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THE ANATOMY AND PATHOLOGY OF TWO IMPORTANT
GLANDS OF THE FEMALE URETHRA.

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 (With lithographic plate.)

UPON each side near the floor of the female urethra, there are two tubules large enough to admit a No. 1 probe, of the French scale. They extend from the meatus urinarius upwards, from three-eighths to three-quarters of an inch. Figure 1 is a drawing from a section of the urethra, laid open by division of its posterior or vaginal wall. The tubules, having been distended by probes passed into them, are plainly seen

Figure 2 shows the same thing from the opposite side, the urethra having been laid open by section of its anterior wall. The space between the tubules is the floor of the urethra. From these it will be observed that the tubules run parallel with the long axis of the urethra.

They are located beneath the mucous membrane, in the muscular walls of the urethra. This is represented by Figure 3, which is a drawing taken from a transverse section of the urethra, about a quarter of an inch from the meatus.

The mouths of these tubules are found upon the free surface of the mucous membrane of the urethra, within the labia of the meatus urinarius. The location of the openings is subject to slight variation, according to the condition and form of the meatus. In some subjects, especially the young and very aged, and in those in whom the meatus is small and does not project above the plane of the vestibule, the orifices are found about an eighth of an inch within the outer border of the meatus. When the mucous membrane of the urethra is thickened and relaxed, so as to become slightly prolapsed, or

when the meatus is everted, conditions not uncommon among those who have borne children, the openings are exposed to view upon each side of the entrance to the urethra. What is here described is rather imperfectly represented in Figure 4. The labia of the meatus have been slightly everted to bring the orifices into view.

The upper ends of the tubules terminate in a number of divisions, which branch off into the muscular walls of the urethra. By injecting the tubule with mercury, and then laying it open, the openings of the branches can be easily seen. Figure 5 is taken from a specimen so prepared, and it shows the small openings of the branches at the termination of the tubule.

This description of the anatomy of these glands is taken from dissections and microscopical examinations made by my colleague, Dr. B. F. Westbrook, who kindly procured a number of specimens of the female urethra, and made the preparations represented in the drawings, which were made by Mr. Leuf.

I have called them glands, because they differ in size and structure from the simple follicles found in abundance in the mucous membrane.

When I first discovered these glands, I presumed that they were mucous follicles that were accidentally of unusual size in the subject examined, but having investigated more than one hundred of these, in as many different subjects, and finding them constantly present, and so uniform in size and location, I became satisfied that they were worthy of a separate place in descriptive anatomy. The dissections made by Dr. Westbrook, and the pathological lesions to which these structures are subject, confirm this belief.

So far as I know, the anatomy of these glands has not been described, nor have the diseases to which they are subject been referred to by pathologists. At least, this much may be said, that the standard text-books on anatomy and gynecology in English, German, and French contain no reference to them.

It is easy to understand why these insignificant glands should have been overlooked by anatomists, or, if noticed at all, classed with other mucous follicles. It is only when their pathology is understood that their real importance becomes apparent.



Fig. 1.

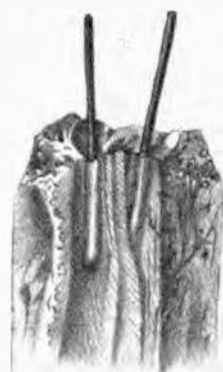


Fig. 2.

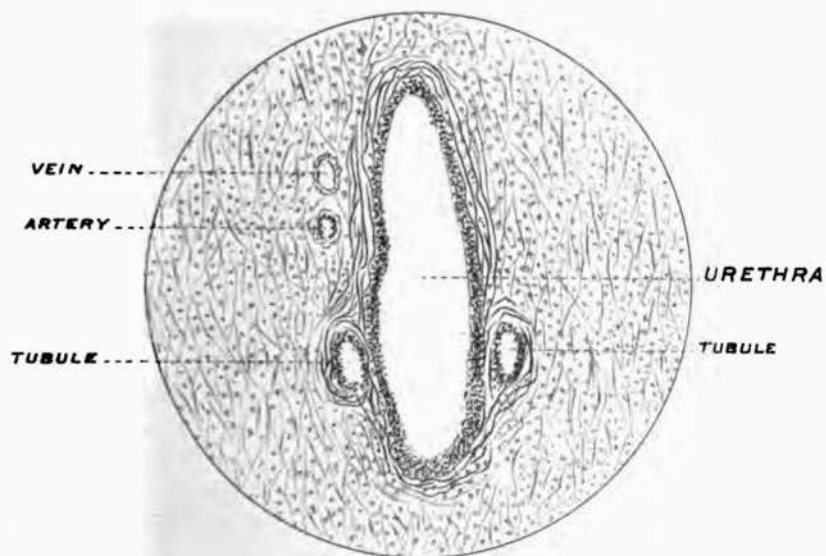


Fig. 3.

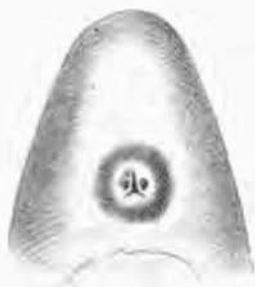


Fig. 4.



Fig. 5.

I know nothing about the physiology of these glands. They serve some purpose in the economy, no doubt, but what is their function is a question to be answered in the future. This will doubtless be attended to at an early date, if the subject is considered worthy of investigation. The pathology of these glands that has been investigated up to this time is of great practical interest, and there remains, no doubt, much still to be studied.

Clinical observation has already shown that they are subject to inflammation of various degrees of intensity.

In the milder forms of inflammation, the mouths of the ducts are enlarged and are surrounded by a very narrow areola of a bright-red color, and by pressure upon the urethra from behind forward, they discharge a white serous fluid. This condition gives the patient very little trouble, and would readily pass unnoticed by the gynecologist, unless especially looked for.

The most important pathological condition observed in this location, up to the present time, is a purulent and continuous inflammation, which extends from the mucous membrane of the ducts to the surrounding tissues. The mouths of the ducts thus inflamed are usually seen externally, being brought into view by a slight prolapsus and eversion of the mucous membrane caused by swelling of the parts. The orifices of the ducts appear like very small ulcers of a yellowish-gray color. The mucous membrane of the meatus urinarius, especially in the neighborhood of the ducts, is thickened by proliferation, and is deep red in color. The general appearance of the parts is quite like that of caruncle or papilloma of the meatus. The lower third of the urethra is slightly thickened, in some cases, from the swelling of the inflamed parts. There is exquisite tenderness to the touch, and in walking or sitting the patient suffers great discomfort, but there is no great pain during urination, as a rule. In fact, the absence of painful urination is the chief point in the symptomatology which distinguishes this disease from urethritis and caruncle.

Inflammation of these glands has heretofore been mistaken for caruncles, at least it has been my misfortune in the past to confound the two affections, and I cannot see how others could have made a differential diagnosis if guided by the current litera-

ture upon the subject. By the light of recent experience, the distinction is easily made. In inflammation of the glands, their orifices can usually be distinctly seen, and by pressure upon the urethra the purulent secretion is seen escaping. There is redness and thickening or enlargement of the tissues surrounding the mouths of the ducts. In caruncles, the glands are normal and the diseased tissue is generally limited to the lower border of the meatus between the orifices of the glands. The effect of treatment also shows a marked distinction between the two affections. A simple caruncle, if thoroughly destroyed by caustics or removed by the scissors, rarely returns, while the vascular growths around the mouths of the diseased glands will return after being removed by any means, and will continue to do so until the inflammation of the glands is cured. This to me is a perfectly satisfactory explanation of the statement made by most of the authors who have written on the subject, namely, that caruncle is very liable to return.

These glands may, I presume, become involved in any inflammation of the vulva, urethra or vagina, but from the history of the cases that have come under my observation I have been led to believe that the disease observed was caused by gonorrhœa, and it persists in the glands long after all traces of the original disease had disappeared. Indeed, when this disease is once established, it has no natural tendency to recovery.

The clinical importance and characteristics of inflammation of these ducts may be best brought out by the history of cases. The first that I shall mention is the one which led me to discover this portion of urethral anatomy.

The patient was a married lady, 30 years of age. She was well developed, and had always enjoyed good general health. With the exception of a mild form of dysmenorrhœa, she had had no disease of her sexual organs until one year before she came under my observation. At that time she was abruptly attacked with a profuse leucorrhœa, and other symptoms of inflammation of the vulva and vagina, including painful urination. She placed herself at once under the care of her family physician, who treated her locally until she came to me. Her leucorrhœa had, by that time, diminished and the painful urination had passed away, but otherwise she had not improved. At my first examination I found traces of the former inflammation of the vulva and vagina. The meatus urinarius was everted and surrounded by a number of papillary projections, of a deep-red color, and altogether present-

ing an appearance resembling that which is known as vascular tumor, or caruncle of the meatus. Fig. 6 gives an idea of the appearance of the projecting and inflamed portions of the mucous membrane surrounding the meatus and the openings of the tubules.

The diagnosis then made was subacute vaginitis, perhaps of gonorrhoeal origin, and inflamed papilloma of the meatus urina-rius. The vaginitis was treated in the usual way, and soon it terminated in complete recovery, but the inflammation and tenderness of the meatus remained unchanged, and annoyed the patient exceedingly. She could not walk or sit without pain, and coitus had to be avoided entirely.

I presumed at first that the disease of the meatus was kept up by the irritating discharge from the vagina, and I hoped that when the one was removed, the other would get well, but such was not the case. I then thoroughly cauterized the elevated and tender points about the meatus with nitrate of silver. This caused very great pain at the time, and was followed by no improvement. Pure nitric acid was used in the same way, but with no better result, except to destroy elevations of the mucous membrane around the orifice. The same areola of inflammation around the meatus continued, and the symptoms remained the same. A full account of the progress of the case would be tedious and useless. Suffice it to say that for eight months I treated the disease with diligence and care, but at the end of that time she was very little better.

Caustics and cauteries being unsatisfactory, I tried sedatives and alteratives, including iodoform, iodine, mercury, and bismuth. At times, the inflammation subsided slightly, and the elevated points became smaller, but in a short time fresh proliferations sprang up again, and the muco-purulent secretion continued to bathe the parts. Towards the end of this long period of treatment, and while making a critical examination, I observed that on each side of the meatus there were two depressions filled with a yellowish-gray matter, looking like minute ulcers, but upon probing them with a view to determine their depth, I found that they admitted the probe over half an inch. After withdrawing the probe, I made pressure upon the urethra from above downwards, and succeeded in expressing a purulent fluid which could be distinctly seen escaping from their orifices. Treatment was then directed to these canals; first they were injected with tincture of iodine, and subsequently they were cauterized by passing a probe, coated with nitrate of silver, along their entire depths. Prompt improvement followed this application. The inflammation around the meatus gradually subsided, and the pain and tenderness passed away. In less than two months from the time that a correct diagnosis was made, and appropriate treatment employed, the patient recovered completely. The satisfaction which this gave to both patient and physician will be appreciated when the fact is recalled that she had been suffering for twenty-one months, and that for nine months she had been under my treatment without any marked improvement.

Such was my experience with this disease before I knew anything about the presence and character of the structures involved. Since then, I have seen quite a few cases of the same kind, and have found the diagnosis easy, and the treatment satisfactory. A brief history of another case will contrast agreeably with the former one.

A delicate nervous lady, *æt.* 33 years, married seven years without having had children. She had suffered for one year from symptoms resembling those of the case given above. At first her sufferings were not so severe, but in time they became intolerable, and she was compelled to consult her physician, who examined her, and found what he supposed to be a vascular tumor of the meatus urinarius. He sent her to me to have it removed. I found that she had the disease now under consideration, and a subacute vaginitis, limited mostly to the upper posterior portion of the vagina. The inflamed papillæ around the mouths of the ducts were deep-red, and so tender as to render it very difficult to examine her. She was directed to use a vaginal douche of borax and warm water. The inflamed papillæ were touched with equal parts of tincture of iodine and carbolic acid; and the ducts were injected with a solution of 3 ii. of nitrate of silver to $\frac{5}{3}$ i. of water. Twice a week subsequently, they were injected with a solution of two grains of nitrate of silver to the ounce of water, and finally borax and water were used. Under that treatment she recovered in six weeks.

For injecting these ducts I use a hypodermic syringe with the needle made probe-pointed.

The history of the two cases given may possibly convey the impression that inflammation of these glands is easily cured. That is only true in some cases; I have seen others that were exceedingly obstinate. The disease would subside, but not fully disappear, and as soon as all applications were suspended the trouble would return.

This has led me to think that other methods of treatment may yet be discovered that will be more prompt and effectual. In the next case that comes under my care, and does not yield promptly, I shall lay the duct open by dividing it from within outwards, *i. e.*, dividing the urethral wall from the ducts into the vagina, and keep the wound open until it heals from below outwards. In short, treat it as I would a fistula in ano.