all these disadvantageous surroundings with an œdematous scrotum, and a tensely-filled tunica vaginalis, careful examination will rarely fail to localize all the hardness and most of the pain in the epididymis. The inflamed mass rapidly reaches the size of the first, but its shape is not so evenly oval as in orchitis. The cord becomes swollen, and painful on pressure. Occasionally so much inflammatory swelling exists here, that the cord becomes partly strangulated in the inguinal canal, since it is impossible for it to swell much there, surrounded as it is by firm fibrous structures. This gives rise to all the well-known symptoms of inflammatory strangulation—excessive local pain, great prostration, anxiety, vomiting, perhaps hiccough.

Pain in acute epididymitis is great, increasing from the first proportionally with the rapidity of growth of the swelling. The pain, however, is not so severe as in true orchitis. It is of the sickening variety, making patients feel faint. Locomotion is almost (sometimes quite) impossible, the motions of the patient are very deliberate as he changes his position, and, if necessitated to stand, he carefully supports and shields his swollen scrotum with his hand. Rest on the back, with the testicle raised, while it modifies, does not allay the pain, but in this position the torture is more bearable. If strangulation of the cord at the ring occurs, the pain is greatly intensified, resembling that described for acute inflammatory true orchitis, being, in fact, dependent on the same cause—inflamed tissues strangulated within unyielding fibrous coverings. If some inflammation of the body of the testis exist, the pain will be proportionally heightened.

As the disease advances, pain increases in intensity for several days (three to six), remains stationary for several days after the organ has reached its full size, and finally begins to decrease, and, even in desperate cases, by the end of the second week has usually disappeared, or become reduced to the slight dragging uneasiness which constitutes the only pain of mild cases. This relief from pain is often experienced while the organ is yet large, the epididymis thickened, the scrotum œdematous, and some fluid still left in the tunica vaginalis. For several days after the pain has ceased, a few moments in the erect posture, with the testicle hanging, will recall it. The form and size of the swelling vary greatly. In the mildest cases the tail of the epididymis alone suffers. All the inflammation localizes itself there, forming a hard, sensitive lump, giving a little uneasiness unless supported, every thing else being normal. The head, together with the tail of the epididymis, may suffer, nothing else being involved, or the whole of the epididymis, while the gland proper may be felt normal in every respect in front of the inflamed mass. The vas deferens may be also involved in mild chronic cases, as in the tuberculoid varieties. It may, however, in any inflammation of the epididymis, be increased in size (perhaps greatly so), and painful on pressure. In very acute attacks the whole cord is sensitive and hyperæmic. The



seminal vesicles are also occasionally inflamed at the same time. Very rarely peritonitis has been seen to come on, provoked by the last-named complications (Hunter, Velpeau, Ricord).

If the disease be at all acute, the tunica vaginalis is sure to be involved, the degree of its inflammation usually, but not invariably, coinciding with the intensity of the epididymitis. This peri-orchitis varies greatly. Fluid may be rapidly poured out, filling the sac to its utmost, giving rise to a tense swelling of considerable size, in which case it becomes impossible to distinguish the constituent parts of the testicle. This form is often attended by excruciating pain, relieved, as if by magic, by puncture of the tunica vaginalis. Again, but little fluid may be effused. This, lying loosely in the sac, fluctuates freely, and does not in the least obscure the fact that the main disease is in the epididymis. The fluid may be absorbed speedily, allowing the plastic material effused with it to glue together the two surfaces of the vaginal tunic, or perhaps only to form numerous bridled adhesions. Some fluid may remain throughout—the nucleus of future hydrocele. In acute cases the scrotum may be so inflamed and œdematous as to give a very exaggerated idea of the size of the tumor.

*The constitutional symptoms*, fever, loss of appetite, etc., are mild, with epididymitis, do not occur at all in chronic and subacute cases, and in acute cases, like the pain, vary with the intensity of the inflammation. What fever there is disappears before the pain, and long before the swelling.

Epididymitis may be said to have a natural limit for its acute symptoms of about two weeks, but relapses are very common, and carelessness may prolong the trouble to as many months. Hardness of the epididymis may remain behind for months, or even years; such indurations retain their sensitiveness on pressure for a long time. Relapses are always milder than first attacks. If the other testicle inflame before the first is well, the latter runs through its course more quickly.

The gradual disappearance of the hardness from the epididymis may extend over many years, and in some cases is never accomplished entirely. The body first attains its natural feel, then the head, and, last of all, the tail. The absorption starts rapidly, but progresses more and more slowly, until in some cases it seems to rest stationary. In such cases the little hard lump at the bottom of the epididymis occasions the patient no uneasiness, is not sensitive to pressure, and is ignored. Suppuration is very rare in true epididymitis, not tuberculoid in character; atrophy never occurs unless the substance of the testicle has been involved.

*Sterility.*—In connection with the sterility often following double epididymitis, the pathological changes seen on section are instructive, and fully explanatory. In the early stages, hyperæmia, plastic, serous, and sanguinolent effusions occur. These plastic deposits take place in

the cavity of the epididymal tubules as well as around them, gluing them firmly together, so that after a certain time, especially in the tail of the epididymis, nothing can be distinguished on section but a homogeneous mass, in which the eye seeks in vain to trace out the convolutions of the epididymis or the course of its canal. In the case of a patient of Velpeau,[1] an examination of the specimen by Robin disclosed the fact that the hard lump occupying the epididymis was homogeneous, resembling cheesy tubercle on section. The convoluted tubes inclosed in this mass were dilated to several times their ordinary size, but filled with the products of inflammation; pus-corpuscles, fatty *débris*, granulation bodies—all of this being within and none without the tube, looking as if all the inflammatory action had expended itself in producing secretion in and upon the free mucous surface, not extensively involving the peritubular tissue. Gosselin[2] found in his interesting dissections that the canal in the lower part of the epididymis was often impermeable, the tubes beyond the obstruction being sometimes dilated, sometimes normal.

Testicles in these cases of obstruction do not atrophy, nor do the seminal vesicles of the same side undergo any change. For purposes of prognosis, it is well to recall the anatomical fact that the head of the epididymis is formed of many tubes (coni vasculosi), all going to unite with and pour their secretion into the canal of the epididymis. Hence chronic induration here may have allowed one or more tubes to escape, and sterility is not so inevitable. The tail of the epididymis, on the other hand, as Gosselin sagely pointed out, is composed of the convolutions of one tube. This tail of the epididymis, too, is just the spot where the chronic induration left behind by epididymitis is apt to become localized. The tube obliterated here cuts off communication with the testicle, and, if both sides are affected, no spermatozoon can reach the urethra.

Yet it is well to know that even in these cases affairs are not always desperate. The patient is by no means impotent, his sexual power and appetite are unimpaired. He ejaculates semen resembling the healthy fluid in quantity, smell, and color, only it contains no spermatozoa, and consequently he is sterile. The same holds good usually of a monorchid, who has epididymitis on the sound side, for the retained testicle seldom furnishes spermatozoa. This sterility lasts from a few months to twenty years, perhaps indefinitely. It disappears with the induration, sometimes before. There is always hope that a well-directed treatment may cause the latter to disappear by absorption, and restore the patient his fertility.[3]

A curious fact in connection with this subject (showing the boundless kindness of Nature in doing every thing to preserve the genital functions uninjured) is, that the testicle does not atrophy, no matter how long its duct may be occluded, and, if the latter finally become pervious, the testicle is ready for use. Animals have been experimented upon by having their vasa deferentia cut, but the testicle does not atrophy. Healthy spermatozoa are found in it months afterward (Curling). Another curious fact is, that in man sexual intercourse may be practised without (as might have been expected) causing painful, or inducing any, swelling of the testicle or upper portions of the epididymis from the accumulation of spermatic elements.

[1] Reported in the *Gazette des Hôpitaux*, December, 1854.
[2] "Archives Générales," Fourth Series, xiv., xv.
[3] Langelbert, "Syphilis dans sa Relation avec le Mariage."



In the vast majority of cases time alone will remove the indurations, and with them the sterility.

*Diagnosis.*—The following table may be of service as bringing into contrast the most marked diagnostic differences between true orchitis and epididymitis. Of course when orchitis complicates epididymitis the symptoms will be mixed.

| *Orchitis.* | *Epididymitis.* |
|---|---|
| 1. Very rarely encountered. | 1. A very common affection. |
| 2. Causes usually, injury, mumps, gout, cold, etc. | 2. Cause almost invariably urethral inflammation or irritation. |
| 3. Pain usually excruciating, and not relieved by position, while enlargement is still moderate. | 3. Pain usually bearable except with extreme enlargement, always modified by position, except in cases of strangulations of the cord. |
| 4. Shape of tumor oval. | 4. Shape oval, roundish, oblong, often irregular—especially from scrotal œdema. |
| 5. Epididymis not distinguishable from the rest of the tumor. | 5. Epididymis distinguishable from the rest of the tumor, enlarged, indurated, and particularly tender; testicle often perceptible, of natural feel in front of it. These symptoms, perhaps obscure for a few days, at the height of the affection, always hold good during the period of decline. |
| 6. Testicle of peculiar hardness, very sensitive. | 6. Testicle often normal in front of epididymis; perhaps hard from inflammation of its tunics, but not as sensitive as in orchitis. |
| 7. Rarely any fluid in tunica vaginalis. | 7. Always fluid in tunica vaginalis in acute cases. |
| 8. Constitutional symptoms usually present. | 8. Constitutional symptoms absent or unimportant. |
| 9. Termination in resolution, abscess, gangrene, chronic induration, or atrophy. | 9. Termination habitually in resolution, leaving slight chronic thickening of tail of the epididymis behind. |
| 10. Never followed by sterility except as result of destruction of tissue, and then, if both sides have suffered, by impotence as well. | 10. Often followed by temporary, sometimes indefinite, sterility if both sides have suffered; never by impotence. |
| 11. Course often slow. | 11. Course generally rapid. |

*Treatment.*—The prophylactic treatment of epididymitis is the use of a suspensory bandage during the existence of urethral disease, together with a strict observance of the hygiene of the urethra (p. 40). When, late in gonorrhœa, or during treatment of stricture, complaint is made of a dragging, uneasy sensation in the groin, or testicle, the patient should be immediately placed upon his back, with the testicle elevated, and the threatened attack may thus be often averted.

In mild cases, where rest on the back with elevation of the testicle is sufficient to quiet pain, these means alone are required to effect a cure, perhaps aided by a light, hot flaxseed-poultice, and a laxative. In a few days the patient can stand, and, by supporting his testicle, walk without pain.

In acute cases the treatment must be more active. Rest on the back and elevation of the testicle over the abdomen are indispensable. The latter cannot be secured by a suspensory bandage, since that supporter allows the testicle to hang down; nor is it well to trust to pillows and compresses under the testicle, since they allow the patient no motion. No improvement on Curling's method has yet been suggested. It consists simply in a handkerchief, or piece of bandage, around the waist, and a large (preferably silk) handkerchief, folded in triangle. The base of the triangle is placed under the scrotum; one (acute) angle on each side is tied to the waistband, the other (right) angle is brought up over the testicles and penis, serving to retain dressings, and is pinned or tied to the waistband. If the testicle be not very large, or the patient move much, the sling tends to slip up in some cases. This may be easily obviated by sewing a tape to that portion of the sling immediately under the scrotum, carrying it between the nates and attaching it at the back to the waistband.

In all inflammatory diseases of the testicle this bandage is of the first importance. Having arranged it, the patient is put to bed with the testicle enveloped from the start in a tobacco-poultice. In cases that require any active treatment at all, and where pain and swelling are already present, any cold or astringent application is harmful. The object is to narcotize the testicle at once, and quiet pain, and this, in the vast majority of instances, tobacco, heat, and position, will do.[1] The poultice is made by mixing a paper of any fine-cut tobacco ( ℥ j) in about ℥ x of hot water, bringing the whole to a boil while stirring it briskly, and then adding ground flaxseed, with or without ground elm-bark, until the proper consistence of a poultice is obtained, stirring the tobacco well in with the meal. A poultice of this mass is made about a quarter of an inch thick, and large enough to envelop the whole testicle. A piece of fine muslin is put on the surface of the poultice, which is perhaps sprinkled with laudanum, and placed upon the testicle as hot as it can be

[1] The tobacco-poultice was subjected to the test of a thorough trial through many years at the New York Hospital. It proved itself more serviceable than any other agent.



borne, the whole covered with a piece of oil-silk—for cleanliness' sake as well as to retain the heat—and supported in the handkerchief-sling above described. Ordinarily, the testicle will be narcotized, and nearly painless in a few hours, unless the patient attempt to stand upright. The poultice is to be renewed every eight hours, and these applications continued steadily until the indurated epididymis has quite or nearly lost its sensitiveness to pressure, when the patient may commence gradually going around, wearing a suspensory bandage containing some woolen batting.

Ordinarily, the acute stage of the disease requires not a whit more of treatment than this to effect speedy resolution. A laxative, with a tempered regimen, is always appropriate where a healthy man is suddenly confined to his back.

In conditions, however, of extreme pain, where the disease is exceptionally acute, we have at our command powerful means of relief. When the cord has become strangulated, and position does not bring relief, from ten to fifteen leeches above the groin, along the course of the cord, will often calm the pain as by magic. The bleeding should be encouraged by the use of hot water. This is much more efficient than the extraction of blood from the scrotum. Another cause of excessive pain, in some cases, is extreme distention of the tunica vaginalis with fluid. A puncture to let this out is followed by striking and immediate relief. Some authors advocate puncture of the tunica vaginalis in all cases, whether it be tensely distended or not, stating that it moderates the pain and shortens the attack. It is often unnecessary, and need not be resorted to where position and local narcotism suffice to quiet pain, as they usually will.

Patients with swelled testicle are sometimes unruly, and refuse to go to bed, taking narcotics and wearing a poultice while they continue at their work. Such a course is certain greatly to prolong the duration of the attack, and to be followed by chronic induration of the epididymis, which is very apt to be obstinate, and to entail sterility, as far at least as one testicle is concerned. Then, again, the impatience of restraint, felt by a man lying on his back and suffering no pain, often induces him to leave his bed too soon, and thus sometimes a relapse is provoked. Patients anxious about business or concealment should be advised from the start that they will save time and trouble, and perhaps avoid destroying the functional activity of the testicle, by yielding to the necessities of the case at once and going to bed. They may be assured that often four or five days are enough, and that not more than a week, or, in the worst cases, ten or twelve days in bed will be required, if they will observe the horizontal position absolutely for that period. In such a case leeches to the cord, puncture of the tunica vaginalis, and diligent poulticing will bring the testicle in a week to a condition of comparative repose, not paining when let alone, but still, perhaps, several times larger

than its fellow, painful on manipulation, and in the erect posture. Under these circumstances, the patient may employ his time as he chooses, and go about at will if the testicle be strapped.

Strapping a testicle to reduce swelling, first proposed by Fricke,[1] of Hamburg, has not met with the favor it deserves, for two reasons:

1. It takes time, trouble, and some experience to apply it so as to give comfort, and be of service.

2. If unskillfully applied, it either does no good, or causes pain, and actually does harm. It has been known to occasion gangrene.

In declining epididymitis, however, this agent, properly employed, is most valuable in abridging the duration of treatment. When the organ is still quite sensitive to pressure, some days before the patient can walk with comfort, even with his testicle suspended, if adhesive straps be carefully and snugly applied, locomotion without pain is at once possible (with a suspender), and there is no fear of a relapse.

Strapping is performed as follows: The hairs are cut from the scrotum, and strips of adhesive plaster[2] prepared from one-half to three-quarters of an inch broad (according to size of testicle), and six to eight inches long. The patient now sits on the edge of a chair in front of the surgeon, with his knees widely separated. The testicle is caught in the hand, gently rolled and manipulated until the scrotum relaxes, and the thumb and finger can encircle the cord easily above it. The position of the encircling finger upon the scrotum is accurately noted with the eye; the patient is instructed to seize the testicle lightly, and hold it in position; a piece of bandage long enough to encircle the testicle, and about two inches wide, is rapidly placed around it, its centre corresponding to that portion of integument previously encircled by the thumb and finger, and a strip of warmed adhesive plaster is placed at once over the centre of the bandage behind and one end brought round to the front and secured. The surgeon now seizes the top of the testicle, draws lightly upon it, at the same time producing constriction with his thumb and finger above, and with the other hand pulls upon the free end of plaster, brings it rapidly around to the front following the central line of the bandage, and attaches it under tension to the back surface of the other end of the same strip. Now the testicle may be dropped. It will be seen to be covered by a tense, shining, perhaps purplish-looking integument, pretty tightly constricted above by a strip of plaster, the latter margined all around on both sides by about three-quarters of an inch of bandage. The object of the bandage (prepared lint is perhaps better) is to keep the sharp edge of the adhesive strip from cutting into the tender scrotum, an accident which always happens

[1] Fricke's proposition was to strap a commencing swelling, and thus prevent it. This is impossible.

[2] Bumstead's suggestion of two parts of adhesive plaster with one of extract of belladonna, spread on thin leather, is a good one. It does away with the necessity of any lint or bandage under the top strap.



to a patient strapped without this precaution, who walks about, and sometimes even in spite of it.

The first strap is put on tight enough to cause a little uneasiness. It has to be snug, or the straps subsequently applied would push the testicle through it. The remaining straps are adjusted in circles, each one covering about half of its predecessor, and all applied with a certain degree of tension which can only be learned by personal experience. After a number of straps have been applied, it will be found that they will no longer adhere (in a circular direction) to the purple, tense, bulging extremity of the scrotum. This portion is consequently covered in from the sides, and from before backward, by attaching a strip of plaster at a given point, high up over the circular strips, bringing it down and tightly across the bulging end of the testicle, and attaching it high up over the circular straps at a point exactly opposite that from which it started. In this way, by starting at successive points, the whole of the exposed skin at the end of the testicle is covered tightly in. One or two more circular straps may now be applied to keep the lateral ones from slipping. The whole looks something like a large cartridge.

A certain amount of soreness follows this apparently rough handling, and it is well for the patient to lie down again for half an hour, to find out whether the strapping feels comfortable or not. If properly applied, comfort will have returned by that time, and the patient may now place his testicle in a suspensory bandage to keep it from dragging upon the cord, and go around at will without fear of pain or a relapse. By the mechanical action of the evenly-adjusted pressure, the blood is kept as thoroughly out of his testicle as it was by his position in bed. If the straps cause pain after half an hour, they should be removed. Straps need to be reapplied every twenty-four or forty-eight hours, whenever they become loose. If they have been carelessly put on, any point where the pressure is uneven will become œdematous. There is habitually some œdema about the bottom of the scrotum on removing the straps, but it is of no importance. The straps may be detached by cutting each one separately, or they may be conveniently removed all at once in a hot bath. After removal, new straps should be applied immediately. Ordinarily after four or five strappings, extending over as many days, or perhaps a week, the testicle will be found to be reduced nearly to its natural size, a certain amount of hardness still remaining in the epididymis, perhaps confined to its tail. This hardness, as a rule, subsides spontaneously in a few weeks, in cases which have been judiciously managed; sometimes, however, it remains for years. Its departure may be hastened by keeping the testicle constantly in a suspender, covered by oil-silk, so as to keep up slight constant heat and moisture, of course treating any urethral disease which may exist. Sometimes it seems as if the continued use of mild mercurial ointment

under the oil-silk hastened the absorption. No known medicine is of any proved service, iodine and iodide of potassium included. Tonics and cod-liver oil do good by improving the quality of the blood.

Nothing has been said of internal medication in the treatment of epididymitis. No medicine has any specific power over it. Gonorrhœal treatment may be continued, as it does no harm. Injections into the urethra are best intermitted.

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## CHAPTER XXV.

### *DISEASES OF THE TESTICLE.*

Pseudo-tubercular Epididymitis.—Tubercular Testis.—Symptoms.—Pathology.—Treatment.—Syphilitic Epididymitis.—Syphilitic Orchitis; Interstitial; Gummy.—Cancer.—Sarcoma.—Diagnostic Table of Syphilitic Testis, Tubercular Testis, Cancer, Sarcoma, including Diagnostic Features of Different Fungi.—Castration.—Dermoid Cyst.—Irritable Testis.—Neuralgia Testis.

Pseudo-Tubercular Epididymitis is very rare. It is simple, slow, chronic inflammation. Désormaux and Fournier[1] seem alone to have called especial attention to it. It is peculiar in being observed, as a rule, only in the course of chronic urethral discharges, and because it simulates tubercularization with the most absolute accuracy, so as to be usually mistaken for it.

It comes on during chronic urethral discharge, often without appreciable, immediate exciting cause, either as a subacute epididymitis, very indolent and not yielding to ordinary treatment, or, even more insidiously, it commences in an absolutely indolent chronic form, simply characterized by knobbed, irregular points of induration in the epididymis, slightly sensitive to pressure. The swelling increases slowly, but the pain ceases, until after a time we may have a large, knobbed, irregular epididymis, a healthy testicle, more or less fluid in the tunica vaginalis, and, perhaps, the vas deferens, which not infrequently participates in the disease, swollen to the size of a pipe-stem, hard, slightly sensitive to pressure, smooth, or knotty and irregular.

There is now a strong tendency to suppuration, and one or more abscesses may form in the epididymis, or possibly in the vas deferens, and discharge externally. Such abscesses long remain fistulous, and closing leave a nodosity which is slow to disappear. Sometimes matter forms near the tail of the epididymis, but the abscess finally dries up without discharging. This may leave a hard, insensitive shot or marble-like lump, freely movable in the scrotum, and connected with the tail of the epididymis by a pedicle. Such curiosities are occasionally encountered. Sometimes resolution is effected after many weeks, perhaps months, without suppuration.

[1] Art. "Dict. de Méd. et de Chir. pratiques."



Case XXXV.—A young gentleman while undergoing treatment for stricture had an attack of epididymitis, which ran its course and got well. Some months afterward, in the early spring, after a winter's hard work at an exciting business, he commenced to run down perceptibly. His gleet, which had ceased, returned, although he continued to use a full-sized sound, and he suffered from an attack of pseudo-tubercular epididymitis. The use of poultices, ointments, and all ordinary means, combined with tonics, failed to effect any improvement. Abscess formed, the vas deferens became as thick as a pipe-stem, the patient was pallid, and more than ever run down. He was now induced to give up business and go to the country, as the only means of safety. He was fortunately very fond of milk. On reaching the country he was directed to give up cod-liver oil and tonics, to stop all medication, general or local, and to live on milk, bread, meat, and fruit. A little abscess which had formed discharged, but general improvement set in at once. The patient gained in flesh and spirits. He continued to use the sound, and his urethral discharge ceased. His abscess closed, and after two months the epididymis and vas deferens had returned nearly to their original size. The following winter they became absolutely normal to the feel.

During this winter, however, again the patient overworked himself, and appeared again in the spring with a precisely analogous condition of disease in the epididymis and vas deferens of the other testicle, but not so far advanced as the previous year. His gleet and general running down had also returned. He still used his sound regularly. The country was again resorted to as a means of treatment, the patient continuing to come to town to his business, wearing a suspensory bandage. No abscess formed, but complete recovery ensued after some months. He is now—three years after his last attack—perfectly well. No induration remains.

Case XXXVI.—Another patient with this form of disease, occurring under precisely similar circumstances, could not be induced to leave town. No treatment seemed to benefit him materially, till after some months he was lost sight of.

The above cases indicate the outline of treatment. It is doubtful if any local measures are of advantage except the wearing of a suspensory bandage.

*The treatment* is hygienic and tonic, in fact exactly the same as for tubercular epididymitis, but with more hopes of entire success.

### TUBERCULAR TESTIS.

Tubercular disease of the testis is usually described as occurring in two forms—one as a continuation and degeneration of chronic inflammatory thickening, left behind by previous disease; the other spontaneous, tubercularization coming on without apparent local cause, and unconnected with any urethral disease. The first of these forms has been described above as pseudo-tubercle. It always affects the epididymis primarily, may extend thence to the vas deferens and seminal vesicles, and finally involve the testis proper as well. It is distinguished under a different head from tubercle proper. Its prognosis is much better. If not arrested, however, its advanced stages may be identical with those of true tubercular testis, and its terminations the same. The pathology of the affection is cheesy degeneration of inflammatory products effused inside of, as well as outside of, the seminal passages.

Tubercular testis proper has certain peculiarities of its own. Its pathology is cell-proliferation, totally outside of the tubes and ducts