Chronic Endocervicitis and its Treatment.

By J. W. Burns, B.A., M.D., B.Ch. (Dublin), F.R.C.S. (Edin.),
Hon. Surgeon, Samaritan Hospital for Women, Liverpool; Assistant Surgeon, Liverpool Maternity Hospital.

From a close study of 84 cases of uncomplicated endocervicitis, its bacteriology, pathology and treatment, I am convinced that the condition as a distinct pathological entity is worthy of more scientific attention than is accorded it in most modern text-books.

It is probable that the condition is responsible for many cases of sterility. Inasmuch as the condition is an infective one there is bound to be a certain amount of absorption of poisonous bodies from the infected area, and this would account for the degree of anæmia and debility from which the patients usually suffer.

Chronic endocervicitis is an inflammatory process involving the cervical tissues, particularly the lining membrane of the cervical canal. It is due to the presence of bacteria. It is a distinct pathological entity apart from endometritis.

According to Curtis [1] the cervical mucosa is very susceptible to infection, while the corporeal endometrium is practically immune. De Lee [2] affirms that the closed cervix is infected in its lower third, the signs of infection disappearing as the upper third is reached. The work of Sturmdorf [3] and Curtis confirm this.

In the majority of the cases which I have investigated there has been a complete absence of signs and symptoms referable to the body of the uterus, such as tenderness, enlargement of the body or changes in the menstrual function such as menorrhagia or metrorragia. Another point which I think strengthens the above view is that eradication of the infected area of the cervical canal, without interference with the interior of the uterus, leads to a complete restoration of health of the patient.

Ætiology.

The condition is common to all women, the incidence in my series being highest in multiparæ between 30 years and 40 years, next 20 years and 30 years, and least in young unmarried girls.

The disease arises as a result of infection from without, either as a direct infection of the cervical canal as in gonorrhœa, infection of cervical wounds received during labour or operation, or, as in the case of the young girl with intact hymen, direct spread upwards from the external genitals.

This latter mode of infection may be denied by those who still hold the view that the vaginal secretion is capable of preventing

infection travelling upwards. I am prepared to admit the truth of this under normal healthy conditions. Under certain abnormal conditions, however, I have reason to believe that this mode of infection is possible. Normally the vaginal secretion is acid while the cervical secretion is alkaline. The amount of cervical secretion is, as a rule, small apart from menstruation, consequently its neutralizing action upon the vaginal secretion will only extend to the vicinity of the external os and the posterior fornix in a normally situated uterus.

If from any cause the cervical secretion is greatly increased, as in endocervicitis, the acidity of the vaginal secretion is reduced almost to the point of neutrality throughout the vagina. As a result of this the bacteria which are usually numerous in the lower portion of the vagina, have little difficulty in spreading up along the warm column of fluid, which is, as a rule, only faintly acid in these cases.

In those cases of endocervicitis in the virgo intacta investigated by me, five showed certain stigmata which one usually associates with masturbation. Three admitted the fact. Sexual excitation is accompanied by congestion of the pelvic organs, and if frequently indulged in brings about a condition approaching chronic congestion. This congestion induces hyper-secretion of the cervical glands, in other words leucorrhœa. The external genitals become bathed in this vaginal discharge, the bacteria which are always present spread up to the cervix and the glands become infected. Once the glands are infected the presence of the organisms and their toxins keep up the hyper-secretion, and so the condition of endocervicitis is established.

Symptomatology.

The predominant symptom in all cases is the vaginal discharge and the discomfort arising therefrom. This discharge varies greatly in colour, consistence and quantity; the most usual type is the thick white mucoid variety, but it may be thin, white, yellow or green. It is extremely difficult to gauge the amount of discharge, but an idea may be arrived at from the number of diapers used by a patient of cleanly habits in a certain time. The discharge is usually more profuse in the morning and just before and after menstruation. In those cases in which there has been a preceding history of gonorrhœal infection the discharge has a tendency to retain the yellow colour and is usually muco-purulent. General debility, lassitude, anæmia, backache and constipation are the other symptoms which go to complete the picture of chronic endocervicitis. It would seem that the general condition of ill-health is due in no small measure to the absorption of poisonous bodies from the infected cervical canal. In about 95 per cent. of these

cases chronic constipation is also present. If these two conditions are dealt with the patient usually makes a rapid recovery.

The menstrual function does not seem to be influenced to any marked extent in these cases of endocervicitis, and only a small proportion of my series complained of dysmenorrhœa. About one-third of the cases complained of pain in the left side. This may be due to the loaded condition of the lower bowel or to a varicose condition of the veins of the left broad ligament.

Pruritus vulvæ. This distressing condition is complained of not infrequently. According to Leslie Roberts it may be followed by a dry, scaly, patchiform eruption, probably due to the growth of the staphylococcus albus. In 11 of my cases complaining of irritation I have been able to demonstrate an adherent præputium clitoridis, a condition very similar to that found in young boys with long tight foreskins. Beneath the prepuce one can usually fine small sago-grain-like particles of inspissated smegma. That the pruritus may be produced by this condition is proved by the fact that a cure is at once brought about by freeing the prepuce and clearing away the granules. I regard this condition as a very potent factor in the production of "bad habits" in young girls at puberty, and, as pointed out above, it may be the primary factor in giving rise to the type of endocervicitis found in the virgo intacta.

Sterility.

Knowing the disease to be an infective one, it might be expected that sterility would play a large part in the symptomatology. In my series the analysis is as follows:—

37 per cent. sterile though exposed to conception;
39 „ one or more children, no miscarriages;
25 „ „ „ „ one or more miscarriages;
2 „ miscarriages only.

Whilst these figures are interesting, the number of cases examined is too small to base any definite conclusions thereon. At the same time it is only reasonable to expect that an infective condition such as this is would present a definte bar to normal conception.

Pathology.

Endocervicitis may be divided into two forms—acute and chronic. The acute form usually found in gonorrhœa and following infection of cervical wounds due to labour or operation, is seldom recognized as a separate pathological entity. The chronic form may follow the acute or may arise as a chronic condition *per se*. The naked eye appearances vary considerably. The cervix may appear quite normal except for the thick tenacious yellowish mucus issuing from the os. The cervix may or may not be hypertrophied.

In old-standing cases the cervix is usually hypertrophied, and is

harder than normal. The same holds good with regard to erosion. The longer the condition has been in existence the bigger the erosion. In some cases the erosion is confined to the posterior lip. This is usually found in association with retroversion. The size of the erosion depends largely upon the area of the cervix, which is constantly bathed in the pathological fluid which collects in the posterior fornix. Old lacerations may also be seen.

Microscopical sections, taken vertically through the cervix so as to include the canal, the erosion and the healthy portion of the vaginal surface show :—

(1) Glands hypertrophied, epithelium well formed and showing goblet cell formation.
(2) Blocked gland ducts.
(3) Small dilated cysts lined by low cubical epithelium.
(4) Areas in which the pavement epithelium has been shed.
(5) Small round cell infiltration around the basement membrane of the glands. Scattered areas of small round cells throughout the cervical tissues, and particularly well marked beneath the eroded area.
(6) A varying degree of fibrosis.

All or a few of these characteristics can be seen in any section. In some cases the eroded area appears to be composed of hypertrophied gland tissue—papillary erosion. In others the eroded area presents the appearance of a healthy granulating surface—granular erosion. Both these forms are apt to bleed easily on touching, and so are liable to be mistaken for early malignancy, especially in elderly women.

Bacteriology.

A bacteriological examination of the cervical canal is by no means a simple procedure. Unless very great care is exercised contamination of the swab is likely to take place by touching the vaginal wall, vaginal surface of the cervix, or the speculum, thus rendering the examination useless. The routine method, which I have found to be the easiest and at the same time minimizes the risks of contamination, is as follows :—

The patient is placed in the dorsal position with knees drawn up. A sterilized glass Ferguson's speculum is passed and manœuvred until the cervix fits into its upper end. Sometimes there is difficulty in getting a good view of the os owing to the backward projection of the cervix into the posterior fornix. This can be obviated by pulling on the anterior lip with a sharp hook. The cervix, having been thoroughly exposed, is wiped dry and clean with sterilized gauze swabs, and a sterile throat swab is pushed into the cervical canal and rotated. The swab is replaced in a sterile test-tube and

conveyed to the laboratory and several media inoculated. These media are examined in 24 hours and 48 hours.

Out of 36 cases of chronic endocervicitis which have been investigated in this way three had a definite clinical history of gonorrhœal infection one to two years previously.

Results of bacteriologcal investigation of cases :—

Total cases examined	66
Positive growths in 24 hours	92.43 per cent.
Negative in 24 hours and 48 hours ...	7.57 „

Types of organism found :—

Staphylococcus albus	48.48 per cent.
„ „ and B. coli	7.57 „
„ „ „ streptococcus..	6.06 „
„ „ „ gonococcus ...	3.93 „
„ „ „ M. catarrhalis	1.51 „
„ „ „ tetragenus	1.51 „
Staphylococcus aureus	1.51 „
„ „ and streptococcus	1.51 „
Streptococcus	6.06 „
B. coli	13.63 „
„ and tetragenus	1.51 „

It will be seen from this that the staphylococcus, either alone or in association with some other organism, is by far the commonest inhabitant of this region.

In 18 per cent. of the cases investigated dermatitis was present, causing intense irritation. This dermatitis varies considerably in extent. In most cases it is confined to the vulva. In one of the above cases it had spread extensively over the thighs, and in another practically all over the body. In all probability this dermatitis is caused by the staphylococcus which has its virulence increased by its sojourn in the cervical canal.

Treatment.

From a study of the microscopical sections, and from the fact that the condition is an infective one in which the bacteria are in the glands, it is quite obvious that treatment to be of any avail must remove the causal agent. It is because most of the methods advocated for the treatment of endocervicitis do not remove the causal agent that they either fail to bring about a cure, or at the best only give a temporary relief. Some of these methods are caustics, curetting, douching, tampons of various makes and ingredients, and some form of trachelorrhaphy. To deal with these *seriatim* :—

Drugs and caustics. Most of these only bring about a temporary cure. They kill off the bacteria on the surface of the canal, but do not reach those deep in the lumen of the glands. In

fact many of them form, with the mucus present, a protective covering for the bacteria in the deeper tissues. As soon as the antiseptic affect has worn off the bacteria come out and reinfect the surface.

Curetting. It is impossible to remove all the gland tissue of the lower two-thirds of the canal with any curette, still less is it possible to remove the bacteria. Curetting also has the disadvantage of leaving a raw surface which has to heal as best it can in, to say the least, very doubtful surroundings.

Douching. This type of treatment is one which is still largely used. Many women are condemned to douche two or three times daily in order to gain a little comfort from this distressing condition. To my mind, it is a confession of failure on the part of the doctor who orders the douching for the treatment of endocervicitis, since it cannot possibly effect a cure. On the other hand, douching tends to keep up the discharge by inducing congestion and so hyper-secretion of the cervical glands. There is also the danger of introducing bacteria from the outside into the upper portion of the vagina.

Trachelorrhaphy. Most operations on the cervix, it seems to me, were devised without due regard to the bacteriology of the cervical canal. One is advised in almost all these operations to leave the mucous membrane of the canal intact in order to prevent stenosis. It is because of this infected mucous membrane that many of these operations prove failures.

Vaccines. During 1914 and the early part of 1915 I treated, with Doctor John E. Gemmell, 33 cases of chronic endocervicitis with vaccines. Autogenous vaccines were used in every case, the injections being given weekly in increasing doses until a good local reaction was obtained. No local treatment was adopted in the majority of the cases. While many of the patients admitted "feeling better in themselves" during the time they were getting the injections, so far as the local condition was concerned the treatment was disappointing. Having given an extensive trial to all the above methods and finding them unsatisfactory, I determined to seek "fresh fields and pastures new."

Sloan [4] and Somerville [5] reported very good results in the treatment of endometritis with ionization. It was from reading their articles that I conceived the idea of applying ionizaton to the cervix alone in these cases of chronic endocervicitis.

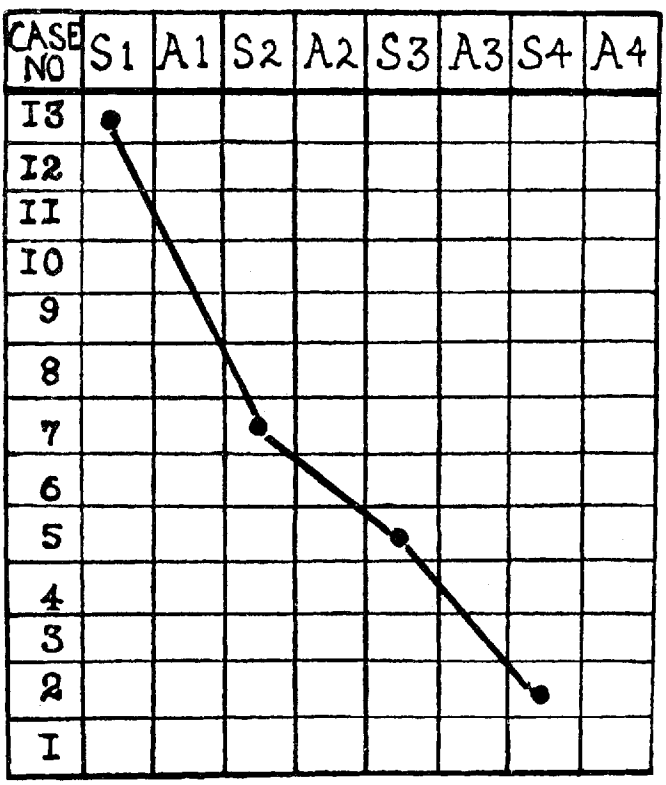
Ionization.

On theoretical grounds at least ionization seems to be the only scientific method of applying antiseptics to the cervical canal. In endocervicitis the bacteria are in the gland lumen, and if a cure is to be wrought the antiseptic must be brought into contact with them.

For this it is necessary to increase the penetrative power of the drug used. Electricity appears to be the only means of doing this at our disposal.

Gautier[6], in experimenting on the uterus of a rabbit, found he got penetration through the entire uterine wall by using a copper electrode with an electric current of 20 milliampères for 10 minutes. The thickness of the rabbit's uterus is about one millimetre. The thickness of the lining of the cervical canal is seldom as much as one millimetre. If it is possible to get penetration of antiseptics to the depth of one millimetre all round the cervical canal, there is a reasonable hope that the bacteria in the lumen of the glands will be reached.

The following graph illustrates the effect of zinc ions in sterilizing the cervical canal. I selected 13 cases in which the first swab proved positive. Ionic applications of 20 milliampères for 10 minutes were made every seven days and a swab taken before each application.



S = swab. A = application.

In 13 cases in which the first swab was positive 7 remained positive after the first application, 5 after the second, and only 2 after the third.

Method of application. The patient is placed in the dorsal position with the knees drawn up. A medium-sized glass Ferguson's speculum is passed until the cervix fits into the upper end. The os is dried and cleaned by means of small sterilized gauze swabs. A swab for bacteriological purposes is then taken from the cervical canal. The reaction of the cervical canal is then taken by means of a roll of litmus paper. A malleable zinc sound is passed into the cervical canal for about one inch or one and a half inches; the speculum is half filled with 0.5 per cent. zinc sulphate solution. The zinc rod is connected with the positive pole of the galvanoset, the negative pole of which is applied to the patient's thigh by means of a metal plate superimposed upon two or three pads of gauze and lint wrung out of warm water. The current is slowly switched on and raised until the milliampèremetre reads to 20 milliampères. It is allowed to run for 10 to 15 minutes. By this time the os and the cervical canal will be seen to be coated with a thick white deposit. At the end of the requisite period the current is cut off and the sound removed. The zinc sulphate is mopped out and a strip of gauze soaked in acriflavine 1 : 1000 is introduced into the vagina. This is removed at the end of 24 hours. This treatment is repeated for three weeks, during which no douching or intercourse is permitted. The external genitals are washed with warm soap and water night and morning, and kept thoroughly dry. Three applications are usually sufficient to render the cervical canal sterile.

Beyond some slight backache for 48 hours following the application the patients seldom complain of any discomfort. In one case, in which there was a history of gonorrhœa 18 months previously, a very acute attack of pelvic inflammation was set alight within 48 hours. In this case I was doubtful about the Fallopian tubes being infected. In another case the uterus was retroflexed, and the menorrhagia from which the patient complained was made very much worse by the applications.

The majority of the patients treated in this way had been complaining of the vaginal discharge for years and had experienced practically every type of treatment without relief. Coincident with the sterilizing of the cervical canal a great improvement takes place in the general health of the patient.

The following is an analysis of the cases treated by ionization :

Cases with erosion	16
Cases without erosion	20
Total	36

Cases with erosion :—

Two were definitely cured, *i.e.*, erosion healed; no discharge for a period of three to four months following treatment.

One case which had been under treatment for 12 months for gonorrhœa, developed symptoms of acute pelvic inflammation following the second application.

Eight cases showed improvement in so far as the amount of discharge was concerned. The erosion remained *in statu quo ante* even after six applications.

Two cases were not improved at all.

Three did not carry out the full course of treatment.

Cases without erosion :—

Thirteen were cured, *i.e.*, no discharge and no discomfort for a period of one to four months following treatment.

One case, in which a supravaginal hysterectomy had been performed some years previously was not improved even after seven applications.

One case in which post-climateric changes in the uterus and vagina were marked, resisted all treatment.

In one case associated with retroflexion of the uterus the symptoms seemed to be aggravated by the applications.

Four cases did not carry out the full course of treatment.

It would appear from a study of these results that :—

(*a*) In cases of endocervicitis associated with erosion ionization will improve matters in so far as the amount of discharge is concerned, but it is not of much value in expediting the healing of the erosion.

(*b*) In cases of endocervicitis not associated with erosion or with any intra-pelvic abnormality, ionization is of great value.

(*c*) Cases in which there is some intra-pelvic complication, such as inflammation of the tubes or displacement of the uterus, are not suitable for ionic treatment.

For those cases associated with erosion the only treatment which I have found to be satisfactory is the removal of the erosion and the lower two-thirds of the cervical canal.

The operation which I have adopted was that devised by Sturmdorf, of New York. It has been beautifully described by Matthews[7]. The operation consists in coning out the lower two-thirds of the cervical canal and covering in the raw area with

healthy flaps from the vaginal surface of the cervix. The part removed consists of a cone which has for its base the eroded area, its apex the upper third of the cervical canal. By this operation the whole infected portion of the canal is removed. Healing as a rule takes place rapidly, and the patient can return home at the end of eight or ten days. I use 20 day catgut sterilized in iodine and allow the sutures to come away.

I operated upon 14 cases of chronic endocervicitis associated with erosion which had resisted all forms of palliative treatment, including ionization. The majority of these patients had been under treatment for periods varying from six to 18 months. Without exception these patients, within a period of three weeks to a month from the date of operation, had quite recovered their normal health, and all discomfort, including discharge and back-ache, had disappeared.

Sufficient time has not yet elapsed to enable me to express an opinion as to the effect this operation has on conception, pregnancy or parturition. Magid[8], in dealing with obstetrical end-results of this operation, states: "The operation has no unfavourable effect on the possibility of future conception, pregnancy or delivery." For my own part, I see no reason why it should give rise to trouble.

Summary.

(1) Chronic endocervicitis should be recognized as a distinct pathological entity apart from endometritis.

(2) Any discharge from the vagina which induces discomfort in the patient is pathological, and is usually due to chronic infection of the cervical canal.

(3) That the condition is an infective one is proved by the fact that a positive culture can be obtained in 92 per cent. of cases. In 50 per cent. of cases staphylococcus, either alone or in association with some other organism, is present.

(4) Applications of various drugs, douching, tamponage, etc., give only temporary relief because the antiseptics do not reach the infecting agent in the lumen of the glands.

(5) Ionization will bring about a marked improvement in those cases in which erosion is not present.

(6) For those cases associated with erosion the only method which will bring about a cure is the removal of the lower two-thirds of the cervical canal, including the erosion.

I would like to tender my sincere thanks to Dr. John E. Gemmell for his kindness in allowing me to try the effect of vaccines on cases of chronic endocervicitis selected from his out-patients; to Dr. Leslie Roberts for his kindly help and interest, particularly in

those cases in which certain skin lesions were associated with the vaginal discharge; and to Dr. L. S. Ashcroft for his help in working out the bacteriology and pathology of the condition.

1. Curtis. Quoted by Matthews, H. B. *Surg., Gynæcol., and Obstet.*, 1921, xxxii, 249.
2. De Lee, J. B. "Principles and practice of obstetrics." 2nd ed., 1915.
3. Matthews, H. B. "A study of chronic endocervicitis." *Surg., Gynæcol., and Obstet.*, 1921, xxxii, 249.
4. Sloan, S. "Vulvo-vaginal electrode for ionic medication." *Proc. Roy. Soc. Med.* (Sect. Elec.-therap.), 1909, ii, 123.
—— "Electro-therapeutics in gynæcology." *Proc. Roy. Soc. Med.* (Sect. Elect.-therap.), 1910, iii, 1.
5. Somerville, W. F. "Ionization in chronic endometritis." *Brit. Med. Journ.*, 1909, i, 89.
6. Gautier, *see* Lewis Jones: "Ionic medication." 2nd ed., 1914.
7. Matthews, H. B. *Loc. cit.*
8. Magid, M. O. "Obstetrical end-results of the tracheloplastic operation." *New York Med. Journ.*, 1921.