I

URETHRITIS AS SEEN THROUGH THE URETHROSCOPE *

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MR. PRESIDENT, LADIES AND GENTLEMEN,—I am very flattered that this Society has asked me to read a paper to-night on "Urethritis as seen through the Urethroscope."

If you will bear with me for a few moments I will, before describing the appearance of an inflamed urethra as seen through the urethroscope, say a few words on the value of the instrument and the necessity for its use by those who wish to study the various pathological changes that are to be found, quite apart from its use in prognosis and treatment. There are those who say that they can see nothing through a urethroscope, and there are others who see too much. A very well-known specialist in the treatment of venereal diseases has been heard to say on several occasions that the only time he used a urethroscope the only thing he saw was the damage he did putting it in. What a wonderful eulogy of the instrument ; what a luminous insight into his incompetence ! An artist can see wonderful pictures in what to us appear drab, dull, everyday sights, but after seeing his paintings produced on canvas even the uninitiated can appreciate a little of what he sees. Whistler has taught us something of what he saw of the Thames at Chelsea. Turner has made us realise something of the colour and tone of a sunset—not that I am comparing the illuminated urethra to a sunset ; and I am sure that he who is sceptical as to the use of the urethroscope would see and appreciate far more if he were shown its possibilities by a master hand.

Long and constant practice with the instrument is necessary before a really valuable opinion can be given. The normal mucous membrane varies so much that, until

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its appearance under varying conditions has been thoroughly mastered, its pathological changes cannot be truly appreciated. Having in these few words given my views on the necessity of using a urethroscope, I will come to the subject of my paper.

URETHRITIS OF THE ANTERIOR URETHRA

The earliest forms of inflammation seen in the urethra, whether due to the gonococcus, other organisms, or the action of chemicals or other irritants, are :—

Simple Littritis.—This condition occurs when the gland of Littré and its duct are involved. Mucus or muco-pus is seen issuing from the mouths of the ducts. A red ring is seen round the openings, which are now plainly visible.

Cysts or Abscesses.—The urethroscope shows very clearly the thin white walls of a cyst, or the yellow, thicker walls of an abscess. A provocative dose of a gonococcal vaccine will sometimes change what appears to be a normal mucous membrane to a red swollen mass containing obvious abscesses, thus saving the surgeon from making a serious mistake. Morgagni's crypts also show pathological changes apart from being involved in infiltration. Vivid red V-shaped figures are seen, the crypts gape and stand out from the surrounding mucous membrane. If the mouths of the pouches are sealed with exudation, they are changed into cysts or abscesses. These are quaintly compared by Luys to "hampers." The gonococcus can live for a long time sheltered from irrigations, the fluid passing by and not entering the pockets.

Soft Infiltration.—This form of urethritis usually commences when the disease is becoming chronic, although it may start during the acute stage. Various stages of the disease are frequently seen in the same urethra. The areas involved become more vascular, and the sub-epithelial layer is invaded with small round cells. The mucous membrane is inflamed, congested, and even œdematous. The epithelium is sometimes more, and sometimes less, shiny than normal. There is usually some slight desquamation; some erosions of a dark red colour have been described, but they must be very rare. The mucosa being thickened, the number of folds become less and correspondingly wider. The central

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figure is now surrounded by dark red folds of swollen mucous membrane ; these bleed easily and have been compared to a mass of hæmorrhoids.

In the anterior urethra the commonest site is the penile portion, especially in the middle and round the peno-scrotal angle and in the bulb. The size varies considerably ; sometimes small semi-lunar patches are seen, sometimes they occupy large irregular-shaped areas. They are usually multiple, separated by areas of more or less healthy mucous membrane. The edges of the patches merge imperceptibly into the healthy tissue.

The glands of Littre and the crypts of Morgagni, in the parts involved in the infiltration, are always infected. At first there is an over-secretion ; later, pus may be seen issuing from them. With a pipette (a special one has been designed by Kollmann for the purpose) it is possible to obtain some of the secretion for microscopic examination. The crypts of Morgagni swell up into little red nodules standing out from the mucous membrane, varying in size from a pin's head to a small pea. Their openings can sometimes be seen with swollen margins and oozing pus. The openings of Littre's ducts project from the surrounding mucosa and have the appearance of tiny red elevations. Under slight air distension it will be found that some parts of the urethra do not dilate normally, but are seen to remain in the same position, or even to bulge into the lumen of the canal. By the pressure of air necessary to dilate the infected areas the stage that the infiltration has reached can be gauged. Papillomata, similar to the so-called gonorrhœal warts, may be found in connection with soft infiltrations.

In cases not treated by dilatation—in time varying from weeks to months—the œdema and redness disappears, but the urethra does not dilate normally. There may be no symptoms, not even a gleet, whilst the pathological changes are taking place, and the patient is not aware that there is anything abnormal occurring in his urethra. A granular urethritis may be seen before the connective tissue formation takes place in the formation of a stricture. The area involved has a mottled appearance, and the surface is covered with small yellow or red elevations budding out from the altered mucous membrane.

Hard Infiltrations.—The urethroscopic tube should have a straight cut end when examining this form of

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infiltration. Two types have been described by Obërlander as seen with the urethroscope :—

- (1) The glandular.
- (2) The follicular or dry type.

Glandular.—The orifices of Littre's glands and Morgagni's crypts stand out very clearly in the urethroscopic picture. The former, normally invisible, are now easily seen. Both glands and crypts are surrounded by rings of inflamed tissue. The openings are enlarged and stand out from their surroundings. Mucus or muco-pus pours from them, and frequent swabbing may be necessary to allow the condition of the mucous membrane to be seen. This accounts in many cases for the increase in the discharge after dilatation. Small cysts can frequently be seen. If these contain gonococci and are ruptured, they are liable to infect the surrounding mucous membrane and cause a relapse.

Follicular.—In this type there are no glandular openings to be seen, the glands themselves being buried under the fibrous tissue of the infiltration. They are to be found in the sub-epithelial layer transformed into cysts, which may contain pus. Those that are much distended are seen as globular swellings bulging into the lumen of the canal. As regards colour, that depends on the thickness of the tissue which separates the cyst from the urethra. If thin, it is of a white or yellow colour ; if thick, it may look normal and the cyst not diagnosed by a urethroscopic examination. In this case it may be felt as a hard nodule under the skin of the penis from the outside. The infected area of all hard infiltrations, whatever the cause, is seen as a rigid tube, the walls do not come together, and the urethra cannot be distended by air pressure. The colour varies with the amount and depth of the infiltration and the length of time the lesion has been present. If the stricture is white or greyish, it means that there is considerable pressure on the blood vessels. Patches of leucoplakia may be seen, which can be removed only with difficulty, and leave a raw and bleeding mucous membrane. Through one stricture others may be seen. On dilating a hard stricture it is usual to find an ampulla behind it, where papillomata may grow.

Before finishing the description of hard infiltrations I should like to say a few words on their pathology. I

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have already said, in reference to soft infiltrations, that the condition starts with a small round-celled infiltration of the sub-epithelial layers. The cause of this condition is the irritation of the gonotoxin or other poison in the sub-mucous layer causing hyperplasia of the tissues and an inflammatory exudation. The epithelium proliferates and the columnar cells are changed into squamous. The next change in an untreated or badly treated case is a sclerosis of the sub-epithelial layer. Later on, the time varying very much in different cases, a thick mass of avascular fibrous tissue develops, destroying the elastic fibres and spreading through the sub-mucous layer and invading the tissues of the corpus spongiosum. In old-standing cases the fibrous tissues become cartilaginous and the colour changes to dirty yellow. This state may take from eight months to twenty years to develop, or may even occur during the acute attack.

One has now to consider other causes of a urethritis, and what one finds on a urethroscopic examination. Signs of irritation of the urethra may be due to a very large number of causes, such as the action of chemicals, the friction of calculi, the passing of surgical instruments or foreign bodies, such as slate pencils, etc., or other causes. If through the urethroscope one sees, for instance, a calculus, the cause of the urethritis is clear, but if not it will be necessary to go carefully into the case from other points of view in order to arrive at the actual reason of the inflammation we can see so clearly.

Urethritis may be brought about by new growths, and a very short description of them is necessary from the urethroscopic point of view.

Benign Growths

Papillomata are the commonest, and can be found apart from soft infiltrations. They may occur in enormous numbers, and may even impede the flow of urine. They are most frequently seen in the bulbous urethra. If they take the form of flat sessile warts they have been mistaken for erosions of the mucous membrane by careless and inexperienced urethroscopic examiners. Large fleshy warts may be seen, or long, thin strands like seaweed. These are very soft and easily broken, and appear in almost every shade of red.

Polypi.—These may be found in the fossa navicularis or the bulb. They are very easily missed, as they do not stand out, and are often hidden in the folds of the mucosa. A discharge that does not react to treatment may be caused by one or more polypi, and can only be diagnosed and treated efficiently by the urethroscope. Other benign new growths that may be seen are fibromata, fibro-myomata, myomata, cysts, angiomata, and lymphoid new growth. *Fibroma* are seen as a small, single, smooth tumour with a distinct pedicle. *Cysts* can be diagnosed without difficulty, but their cause may not be clear. *Lymphoid new growth* can be found in long-treated cases. The whole urethra may be studded with grey bodies the size of millet seeds. *Angiomata*: The urethroscopic appearance is typical, and could not be mistaken for any other condition.

Malignant Growths

Primary growths are almost unknown. Symptoms of urethritis are present, such as a purulent or hæmorrhagic discharge. With the urethroscope two types of growth are to be seen. One is a red papillomatous mass, and the other a warty, white infiltration, closely resembling a warty leucoplakia of the tongue. Its great hardness will be noticed if it is scraped with the end of the tube of the urethroscope. The commonest situation is deep in the bulbous urethra. In an advanced case fistulæ or abscesses are to be seen.

Tubercular Disease.—In the urethra it is always secondary, generally to disease in the kidney or bladder. The bulb is the commonest situation. The diseased urethra is seen as an ulceration or as granulations, occasionally being seen as a caseous infiltration. The urethroscopic appearance is typical of tubercular disease elsewhere, and the ulceration could not be due to any other cause and is brought about by the breaking down of the granulations. As the mucous membrane is acutely tender, speed in the examination is necessary to avoid great pain and the setting up of a violent inflammation.

Primary Syphilis.—The site of the primary chancre may be just inside the meatus or further down the urethra. The urethroscope is a valuable guide to the

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diagnosis in the early stages before the induration has commenced, and when no serum can be obtained for dark-ground examination. The usual appearance is that of a small red or grey ulcer or erosion, which bleeds easily. The surrounding mucous membrane is thickened, and the folds are deepened and reduced in number. Often a follicular condition is present.

Secondary Syphilis.—In this condition a specific urethritis is sometimes found. A thin, or more rarely a thick, discharge calls for a urethroscopic examination. No other signs of syphilis may be found, and a discharge may be the only symptom. Mucous patches give the clue to the diagnosis.

Tertiary Syphilis.—The urethroscope may show us one or more gummata, which are seen as small rounded projections bulging the mucous membrane. These are circumscribed, but diffused gummatous infiltration can occur, in which case a large indurated mass is seen. In both these forms, if the gummata breaks down, typical ulcers are left, which make the diagnosis easy. In a late untreated case phagedena may occur and the whole penis be destroyed—fistulæ, with secondary infection, spreading into the periurethral tissues with disastrous results, or stricture. The stricture may be due to two causes, which can be plainly differentiated by the aid of the urethroscope. One is not a true stricture at all, but only an obstruction due to the pressure of the gummata, and is relieved when ulceration takes place. The other is a true stricture, and is due to the cicatrisation of the ulcerated gummatous mucous membrane, with or without secondary infection. Near the meatus is the commonest place to find this condition.

Chancroids.—These have been found in the urethra, but are rare. In appearance they are exactly the same as are seen elsewhere. They can occur further up the canal than a primary sore.

Ulcers.—It is rare to find ulcers in the urethra. The differential diagnosis is between chancres, chancroids, herpes, tuberculosis, malignant disease, those caused by the injection of strong chemicals, and the irritation of a calculus or a foreign body.

Herpes.—Herpes of the mucous membrane may cause a urethritis. With the urethroscope the typical vesicles may be seen, or, as these are usually broken when intro-

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ducing the tube, herpetic ulcers, occurring in clusters or confluent patches, are not difficult to diagnose.

Necrosis.—This condition is really more than a urethritis, but this paper would not be complete without mentioning it. The whole or part of the mucous membrane may slough away. Occasionally a strong antiseptic, like pure carbolic, may be injected in the hope of aborting an attack of gonorrhœa, but it is usually the work of a lunatic. What one sees depends entirely on the stage at which the condition is seen. The end result is a stricture of almost cartilaginous hardness, especially if the mucous membrane has been destroyed to any appreciable depth. The posterior urethra is not involved owing to the spasm of the compressor urethræ muscle.

Psoriasis Urethralis, or Leucoplakia.—This has been mentioned in connection with hard infiltrations, but can occur without them. It may be caused by treatment, especially with strong antiseptics, but it may occur in untreated cases. Two types have been described. One type consists of one or more patches of a milky-white colour, and resembles very much the condition that is seen on the sides of a syphilitic tongue, but is found in cases that have never had syphilis. In these cases the separation of the patch from the surrounding mucous membrane causes a good deal of pain and hæmorrhage. In the other type the epithelium and mucous membrane are involved. A dirty grey mass is seen, which can be easily scraped off without pain and very little bleeding. Neither of these conditions is at all serious, and usually clears up very easily with dilatation.

URETHRITIS OF THE POSTERIOR URETHRA

There may be no clinical symptoms whatever pointing to the involvement of the posterior urethra. The diagnosis may be made only after a urethroscopic examination. The commonest pathological conditions are :—

Soft Infiltration.—This lesion is by far the commonest, at any rate in a case of gonorrhœa. The mucous membrane is congested, it bleeds easily at the slightest touch, and projects into the lumen of the canal. These infiltrations are found in the membranous portion, having extended backwards from the bulbous urethra. They may be found in the supramontaine region (the prostatic

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fossette), on the verumontanum, and in front of and in the grooves on either side of it. The roof even may be infiltrated. Like the anterior urethra, the glands are involved in soft infiltrations. The infected prostatic ducts swell up and become surrounded by a red œdematous ring. Goldschmidt compares this condition to the eyes of a frog. They may appear in groups, each duct having a tiny purulent point. The verumontanum varies so much normally in size, shape and colour that it takes an experienced urethroscopist to detect abnormal changes in it. As it is erectile and easily engorged with blood, even if it is normal, it may look hypertrophic. A fairly common picture is to see the utriculus surrounded by a ridge-like edge, the opening being enlarged and definitely infiltrated. The openings of the ejaculatory ducts are difficult or impossible to see. The internal sphincter is no longer smooth, and the folds of mucous membrane are thick, irregular, and œdematous. Polypi and newly-formed blood vessels may be seen.

Hard Infiltrations.—In this condition the urethroscopic picture is very typical. The mucous membrane, usually so vascular, has now completely changed. It is of a greyish-yellow colour ; it is dry and anæmic looking, and the epithelium has desquamated over the involved area. In the membranous portion the folds of mucous membrane have disappeared and the urethra has been converted into a rigid pipe. In traumatic cases the membranous urethra alone may be involved, but in cases due to gonorrhœa it is an extension from the bulbous portion. If the verumontanum is involved it becomes wrinkled and contracted ; pressure of the fibrous tissue renders it dry and pale.

Glandular Infection—The glands may become infected apart from being involved in an infiltration. A ring of inflammation surrounds the openings of the prostatic ducts, and they may project into the lumen of the canal. If the prostate is massaged while the operator is examining the floor with the urethroscope, pus can be seen issuing from them. The follicles most frequently infected are those opening into the fossette and those opening into the groove on either side of the verumontanum. If pus is seen to be coming from the utriculus, the “ mirror ” of the vesicles, it is probable that these also are infected.

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Benign Growths.

Papillomata.—These are found in nearly every inflammation of the deep urethra. With the urethroscope they are seen as small, multiple, warty growths that bleed easily. They are so often responsible for keeping up a discharge, and quickly disappear when the urethra is dilated up. The whole of the prostatic urethra may be covered with these growths, in which case they are usually of the cauliflower type. They are very often seen on the verumontanum in the shape of a cock's comb, an eel, a phallus, or other things. In the membranous urethra they appear as polypi, usually with a long pedicle.

Other benign growths have been described, but are rare.

Malignant Growths

Carcinoma may invade the posterior urethra from the prostate. The membranous and prostatic urethra becomes hard and indurated. If the mucosa itself is not invaded one only sees the result of pressure, the mucous membrane becomes red, and the opening into the bladder is irregular in shape.

Sarcoma is very rare in the male urethra.

URETHRITIS OF THE FEMALE URETHRA

Urethritis occurs in the female as well as in the male. As there is so much squamous epithelium in the urethra of the female, it resembles more closely the membranous urethra of the male. The commonest cause of urethritis is gonorrhœa, but there are many other causes, such as the passage of instruments and foreign bodies, like hair-pins, or calculi. If the urethroscope is used in the early stage of the disease (which Heaven forbid), the more glandular portions of the urethra are found to be dotted with a multitude of projecting points. These are the openings of Skene's or other glands. Pressure on them with the end of the urethroscope tube may force out a tiny bead of pus. Later on patches of submucous infiltration will be seen. The whole of the mucous membrane is swollen and dark red in colour and may be bathed in pus. Leucocytes have invaded the mucous and submucous layers, and the epithelium becomes desquamated. Small hæmorrhages may be seen. The

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mucous membrane looks more normal as the disease becomes more chronic. As so many of the openings are microscopic in size, the condition is often difficult to diagnose, and may look, and be passed as, normal. Gonococci can remain latent for years. Most of the pathological conditions in the female are infinitely more tender than is the case of the male. Gonorrhœal urethritis in the female is seen as one of three types, but all types may be present to a more or less degree in the same case at the same time :—

- (1) *Fibrous urethritis.*
- (2) *Proliferating urethritis.*
- (3) *Periurethritis.*

(1) Fibrous urethritis is Nature's attempt to cure the condition. The pathology is the same as in the male. The end result, without proper and sufficient treatment, is stricture. Owing to the large size of the urethra, this may never be diagnosed.

(2) The proliferating type is characterised by the growth of a large number of vegetations or small polypi. In some cases only a small area is involved. In others the whole urethra is covered with them. The commonest symptom is small but frequent hæmorrhages from the urethra. The urethroscopic appearance is typical, and the growth may be seen externally coming out of the meatus and growing on the tissues round the meatus.

(3) Periurethritis is a very frequent cause of a relapse. One sees a number of small red spots round the meatus, standing out from the mucous membrane. Pus can be squeezed out of the ducts. This type of case is often very difficult to diagnose with the urethroscope alone. The condition will never be cured until every follicle that is infected is thoroughly treated.

New Growths

Benign.—Papillomata and polypi are fairly common, especially near the meatus and internal sphincter, but may occur anywhere. If very small they are difficult to see, and if symptoms pointing to their presence are complained of a very careful search must be made. A large size tube should be used and the whole mucous membrane distended with air. They are sometimes found floating back into the bladder.

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Angioma.—This can hardly be described under the heading of urethritis, but as the patient complains of tenderness and pain on passing water the diagnosis must be cleared up. The commonest situation is on the floor of the urethra, at or near the meatus. It may occur at any age, but is rare before thirty. It is very liable to become malignant.

Fibroma, myoma, and fibro-myoma are rare.

Malignant Growths

Primary carcinoma of the female urethra, apart from a changed urethral caruncle, is very rare. Extension from the vagina, bladder, clitoris or labia may involve the urethral tissues. Their hardness and urethroscopic appearance are the same as in the male.

Sarcoma.—This form of malignant disease is supposed to be commoner in the female than in the male, but is very rare indeed. Strictures in the female are usually single. They are generally only discovered by accident. The urethroscope shows a smooth cartilaginous canal, which is permanently open. The mucous membrane is pale, and in long-standing cases yellowish-grey. The urethra behind the stricture is dilated, and often inflamed.

Syphilis.—Urethral chancres are more common in the female than in the male. They are usually found at the lower angle of the meatus. Intraurethral chancres can be found in the anterior part of the canal. The induration is felt through the vaginal wall, and the canal feels like a hard pipe. The secondary and tertiary manifestations are the same as in the male.

Tuberculosis, herpes, chancroid, leucoplakia, and other conditions can occur in the female urethra, but require no further description.

It may be thought that a large part of this paper has very little or nothing to do with urethritis, but surely the inflammation of the urethra caused by a growth is as much a urethritis as a littritis caused by the gonococcus is? To those who think that I have wandered too far from my subject I apologise, and they can attack me in the discussion. To those who think that I have been too sketchy in my description of urethritis I will plead guilty, and offer the vast amount of ground to be covered in the time as my excuse. (Applause.)