and in the case of the vagina this bulge practically always starts either on its anterior or its posterior wall, or its vault, for the lateral walls, by reason of the cardinal ligaments attached to them, are too rigid to bulge. The exact position of this initial bulge or "dropping" depends on which part of the supporting apparatus is yielding under the intra-abdominal pressure.

In normal circumstances the axis of direction of the intra-abdominal pressure during straining is downwards and backwards behind the uterus into Douglas's pouch, into which coils of small intestine may be forced, just as they are forced into a hernia sac when the patient coughs. This happening not only compresses the rectum against the sacrum and forms an important factor in the act of defaecation, but the pressure being applied behind the uterus and the pelvic shelf, the uterus, the vagina, and the whole shelf tend to be pushed forwards and slightly upwards, so that so long as the posterior vaginal wall is equal to the strain, no abnormal bulge into the vagina occurs. When, however, the uterus is retroverted, and more especially when the vagina is retroverted as well, the axis of direction of the intra-abdominal pressure is forwards of the uterus, and the pressure is chiefly exercised in crowding down coils of intestine on to the back wall of the bladder, and on to the pubo-cervical musculo-fascia and vaginal wall which lie immediately beneath it. The result is a tendency for the anterior vaginal wall to bulge abnormally, and this is rendered the more easy if the pelvic floor has been so weakened in its anterior part that the vagina gapes. The point at which the primary bulge occurs differs in different cases. Thus it may be situated at its upper part only, the anterior vaginal vault—that is, that portion of the wall which is above the trigone of the bladder—in which case the protrusion contains no bladder; or it may be situated at that portion against which the trigone lies, in which case a true cystocele is formed; or it may be situated at its lower end, in which case the

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urethra is displaced, with the result that the patient wets herself when she strains.

Prolapse of the anterior vaginal wall is not invariably accompanied by retroversion of the pelvic shelf, or even by simple retroversion of the uterus, but it is so in the majority of cases. Moreover, a something additional to retroversion is required—namely, that stretching and weakening of the pelvic shelf, either in whole or in part, which labour alone can bring about. Thus prolapse of the anterior vaginal wall is very rare in nulliparae.

Prolapse of the posterior vaginal wall, on the other hand, is not primarily dependent on the yielding of the pelvic shelf, but is chiefly brought about by post-parturient weakness of that part of the pelvic floor which supports its lower end. As a result, every time the woman strains this lower attachment is pulled down by the bulging floor, and the posterior vaginal wall becomes elongated so that it droops forwards into the vaginal lumen. At this stage the protrusion is not accompanied by a protrusion of the rectum, the vagina merely slipping down on the front of the rectum. Presently, however, the rectum, deprived of its support in front, commences to slip down the face of the sacrum and buckle forwards, so that the protrusion becomes a true rectocele. This buckling forwards of the rectum depends on the posterior part of the pelvic floor maintaining its stability, for if it bulged too, a rectal prolapse, and not a rectocele, would result. The protrusion is rendered the more easy because of the gaping vaginal orifice which the absence of the perineal body and laxity of the levatores have brought about.

There is a rare form of prolapse of the posterior vaginal wall which does not primarily depend on weakness of the pelvic floor, but is due to a bulge inwards of that upper inch which is in relation to Douglas's pouch. This form of prolapse is a true hernia of the pouch. Speaking generally, prolapse of the posterior vaginal wall, when occurring by itself, is commoner with the uterus in anteversion; and this is what would be expected, for then the axis of direction of the intra-abdominal pressure lies posterior to the uterus, and exercises an effect chiefly on the posterior wall and rectum.

Though prolapse, to begin with, is initiated by a bulge inwards of some particular area of the vaginal wall or vault, it is comparatively rare for the clinician to see the case until several areas of the whole of one or both walls are bulging, for weakness of one part of the supporting apparatus is soon followed by weakness of other parts, owing to the increased strain put on them by the failure of the primary defaulter, until in the end, all of them having failed, the vagina turns inside out.

OPERATIVE TREATMENT.

In these days, when the operative treatment of displacement has reached so high a pitch of satisfactoriness and reliability, no other treatment needs to be considered in the vast majority of cases. The exceptions to the rule are: First, cases of retroversion or prolapse discovered so soon after labour that further involution of the stretched supporting apparatus may be hoped for, if the strain on the parts be temporarily removed or lessened by the wearing of a pessary; a pessary worn this way, as a splint, pending nature's reparative processes, is without objection, but it is objectionable when employed as a permanent orthopaedic apparatus. Secondly, there are those cases of prolapse in aged persons whose physical condition is too feeble for an operation. Age by itself is no contraindication; I have operated several times on women over 80 years of age, with prolapse quite incapacitating them, when pessaries could not be worn.

From a consideration of the mechanism and varieties of genital displacement that I have put before you, one fact is immediately apparent—namely, that no one operation will suffice to cure the many varieties of deformity which come under this head. As in orthopaedic surgery in general, so in that part of it which is concerned with displacements of the genital canal in particular, the operations may be divided into two categories: those which have as their object the repair of the faulty supporting

apparatus, and those which discard it in favour of making a substitute. Thus perineorrhaphy with suture of the levatores and the fascia superficialis to them is a repair operation, because it directly mends the parts at fault; whilst ventrofixation is a substitution operation, because it discards the natural supports of the vaginal vault and replaces them with a new ligament made out of the uterus. Both repair operations and substitution operations are legitimate, and both have their own sphere of propriety and usefulness, and it is the task of the surgeon to decide which amongst them is the most applicable to the deformity present in the individual case. In the abstract repair is superior to substitution, but in practice we often have to deal, not with normal tissue, but with tissues that have permanently lost much of their original strength and resiliency, and in such cases repair may be impossible altogether, and compel absolute substitution—or, being possible, be insufficient without a degree of substitution.

Retroversion.

When operating for retroversion of the uterus we have to distinguish between the three classes of case: in the first of these the fault lies solely with the lax broad ligaments; in the second it centres round the point of insertion of the uterus into the vaginal vault, the extreme upper fibres of the cardinal ligaments being deficient; whilst in the third the defect is a weakness of the whole shelf. The first two varieties are often met with in young unmarried girls, and bear no necessary relation to child-bearing. A congenital defect is often alleged to be the cause in these nulliparous cases, but the term "growth defect" is better, for probably the fibres which should hold the cervix in its normal position fail to keep pace with the enlargement of the uterus that occurs after puberty. The third variety is, I think, always the result of child-bearing, and in these cases the vagina is retroverted as well as the uterus. For the first variety the sling operation is eminently suitable, but for the second it is not ideal, because it does not raise the uterus sufficiently, and the operation of shortening the round ligaments by retroperitoneal plication is to be preferred. In the third variety both of these operations are insufficient because they do not lift the retroverted pelvic shelf, so that though the uterus is brought forwards the entire deformity is not corrected, and later on the patient is liable to return on account of retroversion or prolapse of the anterior vaginal wall. For such cases an operation which pulls up the uterus much higher and much more strongly is needed. Ventrofixation effects this object, and to a lesser extent so does the modification of round ligament shortening that I have employed for some years, which in effect secures strong ventrosuspension from each cornu. Which of the two should be chosen in any particular case has to be decided by consideration of the exact degree of the deformity, the character of the patient's physique in general, and the texture of the pelvic tissues in particular.

Prolapse.

In the treatment of prolapse a number of operations are at our service, all of which have their spheres of applicability and inapplicability. In deciding which of them is suitable to the individual case, the surgeon has to make up his mind: (a) which part of the vagina prolapses, and therefore which part of the supporting apparatus is at fault; (b) whether there is redundancy of the tissues or not; (c) the position of the uterus and pelvic shelf.

In regard to the site of the bulge in vault prolapse and its underlying cause it is the upper fibres of the cardinal ligaments that are relaxed, and these, to an extent, can be tightened from the vagina by exposing them through the lateral fornices after having amputated the vaginal cervix and suturing them together, either in front or behind the cervical stump. The alternative is to discard them altogether and make a new vault ligament out of the uterus by ventrofixing it.

In cystocele it is the pubo-cervical musculo-fascia which is lax and needs repairing, and this can be accomplished

by anterior colporrhaphy, providing that the musculo-fascia is tautened by suture as well as the vaginal wall. When vault prolapse and cystocele are both present Fothergill's operation is suitable, for it tautens both the pubo-cervical fascia and the upper fibres of the cardinal ligaments. An alternative is to combine anterior colporrhaphy with ventrofixation. Which of the two is the better depends on the individual case, but both, when properly applied, give happy results. Another alternative is the interposition operation, which effects some tautening of the fibres of the cardinal ligaments and markedly strengthens the middle section of the pelvic shelf. When the whole shelf has retroverted ventrofixation is indicated, for it cannot be lifted except from above. Laxity of the pelvic floor is perfectly corrected by perineorrhaphy properly performed—that is to say, with suture both of the levatores and the fascia superficial to them. I emphasize this because the latter are sometimes missed.

For rectocele posterior colpoperineorrhaphy meets the case, but in that rare form of prolapse which is a true hernia of Douglas's pouch colporrhaphy by itself is rarely efficient, because the upper part of the posterior vaginal wall is defective, so that the vaginal operation had better be supplemented by obliterating Douglas's pouch from above by suturing the rectum to the back of the uterus.

The question of redundancy of tissue is important because, if it exists, the reparative operation must include the reducing of it by amputation of the cervix or excising large areas of vaginal wall. On the other hand, it is quite common to meet with cases of prolapse in elderly women in which there is not only no redundancy of the cervix and vagina, but actually a diminution of tissue, and in such, if the surgeon unthinkingly excises more, he will have difficulty in bringing together the cut edges of the frail vaginal wall—a most disconcerting experience. Since the ease with which the vagina can turn inside out depends in part on the relation between the thickness of its wall and the size of its lumen, any variety of prolapse can be prevented by sufficiently narrowing the canal. This is the effect of Le Fort's operation, which leaves the patient with a double vagina, each half of which is so narrow that in-falling of its wall is impossible. Great narrowing of the canal is, however, only allowable when the patient no longer has relations with her husband on account of age.

The position of the uterus is important, because if it is retroverted the reparative operation must include the rectification of that part of the displacement, for if it be left backwards the abnormality of the axis of direction of the intra-abdominal pressure remains as before, and menaces a further displacement. The size, or rather length, of the uterus should always be measured with a sound if one wishes to escape the error of opening the abdomen to ventrofix a uterus which is too small to be brought up to the abdominal wall—a state of affairs quite common in aged fat women. Finally, the position of the pelvic shelf must be ascertained by noting the direction of the axis of the vagina, and if it is retroverted steps must be taken to bring it up.

Conclusion.

The exact methods by which these various aims can be achieved I do not intend to discuss, because the object of this introductory paper is to summarize the basic facts of genital displacement, a full appreciation of which is a necessity if the operations for its relief are to constitute a science as well as an art. A surgeon who proclaims that the operation he employs for prolapse is Jones's or Smith's or Robinson's also proclaims himself as belonging to that considerable section of mankind who prefer to get someone else to think for them. Fancy a tailor who advertised that he corrected the bad fit of a pair of trousers by Jones's method! Gentlemen, in the matter in hand we are all tailors, and our aim should be not to carry out any particular preconceived set operation, but, in the words of Gilbert's immortal Lord High Executioner, "to make the punishment fit the crime" by employing just those dissections, excisions, readjustments, and suturings which will, if possible, leave the parts concerned "as good as new."

A Clinical Lecture ON GASTRO-JEJUNAL ULCER.*

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I AGREE with Balfour¹ that "recurrence of ulceration may follow any operation for peptic ulcer, including partial gastrectomy." Gastro-jejunal ulcer, of which two grave examples are recorded below, is the commonest secondary ulcer and the most serious complication of gastro-jejunostomy. It may appear at any time from a few days to twenty or more years after the primary operation. It is generally taught that a new ulcer appears sooner or later at, or near, the stoma after about 2 per cent. of gastro-jejunostomies performed for non-malignant disease. Balfour found the percentage to be 1.6 after 8,600 gastro-enterostomies at the Mayo Clinic; but many patients suffer from this complication who do not seek another operation, but do everything possible to avoid one, and I have reasons for thinking that it is far commoner than is generally believed. After seeing and treating many of these difficult cases, I have come to the conclusion that gastro-jejunostomy should never be performed either without grave consideration beforehand or without the greatest care to make the anastomosis a perfect one.

CASE I.—*Recurrent Gastro-jejunal Ulcer: Gastro-colic Fistula: Operations: Recovery.*

In 1915 I performed posterior gastro-jejunostomy for this patient (a man) at Guy's Hospital for duodenal ulcer with stenosis. In March, 1921, I excised a small anterior gastro-jejunal ulcer which had nearly pierced the colon, and at the same time I enlarged the stoma, which had contracted. He remained well until July, 1927, when he suddenly developed a gastro-colic fistula with faecal vomiting. Some of a barium enema obviously passed into the stomach, but none of another barium enema, given a few days later. However, the diarrhoea and the other symptoms continued, therefore the diagnosis of gastro-colic fistula was made with confidence, and an operation was advised. X-ray examination showed that nearly all the food leaving the stomach passed out through the pylorus and duodenum; there was no delay in the stomach.

At the operation I found two gastro-colic fistulae; one of them admitted the index finger, the other one was smaller; both opened from the front wall of the stoma, which was of good size and position. As the duodenum was now patent and apparently healthy I excised the gastro-colic fistulae and the gastro-jejunostomy, together with the engaged loop of jejunum. This proved to be extremely difficult. The gastric wound and the distal cut end of the jejunum were closed, the end of the duodenum being implanted into the jejunum, thus restoring the normal anatomy and physiology as far as possible.

About a month later the patient was readmitted for severe haematemesis and melaena. The source of the bleeding was uncertain, but it was later proved to be a posterior duodenal ulcer. Careful medical treatment, with the patient in bed at the hospital, was tried in vain for three months. Duodenal stenosis gradually developed and increased so that visible peristalsis became evident in the epigastrium, and vomiting of large quantities occurred about once every forty-eight hours. Gastric lavage only afforded partial relief.

On December 8th, 1927, another operation was performed. The stomach was very dilated, hypertrophied, and inflamed, owing to a large, deep posterior duodenal ulcer penetrating into the pancreas and stenosing the duodenum. No other ulcer could be found. A lateral gastro-duodenostomy was performed well below the duodenal ulcer. The patient made a rapid and excellent recovery from the operation, but he is to continue his extremely careful after-treatment for at least six months, and to observe all the known precautions against recurrence.

CASE II.—*Recurrent Gastro-jejunal Ulcer: Partial Gastrectomy.*

This man was referred to me for the first time early in December, 1927, with the following history. In 1908 he was explored for gall-stones; none were found, but instead a duodenal ulcer with localized peritonitis, indicating an old perforation. The appendix was removed about a year later. In 1910, the duodenal ulcer persisting in spite of medical treatment, it became necessary to perform gastro-jejunostomy. The anterior operation was performed, and the patient remained fairly well for nearly four years.

In 1914 another operation became necessary, when a large gastro-jejunal ulcer was found on the front and right side of the stoma. There was also obvious obstruction of the proximal loop of the jejunum. For these conditions entero-anastomosis was performed; this relieved the patient almost completely for nearly eleven years, then symptoms of obstruction of the stomach recurred, and a severe haematemesis with melaena developed.

* Delivered at Guy's Hospital on December 15th, 1927.