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(5) If only pure bright red blood be withdrawn it comes from a solid tumour of the testicle.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(1) If the bulk and consistence be diminished, the fluid has been withdrawn from a closed cavity as in hydrocele, hæmatocele and abscess. In a case of cystoma the quantity of fluid withdrawn from any of the cysts may be too small to render the change in the bulk of the tumour evident.

(2) If the bulk and consistence be not diminished the fluid has been withdrawn direct from the blood-vessels.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 The quantity of fluid withdrawn establishes the diagnosis.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.*

If the swelling appeared suddenly at the groin, and extended into the scrotum, and it be inseparably fixed to the deep parts of the belly wall, and have a smooth rounded outline, through which coils of intestine or masses of omentum may be felt, it is a *hernia.* For fuller details of the diagnosis of hernial tumours *see* chapter xxxv.

Having excluded hernia, the surgeon should determine whether the swelling is solid or fluid by feeling for fluctuation, and it is often convenient to grasp the tumour in both hands, and then, while gently compressing with one hand, notice whether the fingers and thumb of the other hand are opened out.

If the tumour be fluid, test for translucency, and remember that a collection of serous fluid may fail to appear translucent owing to difficulty in applying the test in the groin or to the thickness of its coverings. Then notice whether the tumour is reducible or irreducible, and the surgeon must not mistake for reducibility mere mobility of the swelling in the inguinal canal; when a tumour is reduced the inguinal canal should be empty; if reducible, feel carefully for a pelvic or abdominal swelling, into which the fluid may have been forced. Similarly examine the effect of coughing, and distinguish between a true impulse filling out or expanding the swelling and a thrust downwards of the tumour; the spermatic cord moves slightly with a cough.

A. **Fluid tumours.**

Hydrocele { congenital. / encysted. / of hernial sac.
Hæmatocele, encysted.
Abscess.

Gently and continuously compress the tumour, and if it disappear or be reducible into the belly, it is a *congenital hydrocele of the cord.* On getting the patient to cough the tumour will fill out again with a distinct expansile impulse. The flow of fluid along the narrow tube communicating with the peritoneal cavity may be attended with a vibratory thrill. If, on the other hand, the tumour be *suddenly* reduced by pressure, suspect *hydrocele of a hernial sac with a reducible hernia at the neck.* This diagnosis will be confirmed by the history of an old inguinal hernia with a recent considerable increase in the bulk of the tumour, and it will be established if, on reducing the swelling and placing the finger gently on the hernial ring and getting the patient to stand up, a translucent fluctuating tumour appear, while on gently raising the finger a further mass of intestine or omentum is felt to descend from the belly.

The tumour being found to be quite *irreducible by taxis,* enquire carefully into its history. If there be a history of a hernia on the same side, for which a truss has been worn, and the swelling conceal the spermatic cord, reaching quite up to the internal abdominal ring, and especially if at its upper end a firmer part be felt, the diagnosis of *hydrocele into a hernial sac,* with closure of the neck of the sac by adhesions or by an irreducible knuckle of intestine or piece of omentum, must be made. Such a tumour may have a slight impulse on coughing owing to the compression of the part in the inguinal canal. The combination of a small *strangulated hernia,* with considerable effusion into the sac, must be remembered. The ordinary signs of strangulation will be present and should lead to a correct diagnosis.

If there be no history of hernia and if the tumour be globular or ovoid in shape, tense, smooth in outline, without impulse on coughing, freely movable on the cord which it does not conceal, and separate from the testicle, it is an *encysted hydrocele of the cord.* Such cysts may be situated in the inguinal canal, and

then are forced downwards on coughing, but the *impulse is not expansile;* more often they are placed between the external abdominal ring and the testicle. In rare cases there is a narrow neck-like prolongation to be traced a short distance up the cord above the cyst; when the tumour is compressed this prolongation fills out, and *vice versâ*. Furneaux Jordon has called this variety *water-bottle hydrocele*.

If as a result of injury or strain an encysted hydrocele have become larger, more tense, painful and tender, and if it be found opaque and indistinctly fluctuating, an *encysted hæmatocele of the cord* may be diagnosed.

If the swelling of the cord be fluctuating, opaque, without impulse on coughing, immovable, irreducible, painful, tender, with the skin over it bulging, reddened and perhaps œdematous, the part being hot to the touch and the general temperature raised, and the internal abdominal ring be free, the diagnosis of *acute abscess of the cord* should be made.

If the swelling be elongated, rounded and smooth on the surface, opaque, fluctuating with a distinct expansile impulse on coughing, reducible into the belly through the inguinal canal but without any gurgle, it is a *pelvic or abdominal abscess* which has escaped along the spermatic cord. The abdominal or pelvic part of the abscess will be felt as a rounded, tense, fluctuating swelling with a distinct wave of fluctuation passing between it and the inguino-scrotal swelling. The abscesses which may thus make their exit are, psoas abscess, suppuration in connection with disease of the acetabulum, suppuration of the cellular tissue in front of the bladder, and abscess of the vesicula seminalis spreading up along the vas deferens to the abdominal ring. In the female, abscess may spread from the pelvis along the round ligament. For the diagnosis of these various forms of abscess, *see* page 528.

B. Solid tumours.

Inflammation of the cord.	Lipoma of the cord.
Diffuse hydrocele of the cord.	Malignant tumour of the cord.
Diffuse hæmatocele of the cord.	

(1) If the *onset of the swelling have been acute* it is *inflammation* or *hæmatocele*.—If the swelling have come on independently of injury or strain, but in connection with urethritis, and the swelling be along the whole length of the cord, very painful, tender and firm, it is *acute inflammation of the spermatic cord*, which quickly spreads to the epididymis, and is rarely seen as an independent affection.

If the swelling appeared suddenly after an injury or strain and was associated with superficial ecchymosis, be irreducible, without impulse on coughing, stationary in size, or gradually or intermittently enlarging, it is *diffused hæmatocele of the cord*.

(2) *The onset of the tumour has been slow and gradual*.—If the tumour be of very slow growth or stationary, lobulated, freely movable under the skin and over the testicles, but loosely fixed to the cord, and if the tumour be irreducible, without impulse on coughing, opaque, and do not extend up to the internal abdominal ring, it is a *lipoma of the cord*.

If the tumour progressively and rapidly enlarge upwards along the cord, attaining a great size, becoming fixed to the surrounding tissues, and at length to the skin over it, and be attended with enlargement of the iliac and lumbar glands, it is a *malignant tumour of the cord* (*sarcoma* or *carcinoma*).

If the tumour be of small size, elongated, with a rounded contour, soft, pitting slightly upon pressure, it is œdema or *diffused hydrocele of the cord*. The swelling may have an impulse on coughing if it extend up to the internal abdominal ring, or may fluctuate at its lower part; it is particularly seen after wearing a truss.

CHAPTER XLI.

DIAGNOSIS OF DISEASES OF THE GROIN.

A. **The affections of the skin.**—*Intertrigo* is common in the fold of the groin of fat corpulent people; for its diagnosis, *see* page 501. *Mucous patches* (*see* page 475) may be met with.

B. **Ulcers of the groin.**—The ulcers met with are the primary, glandular, and late venereal ulcers, and those formed by the breaking down of epithelial or other cancerous growths in the inguinal glands.

If the ulcer be acute, with a depressed spongy base, sharply cut, irregular, worm-eaten or undermined edge, with abundant purulent discharge which irritates the skin around and produces similar ulcers when inoculated, it is a *soft chancre*. The diagnosis is confirmed by finding similar chancres on the genitals or elsewhere, or enlargement of the inguinal glands.

If the ulcer be deep and uneven, with a soft spongy base, livid red greatly undermined edge, profuse purulent discharge which is inoculable and irritates the skin with which it is in contact, and if the patient have at the time a chancre on the genitals, or a recent cicatrix left by one, it is an ulcer due to the formation and opening of a *virulent bubo*.

If the ulcer be covered with a black or white slough adherent to the base, and rapidly extend in area and depth, with formation of new sloughs at first white and then black, with profuse sero-purulent discharge, livid red swelling of the skin around, great pain, and severe constitutional disturbance (rapid weak pulse, anorexia, thirst, dry brown tongue, and pyrexia) it is a *sloughing phagedænic chancre*. This may be a complication of a simple chancre, or of a virulent bubo.

If the ulcer spread slowly, advancing by one (often undermined) edge, healing at the other, and in this manner affect wide areas of tissue, leaving behind it as it travels a firm adherent white scar, mottled with brown patches, it is a *serpiginous ulcer*.

If the ulcer be chronic, steadily progressing, with a very irregular base, being at places deeply excavated, at places nodular or fungating, with profuse fœtid watery or sanious discharge, and the surrounding tissues be infiltrated and thickened or form a considerable tumour, it is a *malignant ulcer*. This may be a primary growth in the groin, or a secondary glandular infection subsequent to malignant disease of the genitals or of the lower limb. The surgeon should examine for enlargement of the iliac and lumbar glands.

C. **Sinus in the groin.**—The *discharge* should be examined for fæcal matter and urine; a probe should be passed to determine the *depth* and *direction* of the sinus; the *neighbouring parts*, especially the spine, pelvis, genitals, and hip joint should be examined.

Sinuses may be divided into *superficial* (those not under the deep fascia) and *deep* (those running through the deep fascia).

The sinus is superficial.—If the sinus be covered with thin livid skin, unattended with much induration, and follow upon an acute abscess associated with gonorrhœa, chancre, an irritable sore on the heel or foot, or a strain, it is a sequel to a simple *bubo*.

If the sinus be irregular, multiple, running in a mass of indurated glands in which the individual glands are not to be distinguished; and if it be the sequel to a slow, painless enlargement of these glands with very chronic suppuration, the disease is known as *scrofulous bubo*. (*See* page 528.)

Artificial anus is recognised by the fæcal discharge, and by the continuity of the mucous membrane with the skin. (*See* pages 162, 454.)

The sinus is deep.

Fæcal fistula.	Necrosis of pelvis or femur.
Urinary fistula.	Pericæcal abscess.
Dermoid cyst.	Iliac abscess.
Morbus coxæ.	Psoas abscess.

If the discharge contain fæcal matter and flatus, it is a *fæcal fistula.* This may follow upon strangulated hernia, or on the right side upon a pericæcal abscess with perforation of the cæcum.

If the discharge contain urine, proved by the detection of urea (*see* page 161), it is an *urinary fistula.* The communication may be with the *bladder*, in which case the probe will pass over the brim of the pelvis; but the fistula more often communicates with the *urethra*, in which case there will be other urinary fistulæ in the perineum, and the probe will pass downwards and inwards outside the pelvis to the perineum. The escape of hair, teeth, fœtal bone or masses of fatty matter and epithelial débris, would show it to be a sinus in connection with a *dermoid cyst.*

If the probe pass towards the acetabulum or along the inner surface of the pelvis and there be evidence of *hip disease* (*see* page 365) there will be no difficulty in associating the sinus with the joint disease.

If the sinus pass down into the pelvis of a woman, and a vaginal examination show considerable induration around the uterus, and especially if the illness followed upon parturition or miscarriage or gonorrhœa, it is a sinus left from a *pelvic abscess.*

If the probe strike bare bone, the diagnosis of *necrosis* will be established, and the surgeon must then determine, by the direction and length of the sinus,

where the sequestrum is; if it be the femur, the sequestrum will move when that bone is moved at the hip joint.

If the sinus open above Poupart's ligament, or below that ligament outside the line of the femoral artery, and extend upwards into the iliac fossa, it is the sequel of an *iliac abscess*; and if on the right side, and the pus be fœtid, and there be a history of constipation and bowel trouble preceding the abscess, the diagnosis of *pericæcal abscess* may be made. Failing that, and failing to find necrosis of bone and disease of the spine or sacro-iliac joint, the diagnosis of *simple iliac abscess* must be made. (*See* page 529.)

If the sinus open below Poupart's ligament internal to the femoral vessels, and run up into the belly, it is a sinus left by the opening of a *psoas abscess.* (*See* page 528.)

D. **Tumours of the groin.**—*The tumour is fluid.*

Abscess.	Aneurism.
Cystic tumour.	Hydrocele of hernial sac.
Varix.	

If the swelling be accompanied with obvious signs of inflammation, either local or in some adjacent part, as the spine, the pelvis or the hip joint, or if the outline of the collection of fluid correspond with the sheath of a muscle, it is an *abscess.* (For further distinctions between chronic abscess and cyst *see* page 295.) The abscess may be acute or chronic. When superficial to the deep fascia, and forming a prominent swelling in the groin, covered with more or less acutely inflamed skin, it is a *bubo*, which may be in connection with the inguinal or the femoral glands, and arise in consequence of a sore on the foot or leg, gonorrhœa, balano-posthitis, or soft chancre; when, in connection with a soft chancre, a gland becomes acutely

inflamed and rapidly runs on to suppuration, and on being opened itself shows all the features of a chancre, it is a *virulent bubo*. Where the inflammation is less intense and the pus forms around the gland, it is a *sympathetic bubo;* and when the abscess is more chronic still, fluctuation appearing at several places in a large ill-defined boggy swelling, it is a *scrofulous bubo*. (*See* page 532.)

The deep abscesses are either *femoral* or *pelvic*, and the diagnosis is readily made by noting the position of the swelling, and the presence or absence of fulness, resistance, and fluctuation in the iliac fossa and true pelvis. *Morbus coxæ* (page 365) is the most frequent cause of femoral abscess, and the surgeon should therefore examine the joint for signs of that disease. If, when fully flexed, movement of the joint laterally and in rotation be free and painless, and pressure upon the trochanter or lower end of the femur does not excite pain, but extension is painful and limited, a deep fluctuating swelling in Scarpa's triangle is *suppuration in the ilio-psoas bursa*. (*See* page 371.) When, with signs of morbus coxæ, the swelling occupies the fold of the groin and bulges above that fold, it points particularly to *disease of the acetabulum*.

If the swelling be mainly in the belly, along the course of the psoas muscle, and be pointing in the thigh internal to the femoral artery, and there be a wave of fluctuation between the two parts of the swelling, and a distinct impulse in the femoral swelling when the patient coughs, it is a *psoas abscess*. To discover the cause of a psoas abscess, examine the spine for caries (page 397), the sacro-iliac joint, and the chest on the same side for fluid in the pleura; examine the urine for pus, albumen, casts, blood, gravel or crystalline deposit, and enquire for a history of attacks of pain shooting from the loin into the groin and testicle.

Caries of the spine is the most common cause of psoas abscess; an empyema may burst into the sheath of the muscle and point at the groin, as may also a perinephritic abscess whether primary or secondary. An abscess from sacro-iliac disease may form in the psoas muscle. In some cases neither of these causes is to be made out, and the suppuration may be ascribed to an injury to the muscle or to a primary psoitis.

If the abscess fill out the iliac fossa, and project above Poupart's ligament near the iliac crest, with or without a part extending beneath that ligament to the thigh outside the femoral vessels (this femoral swelling having an impulse on coughing, being in part or in whole reducible, and having a wave transmitted to it from the swelling in the belly), it is an *iliac abscess*. This may be connected with disease of the *sacro-iliac joint* or *spine*, *necrosis of the ilium*, *injury*, *inflammation* or *ulceration of the cæcum*, or *rupture* of part of the *muscle*. *Perityphlitis* will be recognised by the abscess filling out the right iliac fossa, and not spreading down into the thigh, for the pus is not beneath the iliac fascia; there may be emphysematous crackling of the swelling, or a tympanitic percussion note which will render the diagnosis very certain. The author recently saw a fæcal abscess in this situation following a blow in the groin.

Where an abscess pointing in the groin is associated with symptoms of pelvic mischief, a careful examination should be made of that cavity per anum or per vaginam, and where a swelling is found with a wave of fluctuation passing from it to that in the groin, it will be recognised as a *pelvic abscess*. Pelvic cellulitis is much more common in women than in men. These abscesses may point in the inguinal canal and pass into the scrotum (page 522).

If the swelling be placed below the fold of the

groin internal to the femoral artery, be smooth, and rounded in outline, compressible and easily reducible by direct pressure, and reappear from below when pressure is made just above it, it is a *varix of the saphena vein.* Any of the superficial veins of this region may be varicose. (*See* page 295.)

If there be a history of a femoral hernia (*see* page 464), and this have been succeeded by a tense fluctuating swelling at the same situation, without cough-impulse, not reducible, and there be no signs of strangulated hernia, it is a *hydrocele of the sac of a femoral hernia.* This is very closely simulated when a small knuckle of intestine is nipped in the femoral ring, and the sac beyond becomes distended with fluid; there will, however, be the signs of intestinal obstruction to guide the surgeon. Hydrocele of the sac may be attended with constipation and vomiting.

If a tense fluctuating swelling be found occupying the inguinal canal, without signs of intestinal obstruction, it is an *encysted hydrocele of the cord.* (*See* page 521.)

If the tumour be congenital or first noticed in early life, be soft, lax, irregular in outline, more or less adherent to the surrounding tissues, stationary or slowly enlarging, and perhaps attended with attacks of inflammation from time to time, it is a *cystic hygroma.*

If the tumour be chronic, adherent to the skin, fluctuating, tense, globular in shape, painless and free from tenderness, it is a *sebaceous cyst.*

(For the diagnosis of pulsating tumours, *see* chapter xviii.)

The tumour is solid.—It may be a *hernia,* an *imperfectly descended testicle,* or a solid enlargement of one or more of the tissues of the part. If there be congenital absence of the testicle from the scrotum, and an ovoid firm tumour of about the

size of the testicle be felt in the inguinal or crural canal, or in the iliac fossa close to Poupart's ligament, and especially if pressure upon it cause the peculiar "testicular sensation," it is an *undescended testicle.* If an undescended testicle be not in either of these situations it may be found in the perineum. The testicle may be fixed or may slip up and down the inguinal canal and give a thrusting impulse on coughing. Hernia is often associated with this condition; a softer consistence, a gurgle, a tympanitic percussion note, or a granular feel, together with true reducibility and expansile impulse, will distinguish it from the testicle. A misplaced testicle may be acutely inflamed, or the seat of malignant disease. The congenital absence of the testicle from the scrotum on the same side will be the key to the diagnosis.

An *inflamed retained testicle* may simulate a *strangulated hernia,* and the latter may coexist with an undescended testicle. In *orchitis,* the local pain and tenderness are greater than in hernia; if there be nausea and vomiting the latter does not become stercoraceous, nor is it urgent, and the constipation is not absolute, while the general symptoms are febrile. The surgeon may also find an urethral discharge, or a history of direct violence. If, therefore, the suspected tumour be tense, well defined, with dragging pain referred to the umbilicus, moderate tenderness, urgent vomiting which becomes stercoraceous, and absolute constipation with signs of collapse, the diagnosis should be *strangulated hernia.*

Having excluded this condition, the inguinal and crural canals should be examined for *hernia.* (*See* page 463.) It is only needful here to refer to *hernia of the ovary* into the inguinal canal (it may pass into the labium), which is recognised by the presence of a small ovoid tumour which swells and becomes painful at each menstrual period, and by the absence of the

ovary in the pelvis, as proved by bimanual examination.

A swelling deep under the origin of the adductor muscles, and fixed to the pelvis, may be an *obturator hernia*. (*See* page 464.)

The lymphatic glands are arranged in two sets in superficial fascia, one along Poupart's ligament (inguinal), the other along the saphena vein (femoral), and there is a deep gland occupying the crural canal; by pressure in the iliac fossa the deep inguinal (or iliac) glands when enlarged can be felt along the external iliac artery. The position and the outline of the swelling, together with, in most cases, some local cause of infection in the urethra, penis, scrotum, perineum, buttock, groin, or lower limb, or the co-existing enlargement of other groups of glands, will enable the surgeon to diagnose a *glandular swelling*. (*See* page 283.) When many glands are moderately enlarged, firm, quite movable under the skin and over the deep fascia, without pain, tenderness, or other obvious sign of inflammation, they are known as *indolent buboes;* these are met with following hard chancre, and are sometimes spoken of also as *amygdaloid*.

When a gland is enlarged, painful, tender, fixed to the skin and deep fascia, and its outline, owing to surrounding œdema, is ill-defined, and a source of infection such as a sore on the toe, gonorrhœa, or a soft chancre is found, it is known as a *sympathetic bubo;* the skin over it is hot and reddened, and there is a tendency for the gland to suppurate. Exactly similar enlargements are sometimes seen as the result of strain and over-exertion. If the swelling spread from gland to gland, and they are massed together into one irregular tumour, which slowly enlarges and then softens and fluctuates at places, it is a *scrofulous bubo;* this condition may be started by infection, simple or

syphilitic. In some cases of malignant disease the glands are enlarged from simple irritation, and the swelling subsides when the primary tumour is removed.

Of the remaining tumours in this situation it is only necessary to point out that a hard swelling in the adductor muscles, close to the pubes, chronic and painless, is a "*rider's bone*," or an ossification of the tendon of the adductor longus or magnus muscle. "*Rider's sprain*" (*see* page 35) may occasion a considerable firm swelling in the adductor muscles, lasting some time after the injury. *Lipoma* may be met with in the superficial fat, and *enchondroma* or *sarcoma* may be found growing from the pelvis or thigh bones, and the latter also from the fascia and muscular aponeurosis. (*See* chapters xvi. and xix.)

CHAPTER XLII.

DIAGNOSIS OF DISEASES OF THE URINARY ORGANS.

In investigating any case of disease of the urinary organs the surgeon should proceed systematically, for this will both guard him from error and economise time. Although the symptoms and signs of these affections are numerous, they may all be grouped into four classes, and the surgeon should conduct his examination in four directions. He should first investigate the patient's *pain*, then study the *act of micturition*, then examine the *urine passed*, and, lastly, proceed to investigate directly the *urinary passages, the bladder, and the kidneys*.

I. **Pain** is associated with nearly all diseases of the urinary organs. It owns the same causes and has