

the retro-peritoneal glands, and is finally fatal. They both exhibit the same soft spots, perhaps filled with pultaceous matter, the same white or pink-white colors. The microscope shows the cancer to be a stroma, richly permeated by young cells, inclosing "epitheloid cell-aggregations" which owe their origin (Birch—Hirschfeld) to the proliferation of epithelial cells of the glandular tubuli; the medullary sarcoma, also malignant, shows a broad trabecular work of spindle-shaped cells, with often nests of epithelial cells, showing that it is partly carcinomatous, or a rounded stroma, with elements of other histoid formations (mucous cartilaginous tissue, Rindfleisch). The large soft spaces yield a plentiful juice when pressed, and, if water be run over them, the softer parts may be washed away, leaving a delicate stroma behind. The stroma, again, may be thickened and fibrous. Cysts are not infrequently found, sometimes blood-cysts, or large blood-clots, as in kidney-cancer.

Cancerous degeneration may have attacked a testicle already sarcomatous, when we should find, besides the conditions above described, perhaps cartilage more or less calcified, or mucous tissue, or unstriated muscle.

The enlarged abdominal glands press upon the vena cava. The cavity of the latter has been found obliterated, filled with cancer-growth; the bones of the spine become involved, while secondary cancer may be found in the kidneys, liver, and lungs. A few instances have been cited of cancer of the testicle, beginning in the tunica vaginalis. One or two cases of colloid and melanotic cancer are recorded, as well as a few of scirrhus.

Diagnosis.—In the early stages of the disease, especially if its course be slow, diagnosis is often exceedingly difficult. The diagnosis is with sarcoma, syphilis, tubercle (for which see DIAGNOSTIC TABLE), hydrocele, and hæmatocele, with dense walls. Hydrocele or hæmatocele may be diagnosed, if all other symptoms fail, by exploratory puncture with trocar. If a trocar be used and thrust into a soft part of a carcinomatous testicle, enough blood may escape to encourage the idea of hæmatocele, but it will be noticed that the volume of the tumor does not decrease proportionally to the amount of blood which has escaped.

Prognosis is even worse than for cancer elsewhere. Two years is a fair average duration for the disease, and the liability for secondary cancer to appear in the loins or elsewhere after operation is very great. But few cases, and they could be counted on the fingers, are reported of a continuance of health a number of years after extirpation, and in these cases the operation was always done very early, and perhaps the disease was sarcoma.

Treatment.—Medicine is of no service. Puncture of tunica vaginalis will often relieve pain immediately. A very early operation offers the only hope, but hope departs when the cord and glands become involved.

SARCOMA.

CYSTIC SARCOMA, ENCHONDROMA, MYOMA, MYXOMA.—This affection is even more rare than cancer. Its cause is unknown. It occurs most frequently between eighteen and twenty-five. It is rarely bilateral. The body of the testis is involved, the epididymis sometimes secondarily. When the morbid mass is made up largely of cysts, it is called cystic sarcoma; when there are but few cysts, and much solid matter, it has been customary to call it fibro-cystic sarcoma.

Symptoms.—The growth of sarcoma is slow, and usually painless, so that considerable size may be attained before the disease is noticed. There may exceptionally be some pain or dragging in loin, groin, or testicle, especially after the mass has become bulky. The tumor may attain a weight of several pounds. The shape is oval, and the surface smooth, unless some large-sized cysts happen to be superficial. A healthy epididymis can be felt at first distinct from the testicle; finally it is lost in the general swelling. The tumor may remain many years of a certain size, and then take on malignant degeneration, after which symptoms of cancer supervene.

Sarcoma is liable to be confounded with cancer, tubercle, syphilis (see DIAGNOSTIC TABLE), hydrocele, or hæmatocele, but the tumor is elastic, not fluctuating, and a trocar distinguishes it from the latter affections. Severe pressure often produces a sensation of faintness.

Pathology.—On section the tunica vaginalis and tunica albuginea are found thickened. There may be but a few cysts, or vast numbers constituting nearly the entire tumor, varying in size from a point to a pigeon's-egg. The smaller cysts contain a gelatinous fluid which gets thinner afterward, and may contain cholesterine, fatty debris, etc. The fluid is often colored with blood. A pure, watery serum is rare. Sometimes the fluid is synovial-like, sticky, stringy. The cyst-walls, especially the smaller, are lined by cylindrical epithelium. Papillary excrescences, covered also by cylindrical epithelium, are found growing into the larger cysts, which often become entirely filled up by them, as in cystic sarcoma of the breast, and as in the latter disease, so also in this, it is not uncommon to find in the cysts little, yellow, hard spherules of condensed epithelium.¹ As to the mass of the tumor, fibrous tissue is found in greater or less proportion, and as the tumor is nearly always a complicated one, it is not unusual to discover portions of muscular tissue (of both kinds, Senffleben, Billroth, Nepveu), masses of mucous and even of adipose tissue, and hyaline cartilage, perhaps partly calcified. This cartilage, which may be found in all sorts of curious, branched shapes, has been made out by Paget and Billroth to occupy the lymph-vessels. In Paget's case the cartilage extended up the lymphatics of the cord

¹ These little pearl-like clusters of epithelium are encountered in various pathological conditions of the testis.

into the abdomen, and a mass was found growing from one of them into the vena cava. Cartilaginous nodules were found in the lungs. Where there is much cartilage there are seldom many cysts. Indeed, the tumor may consist solely of hyaline cartilage at first. This grows slowly, painlessly, and may attain the size of a hen's-egg, when, possibly after several years, a sudden, rapid enlargement of the testis sets in, and we find that the cartilage has become surrounded by recently-formed masses of sarcomatous character. Cretification may be found in the testicle and its coverings, in connection with enchondroma or sarcoma (Rindfleisch).

A pure myoma may occur in the testicle as a solid, painless lump. Rokitansky describes one as large as a goose-egg, of striped muscular tissue; Rindfleisch another, of unstriped fibres. Sarcoma may occupy only a portion of the testis, or the whole gland; the tubular structure is then either found spread out upon the new deposit, or scattered through it. It eventually atrophies. The epididymis becomes flattened and wasted, or finally involved in the disease. According to Billroth, sarcoma commences in the sub-epithelial tissues of the seminal tubuli as a round-celled degeneration of the tunica propria, leading to occlusion of the tubule, and subsequent dilatation behind the occluded point. Commencing cancerous transformation may often be detected.

Treatment.—The only treatment is extirpation. The disease may be indeed purely benign at first, and remain so perhaps indefinitely, but it may become cancerous, and, if the individual have one good testicle left, it is unwise to put off the operation. If the patient be a monorchid, strict justice would allow delay, so long as any of the secreting structure of the testis had been spared by the disease, and continued its functions.

DIAGNOSTIC TABLE.

Since it is so difficult often to decide upon the nature of a given chronic enlargement of the testicle, it seems advisable to display the main diagnostic features of the four affections, tubercular testis, syphilitic testis, cancer, and sarcoma, side by side in tabular form, so as to bring out as clearly as possible, and emphasize, their most striking differences:

<i>Tubercular Testis.</i>	<i>Syphilitic Testis.</i>	<i>Cancer.</i>	<i>Sarcoma.</i>
1. Most common in early youth and manhood.	1. Most common in middle and later life.	1. Most common in youth.	1. Most common in early manhood.
2. No change in scrotal veins.	2. Same.	2. Scrotal veins enlarged and varicose after the disease has lasted some time; due to the pressure of cancerous glands above.	2. No change.
3. Does not grow to great size.	3. Is usually comparatively small.	3. May reach an immense size.	3. May become very large.

<i>Tubercular Testis.</i>	<i>Syphilitic Testis.</i>	<i>Cancer.</i>	<i>Sarcoma.</i>
4. Holds second place of frequency.	4. Most common of the four.	4. Holds third place.	4. Least common.
5. Primarily affects epididymis.	5. Primarily affects body of testis.	5. Same.	5. Same.
6. Form knotty, irregular, hard, especially the epididymis.	6. May be perfectly smooth and oval, or more or less lumpy.	6. Uneven; prominent hard and soft spots; indefinite fluctuation.	6. Slightly uneven, oval, perhaps with points of fluctuation.
7. Development slow.	7. Same.	7. Development rapid.	7. Very slow, often suddenly becoming rapid.
8. Pain absent or insignificant.	8. Often absolutely no pain.	8. Pain liable to be severe soon after commencement, sometimes excruciating.	8. No pain.
9. Often discovered by accident.	9. Same.	9. Recognized by pains from the start.	9. Tumor grows slowly, and is usually discovered small.
10. Usually no sensation on pressure, neither pain nor the normal sensation.	10. Same.	10. Darting, sharp, burning paroxysms and constant pains, aggravated by handling.	10. No pain; squeezing testicle often produces feeling of faintness.
11. Fluid in tunica vaginalis sometimes.	11. Fluid in tunica vaginalis nearly always.	11. Fluid in tunica vaginalis usually slight.	11. Fluid in tunica vaginalis rarely.
12. Tendency to suppurate, discharge, and leave fistula.	12. Tendency to atrophy without external opening, sometimes there are a discharge and fungus.	12. Tendency to open, and form fungus hæmatodes.	12. No tendency to open or to form fungus.
13. Both testes often consecutively attacked.	13. Same.	13. Usually only one testicle suffers.	13. Same.
14. Loss or impairment of sexual desire and power when both glands are involved.	14. Same, and more marked; sometimes exists when one gland only is diseased.	14. Both glands not involved simultaneously.	14. Same.
15. Fungus not very common. If found, it is pale and soft, bleeding rather easily, composed mainly of granulations. Pus thin, sinuses leading into testicle, growth slow, usually painless.	15. Fungus very rare. If found, it is hard, yellow, mainly composed of tubes and yellow syphilitic matter, does not bleed very easily, no sinuses, growth slow, painless.	15. Fungus constant if testis remains long enough, grows rapidly, bleeds profusely, sloughs readily, is covered with sanious, badly-smelling ichor, is formed mainly of cancer-tissue, is very painful.	15. No fungus.
16. No glandular enlargement.	16. Same.	16. Inguinal and pelvic glands involved.	16. Glands sometimes involved.

<i>Tubercular Testis.</i>	<i>Syphilitic Testis.</i>	<i>Cancer.</i>	<i>Sarcoma.</i>
17. Very rebellious to medical treatment.	17. If taken early, quickly amenable to treatment. In any case always reducible in size, by intelligent medication, to which all doubtful cases should be subjected, to give them a chance.	17. Treatment ineffective. If cut out, returns elsewhere.	17. Medical treatment ineffective. If cut out, disease does not necessarily reappear; if left, cancerous degenerations may occur.
18. Cord always affected eventually.	18. Cord never involved in a pure case.	18. Cord affected in advanced disease.	18. Cord never affected.
19. Vesiculæ seminales liable to become involved.	19. Nothing of the sort.	19. Nothing.	19. Nothing.
20. Feel lumpy.	20. Excessively hard.	20. Hard and soft.	20. Elastic.
21. Duration, several years.	21. Duration, several years—usually less than tubercle.	21. Duration, average two years.	21. Duration, many years.
22. Prognosis not favorable. Progress always indolent, entire cure rare.	22. Prognosis good; gets well, with functions restored if treated; atrophies if not treated.	22. Prognosis bad; kills by bleeding or cachexia if not removed; by return of the disease if extirpated.	22. Prognosis good. Does not return if removed. If left, liable to become cancerous.

CASTRATION.

This is an operation not very often required since sarcocele (as any chronic fleshy enlargement of the testis used to be called) has been more closely studied and better understood. Still there are occasions when it is proper to remove the testicle. The operation is a simple one, and is best performed as follows: The pubes, perinæum, and scrotum, are first shaved, and any complication in the way of hernia is excluded if possible. An anæsthetic should always be administered.

An incision is made, commencing a little below the external abdominal ring, and carried to the bottom of the scrotum along its anterior aspect. Even if such a length of incision were not required by the size of the gland to be removed, yet it is better to make it long, so that the lower angle may be depending, and thus to allow a free exit for the discharges. The spermatic cord is next exposed, and, if it must be ligated very high up, it is better at once to put a stout ligature around it, and to tie the whole cord quickly and firmly. If enough of the cord is left to be seized, it may be held by the fingers of an assistant, but care must be taken not to let it slip, or it will disappear within the inguinal canal and a great deal of hæmorrhage may occur before it can be recovered by dissection. The cord being cut, the testicle is to be turned out more by tearing than by cutting. An oval piece of skin may be

removed with it if it is very large, and, if it adheres pretty tightly, care may be required to prevent wounding the urethra or the other testicle during the dissection. After the testicle is removed, the arteries of the cord (the spermatic, deferential, and the cremasteric) should be tied, and all the bleeding points in the scrotum secured. If a single ligature has been used for the whole cord tied high up, it may be left, and usually no bad symptoms will occur. Pain, however (and even tetanus), has been said to be produced in this way from including the nerves of the cord and the vas deferens in the ligature. The wound should not be united until all the bleeding points have been secured. There are few operations in surgery which are so liable to be complicated by troublesome bleeding after the wound is closed. This is due to the laxity of scrotal tissue.

If hernia complicates the disease of the testis, care should be taken not to open into the peritoneal cavity. If the cord should slip into the inguinal canal after being divided, the tendon of the external oblique must be cut at the external pillar of the ring, and the dissection continued up the canal until the cut end is reached and all its bleeding points secured. Several instances of death are recorded from neglect of this precaution. If hæmorrhage comes on after the wound has been closed, it should be reopened and the bleeding vessels searched for. A few points of suture are necessary, otherwise the edges of the wound will be kept gaping by the contractions of the dartos. Some strips of adhesive plaster, a tent at the lower angle of the wound, and a T-bandage, complete the dressing. Self-castration has often been resorted to by lunatics, or by individuals, usually young men, laboring under some depression brought on by masturbation or other abuse of the organs. The bleeding is always excessive, but, in the cases reported, has usually been successfully arrested.

DERMOID CYSTS OF THE TESTIS.

The testicle, next to the ovary, is the most favorite site for the development of dermoid cysts. These cysts are cavities lined by integument, furnished with stunted papillæ, sebaceous and hair glands. Their contents are a sebaceous matter mixed with epithelium and rolls of long hair, usually reddish. Besides these there are often found fully-formed teeth, sometimes in great numbers, often embedded in portions of bone, bones with smaller bones articulated to them, cartilage, muscle, nerve.

CASE XXXVIII.—In a personal case a dermoid cyst was taken from a boy who had been allowed to carry it for years, under the impression that it was cancerous. It was found to contain a portion of well-formed inferior maxillary bone, with several molars and a bicuspid tooth firmly fixed in it. Recovery followed.

These cysts may be within or outside the testis, as in Velpeau's case.¹ These are the cysts sometimes known as foetal inclusions.

¹ *Gaz. Méd. de Paris*, February 15, 1840. André, "Mém. de l'Acad. Royale de Méd.,"

Modern pathologists combat the views of Geoffroy St.-Hilaire on this subject, and the more poetical theory of foetal inclusion is rapidly giving place to the common-sense one of simple, accidental, misplaced, formative activity. The cysts are probably always congenital. They usually grow very slowly at first, but may reach an inconvenient size in time. Generally they become very large, then suddenly begin to grow rapidly and are removed, or, becoming injured by a blow, they inflame, suppurate, and discharge their contents, remaining fistulous.

The only treatment is removal with the knife. It should be remembered that the cyst sometimes lies outside the testicle, the latter adhering to it. The gland should be dissected off, and spared if possible.

IRRITABLE TESTIS.

This is a name given to a species of neuralgia of the gland. The whole organ, or usually a particular spot, is extraordinarily sensitive to the lightest touch; contact of the clothing alone is sometimes exquisitely painful. In the recumbent posture, with nothing in contact with the testicle, the pain usually disappears. Sometimes the organ is tense and engorged; but it is of full size, and seemingly normal. Again, it may be decidedly flabby, the scrotal tissues being soft and lax. Irritable testis occurs at all times, from early puberty to late middle life. It is met with chiefly in old bachelors and widowers. The patient otherwise may possess robust health, sometimes (especially with flabby testis) he is anæmic, nervous, hypochondriacal, and dyspeptic.

The causes of irritable testis are lack of use, or abuse, of the sexual powers—perhaps most often ungratified sexual desire. Curling says,¹ "In a person of chaste habits, thus affected, I was informed that the morbid sensibility disappeared on marriage." Temporary irritable testis may be produced in a healthy person, at any time, by prolonged sexual excitement ungratified. Masturbators, who have suddenly reformed, and recent widowers, and those who have abused their sexual powers by over-use, are all liable to the affection under consideration.

These patients are usually hypochondriacal, look upon their own condition as a pitiable one, and ascribe it to loss of seminal fluid—perhaps to nocturnal emissions—to neither of which does it stand in any relation of effect. They often demand castration—a demand which should be acceded to on no account. Curling quotes from Romberg an interesting case bearing on this point: A young man acquired irritable testis after becoming engaged to be married. It distressed him so seriously that he demanded extirpation of the organ, and would not yield until at last the operation was reluctantly performed. Eight days afterward the old pain returned in the other testicle. This being all he had

vol. iii. Ollivier (d'Angers), "Mém. sur la Monstrosité par Inclusion," *Archiv. Gén.*, vol. xv. Verneuil, "Archiv. Gén.," June, 1855, who has collated nine cases besides one of his own.

¹ "On the Testis."

left, the patient preferred to keep it. He married, and "very soon recovered completely."

Treatment.—Hygiene, physical, moral, and sexual, is the proper treatment for irritable testis. As local means, a suspensory bandage and the cold douche are adjuncts. Drugs exert no specific power and cannot be relied upon. Marriage, with a proper sexual hygiene, is the natural antidote to any irritability of the sexual apparatus.

NEURALGIA OF THE TESTICLE.

An extreme degree of the condition just detailed constitutes neuralgia of the testicle, a disease which sometimes attains horrible intensity, and assumes the tic-douloureux type in paroxysms at irregular (occasionally regular) intervals. The pain in some cases is constant, and perhaps quite mild, but increased by walking and standing so as to occasion great discomfort. The character of the pain is acute, darting, stabbing, sometimes dragging, heavy. The cremaster sometimes contracts spasmodically during the paroxysm, forcibly retracting the testicle, and a cold sweat, with nausea and vomiting, is not a rare accompaniment. Between the paroxysms the testicle is often entirely free from pain. Handling the organ is liable to induce a paroxysm. The testis, sometimes swollen and tense, is usually unaltered. There is no febrile action. Neuralgia is usually confined to one testicle, unlike irritability, which is frequently double. Neuralgia must not be confounded with the sympathetic pain in the testis, and its retraction from spasm of the cremaster, accompanying certain morbid states of the bladder, ureter, and kidneys, and so often seen in kidney-colic.

The cause of neuralgia of the testis is sometimes difficult of appreciation. It is often due to the same general influences which lead to the development of neuralgia elsewhere (gout, syphilis, malaria, etc.). It sometimes follows an attack of orchitis. It has been vaguely referred to the spinal cord, deranged digestion, etc. It has been seen to follow injury, and to attend a small, deep-seated, purulent collection. B. Brodie¹ found it in one case always preceded by clay-colored evacuations and pain in the back of the head. He believed the cause in this case was situated in the liver. In another case, he found a small projection on the epididymis, which, on pressure, gave the sensation of touching an exposed nerve in a tooth. The following is an analogous case:

CASE XXXIX.—A middle-aged healthy gentleman married to a sickly wife, with whom he had only occasional sexual relations, applied for treatment of a painful spot on the left epididymis, which could be felt as a little lump not larger than half a grain of rice, and which gave, when touched, the sensation of pressing upon an exposed nerve in a tooth. He had also "irritable bladder," depending on neuralgia of the vesical neck. There was no stricture. The systematic regular passage of a full-sized steel

¹ *Medical Gazette*, vol. xiii., p. 621.

sound, during several months, cured both the irritability of the bladder and the neuralgia of the testis. The little lump (probably a cyst) remained, but its sensitiveness on handling disappeared gradually as the bladder-symptoms got well.

In neuralgia of the testis no nerve-lesion has been found. Sexual hygiene will be often found at fault. The affection may last for years and (possibly) then disappear spontaneously.

Treatment.—Neuralgia depending on bladder, urethral, or kidney disease, disappears with its cause. In true neuralgia, a strict hygiene is all-important; this involves marriage. Among drugs, arsenic, quinine, and iron, bear the best reputation internally; belladonna, opium, and aconite, externally. But little reliance can be placed on them, however; sexual and general hygiene outrank all remedies. If the testicle be extirpated, there is always danger of a return of the pain in the cord, or in the other gland. Diday¹ recently very strongly advocates the continued application of cold in all pure cases of neuralgia, and claims remarkable success with this agent. His method consists in filling two bladders with large pieces of ice. One of these he places upon towels, so arranged as to underlie and support the testis, the patient being supine. The other bag is now placed upon the testis, so that the whole organ is surrounded by ice, or, rather, iced-water. This application is kept up night and day, for two to four days, after which (Diday states) the neuralgia does not return.²

CHAPTER XXVI.

MALADIES INVOLVING THE GENITAL FUNCTION.

Impotence.—True Impotence, its Causes and Treatment.—False Impotence, its Causes and Treatment.—Sterility.—Masturbation.—Pollution, Nocturnal and Diurnal.—Spermatorrhoea.—Erotomania.—Satyriasis.—Priapism.—Aspermatism.

IMPOTENCE is a symptom, usually, of some physical morbid condition entailing inability to accomplish the sexual act. Its causes are very numerous. Most of them have been already considered; the others will receive a few words of detail in this chapter. Impotence will only be considered as affecting the male.

Impotence, from whatever cause, is a complaint not unfrequently submitted to the surgeon; not always frankly and openly as such, but often by implication, as though it should be recognized and inquired about, in answer to remote indications which the patient has scantily

¹ "Annales de Derm. et de Syph.," 1869, No. 3, p. 182.

² In weak subjects the possibility of sphacelus of the skin, or of at least impairing the vitality of the parts by a too rapid reaction on removal of the cold, should not be lost sight of, although these points are not mentioned by the high authority who suggests the practice.

furnished. Indeed, the surgeon who would meet the daily wants of his fellow-men, in reference to troubles of this sort, must possess an accurate knowledge of the physiology of the sexual function, and of its various derangements, and be ready to anticipate the reticence of patients; otherwise he will fail to sound many of the depths of human nature, where suffering lurks—which suffering is for the most part preventable or relievable.

Impotence signifies that an individual cannot beget children because he cannot perform the sexual act properly, no matter what the obstacle may be, whether he have spermatozoa or not. The term must be carefully distinguished from sterility, which signifies inability to beget offspring on account of defect in the semen, whether the individual can have sexual intercourse properly or not. The two are undoubtedly often associated in the same individual, but they may be totally distinct, as the following examples will illustrate. Thus there are two methods of making eunuchs in the East: by one the penis is removed as well as the testicles, and such a eunuch is necessarily both impotent and sterile. By the other method the testicles alone are removed; and a eunuch of this description, though sterile (having no spermatozoa), may be still partly potent, and does not bring so high a price as another eunuch who has no penis. It is a well-known fact that both animals and men, from whom the testicles have been removed after puberty, still retain sexual desires, and may have intercourse, with venereal orgasm and ejaculation of prostatic mucus, occasionally during a period of several years. A cryptorchid is rarely at all impotent, but is very apt to be sterile, and so of a patient with double gonorrhœal epididymitis; while, as instances of impotence without any sterility, may be mentioned, deformities preventing sexual intercourse, where the spermatic fluid is normal (extrophy of the bladder), extreme incurvation of the penis, with or without hypospadias, aspermatism.

The distinction between impotence and sterility being now plain, a few words regarding each of these complaints will perhaps serve to clear them of the mists of uncertainty which often surround them.

Impotence may be considered as true and false.

TRUE IMPOTENCE.

This is exceedingly rare in the male. Any one who can perform the sexual act is potent. This act imperatively involves two conditions, namely, sufficient erection to make intromission possible, and a mucous fluid leaving the body by ejaculation. Roubaud¹ has added two other factors as essential to the act of copulation; namely, the existence of venereal desire and pleasure in the act; and although both of these undoubtedly exist in a state of health, nevertheless the absence of either of them by no means necessitates impotence, while the absence of either

¹ "De l'Impuissance et de la Stérilité," Paris, 1872, second edition.