A CASE OF ACUTE EPIDIDYMITIS IN AN UNDESCENDED TESTICLE, WITH GONOCOCCI DEMONSTRATED IN THE EXCISED ORGAN.

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AN acute inflammation in an undescended testicle demanding operation is not remarkable. The demonstration of gonococci in the organ thus removed is unique, so far as I can learn.

Since 1892, when Eraud¹ published his observations on the etiology of acute epididymitis, and concluded that the toxin obtained by him from a micro-organism cultivated from the urethra was the cause, the bacteriology has been much discussed. Soon after this publication d'Arlhac² substantiated these conclusions by growths on culture media and animal experiments. He isolated this diplococcus, similar in size and staining properties to the gonococcus, but growing freely on ordinary culture media, and called it the orchicoccus. Eraud and Hugouenq³ were able to prove to their own satisfaction that the orchicoccus was distinct from the gonococcus, that it was the cause of epididymitis, but that it might be present in the urethra without exciting such an inflammation. Somewhat later Carpentier⁴ recognized this special organism as an active irritant in epididymitis, and Rollet⁵ believed it to be the sole cause of the inflammation. While these observers uniformly found the growth on culture media to differ from the gonococcus, yet their conclusions have not been received without question, and the orchicoccus as described has not been accepted as a definite organism. Based on the large number of negative and the small number of positive results, a theory of irritation from a gonococcus toxin was advanced, but it lacks experimental proof. When the difficulty of cultivation of the gonococcus is considered, these negative results are not noteworthy. As is illustrated by the case of Collan,⁶ the immediate negative report from cover-glass preparations may prevent further investigation. Here a swelling of the epididymis was aspirated, but only serous fluid withdrawn, which was negative in the stained specimen, but on proper culture media gave an abundant growth of pure gonococci. Also the slight tendency of the gonococcus to cause frank suppuration is well recognized, and without an abscess, or some rare complication, as in the case to be reported, the opportunities of obtaining material for examination are few. Organisms other than the gonococcus have been isolated from an abscess of the epididymis by Jadassohn,⁷ staphylococcus, and Macaigne and Vauverts,⁸ Friedländer's bacillus; so that the possibility of a mixed infection cannot be denied. With our present acceptance of the gonococcus, however, as the cause of acute urethritis, and the not uncommon association of the epididymis with unusual irritation, as in irrigation of the posterior urethra or massage of the seminal vesicles, the probability of its being the etiological factor must be allowed. The increasing number of cases in which the gonococcus has been demonstrated also confirms the opinion that it is the specific organism of acute epididymitis, though inflammation with trauma, circulatory disturbances, as was held by Porosz,⁹

and a mixed infection are possible causes. Rou-tier,¹⁰ in July, 1895, reported gonococci in the pus from an abscess of the epididymis, but gave no data other than a microscopic examination of a Gram decolorizing diplococcus. Grosz,¹¹ in November, 1897, gave the first complete report of a positive growth of gonococci obtained from the pus from an abscess of the epididymis. His observations were complete and the growth on cultures was positive. In the next month Collan reported the case cited above, in which only serous fluid was aspirated from a swelling of the epididymis. Since that time cases have been reported with careful examinations of culture growths by Harttung,¹² Colombi,¹³ Witte,¹⁴ Reach,¹⁵ Pizzini¹⁶ and Karwowski.¹⁷ All cultures were obtained from isolated abscesses in the epididymis except in the case of Colombi, which in addition had a general infection. Laurent¹⁸ notes a case in which the gonococcus was identified by form and color reaction from smears from the epididymis, but no cultures were made.

The case which I have to present entered the Massachusetts General Hospital on August 9, 1901, on the service of Dr. S. J. Mixter. He was seen by Dr. G. W. W. Brewster, and I have these gentlemen to thank for the opportunity of operating on and reporting the case.

J. B., twenty years old: single; clerk. On the afternoon of August 9, patient was admitted to the accident room with the diagnosis of strangulated inguinal hernia.

Previous history unimportant except that the left testicle had never been in the scrotum, and five weeks before he had contracted his first gonorrhea. Treatment had been by internal remedies, and for some days the urethral discharge had been practically absent. No acute symptoms until the morning of the day before entrance, when he noticed a small lump in the left groin which was exceedingly tender and painful. During the last twenty-four hours pain and tenderness increased. Bowels moved on the morning of the 9th. No vomiting. Examination showed a fairly developed and nourished man, who seemed moderately sick. Temperature, 102.4; pulse, 108; respiration, 26; white count, 18,000; heart, no murmurs; pulse, of fair strength; lungs, negative; belly, soft, not distended; right testicle in the scrotum and of normal size; left testicle absent; penis free from sears; no urethral discharge could be expressed. In either groin were slightly enlarged glands. On the left side just above Poupart's ligament and external to the external ring was a tender tumor, the size of the end of the first finger, over which the skin was reddened. It was apparently distinct from the chain of glands, dull on percussion, and gave no impulse on cough. The external inguinal ring was plugged with a mass which seemed to extend on the external oblique fascia to the tumor. Right inguinal canal normal.

Diagnosis made of acute inflammation of an undescended testicle, and the patient sent to the ward with an ice bag on the groin. In the ward he seemed to grow more acutely sick and suffered great pain. No vomiting, and belly unchanged. At 8 p.m. the temperature had risen to 104.2 and the pulse was of poorer quality. Operation was

advised, and the patient consented to the loss of the testicle if necessary.

Operation with general anesthesia. The incision was made over the tumor as for hernia. Carrying the dissection through the skin, the subcutaneous tissue was found very edematous. Lying on the external oblique fascia about one cm. outside of the ring was what appeared to be a small testis. An enlarged and porky cord extended from this, and at the external ring was acutely flexed. The testicle was atrophied to such an extent and the cord so short that no attempt to replace it in the scrotum was made. The external oblique fascia was split to the internal ring. Then the indurated cord was tied off as high as possible with catgut and the fascia caught together with interrupted stitches of the same material, a small gauze drain being left in the inguinal canal. Skin closed in the usual way. Dry dressing. After the operation the patient had a very comfortable night, and by morning the temperature had dropped to normal, with the disappearance of all symptoms. The wick was removed on the second day, and the wound healed practically by first intention. Patient was discharged on the eighteenth day.

The specimen removed at operation was examined by Dr. James H. Wright of the clinicopathological laboratory of the hospital, and his report is as follows:

The specimen sent for examination consists of an epididymis without any apparent testicular substance. It is surrounded by what appears to be a thickened tunica vaginalis. Perhaps 1.5 cm. of spermatic cord is present. On longitudinal sections made through the epididymis, the interstitial tissue appears to be increased in amount and the color of the cut surface is dark red with a number of grayish walled tubules showing, which are filled with a yellowish semi-solid material or with thick opaque white fluid.

Microscopical examination of cover-glass preparations from the material in the tubules, stained by Gram's method and afterwards with Bismarck brown, shows a small number of brown-stained diplococci, like gonococci in size and shape, situated both within and outside of the pus cells, which are numerous. In cultures on hydrocele agar from the contents of the tubules above described there developed a variable number of colonies, grayish white and pearly in appearance, and of rounded outline, the larger of which attained a diameter of about 2 mm. after about forty-eight hours in the incubator. These were composed of Gram decolorizing diplococci, sometimes appearing as tetrads and resembling gonococci. Further study of these cocci in subcultures resulted as follows: They do not grow upon plain agar (reaction + 1.7). In one tube, upon which a considerable quantity of material was sown, two or three colonies developed, but several other plain agar tubes inoculated parallel with the hydrocele agar cultures showed no growth after forty-eight hours. The colonies on the hydrocele agar appear as rounded, translucent, pearly disks attaining the diameter of about 2 mm. in some instances.

On dry hydrocele agar the growth has a viscid consistency, stringing out when touched with a platinum needle. Under a low magnifying power the colonies appear as translucent disks with smooth, rounded outlines, showing in their central portions small brownish granular masses irregularly distributed. The coccus decolorizes by Gram, and shows a tendency to grow in the form of tetrads. In a culture about forty-eight hours old the cocci show marked involution forms and degeneration. The organism in this case is clearly the gonococcus.

Microscopical examination of hardened sections taken from different places in the specimen shows the larger tubules to be filled with pus, while some of the smaller tubules are not so affected. The epithelium of the tub-

ules containing pus is for the most part absent, and there is in some instances purulent infiltration and degeneration of the surrounding tissue. In some tubules diplococci like gonococci are present inside the pus cells. The interstitial tissue shows marked infiltration with fibrin, and moderate infiltration with leucocytes and other inflammatory cells.

The blood vessels are dilated and gorged with red blood cells.

In cross section of the spermatic cord, the lumen of the vas deferens contains pus and the epithelium lining it is absent and disintegrated. In the pus, diplococci like gonococci are observed in small numbers. There is some infiltration of the substance of the cord with inflammatory cells together with fibrin. No proper testicular substance is apparent in the sections.

We have to do, then, with a case of epididymitis without abscess formation, the usual clinical condition. The gonococcus clearly was the infecting agent in this case, and it seems to me that the only reasonable ground to take is that it is the micro-organism concerned in all cases of epididymitis with gonorrheal urethritis, possibly rarely associated with a mixed infection. Why the smaller tubules were not generally involved it is hard to explain unless they represent more distant portions of the vasa efferentia beyond the limits of the process. This specimen must, I think, add materially to the evidence that epididymitis is due to the presence of the gonococcus in the epididymis, and is not due to the absorption of toxin from the urethra or to the primary infection of other micro-organisms. Clinically the differentiation from the other possibilities of acute inflammation, as adenitis, incarcerated or partially strangulated hernia, is not without interest.

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THE NERNST LAMP FOR THE PRODUCTION OF ETHER WAVES FOR USE IN THERAPEUTICS.

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ETHER waves from two forms of electric lamps are now used extensively in therapeutics in Europe and to a less extent in America. Where short ether waves are required the arc is the more suitable, as the temperature is higher, making the proportion of short waves greater; and having no glass covering like the incandescent lamp there is no absorption from this source. Glass absorbs practically all the