OBSERVATIONS
ON
CYSTIC DISEASE OF THE TESTICLE.

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THERE is no disease affecting the testicle which appears to be less understood than the Cystic, various opinions being entertained both of its nature and mode of origin. This obscurity has arisen chiefly from the late period of the disease at which the morbid specimens are examined ; for, as they are obtained only after an operation which the surgeon delays until considerable disorganisation has taken place, the pathologist rarely possesses the opportunity of making an investigation in the early stage of the cystic development. Having recently removed a testicle, in which the disease was less advanced than usual, and having with the valuable aid of Mr. John Quekett succeeded in determining the mode in which the cysts are formed, I beg to communicate the results of these observations to the Society.

It is well known, that the cystic disease of the testicle was described by Sir A. Cooper, under the name of the "hydatid disease;" and yet this distinguished surgeon evidently supposed that the cysts might be formed of enlarged and obstructed tubuli, for he remarks, "although at first sight they appear to be cysts, yet when traced they are not distinct bags, but send out solid processes by which they are connected with other bags."¹ In this opinion I was disposed to concur, the disease appearing to me to be analogous

¹ Observations on the Diseases of the Testis, p. 83.

to the cystic tumours in the breast, which originate in a morbid dilatation of the lactiferous tubes.¹ But having subsequently observed in several specimens of cystic testicle, that the tubuli seminiferi in a healthy condition formed a layer spread over the morbid mass, I was at a loss to reconcile the tubular origin of the disease with this condition of the part until the difficulty was solved by the inquiries made in the following case.

M—, a tradesman from a town in Kent, æt. 37, of a pale and somewhat unhealthy aspect, consulted me December 1st, 1852, on account of an enlargement of the testicle. He first observed the swelling in the preceding May, and applied to Mr. Ely, a surgeon, in Rochester, shortly afterwards. Notwithstanding the remedies employed, including mercury and iodine, the testicle steadily increased in size, and when I examined it, was more than four times the natural size. The enlargement was nearly uniform, and chiefly of a solid character. Feeling fluctuation I introduced an exploring trocar, and removed from the tunica vaginalis about two ounces of bloody serum, which formed a thin layer around the diseased gland. There was no disease of the spermatic cord, and no perceptible enlargement of the inguinal and lumbar glands. Having no doubt that the disease was either carcinomatous or cystic tumour of the testicle, I recommended its removal, and performed the operation on the 8th inst. The patient recovered favorably, and returned into the country on the 26th, and I am informed by Mr. Ely, that up to the present time he has continued in good health.

On making a section of the tumour, I found a thin layer of the brown tubular structure of the testicle spread over a part of the surface, just beneath the tunica vaginalis reflexa; but the mass was principally composed of a multitude of small cysts varying in size, and in the nature of their contents. Some of the larger cysts measured half an inch in diameter, but the majority were much smaller, and many were no larger than millet seeds. A great many of

¹ Author's Treatise on the Diseases of the Testis, p. 361.

the cysts contained a transparent limpid fluid, others a bloody fluid, a few coagulated blood, and several a solid whitish opaque matter. The cysts were imbedded in fibrous tissue, which was particularly dense towards the centre of the growth. The appearances presented by a section of the tumour, are figured in Plate 1, but the cysts represented are less numerous than in the specimen.

Thin slices of the tumour being examined in the microscope, the origin of the cysts in a dilatation of the tubes was clearly made out. Thus in some specimens (figs. A, B, Plate 2), a tube could be traced to a termination in a dilated pouch. In others, a cyst appeared to arise from a lateral dilatation of a columnar tube, or at the extremity of a loup, as in fig. C, whilst in others, the dilatation appeared to be uniform, as in fig. D. These dilated tubes and cysts were lined by a tessellated epithelium, and many of them contained a dark granular matter, (fig. C.) The opaque whitish substance found in several of the larger cysts, consisted of a mass of modified tessellated epithelial scales (fig. 2). The cysts containing this white matter were firmer and denser than the others. No spermatozoa were detected in any of the cysts or morbid tubes.

This tumour must be regarded as the ordinary cystic disease, and the minute examination fully establishes the origin of the cysts in a morbid condition of the ducts. The circumstance of the healthy tubular structure being found external to the morbid growth, or extended over its surface, an arrangement which I had long ago remarked as occurring in the cystic testicle, shows that the ducts affected are not the tubuli seminiferi. If the latter were the seat of the disease, we should expect such of the tubes as remained sound to be pushed to one side, or at any rate near or mixed up with the diseased ducts, and not spread over the surface and distinctly separated from the morbid growth. Nor can the diseased ducts be those of the epididymis. In the examination of several cystic tumours of the testicle, I have found this part quite unaffected; whilst in others, it has been wasted, and lost in the morbid mass. If the disease

sprang from the tubes of the epididymis, the glandular structure of the body of the gland, if not destroyed by pressure, would certainly be found in a mass, enclosed in its own tunics, distinct from the morbid growth, and not spread over its surface.

It being clear that neither the tubuli seminiferi nor the ducts of the epididymis are the tubes which undergo these changes, constituting the cystic disease, its seat may be considered as conclusively traced to the ducts of the rete testis. Why these ducts alone are subject to the morbid change, I confess my inability to explain.

In some specimens of cystic disease in which the cysts had attained rather a large size, I have noticed growths springing apparently from the walls, and occupying more or less of the cavity of the cysts. Some of them were of a polypus form, with a narrow neck; others, of a lobular shape. In external appearance they resembled very much the intra-cystic bodies, often observed in cystic tumours of the breast. In my work on the Testis (p. 362), a specimen in the Hunterian Museum (No. 2390), showing these lobulated growths, is figured. It was removed by Mr. Liston, from a man thirty-three years of age. There was no return of the disease after the operation. On a recent examination of the growths in this specimen, which Mr. Quekett made at my request, they were found to possess a cellular structure, and to be covered on the surface with cylindrical epithelium, like that covering the villi of the intestine.

In the examination of specimens of cystic testicle, I have frequently remarked the occurrence of small masses of enchondroma mixed up with the morbid growth, and in my article on the Morbid Anatomy of the Testicle, contained in the 'Cyclopædia of Anatomy,' the little pearly-looking masses are represented in a woodcut. In describing them, I state "that they appeared to be contained within the cysts, but I believe that they are developed externally." It is clear, however, from recent observations, that enchondroma is originally formed within the tubes and

their cystic dilatation. I have been favoured with an opportunity of examining a remarkably fine specimen of enchondromatous testicle, removed by Mr. Hancock, which was recently exhibited at the Pathological Society. The tumour had attained so great a size, as to weigh 4 lbs. 6 oz. Mr. Quekett and Mr. Hogg, in the examination of this specimen, distinctly recognised the dilated tubes as the sites of the enchondromatous masses; and elongated masses of cartilage extracted from some of the tubes, are represented in Plate 3. In other specimens of cystic disease with enchondroma, which I have examined with Mr. Quekett, the intra-tubular development of the cartilage was equally manifest. The Hunterian Museum contains a large cystic testicle, which was presented to the college by Sir S. L. Hammick. It consists of a multitude of cysts, surrounded by fibro-areolar tissue, and numerous masses of enchondroma within cysts or dilated tubes. The cartilage occurs in elongated portions resembling those already described, and are easily detached from the cysts enclosing them. Many of the larger cysts are also filled with a whitish substance, composed of a modified tessellated epithelium, similar to the whitish matter observed in the cysts of the testicle, in the case described in this paper.

The minute examination of these cystic tumours shows the non-malignant character of the disease, which, moreover, is fully confirmed by the accounts of those cases in which the history has been preserved, patients having lived many years after the excision of the organ, and died of a different disease. This is a point of considerable practical importance, for it enables the surgeon, after a minute inspection of a cystic tumour of the testicle which has been removed by operation, to assure his patient of his permanent recovery, and immunity from all risk of a relapse.

Cases, however, have occurred which, nevertheless, would strongly tend to shake our confidence in the above conclusion. Some years ago a medical friend, æt. 32, was attacked with disease of the testicle. It continued to increase in size, and at the end of eighteen months was excised by Mr.

Luke. On a cursory examination of the tumour, I found it to exhibit the ordinary appearances of cystic disease, blood being, however, extravasated in two or three places, which was attributed to some exploratory punctures made previous to the operation. The patient never regained his health, but remained cachectic. In about six months he suffered from hæmoptysis, which was followed by attacks of severe lumbar pain, and subsequently the liver enlarged to a great size. He died eighteen months after the operation. On examination of the body, masses of medullary cancer were found in the lumbar glands, lungs, and liver.

In a visit which I paid several years ago to the Museum of St. George's Hospital, Mr. Caesar Hawkins showed me some preparations in his collection, of cystic testicles which had been removed by operation, the patients having died within two years afterwards of internal tumours, and he expressed to me his opinion that this disease of the testicle was a malignant affection. In pursuing the investigations which form the subject of this paper, it appeared important that the nature of the morbid change in these cases should be clearly ascertained, and with the sanction of Mr. Hawkins, and the assistance of the able curator, Mr. Gray, I have recently made a careful examination of the preparations alluded to.

Two specimens were shown me, one marked V 18, entitled in Mr. Hawkins's catalogue, "*Fungus hæmatodes of the testis.*" It appeared that a small lump was removed from the epididymis, and that three or four years afterwards the testicle, which had grown to the size of a melon, was excised. The operation was performed in October, 1834. In November, 1835, the patient was attacked with disease of the lungs, and with pain in the back, and, after expectorating blood, died in the February following. The abdomen contained large masses of diseased glands, and the lungs and liver were full of fungus hæmatodes tumours, which were dark and bloody. The diseased testicle is stated to consist of a great number of cysts containing fluid, for the most part transparent, but in some dark coloured. The

bulk of the tumour was formed of thick white matter between the cysts, hard and firm in consistence, and in some places, as if filling cysts, were portions of coagulated blood.

This preparation exhibited the ordinary character of the cystic disease. I observed two or three small portions of enchondroma in the substance of the tumour, and the tubuli testis were spread out in a thin layer over its upper part, being otherwise in a healthy condition, and altogether distinct from the cystic disease. The deposits of blood were, however, more numerous than is commonly met with in cystic disease.

The second preparation, marked V 20, and also entitled "Fungus hæmatodes of the testis," was removed by Mr. Babington seventeen months before the patient's death. A tumour appeared in the neck about a twelvemonth after the operation, and another in the abdomen four months before his death. The disease in the abdomen consisted of a mass of globular tumours on the right lumbar region, (the side from which the testicle had been removed,) extending up to the diaphragm, and surrounding the aorta: There was similar disease in the omentum. The greater part consisted of a number of cysts of various colours and consistence, but many, especially about the stomach and root of the mesentery, contained a milky fluid like chyle. Others were more solid and pulpy, and of the usual appearance of fungus hæmatodes. The tumours in the neck had a similar appearance.

The cysts in this preparation were of remarkably large size, larger, indeed, than I have observed in any other specimen of cystic disease of this gland. The intervening tissue was very firm, and there were a few deposits of blood, and of a soft granular substance.

The soft matter from the cysts of both these tumours, when submitted to microscopic examination, appeared to consist of a mass of nucleated cancer cells. Some of them contained numerous dark granules, and where the diseased mass was the softest, the granules were more abundant than the cells, the cell walls in these instances having been most

probably destroyed. In some of the masses portions of ducts filled with cells might be observed. No epithelial scales could be detected in either of the specimens.

In describing a malignant form of cystic disease of the testicle, I do not comprise cases of encephaloid cancer of the organ in which two or three cysts may be found mixed up with the cancerous disease, but tumours the great mass of which is composed of cysts of various sizes. It seems probable, however, that in the early stage of this form of the disease, the cystic structure prevails, but that at a later period the cysts become destroyed by the rapid growth of carcinomatous tissue. This had probably occurred in a specimen in the Hunterian Collection (No. 2416). It is a section of a large tumour of the testicle, the upper part of which is composed of a multitude of small cysts, whilst the remainder exhibits the usual appearances of medullary cancer, of which the patient died a few weeks after the removal of the tumour by Mr. Guthrie. There can be little doubt that encephaloid cancer commences commonly, if not always, in the rete testis, and in specimens where the disease is not too far advanced, the tubuli seminiferi may be found, as in the cystic testicle, extended in a layer over the tumour. This I have observed in several instances.

The facts here adduced seem sufficient to show, that cystic disease occurs in the testicle in two forms, a malignant and non-malignant, the former being, I believe, by far the most rare. The presence in the cysts of tessellated epithelium, will indicate the character of the non-malignant, and the presence of nucleated cancer-cells the nature of the malignant, and if these observations be confirmed, we shall thus possess the means of determining a most important distinction, illustrating the valuable aid which the microscope is capable of affording in solving the difficulties of practice.

The following are the propositions resulting from the preceding inquiries :

1. Cystic disease of the testicle occurs in two forms, an innocent and a malignant.
2. Both forms are the result of morbid changes in the

ducts of the rete testis, this part of the gland being the sole seat of the disease.

3. The innocent form of the cystic disease is characterised by the presence of tessellated epithelium in the cysts.

4. The malignant form is characterised by the presence of nucleated cancer cells in the cysts.

5. Enchondroma occurs in both forms of the cystic disease, and almost constantly in old cases of the innocent, the cartilage being developed within dilated tubes.

A & B. Oviducal tubes, terminating in a dilated pouch. C. Lateral dilatation of a tube filled with dark granular matter. D. Uniform dilatation of a tube. E. Tessellated epithelium from a large cyst.

Casts in tubuli. Enchondroma from diseased Testicle. 30 diam.