and fluctuation is obtained there, it is due to *suppuration of Bartholine's gland.* Labial abscess may be chronic as well as acute.

A rapid sloughing of the vulva is sometimes seen in young children. It is called *noma vulvæ.*

Ulcers.—*Hard chancre* and *soft chancre* are common in this situation; for their diagnosis *see* page 496. Occasionally, numerous small punched-out superficial ulcers are found on the inner surface of the labia, the nymphæ, and on the clitoris, which result from the breaking down of small superficial nodules; it is a rare disease, known as *follicular vulvitis.* Chronic ulcers, with sloughy base and ragged edges, are due to late *syphilis;* they may, when very chronic, become indurated, but the history and signs of constitutional syphilis distinguish them from the "primary sore." A chronic ulcer, with irregular granular or fungating base, and indurated everted edges, steadily growing with enlargement of the inguinal glands, is *epithelioma.*

Mucous patches and erosions are common in the secondary stage of syphilis.

A deep red, painful and tender swelling at the meatus urinarius, attended with severe pain in micturition, is a *vascular papilloma;* this tumour is most common in women of middle and late life. Hypertrophy of the nymphæ, or great enlargement of the labia with pendulous solid outgrowths are not uncommonly observed; the latter especially in the subjects of syphilis.

CHAPTER XXXIX.

DIAGNOSIS OF DISEASES OF THE SCROTUM, TESTICLE, AND SPERMATIC CORD.

THE scrotal tissues are freely movable over the testicle and cord, and this fact enables us at once to distinguish diseases limited to them from affections of the scrotal contents.

A. **Diseases of the scrotum.**—The presence of superficial *varicose veins,* of *pendulous scrotum* from relaxation of the dartos, and of *hypospadias,* with vertical cleaving of the scrotum into two labium-like halves, each generally containing a normal testicle, is easily recognised. Want of development of the scrotum is associated with absence of the testicle from the scrotum, and may involve one or both sides.

Simple redness of the skin of the scrotum may be due to:

Intertrigo.	Syphilis.
Eczema.	Subjacent inflammation.
Erysipelas.	Blood-staining.

The surgeon should observe whether it is acute or chronic, a purely local affection, or attended by signs of constitutional disease such as fever, syphilis, gout, and whether there is any sufficient local cause for the erythema, such as dirt.

If it occur on the sides of the scrotum where it is in contact with the thigh, and be accompanied by a similar change in the skin of that region, the surface being constantly moist, it is *intertrigo.* This is most common in young children and in stout adults.

If the surface be moistened with a thin discharge which stiffens linen, and in places be covered with thin scaly crusts of dried discharge, it is *eczema.*

If the affection be acute, marked by a bright red colour of the skin, with œdema, a tendency to vesication, smarting or itching pain with marked tenderness, and be associated with severe constitutional disturbance and fever, it is *erysipelas*. (*See* page 68.)

Occurring in young children as a part of a coppery-red eruption, involving the nates as well as the scrotum, with flat papules, and perhaps moist mucous patches, it is a manifestation of *inherited syphilis*.

The skin is reddened in acute inflammation of the testicle or epididymis, the signs of which are very severe local pain and tenderness, and swelling. (*See* page 502.) The discoloration from *blood-staining* is readily recognised. (*See* page 26.)

Swelling of the scrotum.—The surgeon must notice whether the swelling pits on pressure (*œdema*), fluctuates (*abscess*), or is solid.

Œdema may be *local*, or part of *general* œdema from Bright's disease, morbus cordis, or obstruction to the inferior vena cava. *If local*, it is inflammatory or urinary; when the swelling is attended with redness, pain, heat and fever, and especially if it affect only a part of the scrotum, it is *inflammatory*, and may be erysipelas or a commencing abscess. If, however, the swelling be at first unaccompanied by these signs, and have come on suddenly during an effort to pass water after a rupture or wound of the urethra, retention from a tight stricture, or a sudden discharge of pus from the urethra, and little or no urine flowed from the meatus, and if the swelling be found to involve the anterior part of the perineum as well as the whole scrotum, it is *extravasation of urine*. The swelling will spread to the penis and up over the belly, but not on to the thighs or around the anus; patches of skin may become gangrenous; the pulse is rapid and weak, while the tongue is usually dry and brown.

If the swelling fluctuate, and there be redness of the skin, heat, pain and surrounding œdema, it is an *abscess*.

If the swelling fluctuate, be tense, globular in shape, adherent to the skin in the centre, freely movable over the deeper parts, chronic and quite free from all signs of inflammation, it is a *sebaceous cyst*.

If the scrotal tissues be greatly thickened, very firm, with large wart-like projections from the surface, and this condition of "solid œdema" be the sequel of successive attacks of superficial erythematous swelling, it is *elephantiasis*. The parts often assume an enormous size, and the penis and the thighs may be involved. It is most common in natives or residents in Barbadoes, India, and other tropical and malarial districts, but it may occur in persons who have never been out of England. The same condition of skin and subcutaneous tissue of the leg is known as *Barbadoes leg*; there is a great tendency to ulceration.

A condition like elephantiasis scroti, but characterised by the presence of soft warty projections, which from time to time discharge a watery (lymph) or milky (chyle) fluid, is known as *lymph scrotum*. This is often associated with chyluria. (*See* page 544.)

Circumscribed solid tumours.—Flat dusky papules with fine desquamation of the surface, are often seen during the period of *secondary syphilis*, and if these papules have a moist surface with a milk-white appearance, they are known as *mucous patches*, there will be other signs of syphilis to corroborate the diagnosis.

If the papules be quite small, firm and red in colour and the skin around be pigmented and the seat of intolerable itching, the disease is *prurigo*.

A single chronic warty growth in or from the skin, over which a scab forms, which when removed exposes a red granular surface, is probably a *soot-wart* or *epithelioma*. If the wart infiltrate the skin, and be found to spread slowly and to deepen in spite of local

treatment, and especially if an inguinal gland on the same side become enlarged, this diagnosis is established. This disease is most common in chimney sweepers, and in men past forty years of age.

If the tumour grow under the skin which is freely movable over it, and have a soft consistence and a lobulated surface, and the growth be slow and painless, it is a *lipoma*.

Ulcers of the scrotum should be examined in the same way as ulcers of the penis (*see* page 492); but special care should be taken to notice whether the ulcer is adherent to the testicle, or if it be a sinus leading into the testicle.

If the ulcer be acute, sharply cut with deep spongy base, red areola and purulent discharge, and if it were noticed a few days after an impure coitus, or if it have developed in succession to similar sores on the penis, it is a *soft chancre*.

If the ulcer take the form of a well-defined raised induration, with abraded or ulcerated surface, with a serous discharge, and there are indolent buboes in each groin, it is a *hard chancre*. (*See* page 496.)

If the ulcer be chronic, sinuous or serpiginous, with depressed smooth base, or be in the form of a deeper chasm with undermined edges and a tough yellow sloughy base, it is a late *syphilitic ulcer*.

If the ulcer be chronic, slowly but steadily advancing, with induration of the base and around the edge, and a warty surface, it is *epithelioma*.

Some ulcers are traumatic in origin or result from the separation of sloughs. *Sinuses* are either *urinary* or *tubercular*; in the one case urine flows from them, and in the other there is tubercular disease of the testicle or epididymis.

If the base of the ulcer be formed by the testicle which projects beyond the skin, it is known as *fungus* or *hernia testis*.

Fungus testis.—(1) If the base of the ulcer project but little and be formed of granulations of a pale pink colour, and the outline of the testicle be unaltered or moderately enlarged, it is a case of *superficial fungus* due to a growth of granulations from the tunica vaginalis and tunica albuginea.

(2) If the base of the ulcer be more prominent, of an ash-grey sloughy appearance, with a thin discharge in which spermatozoa are found under the microscope, the outline of the testicle being greatly altered from more or less of its structure being protruded through the scrotum, it is *syphilitic fungus*, due to softening and sloughing of a gumma of the testicle, with protrusion through an opening in the skin. There will be other evidence of syphilis.

(3) If the ulcer be on the outer side of the scrotum, with a pale grey base formed by a protrusion from the epididymis, the rest of which is enlarged and nodular, it is *strumous fungus*. The discharge is thin pus, with caseous or cretaceous flakes, and never contains spermatozoa. This form of fungus may be met with in connection with the body of the testicle.

(4) *Fungus testis* may follow the opening of any abscess in the testicle, and so may occur in the rare cases of acute orchitis which end in suppuration.

(5) If the testicle be *greatly* enlarged, with all the signs of malignant disease (*see* page 514), with an irregular mottled mass protruding from an ulcerated opening in the skin, with an abundant sero-sanious discharge, often attended with repeated hæmorrhages, it is *malignant fungus*. Whenever a malignant tumour fungates through the skin, and bleeds freely from time to time, it is known as *fungus hæmatodes*.

Gangrene of the scrotum is most commonly caused by extravasation of urine; it may result from phlegmonous erysipelas, frost-bite, or thrombosis after acute fevers. The author has seen a case of

mortification of the entire scrotum of a little boy, which appeared to be analogous to noma vulvæ. (*See* page 500.)

B. **Diseases of the contents of the scrotum.**—The surgeon may find one or both of the *testicles absent or too small*, and if so, he has to distinguish between the congenital and the acquired forms of these affections.

A testicle is absent from the scrotum.—If the corresponding pouch of the scrotum be, and always have been, small, and no scar be visible in it, while there is no trace of testicle or cord to be felt there, it is a case of *undescended testicle.* The surgeon must seek the gland in the inguinal canal, the iliac fossa, or the perineum. (*See* page 531.) If, however, a linear cicatrix be seen in the scrotum, and the testicle cannot be found elsewhere, it is a case of *castration.*

A testicle is too small.—This may be due to imperfect development, or to wasting of the organ. The surgeon should notice whether the whole testicle is absent, the vas deferens being entire, or the body of the testicle alone is absent, or the body small; and, further, he should notice any scars in the scrotum or adhesion of the organ to the skin. Entire absence of a part is a congenital deformity; in wasting of the organ its remnant is always to be detected. A small size of the left testicle is not uncommon in association with varicocele, and is to be distinguished from wasting of the organ, by the absence of softening, or of nodular induration. The known causes of wasting of the testicle (affecting the body only) are acute inflammation, particularly in association with parotitis or injury, injury to the back of the head or spine, strumous disease of the same or of the opposite testicle, and aortic aneurism blocking the orifice of the spermatic artery. The author has had under his care a man with advanced

strumous disease of the left testicle, in whom the right organ has been observed to waste away to a small pea-like appendage of the epididymis.

The cases that present difficulty in diagnosis are those of enlargement of the scrotal contents. The surgeon should commence his examination by grasping the root of the affected side of the scrotum between fingers and thumb, which will enable him to distinguish between tumours entirely in the scrotum and those which reach up into the inguinal canal. Many scrotal tumours are associated with swelling of the spermatic cord, but a little experience will enable the surgeon to distinguish this from an extension of the actual tumour into the groin. Only scrotal tumours will be considered in this chapter; inguino-scrotal tumours are discussed in chapter xl.

DIAGNOSIS OF INTRASCROTAL TUMOURS.

The surgeon should first feel whether there is an expansile impulse in the swelling during coughing, or in children during crying or straining (*see* pages 271-2); then try whether the swelling is reducible into the belly (*see* page 269 *et seq.*), translucent or opaque (*see* pages 261-2), and then he should enquire into the history of the origin and course of the swelling. The next step is to trace out accurately the relation of the swelling to the body of the testicle and the epididymis; and it must be borne in mind that this organ may be so rotated that the epididymis is anterior to the body, or, more rarely, on the outer or inner side. In the following descriptions the body of the testicle will be spoken of as the "testis," in contradistinction to the "epididymis," and the entire organ will be called the "testicle.'

I.—The tumour gives an expansile impulse.

Congenital hydrocele.
Varicocele.

Examine for translucency.

If the swelling be translucent and fluctuating it is a *congenital hydrocele.* These tumours are rounded and even, usually distending the scrotum and completely surrounding the testicle (*vaginal*) ; they may be limited to the cord (*funicular*).

If the tumour be opaque, with a soft knotty feel, it is a *varicocele.* This affection is usually limited to the left side, it is very common in young men, and may attain a large size, reaching down to or even below the testicle, but never all round it. It is easily reduced into the belly by placing the man on his back and then raising the scrotum ; if now the surgeon place his finger gently over the external abdominal ring and allow the man to rise, the swelling will gradually reappear in the scrotum from below up, without giving the surgeon the sensation of anything slipping past his finger. This sign is pathognomonic of varicocele.

II.—**There is no impulse on coughing.** —Examine for fluctuation, and then for translucency.

III.—**The tumour fluctuates and is translucent.**

Acute hydrocele.
Chronic vaginal hydrocele.
Encysted hydrocele.

(1) If the swelling have formed rapidly, existed but a short time, be painful and very tender, and covered by reddened skin, it is *acute hydrocele.* This is but an accompaniment of acute epididymitis, and is only rarely so marked as to be recognised distinctly. There are the usual signs of epididymitis. (*See* page 511.)

(2) If the swelling be chronic and surround the testicle completely, that organ being found at the bottom of the tumour and usually at the back, it is a *chronic vaginal hydrocele.* This tumour is painless except from its weight, and fluctuates distinctly. It is most frequent in men at and past middle life, but not uncommon in young children.

In all cases of vaginal hydrocele it is essential to *determine the position of the testicle in the sac.* If the parts were previously normal, the testicle will be at the back and lower part of the sac. But if the testicle be inverted, it will be in front and at the lower part ; and as there will be nothing in the history of the case or in the condition of the other testicle to indicate this, it must be determined by examination. There are *three means of determining the position of the testicle in a hydrocele :*

(*a*) *It is more resistant* to pressure than is the fluid.

(*b*) *It is tender* to pressure, the patient experiencing a sickening sensation when the testicle is compressed.

(*c*) *It is opaque.* When determining the translucency of a hydrocele always search for the opaque testicle. (For characters of fluid, *see* page 517.)

(3) If the swelling do not surround the testicle or take the form of the tunica vaginalis, it is an *encysted hydrocele.* The surgeon can determine by palpation whether it is connected with the *testicle* or the *cord.* If the former he should feel whether the base or pedicle of the tumour is fixed to or rests upon the epididymis or the testis. These cysts are common, especially in young men, are often of small size and stationary for years, or they may be large and multiple, or associated with vaginal hydrocele. Their outline is usually globular.

IV.—**The tumour fluctuates and is not translucent.**

Hydrocele Hæmatocele.	Abscess.

If the *tumour have appeared suddenly* after an operation, accident, or strain, it is a *hæmatocele.* Or if a chronic tumour have suddenly become larger and

very tense after an accident or strain, it is a *hydro-hæmatocele*, or a hydrocele into which blood has become effused. *Hæmatocele* is a rare affection, often associated with an extensive subcutaneous extravasation of blood. As fibrin coagulates on the interior of the sac the tumour becomes firm and fluctuation is obscure. If tapped, coffee-coloured fluid is withdrawn, and the tumour partially or wholly disappears. The tumour is heavy, generally ovoid in shape; the testicle when normally placed is at the lower and back part of the swelling. *Hydro-hæmatocele* may be vaginal or encysted, the distinctions between which are the same as those between vaginal and encysted hydrocele, *q.v.*

If the tumour have gradually increased, with signs and symptoms of inflammation, it is an *abscess*. The pus may be visibly pointing most often at the bottom of the scrotum. Abscess may be the termination of hæmatocele, or of strumous disease of the testicle.

If, after the disappearance of the blood from the tunica vaginalis, the testicle be found enlarged, hard, and tender, it is probably the seat of *parenchymatous hæmatocele*, and if, an incision having been made into the tunica vaginalis, the testicle protrude at the opening, and ultimately the tunica albuginea give way and a dark brown or black fungus protrude from it, this diagnosis is established; the fungus in such a case is composed of seminal tubules and blood clot.

If the swelling be chronic, fluctuating throughout, of the usual shape of the distended tunica vaginalis, and there be an absence of all history of injury, strain, or sudden appearance, it is a case of *opaque hydrocele*.

Solid tumours must be grouped into acute and chronic; the position and shape of the swelling, and, in acute disease, the position of chief pain and tenderness, will determine whether the testis, epididymis, or both, are involved. In chronic disease special attention should be paid to the consistence, outline, and

sensitiveness of the swelling, its adhesion to the scrotum, the affection of one or both testicles, thickening of the cord, and the association with enlargement of the inguinal, iliac, or lumbar glands. The surgeon should investigate the condition of the urethra for urethritis, stricture, calculus, and enquire for a history of urethral instrumentation and signs of tubercle, struma, or syphilis in other parts. The vesiculæ seminales should be examined from the rectum.

V. The tumour is solid and acute.—

Acute epididymitis.	Acute orchitis.

Acute epididymitis is much the more frequent. Acute inflammation causes swelling, tension, hardness, pain and acute tenderness of the part affected. Examine the organ carefully to determine what part is swelled or indurated or most tender. If the swelling be elongated and at the back of the organ and the body of the testicle be felt of its usual size and consistence at the upper and anterior part of the swelling, it is *acute epididymitis*. If the swelling be globular in outline and the induration and tenderness be most marked in front and at the sides, it is *acute orchitis*. It must be remembered that with inversion of the testicle, acute epididymitis causes an elongated indurated swelling in front, and the body of the organ is felt at the back. Inflammation may spread from the epididymis to the testis proper. The pain and tenderness are more severe in acute orchitis. The coverings of the scrotum are red, swelled, and the veins full. The spermatic cord is enlarged and tender. The history of gonorrhœa, stricture, catheterism or of an impacted calculus or of some operation upon the prostatic urethra aids the diagnosis of epididymitis. The history of parotitis supports the diagnosis of orchitis.

VI. Chronic solid tumours of the epididymis.

Simple chronic epididymitis.	Strumous epididymitis. Syphilitic epididymitis.

If the disease began acutely, and the pain, the redness of the scrotum, the fulness of the cord and in part the swelling of the organ have subsided; and especially if the man were the subject of gonorrhœa, gleet, or stricture of the urethra when the disease commenced, it is *simple epididymitis*. The enlargement is always hard; it may implicate the *globus minor* only, or the whole of the epididymis.

If the disease have been chronic from the first, slowly advancing, commencing in one testicle, and only after a time, if at all, affecting the other, nodular, varying in consistence from firm or elastic to fluctuating, slightly tender with fulness or nodular thickening of the cord, it is *strumous epididymitis*. This is confirmed if a nodular growth like that in the epididymis be found in the cord or if the vesicula seminalis of the same side or the prostate be found to be enlarged, or if there be evidence of tubercular disease of the bladder, kidneys, lungs, or other organ. Strumous epididymitis may commence very insidiously, or in an attack of gonorrhœal epididymitis or there may be a history of an injury. Before suppuration occurs, adhesions of the epididymis to the scrotum form; these are most common at the globus minor. Strumous epididymitis may be associated with hydrocele or hernia testis.

If the disease affect the globus major first and alone, or more markedly than the rest of the epididymis, causing a hard smooth swelling, varying in size from a pea to a walnut, painless or nearly so, and this occur during the first twelve months after syphilitic infection, it is *syphilitic epididymitis*. This disease is

often bilateral, and it is very rarely accompanied by any affection of the body of the testicle. *Gumma of the epididymis* is occasionally met with, nearly always in association with gumma of the testicle.

VII. Chronic solid tumours of the testis only.

Chronic orchitis.
Tumour of the testicle.

It is sometimes impossible to distinguish between these two affections without watching the case to note the course and progress of the disease and the effect of mercurial treatment. Chronic orchitis can generally be recognised by the origin of the disease, or by the detection of the syphilitic diathesis.

A uniform firm enlargement of the testicle, arising insidiously or from a blow, or in association with constitutional syphilis, gout, malaria or disease of the urethra or prostate, especially if painful and slightly tender, first affecting one testicle and then the other, with slight or no thickening of the cord, and no enlargement of inguinal, iliac, or lumbar glands, is *chronic orchitis*. Of this there are several varieties.

If the testicle be only moderately enlarged, the whole testis being indurated (often it is of stony hardness) smooth on the surface, very slightly, if at all, tender, with loss of "testicular sense," no pain except a sense of dragging in the groin and loin from the weight of the organ, and the cord be not enlarged or merely full; and if this be found affecting both testicles in a young or middle-aged man the subject of syphilis, most often two or three years after infection, or a young child the subject of inherited syphilis, the disease is *interstitial syphilitic sarcocele*. There is often a small amount of hydrocele associated with and partly concealing the testicle.

If the enlargement be distinctly nodular and the enlargement greater, although perhaps affecting only a

part of the testicle, and especially if the scrotum be adherent to the testicle at any part or there be a fungous protrusion of the testicle through an ulcer in the scrotum (*see* page 505), or there be a sinus leading down to the enlarged testicle which may be seen to be yellowish-grey in colour, tough and sloughy; and if this be met with in a man suffering from tertiary syphilis, several years after infection, it is a case of *gummatous sarcocele.*

If the enlarged testicle be painful and tender, less hard than in syphilis and associated with dyspepsia, cramps in the calf of the leg, pain in the heel, and an acid loaded state of the urine, it is to be regarded as *gouty orchitis.*

A similar uniform enlargement coming on insidiously with moderate pain and tenderness, and some fulness of the cord, may be met with in men who have long resided in malarious districts, and is regarded as *malarial orchitis.*

Malignant tumour of the testicle is to be recognised by some or all of the following signs: generally an insidious origin, very rapid growth or gradual progressive enlargement in spite of treatment, great size of the tumour, and heaviness, difference in consistence in different parts, early loss of "testicular sense," dilatation of scrotal veins, adhesion of the scrotum, fungus (*see* page 505), enlargement of the cord (uniform or nodular) and secondary enlargement of the lymphatic glands in the groin, iliac fossa, and along the lumbar spine; in some cases there is well-marked cachexia. These tumours occur most often in children and in men after thirty-five years of age. If there be vaginal hydrocele there may be fluctuation over the front of the tumour. The malignant tumours vary much in their rate of growth, and their signs differ at successive periods of development. The first sign is a uniform firm enlargement of the testicle, which

later on becomes softer in places; then follow enlargement and implication of the cord (in some cases), glandular enlargement, and later still (in some cases) adhesion of the scrotum and malignant fungus. (*See* page 505.)

(1) All malignant tumours occurring before puberty are *sarcomata.*

(2) All malignant tumours affecting both testicles are *sarcomata.*

(3) A preliminary period of quiescence or of slow growth in the tumour, with a sudden accession of activity and very rapid growth, is in favour of the tumour being a *chondro-sarcoma.*

(4) Uniform rapid growth of the tumour, with early and marked implication of the spermatic cord, is a frequent sign of *carcinoma.*

(5) A very gradual enlargement of the testicle, especially if soft spots can be felt on the surface, and if when the tumour is tapped a mucoid fluid mixed with blood (*see* page 518) is withdrawn, indicates that the tumour is largely *cystic* in nature. Although cystic disease of the testicle is generally *cystic sarcoma* and therefore malignant, other examples are to be classed rather as *cystic fibroma.* This distinction can only be proved by careful microscopic examination; but the slower the rate of growth of the tumour, the less the probability of its being sarcomatous. Cysts are met with also as the result of degenerative changes in sarcoma and carcinoma.

(6) If the testicle be plainly perceptible to touch, and by the patient's "testicular sense" at the back of the mass in the scrotum, the tumour is *malignant disease of the tunica vaginalis*, a very rare affection.

(7) A very gradual enlargement of the testicle with bossy or tuberous surface, incompressible, heavy, without affection of the cord or glands, or adhesion to the scrotum, is probably an *enchondroma.*

If tumour of the testicle, of insidious origin, have grown extremely slowly, and be firm, nodular, and painless, without affection of the cord, lymphatic glands, or scrotal coverings, and occur in a patient free from syphilis, gout, malaria, or urethral disease, it may be diagnosed as a *benign tumour of the testicle.* These are very rare. They may be *fibroma, myoma,* or *fibro-myoma,* and some would also include amongst benign tumours of the testicle, *enchondroma.*

If a congenital tumour be found to spring from or close to the testicle, and be of globular outline and varying consistence, being in places fluctuating and at others solid, it is probably a *dermoid cyst.* These tumours may remain small or grow to an enormous bulk or suppurate, etc. Cysts containing *guinea-worms* and *acephalocysts* have been met with in the scrotum. They cannot be diagnosed.

VIII. Chronic solid tumours of the testicle.

Strumous orchitis. Syphilitic orchitis.	Secondary orchitis.

If the disease began in the epididymis, which is found nodular, enlarged and with the characters of *strumous epididymitis* (*see* page 512), the body of the testicle being affected less and later, this affection consisting of an irregular enlargement, it is a case of *strumous orchitis,* in which the disease has advanced from the epididymis to the body of the gland. This disease may be complicated with *hydrocele, suppuration, fungus testis,* or *sinus.*

If the body of the testicle be enlarged and indurated, with the characters mentioned as distinctive of *syphilitic sarcocele* (page 513), and in addition there be a hard nodular projection at the back and outer side of the gland, it is from the disease having spread to the epididymis, and it may be called *syphilitic orchitis.*

This is a rare condition. It may be complicated with *hydrocele* or *fungus testis.*

A chronic enlargement of the testicle, in which the epididymis is not to be distinguished, tender and distinctly painful, with thickening of the cord, may be met with in connection with stricture of the urethra, prostatic enlargement or prostatic calculus, and is to be recognised as *secondary orchitis.* In these cases the disease has spread from the epididymis to the body of the testicle.

Diagnostic value of puncture of scrotal tumours.—In some instances it is impossible to determine the nature of a swelling, without resort to an exploratory puncture. The cases in which this would be employed are chronic tumours without obvious signs of inflammation, and they particularly include cases of hydrocele with thickened walls, hæmatocele, malignant disease, hydro-sarcocele and fibro-cystic disease.

Exploratory puncture is employed for three purposes:

First. To ascertain the *character of the fluid* withdrawn. (*See* page 274.)

(1) If the fluid be straw-coloured or greenish, slightly viscid and richly albuminous, it is from a *vaginal hydrocele.* This may be altered by the admixture of blood, of cholesterine crystals, or of fat. It contains a large amount of albumen (6 per cent.).

(2) If the fluid be colourless and watery, containing only a trace of albumen, it is from an *encysted hydrocele* of the testicle, epididymis, or cord.

(3) If the fluid have a more or less milky appearance it is from the admixture of semen (seminal cyst), and spermatozoa will be found by a microscopic examination. The addition of acetic acid causes effervescence but no turbidity or precipitate. In cases where an encysted hydrocele of the téstícle

has ruptured into a vaginal hydrocele, spermatozoa may be found in the deposit from the straw-coloured fluid characteristic of the latter.

(4) If the fluid be mucoid, mixed probably with some blood, it is from one or more of the cavities of a "cystic testicle." The addition of acetic acid causes turbidity from the presence of mucin.

(5) If only pure bright red blood be withdrawn it comes from a solid tumour of the testicle. The rapidity of escape will show the degree of the vascularity of the tumour.

(6) If the fluid be altered blood, thicker in consistence and darker in colour, it is an old exudation (a hæmatocele).

(7) Dark amber-coloured fluid is probably the contents of a hydrocele of a hernial sac. (*See* page 521.)

Second. To ascertain the *effect of the tapping upon the* bulk and consistence of the *tumour*.

(1) If the bulk and consistence be diminished, the fluid has been withdrawn from a closed cavity as in hydrocele, hæmatocele and abscess. In a case of cystoma the quantity of fluid withdrawn from any of the cysts may be too small to render the change in the bulk of the tumour evident.

(2) If the bulk and consistence be not diminished the fluid has been withdrawn direct from the blood-vessels. In cases of congenital hydrocele and ascites, many pints of fluid may be drawn off through a scrotal puncture, and it will not be until the tension of the fluid in the belly is considerably diminished that the tension of the scrotal swelling will be materially lessened. The quantity of fluid withdrawn establishes the diagnosis.

Third. To permit of *a proper examination of the solid parts of the tumour.* In cases of syphilitic or strumous sarcocele with much effusion into the tunica vaginalis, it is impossible to examine the

testicle until this fluid has been drawn off. In cases, too, of malignant disease of the testis there may be a considerable amount of secondary hydrocele, giving rise to fluctuation over the front of the tumour and concealing the surface of the growth. In cases of dermoid cyst a fine probe passed through the canula may strike upon teeth or bone.

The testicle is painful, without any alteration in its bulk.

If the testicle be simply abnormally sensitive, the slighest contact causing pain, the condition is known as *irritable testicle.* This is not unfrequent at puberty, and is also met with later in life as the result of masturbation, sexual excess, strong ungratified sexual desire, and debility, and in connection with hypochondriasis, varicocele, and gonorrhœa.

If the testicle be the seat of paroxysms of pain, dull, or intensely acute, of darting character usually passing up to the groin and loin or in the reverse direction, the condition is *neuralgia of the testicle.* In all such cases examine carefully for pyelitis, a renal calculus, renal colic, malaria, injury to the spermatic cord, disease of the lumbar spine or an abdominal tumour pressing upon the genito-crural nerve.

CHAPTER XL.

DIAGNOSIS OF INGUINO-SCROTAL TUMOURS.

IF, on grasping the root of the scrotum, part of a scrotal swelling be felt between the fingers and the thumb, or if, the tumour being entirely in the scrotum, it can be pushed up into the groin apart from the testicle, it may be distinguished as *inguino-scrotal.*