CHAPTER X.

SWELLED TESTICLE.

THE most frequent complication of gonorrhœa is an affection of the scrotal organs, variously known by the names of swelled testicle, hernia humoralis, orchitis, and by the more correct term *gonorrhœal epididymitis*. In order to understand the mode in which this complication supervenes upon gonorrhœa it is desirable to recall to mind the canal which connects the testicle and the urethra, and which is designed for the passage of the seminal fluid. Tracing this canal from before backwards, we have first the aperture of the ejaculatory duct, near the anterior extremity of the veru montanum in the prostatic portion of the urethra; following this duct, we find that it merges into the vas deferens, which passes round the bladder, through the spermatic canal in the abdominal muscles, and finally descends within the scrotum, where it terminates in the numerous and intricate convolutions of the epididymis. We thus have a passage lined with mucous membrane, which is continuous with the mucous membrane of the urethra, and connects the deepest portion of this canal with the epididymis.

In the early stages of urethral gonorrhœa, the inflammation is generally confined to the neighborhood of the fossa navicularis. At a later period, however, the deeper portions of the canal are involved, and the disease may thus gain access to the ejaculatory duct, and, under the influence of any exciting cause, extend along the spermatic canal to the epididymis, or even beyond this to the testicle and the tissues which envelop it. The patient's own sensations will sometimes indicate that in this mode has originated the affection of the testicle. He has felt a dull pain in the perinæum and in the groin, along the course of the spermatic vessels, for a day or two before he observed the tenderness and swelling of the testis. Again, in some cases, we find additional evidence of the same, in the fact that the cord corresponding to the inflamed testicle can be felt externally to be swollen and hard, and can be traced from the testicle through the inguinal canal, down to the iliac fossa. Post-mortem examinations, also, have exhibited the ordinary appearance of inflammatory action throughout the whole of the canal connecting the testicle and urethra. There can be but little doubt, therefore, that, in some instances, swelled testicle owes its origin to the extension of the inflammation along a continuous mucous surface.

This explanation, however, will not account for all nor even a majority of cases, for in most instances, there is no evidence whatever

that the cord has been involved.[1] Moreover epididymitis may occur before the disease has reached the prostatic urethra. Again, there is another question which comes up here for explanation: Why is it that the urethral discharge commonly ceases, or at least diminishes, on the occurrence of the epididymitis? It must be acknowledged that as yet no satisfactory solution of this problem has been reached. "Sympathy," "metastasis," and "reflex irritation" (Brown-Séquard) have been adduced in explanation, but they do not explain the facts, nor can they satisfy the mind of the inquirer. Further progress in our knowledge of the nervous system may throw light on the subject, but this end has not yet been reached. The fact is, we know nothing about it, and we do not propose to enter into speculations.[2]

In this connection, a case reported by Mr. Furneaux Jordan[3] is interesting, in which inflammation travelled in the opposite direction, viz., from the epididymis to the urethra. The patient received a severe blow on the scrotum, and the left epididymis was found to be enlarged, painful and tender. Inflammation extended up the cord into the ring, followed by a slight urethral discharge, and all the symptoms of a mild urethritis.

CAUSES.—Gonorrhœa of the urethra is the only form of gonorrhœa that gives rise to swelled testicle, which is never met with as a complication of balanitis.

The following table, drawn up by M. de Castelnau,[4] exhibits the times of its appearance in the course of the gonorrhœa, in 239 cases, collected from different sources:

	GAUSSAIL.	DESPINE.	AUBREY.	DE CASTELNAU.	TOTAL.
1st week, ...	3	2	8	3	16
2d "	4	6	17	7	34
3d "	5	2	9	8	24
4th "	16	2	15	6	39
5th "	39	2	8	5	54
6th " and later, . .	6	15	43	8	72
Total, ...	73	29	100	37	239

In the experience of most surgeons, swelled testicle is even rarer during the first fortnight of a gonorrhœa than would appear from the above statistics. As a general rule, it may be said to supervene after the third week, and most frequently after the sixth week.

Cases are reported in which it has occurred after the discharge had entirely disappeared, and in one as late as three months. A patient

[1] Out of 346 cases of epididymitis, Berg, of Copenhagen, found the cord involved in only 182. Jahresb. ü. d. Leistung. u. Fortschr. d. ges. Med., Berlin, 1868, p. 588.

[2] For a specimen of the bosh that may be written on this subject, the reader is referred to The Practitioner, London, Nov., 1878, p. 345.

[3] Jr. Brit. M. Ass., Aug. 1871.

[4] Ann. d. mal. de la peau et de la syph., Paris, Mai, 1844.

once came to me with swelled testicle, five weeks after I had treated him for a clap, and had dismissed him as cured, and he assured me that he had not perceived any discharge in the meanwhile, nor could I discover any upon examining the penis. It is probable, as stated by Velpeau, that in these cases there still remains, in the prostatic portion of the urethra or at the neck of the bladder, a small amount of inflammation, but not sufficient to manifest itself externally.

Instances are recorded in which the swelling of the testicle is said to have appeared before the discharge from the urethra. In one case reported by M. Castelnau, the epididymitis was developed a week after coitus, and the urethral running was first seen five days afterwards. M. Vidal (*Ann. de chir.*, 1844) gives a similar case, and Velpeau (*Dict. de méd.*, art. *Testicule*) admits such an occurrence. Dr. Fred. R. Sturgis (*Med. Rec.*, N. Y., Oct 9, 1875) also reports a case in which the epididymitis is said to have appeared on the tenth day after exposure, with no discharge from the urethra until five days afterwards. It is not improbable that a gonorrhœa really existed, but was overlooked, in these cases; still it is by no means impossible, especially with the knowledge we now possess of the effects of immoderate sexual indulgence, that the prostatic portion of the urethra alone received the irritation from coitus, and that the effect produced was insufficient to manifest itself by a discharge until after the swelling of the testicle had taken place.

In some instances we are able to trace an attack of swelled testicle directly to some exciting cause, which has aggravated the urethral disease. Thus the patient may have been imprudent in exercising or in exposing himself to cold, or he may have indulged in a debauch or in sexual intercourse. Strongly irritant injections, or any violence done to the canal by a large bougie, or by forcible distention when using a syringe, may also occasion it. One of the most severe cases of this disease that I ever met with had been induced by the forcible introduction of a large bougie in the treatment of a gleet of several years' duration. In other instances, however, the exciting cause of epididymitis is not apparent, independently of the fact that the inflammatory action has had time to involve the prostatic portion of the urethra and gain access to the spermatic ducts. It has been supposed by some surgeons, that the use of copaiba and cubebs is occasionally the cause of epididymitis; while others have not only denied this, but have even recommended these drugs in the treatment of this affection. I have already referred to this subject in speaking of the anti-blennorrhagics, and will only say at present that evidence is wanting in favor of both these assertions. We have no reason to believe that copaiba and cubebs ever occasion this disease, and still less reason to believe that they can be used with benefit in its treatment.

Epididymitis may also be caused by the presence of urethral stricture; by a stone in the bladder or the lodgment of a small calculus or fragment of stone in the prostatic urethra; in fact, by any irritation set up in the prostatic sinus; and I have met with a few cases in

which the only exciting cause has appeared to be exposure to cold. Mr. Samuel Osborn[1] reports two cases of epididymitis in boys, due to pressure of a truss.

It should not be forgotten that wearing a well-fitting suspensory bandage during an attack of gonorrhœa is the best protection against swelled testicle. The patient is thus relieved of the weight of the scrotal organs, the flow of blood from the part is facilitated, and the liability to inflammatory action is consequently much diminished.

Seat.—Gonorrhœal epididymitis more frequently attacks the left testicle than the right. Of 1342 cases observed by Prof. Sigmund, of Vienna, the left testicle was affected in two-thirds.[2] The greater frequency of this disease on the left side has been attributed by some authors to the fact that men usually "dress" on this side, and that the left testicle consequently receives less support than the right. This explanation, however, is very questionable. The difference is doubtless to be found in that cause, as yet not explained in a perfectly satisfactory manner, which renders the left testicle more prone than the right to take on various forms of morbid action. Both testicles rarely become inflamed simultaneously. Osborn (op. cit.) thinks the reason why only one testis becomes affected at one time, to be that the congestion caused by the inflammation occludes the adjacent opening of the vas deferens on the other side. Not unfrequently one testis is attacked after the other. This usually occurs only after the lapse of several weeks, though I have seen the two attacks separated by only a few days' interval. Sigmund states that both testicles were affected in seven per cent. of his hospital patients, and in five per cent. of his private cases. Occasionally, the inflammation, after leaving one testicle and attacking the other, will return to the first; to this form of the disease Ricord has given the expressive name of *see-saw* epididymitis.

It is the epididymis of all the scrotal organs which is first and chiefly involved in most cases of this disease. It is here that the vas deferens terminates, and we may suppose that the inflammatory action is retarded in its progress by the innumerable and intricate convolutions which compose this appendage to the testicle. At an early stage of the inflammation, and also after the swelling has somewhat subsided, the epididymis can be felt enlarged to several times its natural size. The normal position of the epididymis is posterior and external to the body of the testicle, and pressure upon this part excites more pain than elsewhere. The epididymis, not being enveloped, like the testicle, in a fibrous capsule, is susceptible of an indefinite

[1] Lancet, Lond., July 13, 1878.

[2] Brit. and For. M.-Chir. Rev., Lond., Oct. 1856. Mr. Curling (Diseases of the Testis, 4 ed., 1878, p. 267), gives 138 cases, seventy-three observed by Gaussail, twenty-nine by D'Espine, and thirty-six occurring in his own practice, in the majority of which the right testicle was affected.

BIBLIOTECA FAC. DE MED. U.A.N.L.

amount of tumefaction, and frequently enlarges to such an extent as to partially surround and encase the body of the testis.

It should be recollected, however, that the position of the epididymis, relative to the testicle, may be abnormal; in which case the seat of the greatest tenderness and swelling will differ from the description just now given. Such malpositions are called by the French *inversions du testicule.* They have been thoroughly investigated by M. Eugène Royet,[1] who admits the five following varieties:

1. The epididymis may be anterior to the body of the testicle.
2. It may be on one side, either the external or internal.
3. It may be superior; the long axis of the testis being antero-posterior, and the epididymis resting upon its upper surface.
4. In the fourth variety, the epididymis and vas deferens form a loop or sling, which surrounds the testis from before backwards.
5. In the fifth variety, the relative position of the epididymis and testis varies from day to day, without appreciable cause.

All these varieties are rare, with the exception of the first, which, according to Royet's researches, is met with in one out of every fifteen or twenty persons. The abnormal position of the epididymis in front of the testicle is, therefore, the only one possessing much practical importance. The possibility of this malposition should be borne in mind both in operating for hydrocele and when forming a diagnosis of scrotal tumors. In cases of epididymitis, when the inflammation is not general, the epididymis may be recognized by its hardness to the touch and its sensibility to pressure. When all the scrotal organs are involved in the inflammatory process, Royet states that the chief means of recognizing an anterior position of the epididymis are, a want of mobility in the skin anteriorly, owing to its adhesion at this point to the epididymis, and the fact that the vas deferens can be felt in front, instead of behind the other vessels of the cord.

Next to the epididymis, the tunica vaginalis is most frequently involved in gonorrhœal epididymitis. M. Rochoux has advanced the idea that inflammation of this membrane is the chief and constant lesion in swelled testicle;[2] but this is a mistake. Vaginalitis, although a very frequent, is not a constant symptom, and is always consecutive to the inflammation of the epididymis. There is commonly an effusion, varying in quantity and character, within the tunica vaginalis. This may consist only of serum and be apparently due to simple obstruction of the circulation; or it may contain fibrin and other products of inflammation. Sometimes bands of lymph bind the two opposed surfaces together, as in pleurisy. The subscrotal cellular tissue also participates in the inflammatory action, and is thickened by œdema or fibrinous deposit. The frequency

[1] De l'inversion du testicule. Paris, 1859, p. 55.

[2] Du siège et de la nature de la maladie improprement appélée orchite blennorrhagique, Arch. gén. de méd., 1833, t. ii., p. 51.

with which the tunica vaginalis is involved in swelled testicle, while the body of the testicle is unaffected, has been explained by Gendrin,[1] who states that when the cellular tissue of an organ is continuous with that underlying a neighbouring serous membrane, it becomes a ready means of communicating inflammatory action; but when a contiguous organ is not thus connected with the original seat of the disease, the passage of the inflammation is less easy. The connecting line between the epididymis and tunica vaginalis is found in the areolar tissue which penetrates the former and underlies the latter, while the testicle is surrounded by the fibrous tunica albuginea, and, being thus isolated, generally escapes.

Following the tunica vaginalis, in the order of frequency, the spermatic cord is next found to be the seat of inflammatory action in gonorrhœal epididymitis. The body of the testicle is rarely affected; and, even when involved, the fibrous tunic which invests it limits the amount of swelling of which it is capable, although it greatly increases the suffering of the patient by constricting the inflamed tissues.

Some idea of the comparative frequency with which the different tissues now mentioned are attacked in this disease may be formed from the statistics of Professor Sigmund, already referred to. In 1342 cases, the epididymis was alone affected in 61; the epididymis and tunica vaginalis in 856; the epididymis and cord in 108, and these three parts together in 317.

The propriety of the name, gonorrhœal epididymitis, will now be evident. It is no objection to this term that the epididymis, in many cases, is not the only part involved. As in diseases of the eye, we call a certain inflammation iritis, though other parts besides the iris are involved, so, in swelled testicle, the principal seat of the disease should determine its scientific name. The term orchitis, which is adopted by Vidal, Velpeau, and most English authors, is less correct, and is, moreover, objectionable, because it is calculated to confound this disease with that affection of the testicle which is produced by syphilis, and which is totally distinct in its character and symptoms.

Symptoms.—There are generally no marked premonitory symptoms preceding an attack of swelled testicle. Sometimes, however, we find that the patient has suffered from malaise for several days; that he has had slight fever, perhaps a chill, and a dull pain or heavy sensation in the perinæum, cord, and scrotal organs, attended with a frequent desire to pass water. His attention is soon attracted to the testicle by pain, felt especially on motion, and, on examina-

[1] Histoire anatomique des inflammation, t. i, p. 143. Curling, op. cit.. p. 252, expresses the opinion that the inflammation seldom passes to the testicle, and quotes from Hardy, who professes to have found the testicle involved only nine times in 226 cases of gonorrhœal epididymitis, an experience not at all in accordance with our own.

BIBLIOTECA FAC. DE MED. U.A.N.L.

tion, he finds this organ swollen, and tender on pressure. The swelling and tenderness rapidly increase, and the pain extends to the corresponding thigh, to the groin, and to the lumbar region. In the course of twenty-four or forty-eight hours, the affected side of the scrotum may have attained the size of the fist; the skin is tense and in some cases of a dark-red or almost purplish hue; the pain may be very severe, especially at night, preventing sleep; the least pressure upon the part, even from the bedclothes, is almost unendurable; partial ease only can be attained by keeping perfectly quiet in the horizontal posture with the addition of some support to the genital organs. If the cord be involved, the pain, swelling, and tenderness are found to extend upwards to the inguinal canal. The cord may indeed be involved alone without the epididymis being affected. The possibility of this was denied by Ricord, but Beaumé has reported several and Bergh one case of this kind (Zeissl). Kohn also mentions it.[1]

There is generally more or less febrile disturbance of the system at large. The skin is hot, the tongue coated, the pulse increased in force and frequency, and the patient extremely nervous and agitated. Cases are reported in which the swelling of the cord was so excessive as to produce strangulation at the abdominal ring, attended by symptoms resembling those of strangulated hernia, such as abdominal tenderness and vomiting. It must not be supposed, however, that the symptoms are always so severe as those now described. Such severity is more apt to be met with in persons of a nervous temperament, in whom this disease is one of the most distressing that can occur. In other cases, however, the suffering is comparatively slight, and I have known patients to attend to their daily occupation during its whole course. Between these two extremes we may have every shade of variation.

While the inflammation is at its height it is impossible to distinguish the different portions of the scrotal organs. Judging from mere inspection of the swelling, we might be led to suppose that it was chiefly made up of the body of the testicle. This, however, is not so. It is composed, for the most part, of the swollen epididymis, of an effusion into the tunica vaginalis, and of œdema of the subscrotal cellular tissue. The hydrocele is often, but not always, sufficient to enable us to detect distinct fluctuation, and rarely, if ever, is the tumor transparent; but, on gently touching it, the surface is found to yield for a short distance before the fingers come in contact with the firmer body of the testicle beneath. This yielding is due to the displacement of the œdema of the scrotum and of the fluid in the sac. If the tumor be punctured with a lancet, bloody serum, varying in amount from a few drops to several drachms, will escape.

Resolution begins to take place in a few days, commencing in the

[1] See Am. J. Syph. and Derm., N. Y., vol. ii., p. 165.

anterior portion of the tumor. The œdema of the scrotum and the hydrocele disappear, and the different portions of the testis can now be distinguished from each other—the epididymis, still swollen and hard, behind; and the body of the testicle, preserving, in most cases, its normal elasticity, in front. The whole duration of the attack varies from one to three weeks. In a discussion on the treatment of this disease before the Academy of Medicine in Paris, 1854, Velpeau stated that its duration under ordinary methods of treatment averaged 16 to 18 days.

In some cases of swelled testicle, after the more acute symptoms have subsided, the parts still remain engorged and the disease shows a tendency to become chronic. This is most likely to occur in patients of weak habit, and, while this condition lasts, the least exciting cause may induce a return of the acute inflammation.

Most cases of swelled testicle terminate favorably. In some rare instances, however, abscesses form in the cellular tissue underlying the scrotum, or in the epididymis or body of the testicle. Mr. Edwards[1] has reported a case in which the whole testicle protruded through an opening formed by an abscess in the scrotum, the skin being drawn in around the orifice. Mr. Edwards "pared the edges, drew them asunder, making with the handle of the scalpel a sufficient separation of the deeper tissues, and the testicle was at once drawn, as it were, back into the scrotum, the wound closing over it. Three hare-lip pins were inserted; the wound closed by first intention, and the patient was walking about perfectly well on the seventh day." If an abscess form and be not early evacuated, the pus generally burrows in various directions, forming sinuses, and destroying a portion of the parenchyma, but the loss of a portion of the organ does not appear to be followed by any disturbance of its function; sometimes a circumscribed abscess is formed, which may become encysted, and, the more fluid portion being absorbed, the solid portion may remain in a concrete state for an indefinite length of time, and closely resemble a tubercular deposit. The presence of the cyst will clear up the diagnosis, since true tubercular matter is always found in direct contact with the parenchyma of the testis, and is never encysted.

The swelling of the testicle attendant upon gonorrhœa may, however, be the exciting cause of true tubercular deposit, in persons of a strumous diathesis.[2]

As the epididymis was the first part attacked, so it is the last to recover its normal condition, and in some cases it retains, for months or years, an irregular and knotty mass of induration, which may obstruct the passage of the semen and render the affected testis useless. If this induration exist on both sides, or if the opposite testicle be undeveloped,

[1] Edinb. M. J., Nov., 1860, p. 455.

[2] A case of this kind was recently exhibited at a meeting of the Anatomical Society of Paris. Bull. Soc. anat. de Paris, 2d série, t. iv, p. 2.

BIBLIOTECA FAC. DE MED. U.A.N.L.

as is often the case with an undescended testis, the patient will probably be impotent. In a few rare cases gonorrhœal epididymitis has been known to terminate in atrophy of the testicle. Hypertrophy is extremely rare, but is sometimes seen in persons who have had frequent attacks of swelled testicle.

The reflex neuralgias which not unfrequently[1] complicate cases of gonorrhœal epididymits have been admirably described by Mauriac in a pamphlet entitled *Étude sur les névralgies réflexes symptomatiques de l'orchi-épididymite blennorrhagique*, Paris, 1870, which is well worthy of perusal.

In the majority of cases the pain is unilateral and is confined to the sphere of distribution of the lumbar and sacral nerves upon the same side as the affected testicle. At other times, the pains radiate in various directions, cross the median line and extend far beyond the limits above mentioned.

The pains in the spine appear to have their focus at a point corresponding to the anastomosis of the lumbar with the sacral plexus of nerves; they *may be* bilateral and more intense on the side opposite the epididymitis. Some patients feel as if the pain started from, others that it terminated at, this point.

Sometimes the whole of the lumbar region from the ribs to the sacrum is the seat of dull pain, or the latter is felt deeply in the region of the kidney; this being due to reflex manifestations in the plexus of the grand sympathetic. From the lumbo-sacral focus the pain radiates to the abdomen and the lower extremity. The abdominal pains, which are almost as common as the lumbar, sometimes feel like a constricting belt encircling the body beneath the umbilicus. Most frequently they do not cross the median line. They are superficial and are relieved rather than exasperated by pressure.

The walls of the thorax are sometimes involved, and a vague aching sensation is felt at a fixed point with radiations along the course of the intercostal nerves.

The sympathetic pains which extent to the lower extremity on the affected side, may be divided into two groups, an anterior or crural and a posterior or sciatic. The anterior group may occupy two-thirds or even the whole of the antero-internal surface of the thigh, and it is then difficult to say exactly what nerves are invaded. Below the knee, the internal saphena, the fourth terminal branch of the crural nerve, is the one evidently involved.

As regards the posterior group, we often find the pains limited to the buttocks and to the postero-external portion of the thigh. They are generally most marked over the upper part of the sciatic notch behind the great trochanter, towards the middle of the thigh behind and in the popliteal space.

The characteristics of these reflex neuralgias are precisely similar

[1] In 200 cases of epididymitis Mauriac found 15 with very decided reflex pains.

to those of the direct neuralgias. In their intensity they vary greatly. Sometimes they become intolerable from their sharpness, their frequency, and their extension to all the branches of the nerves which emanate from the lumbar and sacral plexus. The whole side of the body corresponding to the affected testicle may be the seat of agony. There follow insomnia, anxiety, and general nervous excitement, which sometimes rises to the point of hysteriform spasm. Patients will cry out with pains. They try to calm it by bending the trunk toward the thighs, or by pressing upon the more painful points; it is not, however, usual to find those painful foci of the disease so much insisted upon by Valleix as a characteristic of neuralgia.

The duration of these pains is very variable, extending from twenty-four hours as a minimum to several months. Those situated in the branches of the lumbo-sacral nerves are much more persistent than those which appear to have their seat in the sympathetic, and among the former those which radiate towards the testicle will commonly be found to be the most lasting.

When appearing in the form of paroxysmal attacks, these pains have no regularity, and occur, as they also disappear, without consulting the clock. Their termination is always favorable, if we except the fact that their continuance is liable to keep up the engorgement of the epididymis (which the cause and which the effect?).

It may here be remarked in advance of the treatment of gonorrhœal epididymitis that Mauriac speaks highly of the application of leeches over the cord, as well as of puncture of the tunica vaginalis, and other means to be mentioned hereafter. In brief, the treatment of these reflex neuralgias is the treatment of the exciting cause.

Zeissl states that the *most frequent* sequence of epididymitis is chronic hydrocele, which we have often had occasion to observe. Vétault[1] claims that this affection is caused by pressure of the products of inflammation thrown out in the head of the epididymis and in the cord upon the vessels.

Zeissl states that those men who have had frequent attacks of epididymitis are most prone to have orchitis in case they subsequently contract syphilis. I have several times noted this occurrence.

The condition of the urethral discharge preceding and during an attack of swelled testicle has been the subject of considerable discussion. It was at one time supposed that this complication of gonorrhœa was usually preceded by a diminution of the running, and hence that it might be attributed to the use of active measures, which were supposed to drive the disease from the urethra to the testicle. On this supposition has been founded the theory that swelled testicle may be caused by metastasis. A proper appreciation of the facts in the case, however, does not warrant this conclusion. It is, indeed, true, as a general rule, that the urethritis has passed the acute stage, and that the discharge has consequently diminished be-

[1] Considérations étiologiques sur l'hydrocèle des adultes, Paris, 1872.

BIBLIOTECA FAC. DE MED. U.A.N.L.