CHRONIC CERVICITIS: ITS INFLUENCE ON THE URINARY TRACT AND ITS TREATMENT BY THE DIATHERMY CUTTING CURRENT CURETTE*

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For the past eighteen months my attention has been more and more drawn to the fact that chronic cervicitis is responsible for certain diseases of the urinary tract the aetiology of which in the past has been only imperfectly understood. This conclusion is supported partly by clinical observation, partly by experimental evidence, and mainly by the results which have followed operative treatment of this focus of infection.

Any urological out-patient department is overcrowded with women whose chief symptoms are frequency, dysuria, pain in one or both loins, and varying degrees of backache, and with a history usually of having borne one or more children. Many are referred from the gynaeco-

FIG. 1.

logical department with a note: "Will the urologist please see and treat." Examination may reveal some urinary cause of the condition, such as cystocele, a stone in the bladder, or tuberculous kidney, but in the majority of cases no such abnormality can be discovered, the cystoscopic appearances being those of mild trigonitis, as shown by redness, swelling, and often pseudo-membranous patches on the trigone. Fig. 1 is a composite view of the bladder floor showing pseudo-membranous trigonitis. There is, as a rule, an associated chronic urethritis, the urethra being more tender than usual to the passage of an instrument, and if stretched with a straight Kollmann's dilator will not tolerate an expansion of more than about 25 degrees Charrière, as compared with the normal of 35 degrees.

The changes in the upper urinary tract are seen by intravenous pyelography, which may demonstrate some degree of dilatation of the renal pelvis and upper inch or two of the ureter, and, in neglected cases, kinking of the pelvi-ureteral junction, due to inflammatory adhesions between the renal pelvis and ureter, and a varying degree of hydronephrosis from the increasing urinary obstruction. The urine is usually sterile, but may contain pus cells and *B. coli*, in which case renal specimens are collected by ureteric catheterization. Almost invariably, however, these are normal, which proves that the kidneys are not the source of the bladder infection.

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The Association of Urological Inflammation with Genital Infection

The most significant thing in the majority of these women is the evidence of some degree of genital infection as shown by chronic cervicitis or cervical erosion, with or without some laceration of the cervix, and often by tenderness and thickening in the fornices. This association of genital and urological inflammations is so constant that one has almost been able to predict from the cystoscopic findings what the cervix would look like when viewed through a speculum; thus much suspicion has come to fall on this structure, and with it a desire to know more about its habits and their consequences.

This led some two years ago to a series of animal experiments carried out by Winsbury-White, and described by him in his Hunterian Lecture in February, 1933, under the heading of "The Spread of Infection from the Uterine Cervix to the Urinary Tract, and the Ascent of Infection from the Lower Urinary Tract to the Kidneys." Briefly they consisted of the injection of Indian ink or tubercle bacilli into the cervixes of rabbits, rats, and guinea-pigs, and in killing the animals at periods of time varying from one hour to three weeks later. The pelvic organs and the soft parts of the posterior pelvic and abdominal walls were then sectioned in a serial manner and examined microscopically.

The Spread of Infection

Perivascular lymphatic spread was demonstrated both forward to the submucous coat of the trigone of the bladder and upward to the kidney by way of the base of the broad ligament, the hollow of the sacrum, the brim of the pelvis in the region of the common iliac vessels, the glands and lymph vessels of the renal hilum, and, finally, by invasion of the renal substance through the fibro-fatty tissue surrounding the calyces. That the invasion was not haematogenous was proved by the absence of pigment or inflammation in the glomeruli and capillaries of the renal cortex which is characteristic of a blood-borne infection. That it did not spread up the walls of the ureters was shown by the complete absence of pigment in all sections made through them at successive levels. Winsbury-White considers that this ascending spread is supported by the clinical facts which are so constantly observed and which include tenderness in the fornices and backache, and by x-ray examination, which shows phleboliths on the pelvic floor and calcified glands along the posterior abdominal wall.

These experiments and the fact that frequency and dysuria in women are often very resistant to treatment, if this be directed solely to the urinary tract, emphasize the importance of visual inspection of the cervix and careful bimanual examination of the uterus and adnexa in the investigation of patients with urological symptoms. That they should be resistant to treatment becomes simple to explain when often no attempt is made to deal adequately with a cervicitis the significance of which has not been realized.

Frankl of Vienna has shown that the area of infection is not only the cervical canal, but also that part of the endometrium lying immediately above the internal os and known as the pars intermedia. Dr. Knott of Guy's Hospital, by sectioning a series of cervixes removed by amputation by Mr. Lyle Cameron at the Royal Waterloo Hospital, has shown that the cervical glands, as a result of chronic inflammation, penetrate to a depth which rarely exceeds one-eighth of an inch. The complete cure of the condition, therefore, necessitates the removal of the lining membrane of the cervical canal and pars intermedia and all the subjacent glands.

Amputation or Cauterization of Cervix in Treatment

The methods of treatment which have been employed for chronic cervicitis are many and various. The non-surgical procedures, such as douches, local applications, tampons, ionization, ultra-violet light, and medical diathermy, are, on the whole, disappointing, and are usually followed by an early relapse when discontinued. Surgical methods are much more reliable, and the two procedures commonly employed are amputation of the cervix and dilatation of the cervix followed by cautery. In my opinion neither of these is satisfactory. Complete

FIG. 2.—Diathermy cutting current curette.

amputation, if skilfully performed, will certainly remove the infected tissues, but this operation is not to be recommended in nulliparae or in younger women who are anxious to bear more children. Dilatation followed by cautery is a popular method, and although the whole of the affected area can be treated, the deep-seated glands are not completely destroyed, there is frequently but slight improvement of the local condition, and the treatment often has to be repeated. A number of women in whom hysterectomy was advised for other reasons were submitted either to partial amputation of the cervix or to dilatation and cauterization of the cervix before the uterus was removed. Microscopical examination showed

On the principle of the McCarthy cutting loop for the removal of fibrous prostates through a cystoscope, and by means of which longitudinal strips of the gland can be resected, Mr. Schranz of the Genito-Urinary Company has made for me a series of cutting current curettes of various sizes. They consist of a fine tungsten wire loop, elliptical in shape and fixed at an angle of 30 degrees at one end of a well-insulated metal rod. The other end of this rod is threaded, and screws into a larger rod about four and a half inches long, which engages in a socket fixed at a right angle on an insulated handle in such a

FIG. 3.—Method of using the cervical curette.

way that it can rotate but not disengage without a strong pull. The insulation of the rod is increased near the handle to form a collar, serrated at the circumference, by which it can easily be rotated with the thumb and index finger of the right hand. The cable from the cutting diathermy machine plugs on to the pin at the lower end of the handle (Fig. 2).

The patient, who should arrange to stay in a hospital or nursing home for a week, is anaesthetized and placed in the lithotomy position. A lead belt surrounding the waist is connected to the diathermy machine and constitutes the indifferent electrode. The skin and vagina are painted with surgical dettol, which is non-inflam-

FIG. 4.

FIG. 5.

FIG. 6.

that in both methods much infected glandular tissue was left behind, which explains the relapses that may follow these operations.

The Diathermy Cutting Current Curette

In my opinion the ideal way of complying with the essentials of treatment is to remove the glandular tissues completely by means of a wire loop activated by the diathermy cutting current. The method was, I believe, first introduced by Everard Williams, and a loop made for him which he called the "coniser." I have used this loop, but have not been satisfied with its results.

mable, towels are adjusted, a speculum inserted, the cervix grasped laterally with vulsellum forceps and pulled forward. The uterine cavity is explored with a sound, the cervical canal dilated to No. 8 Hegar (25 degrees Charrière), and dried as far as possible with gauze.

The strength of the current is adjusted (dial setting 4 on the genito-urinary endodiathermy machine), and the curette passed a quarter of an inch beyond the internal os (Fig. 3). The current is then turned on with the foot-switch, and a strip of pars intermedia and cervix removed from the roof of the canal, the instrument being steadied with the fingers of the left hand. Great

care must be taken not to allow the cutting loop to slip as it leaves the external os, and to remember at this point to turn off the current with the foot-switch; also to hold the stem of the curette parallel with the cervical canal in order not to cut too deeply. The loop is so constructed that strips of lining membrane and underlying glands are removed in one piece if the instrument is correctly held. If for any reason it is necessary to make a deeper cut, the instrument can be tilted and tissue up to one-quarter of an inch in depth cut out. Strips are then cut from the sides, and lastly the floor. As each cut is made bleeding automatically stops from this area, until finally the endocervix is completely dry, which enables the operator to gain a perfect view and to deal with any small part which may have escaped resection. If an erosion is present it is excised by a larger cutting loop mounted on a bakelite handle, and the uterine cavity and cervical canal packed with gauze plugging soaked in 10 per cent. picric acid in absolute alcohol, which is removed eight hours later. The operation is completed by dilating up the urethra with a special pair of urethral forceps to 40 degrees Charrière in order to deal with the associated urethritis.

Saline douches are begun fourteen days later, and continued until the cervix is healed, which takes about two months. Intermittent dilatations of the urethra at fortnightly intervals are continued until a calibre of 40 degrees Charrière is attained without bleeding and without any appreciable resistance.

Figs. 4, 5, and 6 show a chronic cervicitis with an extensive erosion before treatment, directly after treatment, and three months after treatment. The results of this method of operative treatment for chronic cervicitis, especially if it has given rise to renal or vesical symptoms, I have found to be excellent, both clinically and pathologically.

Clinically the vaginal discharge, frequency, dysuria, renal pain, and backache disappear in the absence of any other gynaecological or urological cause, and in a series of eighty cases which have been followed up by Dr. Bryce Cooper and myself, both at the Royal Waterloo Hospital and in private, there was no distortion or contraction of the cervical canal. This was only to be expected, as excision of tissue by the diathermy cutting current is followed by a supple scar, which does not contract; and so resembles the results obtained in other parts of the body. Sufficient time has not elapsed for me to give an opinion on the effect that this treatment may have on conception and future pregnancy, but in one case in the series conception took place for the first time after twelve years of married life, and resulted in a normal pregnancy.

Pathologically a series of hysterectomies was performed by Mr. Lyle Cameron, in some cases immediately following the diathermy curette and in some six months later. By serial sections of the cervix Dr. Knott showed in the former that all the infected tissues had been removed, and in the latter that there were no signs of cervicitis.

In 1933 the British Science Guild began the Research and Development Lectures with the object of directing public attention to the importance of scientific research and of the utilization of its results in the service of mankind. Early in 1934 a proposal was made that the lectures should be given in the theatre of the Royal Institution, where special equipment and facilities exist for experiments and demonstrations, and arrangements were made by which the Guild had the use of the theatre on two occasions in May. Four further lectures have now been arranged, including one, on December 12th, at 9 p.m., by Dr. G. W. C. Kaye, on "Sound and Noise."

GAS GANGRENE RESTRICTED TO THE SUBCUTANEOUS TISSUES

REPORT ON A CASE

BY

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The following case is thought to be of sufficient interest to report on account of: (1) the limitation of the infection to the subcutaneous tissues of one limb; (2) the good general condition of the child, maintained until pyogenic organisms made their appearance; and (3) the uneventful recovery, whether due to the mild pathogenicity of the organisms or as a response to serum.

Case Record

A small boy, aged 7, ran a nail into the right leg, just below the knee, on February 10th, 1934. This was shortly afterwards withdrawn by his father. He was sent into hospital on February 14th as a case of cellulitis of the leg. On admission his temperature was 99.2°, and pulse 100. He did not look ill or toxic, nor did he seem in any great pain, but on questioning he said: "I'm all right in myself, but my leg hurts me."

On examination the entire right lower limb was very swollen, tense, of a whitish colour, and there was a very small perforating wound over the external tibial condyle above the site of origin of the anterior tibial group of muscles. There was no pitting or crepitus; the oedema was solid. The circumference of the thigh was 15½ inches, as compared with 12 inches on the left side. An anaesthetic was given, and on cleaning the wound preparatory to excision of the skin edges a few bubbles of gas and a small quantity of pus issued from it. The surrounding tissues were gently pressed, and a few more bubbles and thin, brownish serum appeared. A smear was taken, the edges of the wound excised, and the latter left open.

An immediate examination of the pus was made, and, on finding organisms typical of the *B. welchii* group, anti-gas-gangrene serum was given, 5,000 units intravenously and 5,000 intramuscularly. Hot fomentations were applied to the wound, and the leg placed on a back splint. The child's general condition remained good, and the condition of the limb unchanged, the oedema not extending above Poupart's ligament. An x-ray photograph showed gas bubbles subcutaneously only in the region of the knee. A further 10,000 units of serum was given on February 15th into the subcutaneous tissues of the right thigh, and 5,000 intravenously with 5,000 intramuscularly on February 17th.

Up to February 28th the circumference of the thigh had diminished by one inch, the child was well and comfortable, and there continued to be a small sero-purulent discharge from the wound; but on March 1st his temperature and pulse began to rise, and he complained of increasing pain on the inner side of the thigh. An inflamed indurated area was present along the inner side of the lower third of the thigh, which was very tender. Slight pitting oedema of the scrotum developed at this stage, but soon disappeared. On March 2nd an incision was made into the subcutaneous tissues along the inner side of the thigh and a small quantity of pus obtained, which was sent for pathological examination, the report being haemolytic streptococci only. Following this incision quantities of serum drained from the wound. Further incisions were made into the subcutaneous tissues in the now indurated areas in the popliteal region and inner side of the upper part of the leg on March 5th and 9th, and the small quantity of pus which was first obtained was soon followed by the discharge of large quantities of serum. Hot fomentations were applied and, later, eusol dressings. During the period of pyogenic infection the child had a raised temperature and pulse, but these became normal on March 14th, and he was discharged on the 19th. The limb was now 1½ inch less in circum-