LEUCORRHOEA

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The canal of the cervix uteri is lined with columnar epithelium. From this lining, branching glands lined with similar epithelium ramify deeply in the fibro-muscular structure of the cervix. The physiological purpose of all this columnar epithelium is to secrete mucus; and the functions of this secretion are threefold. (a) to keep moist, and so to lubricate, the vaginal epithelium which itself is devoid of glands. (b) to assist fertility, in that, being alkaline in reaction, it offers sanctuary to spermatozoa deposited in the vagina with its acid reaction, lethal to spermatozoa, and (c) to act as a barrier against ascent of infection.

With this last function we are not concerned here. This article is concerned only with the subject of leucorrhoea. But the function of the cervical discharge with reference to fertility does require passing notice. For though excess of cervical discharge is well known to be a factor in the production of sterility, it is perhaps less widely realised that diminution in, or absence of the cervical secretion (e.g. as a sequel to amputation of the cervix which might be advised as a treatment for certain cases of excessive discharge) can also be followed by sterility. The explanation is, presumably, that no refuge from the inimical action of the acid vaginal contents is offered to the spermatozoa. Therefore a warning against any hasty decision to amputate the cervix of a young woman in the attempt to cure her leucorrhoea, is not out of place here. Yet it is with the first mentioned function of the cervical mucous secretion that this article mainly deals, for leucorrhoea, in the strict application of the word, is merely an excess of the normal cervical mucus. There is a too liberal supply of the normal lubricant of the vaginal skin.

The word "Leucorrhoea" simply means a white flow—a white discharge. Such a white discharge is merely an excess of clear cervical mucus. Strictly speaking it should not include any discharge which contains pus cells. For the admixture of pus cells causes a discharge to be yellow in tint as evidenced by the frankly yellow colour of the thickly purulent discharge of acute gonorrhoea. One is not going to examine microscopically the discharge from any case with this complaint, and, on finding one or two pus cells, cast it out of the category "leucorrhoea" on this account. So here, the word leucorrhoea will be taken to include all discharges via the vagina which are not mainly of blood or frankly purulent.

When we come to consider cases of leucorrhoea from this point of view one of the first things it is important to realise is that only on the rarest of occasions do such discharges owe their pathogenesis to any condition above the level of the internal os uteri. So curetting does not and cannot do any good. The cause of the discharge is to be found in the cervix or in the vagina, and it is to these organs that investigation and treatment must be applied. In the first place, here, consideration will be given to the lesions of the cervix causing leucorrhoea.

CERVICAL LESIONS

Perhaps the commonest of the cervical lesions which can cause leucorrhoea is **Mucous Polypus**. Such a polypus forms a bright red stalked mass about $\frac{1}{8}$ " in diameter, with its attachment, usually, just inside the cervical canal. It is made up of a richly cellular stroma in which ramify typical cervical glands and its surface, except in old standing cases, consists of columnar epithelium. This epithelium, exercising its usual function of secreting mucus, leads to the discharge of which the patient makes complaint. In addition there may be noticed occasional streaks of blood, and such are particularly likely to be found after any trauma, e.g. coitus. These innocent little tumours are easily diagnosed when the cervix is inspected through a speculum. Their characteristic bright red appearance could hardly be mistaken for anything else. With regard to treatment this is simple. It is usually sufficient to grasp the stalk with a long pair of Spencer-Wells forceps and the stalk breaks away as it is grasped. If at some date subsequent to this simple treatment, another similar polypus should appear, it is wiser to make a more thorough removal under an anaesthetic and histologically to examine this recurrent tumour. At the same time opportunity can be taken to curette the body of the uterus, and to cauterize any area where there is columnar epithelium exceeding its normal bounds and to scrape with a sharp spoon the area from which the polypus grew.

Erosion: This word is unfortunate in that it implies, what is not in fact the case, a loss of surface. Moreover, such loss of surface is perhaps suggested by the appearance of the cervix in these cases, for there is a red and finely granular area surrounding the external os. This area bleeds easily, and so further suggests a deficiency in the epithelial covering. But such deficiency is only apparent. The granular area is really covered by columnar epithelium, which instead of giving place to squamous epithelium at the external os, drives back the squamous epithelium over the surface of the portio vaginalis and immediately covers the surface thus denuded. There is thus no area of the cervix uncovered by epithelium except a minute hiatus between the receding squamous epithelium and the advancing columnar. This hiatus is of no importance, and the symptoms, namely, discharge and perhaps occasional slight loss of blood usually after trauma, are the result again of there being an excess of columnar epithelium with its natural corollary, excessive secretion. The occasional bleeding is due to the fact that this epithelium is very thin and vascular. It bleeds fairly easily if touched; but the substance of the cervix underneath this "erosion" is not friable. It does not break down under pressure. This serves to distinguish these cases from carcinoma. If, in a doubtful case, the suspected area is exposed by means of a speculum and then subjected to pressure by the point of an uterine sound, this point will sink into the substance of the area should it be carcinomatous. It will only dent the surface of an erosion and on releasing the pressure the dent will fill up. This test is, in the writer's opinion, quite as reliable as the tests with Lugol's iodine. And should a case appear in which the diagnosis remains in doubt after this simple clinical investigation, it is wiser to make absolutely certain by excision of a fragment for microscopy, than to rely on chemical reactions.

Treatment of an erosion.—Up to comparatively recent times it has still been customary to advise treatment by douches or to employ various chemicals with which the surface of the erosion is painted. Some of these chemicals do appear to have been beneficial in an occasional case; but generally speaking such mild treatment cannot produce a cure of any marked case of erosion. Even a mild case is only improved or perhaps cured after the expenditure of a great deal of time and trouble. When treatment is necessary it would appear to be quicker and therefore preferable to make a much more active attack on these erosions and thoroughly to destroy, by one means or another, the excessive columnar epithelium on the surface of the portio vaginalis and in the cervical canal. This destruction can be procured by actual cautery, by diathermy, or by chemical means. It must at once be admitted that many gynaecologists always advise deep linear cauterization by about six radial applications of the hot electrode as the routine treatment for an erosion. They maintain that the results are good and contend that this minor operation is one of the most satisfactory in gynaecology. But linear or other cauterization of the cervix, if it be carried deep enough to ensure a cure is not without risk. The same is true of diathermy. For any deep cauterization of the cervix may be followed by secondary haemorrhage and possibly by scarring and stenosis. The cases of secondary haemorrhage are apt to occur about sixteen days after the cauterization has been done and so, if this is not to happen after the patient's return home, a long stay in the hospital or nursing home would appear desirable. It would therefore seem that, at any rate for the milder cases of erosion, and particularly for those cases in which the cervix has not been lacerated and in which the cervical canal remains circular (and thus able closely to grasp the china-clay pencil which is employed) the simplest and best method of treatment is the chemical one of cauterization by a saturated solution of zinc chloride applied by means of the china-clay applicator above mentioned according to the technique described by Bourne (1).

It will be observed that all these methods of treatment involve the destruction of the excessive columnar epithelium, not only on the surface but also in the canal and the surrounding area of the cervix. This would be quite logical if the excess were inflammatory as has been for many years the usually accepted explanation. But of recent years some gynaecologists have suggested that the cervical epithelial hyperplasia might be hormonal, i.e. oestrogenic in origin, just as is the endometrial hyperplasia normal to the menstrual cycle. It would thus seem reasonable to attempt to benefit these cases by injection of the opposing hormone, Progesterone. Such treatment has, however, been without benefit, and for the present at any rate, one will continue to advocate treatment by the destructive methods above mentioned.

Ectropion. This cervical lesion is produced as a consequence of tearing of the cervix during labour, and particularly in those cases where the cervix is split bilaterally and thus converted into a two-lipped structure. In the event of such a split, the mesial part of the raw surface is contiguous with the columnar epithelium of the cervical canal, while the peripheral

part adjoins the squamous epithelium of the portio vaginalis. Healing occurs by these two epithelia growing over the raw surface, and it may be regarded as a race between the two to decide which shall cover most of the tear. If it so happens that the squamous variety wins, then the tear is covered chiefly by that type of epithelium. This cervix will then be of no trouble to its owner as there is relatively little excess of secreting epithelium. But in other cases the columnar epithelium succeeds in covering the greater area of the tear, and the patient with this state of affairs will be bound to have the symptoms that one would expect: these are, an excessive mucous discharge and perhaps occasional streaks of blood after any trauma.

A patient with a lacerated cervix may thus have no symptoms, and may never present herself for examination. In other cases the lesion is found, but only when the patient is examined because of some totally unconnected symptom. In such a patient the cervix may feel suspicious in that it is irregular, divided into knobs, and perhaps hard if there has been much scarring. An unaccustomed examiner may mistake this for carcinoma, because hardness is a quality which one is taught to expect in a carcinoma. It would perhaps be wiser to teach that a carcinoma is friable, and breaks down under pressure. It may perhaps be conceded that this quality is more akin to softness than to hardness and it is here suggested that it is misleading to describe a cervical cancer as "hard." It may thus occur that a hard knobby cervix which was perhaps suspected of being carcinomatous may be recognised by one more experienced as being merely a lacerated cervix. It follows from what has been said above that this lacerated cervix in which the tear is covered by squamous epithelium produces very little in the way of symptoms.

It may be the counsel of perfection that cervixes of this type should, as a patient approaches the menopause, be amputated as a precaution against the possible future development in such a damaged cervix, of carcinoma. But this will hardly appeal to the more mentally balanced of us as being an economically sound proposition.

But the split cervix converted into an "ectropion" by the fact that the gaping lips have been covered by mucous secreting columnar epithelium is a considerable nuisance to its owner. It will cause a troublesome excess of discharge, and some gynaecologists think that it may also be the cause of backache. It must, however, be regarded as extremely doubtful if this latter is true. In the writer's view, and it is believed that his opinion is generally held, cervical lesions do not cause backache. But this cervical ectropion will cause enough discharge to demand treatment and such treatment must take the form of surgery. It is quite useless to attempt a cure by any local application to the cervix. Limited cauterization of the superabundant columnar epithelium is equally ineffective. A lasting cure can only be secured by the operation of trachelorrhaphy. This is not the place to discuss the technical details of this operation, but the broad outline is that the split is denuded of the epithelium by which it had become covered in the process of healing and the two denuded surfaces are sewn together so as to reconstitute a normally shaped cervix. It may perhaps be mentioned that the writer, having been trained to believe that silk-worm-gut was the best suture material to use for this operation, went through a long period during which he abandoned this teaching and used catgut. But he has now returned to silk-worm-gut despite the nuisance entailed in its removal. For he is confident that better healing is thereby secured and that the risk of secondary haemorrhage from the cervix is almost eliminated.

Acute Cervicitis. This condition should hardly be included in this article as the consequent discharge is purulent. It is mentioned here merely because this condition may be followed by chronic cervicitis which does really produce leucorrhoea; and there are occasions when the initial acute cervicitis is a comparatively mild affair of which the patient takes no serious notice. Such cases can occur even when the infecting organism is the gonococcus. Even with this, the initial infective process may sometimes be relatively mild and the patient first presents herself as one complaining of a white discharge.

Chronic Cervicitis. This may follow a typical acute cervicitis, or it may succeed a mild acute attack such as has already been mentioned. It may on occasion appear insidiously. In this latter case the infection has usually been given an opportunity to establish itself in consequence of some obstetric or gynaecological event. It may thus date back to a miscarriage, or a confinement, or even to some period in the woman's life when she was in a poor state of health, perhaps in association with some pelvic symptoms.

In many cases, a chronic cervicitis manifests itself in the form of one of the lesions already described. Thus an "erosion" has been noted to be generally regarded as a hyperplastic con-

dition of the columnar epithelium consequent upon a chronic infection. Similarly the split cervix that is covered by columnar epithelium owes, in the opinion of many, the presence of this epithelium in excess to the fact that the healing process was complicated by the presence of infection. A mucous polypus of the cervix has also already been noted as another manifestation of a chronic cervicitis.

In other cases a chronically infected cervix appears in different form. There may thus be a mere general enlargement of the cervix which on histological examination would reveal an increase in the cervical glands ramifying deeply in the fibro-muscular stroma of the organ. Furthermore, by the enlargement of the cervix, an elongation of the cervical canal is obviously bound to occur. This again will provide an increase of the secreting columnar epithelium and thus, though no excess of this is visible on the surface, an excess of the glairy mucoid discharge characteristic of the secretion by the cervical canal and its glands is bound to occur. On inspection of such a cervix through a speculum there will perhaps be visible merely the enlargement, though on occasions distension cysts are seen. These owe their existence to blockage in the duct of a cervical gland with consequent distension of the more distal parts which may appear as pearly bulges under the epithelium of the portio vaginalis. These are the so-called "ovula Nabothi." Yet other cases of chronic cervicitis may, on cursory inspection, reveal but little abnormality. The proof that the patient's complaint of excessive discharge is justified is obtained if the cervix be squeezed. There will then appear at the external os an efflux of the typical glairy cervical secretion.

Treatment of chronic Cervicitis. Topical applications to a cervix of this type are useless; the same is more or less true of limited cauterization, ionization, etc. In fact, it will be evident from what has already been said that destruction or elimination of the excess of the columnar epithelium is what is to be aimed at. A brief survey of the methods of this destruction has already been given. It may here be permissible again to suggest that the chemical method of cautery by zinc chloride is worth a trial, particularly for those cases where the cervical canal is circular in section and thus able tightly to grasp the china-clay applicator which is used in this method of treatment. Should this fail, the next procedure to be advised is linear cauterization of the canal and its surroundings by four to six radial cautery strokes. It has already been stated that adequate excavation of the excessive gland material by deep burning with the actual cautery or by surgical diathermy is, in the writer's view, potentially dangerous, as it is apt to be followed by secondary haemorrhage and perhaps by cervical stenosis. The same is true for amputation of the cervix by any of the standard methods. Nevertheless, it is suggested that this operation should be the selected line of treatment if chemical cautery and linear cauterization fail to cure. For the risks of untoward happenings are probably less with a properly performed amputation than with a cauterization which is deep enough to destroy all the excess of columnar epithelium.

It must further be emphasised that any one of these three, cauterization, diathermy, or amputation, is undesirable in a young woman. In such a patient, postpone drastic methods of treatment if possible. For if secondary haemorrhage should occur it produces a serious illness at the time, may be followed by a lengthy period of ill-health and the anatomical result of the cervical treatment will be unsatisfactory. Should stenosis of the canal follow at a later date, troubles are even worse. Spasmodic dysmenorrhoea of perhaps intolerable violence may appear, and this, or even the occurrence of haematometra may demand hysterectomy. Sterility is also attributable in many cases to a previous amputation of the cervix with, as a consequence, too great a diminution of the alkaline cervical discharge. Again, it may be repeated that drastic surgical treatment of a cervix in a young woman is to be avoided where possible. This objection does not carry such weight if the patient be at or near the menopause. In such cases a well-performed amputation of the cervix may prove of great benefit to the patient. In other women at about the climacteric, a cervical lesion may be associated with prolapse, so that the performance of Fothergill's operation with its amputation of the cervix not only cures the prolapse but eliminates also the symptoms due to the diseased cervix. Finally, a patient may have, shall we say, a few fibroids associated with menorrhagia and the approaching menopause and thus be a case for which radium or deep X-ray therapy might be suggested. But should she also be suffering from symptoms due to chronic cervicitis or to any similar cervical lesion, this fact would constitute a very strong argument for treating such a patient by total hysterectomy. The symptoms due to her uterine body are thus eliminated, and those due to her diseased cervix are equally effectively eradicated.

DISCHARGES CONSEQUENT UPON VAGINAL LESIONS

A good deal has been written about the changes in the pH of the vaginal secretions and the variations that can occur in the cellular content of a vaginal discharge under different physiological and pathological conditions. Indeed, one accustomed to this investigation could make a good guess at the infecting organism from observations on the pH and on the type of cell which is found or which predominates in the discharge from any given case. This applies to the cases which we are about to discuss—cases of trichomonas vaginitis—as well as to others of cervical origin. But the ordinary clinician will hardly want to adopt these methods of investigation and so a description only of the more obvious features of these cases and of the more simple investigations will be given here.

Trichomonas Vaginitis. This troublesome cause of vaginal soreness, irritation and profuse discharge is due to infection by a protozoon, *Trichomonas Vaginalis*, which is found with varying degrees of frequency in the vagina of healthy women but which must be present in great numbers, owing to a tremendous multiplication for no known reason, if it is to cause vaginitis. It is of comparatively recent discovery mainly because it is not seen in the ordinary Gram-stained films of a cervical discharge. It can only be found if a drop of the vaginal discharge is diluted with some normal saline and then examined on a warm slide by high power magnification. Better still is examination of a wet specimen by means of dark ground illumination. The protozoa are about the size of a lymphocyte and are recognised by their motility and by the movement of the terminal flagellum. The more usual method of examining stained smears from such a discharge would previously have been the sum total of the investigation and it would not have revealed the parasite unless special staining methods were employed.

But the diagnosis can usually be made with very fair certainty by clinical methods. The patient complains of irritation and soreness of the vulva, a hot feeling in the vagina and a profuse irritating discharge. On examination there may be found vulvitis; and the passage of a speculum reveals a pale greenish discharge in which are seen many small gas bubbles. The vagina will show some redness as the result of inflammation and sometimes these changes are severe enough to merit the description of "granular vaginitis." In this event there may be some oozing of blood from denuded areas where the superficial layers of the vaginal epithelium have been shed. If so, the discharge may be stained pink instead of showing the usual colour. Characteristically, however, it is a profuse pale green, slightly frothy discharge which is found.

The usual treatment prescribed is, for one week, the *nightly* insertion of two "Stovarsol" pessaries followed by a morning douche of lactic acid (B.P.), 2 drachms to 2 pints. This is followed by the same treatment on *alternate nights* for two more weeks. The whole course should be repeated after the next one or two menstrual periods. This treatment often fails to cure as the patient cannot herself insert the pessaries sufficiently high into her own vagina. Ideally perhaps, and certainly in all cases where the above has failed, it is therefore desirable to initiate a course of treatment by giving a short anaesthetic, carefully drying all the vaginal crypts and folds and thoroughly applying an antiseptic such as a 2 per cent. aqueous solution of gentian violet. Subsequently the patient herself, or better, a visiting nurse can give the first mentioned courses of treatment. An alternative method of therapy is the periodic distension of the vagina and the application of silver picrate powder by means of the "Picragol Insuflator." This is followed up by the regular insertion of picragol pessaries. This method also gives good results and a cure of this distressing condition, by whatever method is selected, brings very great relief to the patient—not only to her symptoms but also to the anxiety she may have felt that there was present, perhaps, a venereal disease.

Thrush. This is a very much less common condition and will need only a brief survey in this article. Clinically it occurs in two forms (1) as white patches on the vaginal wall, particularly high up and in the fornices. The patients in these cases are usually young women and the discharge is watery. The diagnosis is one for an expert and he will examine specimens secured either by washing out the vagina or directly from the white patches. (2) as a very profuse, thick, pasty, irritating discharge found in pregnant women and often in such quantity as to give the impression that the vagina has been stuffed with some white material.

Vaginal thrush is fortunately cured with comparative ease. Cleaning the vagina and then applying (under evipan or other anaesthesia if necessary) with great thoroughness a 2 per cent. aqueous solution of gentian violet on about two occasions separated by a day or two, produces

a cure with almost dramatic suddenness. But it may perhaps be again pointed out that thrush (monilia) is not a common cause of a leucorrhoeal discharge.

Foreign Bodies. A forgotten and retained pessary which has long ago been inserted to relieve prolapse can cause profuse vaginal discharge, ulceration, and even carcinoma. A less neglected pessary can cause a lesser degree of discharge which the patient may describe as the "whites." Consequently some discussion of such a discharge may be permitted and it may here be urged that it is always desirable to instruct a patient who is wearing any pessary, be it a ring or a Hodge or other pessary and whether it be of rubber, vulcanite, metal or porcelain, to use a daily douche of some mild antiseptic solution or even normal saline. Admittedly this is not the teaching of everyone. Some gynaecologists do not like their pessary patients to use a douche and they maintain that these pessaries do not cause a discharge and that they do not indicate regular douching. But it has fallen to some of us to have the unpleasant experience of being required to change the pessary for a patient on this routine. The lesson is always salutary. After one such experience it will be that the doctor's invariable practice is to order douches for his pessary patients!

Of recent years one other foreign body has occasionally been the cause of a vaginal discharge which, though it can hardly be called leucorrhoea—for this discharge is purulent and stinking—should perhaps be mentioned here. The foreign body referred to is the internally worn vaginal tampon often used during menstruation instead of the sanitary towel. Whether it be that this method of female hygiene has always been potentially dangerous, or whether it be that the quality of the article usually sold has deteriorated during the present war, is neither here nor there. The fact is that several cases have occurred recently in which, after pulling out something by means of the string incorporated in the tampon, and presumably dropping it unseen down a lavatory, part or possibly the whole of the cotton wool plug has remained in the vagina and caused a blockage. Above this, menstrual fluid, cervical discharge, etc., has accumulated and its subsequent infection is inevitable. The result is that the upper part of the vagina has become to all intents and purposes an abscess cavity. The stinking purulent fluid seeping through or leaking past the plug has led to the appearance of a most offensive discharge, which, as a rule rapidly and spontaneously clears up, after removal of the obstruction to the vaginal outflow. But it can well be imagined that more serious infections might arise and a persisting cervical "erosion" appears to have been a fairly common sequel. This in its turn would lead to a persistent discharge to which the term leucorrhoea can more correctly be applied.

REFERENCE

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SOME RECENT ADVANCES IN THE APPLICATION OF ANTENATAL CARE

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The expectant mother is one of the most valuable assets of the community, more especially since the recent alarming fall in the birth-rate. It is, however, only in recent years that antenatal care has been recognised as of importance, either to the mother, or to the community as a whole. The establishment of hospital beds for the treatment of disorders of pregnancy has only occurred within the twentieth century, but in the space of a little over forty years many advances have been made, all of which are impossible to deal with in the scope of an article of this nature. There is much to criticise and many advances to be made in antenatal care. Here, it is proposed to discuss critically some of the aspects of the subject in which advance has been made recently, and in which further advance can be expected in the future.