

nodules may be seen and felt. Further questioning usually reveals a history of rather frequent calls to urinate; while examination of urine, prostate, vesicles, and kidneys will often reveal some congestion or inflammation of the internal sexual organs and perhaps an inflammation of the kidneys as well.

Diagnosis.—See Diagnostic Table, on p. 185.

Prognosis.—The usual course of the disease is that of a local tuberculous trouble advancing slowly to a fatal termination. Innumerable castrations are performed in the hope of eradicating the disease while still confined to one testicle; but its recrudescence on the opposite side affords bitter confirmation of the belief that tuberculosis here as elsewhere is not a local but a systemic disorder. In fact, it has seemed to me that removal of one testis hastens the appearance of tuberculous nodules in its fellow.

The prognosis of the disease is quite as indefinite as is the prognosis of tuberculosis elsewhere in the body. If the testicular lesion is circumscribed and chronic, if there is no evidence of grave internal disease, and if the patient can and will put himself for a long period of time in proper hygienic surroundings, the prognosis is good. The sexual potency of the testicle is lost, but the potency of the individual is unimpaired, and probably the testicle will not atrophy. If the local foci go on to suppurate they may be drained, and climatic and tonic treatment may be expected to control the disease and to prolong the patient's life indefinitely, even in many cases to effect a cure.

On the other hand, the prognosis of fulminating tuberculosis is bad. If seen early and treated intelligently this condition may subside and become chronic; but the very occurrence of the hyperacute form of the disease is evidence that the patient's tissues form a good soil for the growth of the tubercle bacillus, and is a warning that the greatest care will be required to prevent generalization of the disease, if indeed this has not already occurred.

Treatment.—From what has been said in the preceding paragraphs it is evident that not much need be expected from the surgical treatment of testicular tuberculosis. A recent discussion of this subject before the Paris Surgical Society (*Annales des Maladies Génito-urinaires*, 1900, xviii., 961, 1066) is brilliantly expressive of the change of opinion upon this subject which has occurred in France during the past quarter of a century. The consensus of opinion now favors conservatism and the belief that, in most cases, castration is harmful. My own experience with acute tuberculosis of the testicle is that treatment by hygiene, cod-liver oil, creosote, and perhaps local applications of guaiacol, will sometimes cause resolution and will oftentimes be followed by localized suppuration and subsidence of the general acute inflammation; while any surgery, beyond drainage of the suppurating foci, will only start up new trouble in the testicle or, if this is removed, in other parts of the body.

In the more chronic forms of the disease incision and drainage of suppurating foci is always indicated, and, when the whole epididymis is involved in a suppurating indurated mass, it is undoubtedly advantageous to perform the operation of epididymectomy; but it is questionable whether any benefit is obtained by removal of discrete, uninfamed caseous lumps.

Castration is never indicated unless the whole organ is reduced to a suppurating cavity. Many surgeons prefer to castrate for fulminating tuberculosis, but my experience is against this.

XXV. EPIDIDYMECTOMY.—The operation of epididymectomy resembles orchidectomy, except that, instead of removing the whole testicle, the inflamed epididymis is shelled off from the gland and removed with the extrapelvic portion of the vas deferens. If the upper end of the vas is found inflamed or exuding pus, it should be stitched into the wound; otherwise it will cause deep suppuration. The removal of the whole vas and of the vesicle along with the epididymis is an operation required only in the most exceptional cases in which there

is considerable inflammation of the vesicle itself. It will not give good results as a routine procedure. (See Tuberculosis of the Seminal Vesicle.)

XXVI. SYPHILIS OF THE TESTICLE.—The testicle may be involved by syphilis in its secondary and in its tertiary stages.

Secondary Epididymitis.—Secondary syphilis sometimes causes a slight painless enlargement of the epididymis. This occurs at the time of the secondary skin manifestations, and is insignificant.

Tertiary Lesions.—Tertiary syphilis attacks the testicle and the epididymis. The disease may show itself by the deposition of gummata or by a diffuse infiltration of the organ. In the former case the testicle is enlarged, painless, and nodular, and in the latter—a more common form—the testicle is enlarged, painless, and smooth. The most characteristic changes are found in the epididymis, which may be affected throughout or at one or the other extremity; the part involved is evenly enlarged in such a way as to cap the testicle, forming a sharp-edged, hard mass like a clam-shell in which the testicle lies. As hydrocele is a very common accompaniment of this inflammation, the clam-shell characteristics of the epididymis are often obscured by the vaginal effusion; but aspiration of the hydrocele will in fully seventy-five per cent. of all cases of syphilitic orchitis reveal the pathognomonic, insensitive clam-shell epididymis. The cord is habitually normal. I have never seen double syphilitic testicle.

Syphilitic testis rarely appears before the second year of the disease. The gland enlarges gradually and painlessly; it is never tender unless there is some complicating gonorrhoeal inflammation. The progress of the disease is very slow. The sexual function is little impaired. Syphilitic testicle occurs as a hereditary manifestation.

For *diagnosis*, see Diagnostic Table.

The *prognosis* is good. The disease is sometimes quite rebellious to treatment; but, inasmuch as the seminal tubules are not immediately involved and perish only by atrophy from pressure, a testicle may be syphilitic for a long time without losing its function.

Local *treatment* is useless. Mixed treatment will generally conquer the lesion, and, if this fails, hypodermic injections once or twice a week of 1 gm. of a ten-per-cent. solution of mercuric salicylate in benzoinol will often effect a cure.

XXVII. TUMORS OF THE TESTICLE.—Testicular tumors are so rare and so diverse and mixed in character that an entirely satisfactory classification of them has yet to be made. They may be roughly divided into benign tumors, cystic tumors, and malignant tumors.

Benign Tumors.—Enchondroma, fibroma, osteoma, and myoma have been observed, and in the tunica vaginalis, lipoma and fibroma. These if small are not discovered ante mortem; if large it is usually impossible to distinguish them from beginning malignant disease.

Cystic Tumors.—Teratoma, benign cystic disease, and malignant cystic disease (Fig. 4258) are recognized by the pathologist; but clinically they are often indistinguishable from one another. Dermoid cysts and teratoma both have a tendency to malignant degeneration, and it is impossible—given a cystic tumor of the testicle—to be sure that it is benign and will so remain. Therefore, from a therapeutic point of view, all such cystic growths must be classified as at least potentially malignant.

Malignant Tumors.—Kober has recently collected the records of one hundred and fourteen cases of sarcoma of the testicle. Seventy-one per cent. occurred between the ages of twenty and fifty with a history of trauma in forty-three per cent. The tumors were usually rounded or spindle-celled, less frequently cystic and alveolar. Carcinoma, usually medullary, is rarer than sarcoma; cystic and chondrocarcinoma have been described. The occurrence of lymphadenoma is affirmed by the French and denied by the Germans. Jacobson has seen three

cases of myxoma. Four cases of sarcoma of the tunica vaginalis have been reported.

The only symptom of testicular tumor is the presence of a growth. The patient comes complaining of an en-

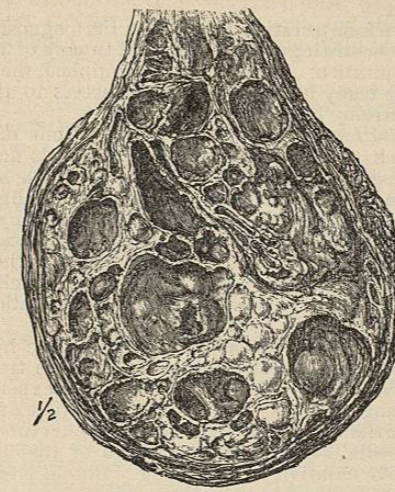


FIG. 4258.—Cystic Disease of the Testicle.

largement of the testicle which may have been present for many years without varying notably in size; or it may have suddenly taken on a more rapid enlargement after many years of quiescence; or it may have grown rapidly from the outset. In any event the tumor is usually found to be an irregular enlargement of the whole testicle, perhaps cystic in places, perhaps complicated by hydrocele. The pain is not severe and the general shape of the testicle is preserved, while testicular sensation is lost. If the disease has been present for some time enlarged iliac and lumbar glands may be felt by deep abdominal palpation. The inguinal glands are not involved until very late in the disease when the neoplasm has burst through the tunica albuginea and reached the scrotal tissue. The patient is usually seen before he has reached this stage, and, in the present surgical days, malignant fungus of the testicle (ulcerating neoplasm) is practically unheard of.

Diagnosis.—While it may be possible to state clinically that a tumor of the testicle shows no evidence of malignancy, one can never feel sure that it will not at some time undergo malignant degeneration. Therefore it is only necessary to be sure that the growth is a tumor in order to have recourse to immediate orchidectomy. To

be sure, it is always necessary to employ mixed treatment and the aspirator; the one to rule out syphilis, the other to exclude hydrocele, spermatocele, and hæmatocele.

XXVIII. ORCHIDECTOMY.—Preparation.—The usual preparations for an aseptic operation are required. I prefer general to local anaesthesia.

The Incision.—Dr. White removes both testicles through an incision in the median raphe of the scrotum; but, since it is usually necessary to remove only one of these organs, the best incision is in the upper part of the scrotum just below the groin, an extension downward, as it were, of the ordinary incision for hernia.

The Actual Operation.—The cord is laid bare as in the operation for hernia and is divided between ligatures. The testicle is then drawn upward and out through the incision, and excised. If the skin is adherent the incision must be carried down far enough to remove the portion of skin involved.

Treatment of the Cord.—If the operation is performed for tubercle the end of the vas should be sutured to the skin in order to avoid deep suppuration. It is always safer to use one ligature for the vas and one for the bundle of veins in order to prevent hemorrhage.

Termination of the Operation.—The surface of the wound must be carefully scrutinized and every bleeding point caught and tied, for in the loose cellular tissue of the scrotum the slightest oozing may cause enormous hæmatoma. To guard against this still further it is convenient to apply an adhesive plaster dressing supporting the scrotum upon one strap running from thigh to thigh, and compressing it under a light aseptic dressing between other straps running criss-cross from the thighs to the abdomen. Weir and others have replaced testicles by celluloid and paraffine substitutes.

Complications.—Hemorrhage is the only complication to be feared; it may require reopening and repacking of the wound. The post-operative insanity alleged to result from castration for hypertrophy of the prostate has not been proven peculiar to this operation.

XXIX. SYMPTOMATIC HYDROCELE.—The hydrocele that so frequently complicates inflammatory diseases of the testicle is called symptomatic. The inflammation of the tunica vaginalis is secondary to the testicular disease, and, while the patient's comfort may be increased by the occasional tapping of such a hydrocele, no permanent relief may be expected in most cases unless the prime cause—the disease of the testicle—is removed.

XXX. IDIOPATHIC HYDROCELE.—An accumulation of serum in the tunica vaginalis occurring without any recognizable disease of the testicle is called idiopathic hydrocele. This disease is more common in the tropics than in temperate climes. It usually affects men who

DIAGNOSTIC TABLE.

	Simple chronic epididymitis.	Tuberculosis.	Syphilis.	Tumor.
History	Gonorrhoea, stricture, or hypertrophy of the prostate.	Tuberculous, family or personal.	Syphilis, inherited or acquired.	Perhaps trauma.
Frequency	Uncommon	Frequent	Frequent	Rare
Size	Small between attacks	Does not reach any great size.	Does not reach any great size.	May reach any size.
Sensitive	Yes	Yes	No	No
Shape	Between attacks testis normal, epididymis nodular.	Epididymis nodular. Testis not involved unless acute or ancient.	Testis evenly enlarged, slightly nodular. "Clam-shell" epididymis as a rule.	Testis considerably enlarged; no characteristic involvement of epididymis.
Cord	May be slightly thickened	Usually enlarged and nodular	Free	Free; veins dilate in later stages.
Seminal vesicles	Usually distended	Tuberculous	Uninfluenced	Uninfluenced.
Prostate	Posterior urethra congested or inflamed.	Congested; may be tuberculous.	Uninfluenced	Uninfluenced.
Urine	Cloudy	Cloudy; may contain bacilli.	Clear	Clear.
Hydrocele	Unusual	Often	Nearly always	Unusual.
Onset	Usually acute	Usually chronic	Chronic	Chronic.
Course	Recurrent acute attacks.	Usually chronic	Chronic	Fairly rapid.
Opposite testicle	Often involved simultaneously.	Usually involved subsequently.	Free	Free.
Abscess	Unusual	Common	Rare	None.
Potency	Unimpaired	Somewhat impaired	Somewhat impaired	Unimpaired.
Atrophy of testis	Rare	Rare	Common	Never.

At the end, as at the beginning, the iodides with mercury, and the aspirator.

have reached middle age, but may occur in youth and in infancy.

Varieties.—The commonest form of hydrocele as seen in the adult is confined to the tunica vaginalis (Fig. 4259). In infancy and less frequently in later life the fluid may be found to fill not only the tunica vaginalis but also the unobliterated processus funicularis up to and into the inguinal canal. This is *infantile hydrocele*. Another form of hydrocele met with in infants is called *congenital hydrocele*. In this condition the funicular process of peritoneum has never been closed off at all, and the hydrocele sac communicates directly with the abdominal cavity and is habitually complicated by congenital hernia.

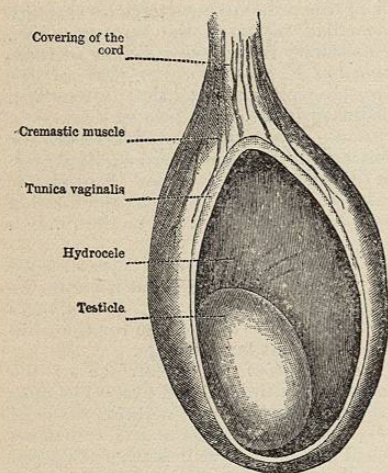


FIG. 4259.—Hydrocele.

A fourth variety is *hydrocele of the cord* in which the funicular process, closed off from the abdominal cavity above and from the cavity of the tunica vaginalis below, is affected by hydrocele. Exceptionally, hydrocele occurs in the tunica vaginalis of a retained testicle; this is *inguinal hydrocele*. And again, hydrocele may occur in an old hernial sac the neck of which has been shut off by adhesions. These varieties are extremely rare. There are also certain cysts that develop in connection with the testicle, *i.e.*, *spermatocele* and multilocular hydrocele of the cord. Neglecting for the present all these more or less unusual varieties in intrascrotal cysts, we may consider at length idiopathic hydrocele of the tunica vaginalis.

Symptoms.—This condition presents itself as a fluctuating or elastic ovoid swelling somewhat pear-shaped, being larger below than above. Its surface is smooth, it is irreducible into the inguinal canal; indeed, the spermatic cord, normal in size and sensibility, can usually be grasped above the top of the tumor. There are almost no subjective symptoms; the patient complains only of the large tumor and of some dragging and pain due to its position and weight. The history is always chronic, the fluid accumulating by slow degrees.

Diagnosis.—In examining a hydrocele the two points to be determined are the fluid nature of the tumor and the position of the testicle in reference to the fluid. If the normal cord can be felt above the tumor, if fluctuation can be obtained in it, and if palpation reveals the testicle as a slight nodosity with testicular sensation, both of these questions are answered without further investigation. But the testicle may be impalpable, fluctuation may be unobtainable; and a large hydrocele extending into the inguinal canal exhibits a slight impulse on coughing, and so requires some test to distinguish it from irreducible hernia. For this purpose the so-called light test is commonly employed.

The room is darkened and a tube is made by rolling a sheet of paper upon itself, and, while one end of this is applied to one side of the tumor, a match or a candle is lighted and held at the opposite side. If the tumor is fluid light will be transmitted through it, and a dull red glow may be seen by looking into the paper tube. The same effect may be more brilliantly obtained by the use of an electric light, by which means the whole tumor may often be made luminous without darkening

the room and without the use of the paper tube. It is alleged that this reaction may be obtained in small hernias in infants; but with this possible exception its positive result is absolute evidence of the presence of hydrocele.

If there is no question of hernia in the diagnosis hydrocele may be distinguished from solid tumors of the testicle by aspiration. When this test is applied, the surgeon should be ready in the event of its success to attempt a radical cure by injection.

Complications.—Exceptional complications of hydrocele which may interfere with the diagnosis and treatment are great thickening of its walls, which may proceed even to calcification (and so frustrate the light test), multilocular hydrocele (resulting either from an adhesive inflammation or from the simultaneous existence of several varieties of hydrocele), fibrous bodies in the hydrocele sac (doubtless the result of previous attacks of inflammation), and, very exceptionally, suppuration or hemorrhage into the hydrocele.

Treatment.—It is so easy to cure idiopathic hydrocele in children that a great number of palliative treatments have been devised by those whose chief experience is with young patients. Thus the application of various counter-irritants to the skin, multiple puncture with a sharp needle, and simple evacuation of the fluid will often prove curative in the young. But in adults such treatments are purely palliative, as is instanced by Curling's case, who had ruptured his hydrocele thirty times only to see it return within a few months. I have seen a similar case, the patient returning for tapping every six months for many years, but refusing to have any more radical procedure attempted, although the fluid reaccumulated with unvarying regularity.

Of the radical cures of hydrocele the one which I prefer is aspiration followed by the injection of pure carbolic acid. All simple hydroceles which are translucent, no matter how old or how large, are amenable to this treatment; and in such simple cases injection can boast a percentage of cures equal to that of any other operation. Injection will not cure symptomatic hydrocele, nor will it cure suppurating, hemorrhagic, or fibrotic hydrocele.

A great number of substances have been employed for injection into the tunica vaginalis, but for safety and comfort and assurance of success none equals pure carbolic acid. The method of operating is as follows: If the hydrocele contains more than six ounces of fluid it should be tapped and the patient told to return for the cure a week or two weeks later, when partial reaccumulation shall have occurred; otherwise the aspiration and injection may be performed at once. The instruments required are a large hypodermic syringe and an aspirator. The solutions are a bottle of carbolic-acid crystals deliquesced by heat, some pure alcohol, and some green soap to cleanse the skin. The needles are boiled; the surgeon cleanses his hands and the skin of the patient with green soap and alcohol. A hypodermic syringe is then filled with the pure carbolic acid, and its needle, unattached, is plunged into the front of the tumor, the drop of serum issuing through it proving that its point is in the cavity. The needle of the aspirator is then plunged into another point on the surface of the tumor (the position of the testicle having been previously ascertained by the light test), and immediately serum gushes from this. The aspirator is now set in action and the contents of the sac are drawn off, every effort being made to withdraw the fluid even to the last drop.

Only two precautions need be taken: (1) not to allow the hypodermic needle to slip from the sac; (2) not to wound the testicle. The sac being dry, the hypodermic syringe is attached to its needle and from five to thirty drops of the pure carbolic acid are injected. I have injected two drachms of pure carbolic acid without any serious reaction; but the use of such large quantities, while it does not cause carbolic-acid poisoning, may produce a good deal of inflammation, and is, I believe, quite unnecessary. Indeed, Dr. Coley has had excellent

results from the injection of a single minim of the acid; but, inasmuch as it is impossible entirely to empty the sac, I always prefer to inject enough fluid to cover its surface thoroughly. Immediately after injection the needle is withdrawn, some alcohol poured over the skin to protect it from the carbolic acid, and the scrotum briskly rubbed in order to diffuse the fluid throughout the tunica vaginalis.

After this little operation the patient may often continue to go about, but as the reaction for the first forty-eight hours is often considerable, it is better that he should lie in bed during this time.

During the first week the sac usually refills, but thereafter this fluid is gradually absorbed, and at the end of six weeks the patient should be practically well, except for the presence of the hardened, thickened tunica vaginalis which gradually softens and disappears during the succeeding months. If the reaccumulated fluid does not disappear within a few weeks aspiration should again be performed, and a few drops more of carbolic acid may be injected at this time, although this is usually unnecessary.

Failure of the injection treatment may be attributed to three causes, namely:

1. Application of injection to cases incurable by this method—*i.e.*: (a) Most symptomatic hydroceles, (b) Some spermatoceles, (c) Hydroceles with inflamed, indurated, or calcareous walls, (d) Hæmatoceles and chyloceles.

2. Errors of technique, notably: (a) Endeavoring to cure too large a hydrocele. If the sac contains more than six ounces its contents must be reduced by one or more preliminary tapplings. (b) Incomplete evacuation. This I believe to be the most frequent cause of failure; to insure success the last drop must be squeezed from the vaginalis. (c) Injection of the carbolic acid into the cellular tissue. I need scarcely insist upon this point. (d) Failure to perform the secondary aspiration which is sometimes part of the cure.

3. The use of iodine instead of carbolic acid. Iodine injection is painful and uncertain, while carbolic acid, being a local anæsthetic, produces only a momentary tingling and, at my hands, has been a certain cure.

The Open Operation.—For cases in which the diagnosis is not certain or in which, for one of the reasons stated above, the injection treatment is inapplicable or has failed, the open operation should be performed. This operation may be done in one of three ways:

1. Volkmann's operation consists of simple incision and drainage. The sac is opened by one sweeping cut, its edges are sutured to the skin, its surface swabbed with pure carbolic, and a wick of gauze inserted into the wound. The convalescence from this operation is so prolonged that it has been generally discarded in favor of—

2. Von Bergmann's operation. Here an attempt is made to excise the sac; skin and fascia are divided down to the tunica vaginalis, and this is shelled out, opened and cut away up to the testicle. That part of the tunica which is adherent to the testicle is then swabbed with pure carbolic acid, and the skin incision is closed over a drainage-tube which is removed in a few days.

3. Eversion of the sac is an operation recently proposed to take the place of von Bergmann's operation, the ad-

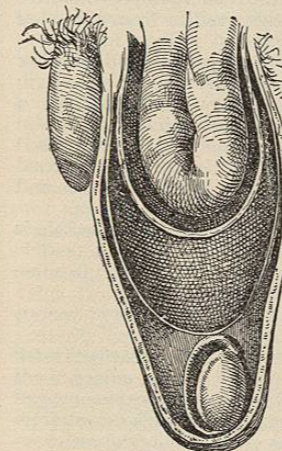


FIG. 4260.—Hydrocele of the Cord Complicated by Hernia.

vantages claimed for it being that it is more rapidly performed and that it requires no drainage. The sac is dissected out roughly and the greater part of its parietal layer cut away. The testicle is then extruded through the wound, and the remainder of the sac is inverted and sutured behind the testicle by a few strands of catgut. Testicle and sac are then replaced and the skin wound sutured.

I prefer this operation to any other open procedure, and expect to cure by it within ten days; yet there have been recurrences after this as after every one of the various operations advised for hydrocele.

Congenital Hydrocele.—Congenital hydrocele, in which the hydrocele sac communicates with the abdominal cavity, occurs in infancy.

Congenital hydrocele is often confused with hernia, since the tumor is continuous into the inguinal gland and is reducible into the abdomen. The distinction between the two conditions is not important, since with congenital hydrocele there is habitually hernia, and the treatment of the two conditions is the same—namely, a well-fitting truss, and if this fail, the operation for radical cure of hernia. Congenital hydrocele should never be injected.

Infantile Hydrocele.—Infantile hydrocele is far more common than the congenital variety. Thus Horwitz records one hundred and ten cases of hydrocele, of which twenty-two were infantile and only one congenital.

The diagnosis and treatment of this condition present no peculiarities.

Abdominal Hydrocele (Bilocular Hydrocele).—This is a very rare variety of infantile hydrocele, in which the sac fills the scrotum and also extends into the abdominal cavity, pushing the peritoneum before it, sometimes forming an enormous cyst in the latter. Some twenty cases have been recorded, cure having been accomplished by simple drainage and by injection.

XXXI. HYDROCELE OF THE SPERMATIC CORD.—Hydrocele of the cord (Fig. 4260) may be multilocular (diffuse) or encysted. Kocher classifies multilocular hydrocele under the following heads: (1) Echinococcus cysts, (2) spermatocele, (3) encysted hydrocele of the cord subdivided into loculi by adhesive inflammation, (4) cysts of Müller's duct of the Wolffian body or of the organ of Gherdes, (5) cystic lymphangioma.

The three conditions commonly classified as encysted hydrocele of the cord are: (1) Hydrocele of the processus funicularis, (2) spermatocele, and (3) hydrocele of an old hernial sac.

Whatever the true nature of the hydrocele, it is in appearance either a single cyst or a number of small cysts occupying the region of the spermatic cord. Habitually the cyst is either a hydrocele of the processus funicularis (the serous peritoneal prolongation surrounding the cord, which normally disappears during infancy, but which sometimes persists and is then liable to hydrocele) or spermatocele.

The treatment of hydrocele of the processus funicularis is by injection.

XXXII. SPERMATOCELE.—Spermatocele (Fig. 4261) (encysted hydrocele of the testicle, epididymal cyst) is a collection of fluid "contained in a cyst or in cysts distinct

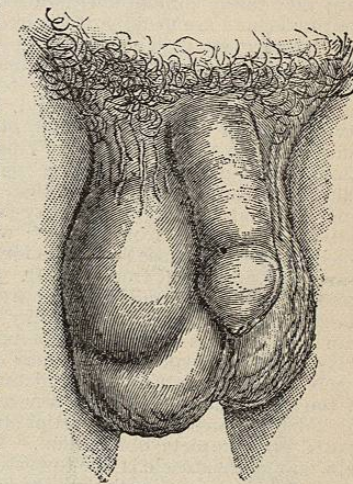


FIG. 4261.—Spermatocele.

from but close to the cavity of the tunica vaginalis" (Jacobson).

Clinically, two classes of spermatocele may be recognized.

1. Small cysts are very common about the head of the epididymis in old men. They do not attain any notable size; they rarely contain spermatozoa; they produce no symptoms, and are usually discovered by accident.

2. Large cysts develop in the epididymis before the fiftieth year, as a rule; they are often multiple and usually contain spermatozoa. They form irregular fluid tumors about the top of the gland, the smaller tumors having a notch in the upper end, giving them a shape comparable to that of a heart. This heart shape is so common as to be considered a pathognomonic sign. These cysts rarely contain more than an ounce or two of fluid, although Curling drew thirty-two ounces from one individual and forty from another; while Jacobson mentions a case from whose right side forty-nine ounces were drawn and fifty-eight from the left. Such large cysts as these are habitually mistaken for hydroceles, their true nature being disclosed by the milky fluid which, on examination, proves to be full of spermatozoa.

Hydrocele and spermatocele may coexist. Spermatocele is commonly attributed to dilatation and sacculation of the spermatic ducts behind a partial obstacle, just as the kidney dilates behind a partial obstruction but is not dilated by complete obstruction. The earlier authors held that spermatocele is due to cystic growth in various fetal remains, and attributed the presence of spermatozoa to the bursting of the cyst into the epididymal canal. The communication between the cyst and the epididymis has several times been demonstrated.

Diagnosis.—The heart shape, though pathognomonic, is not always present. The diagnosis may usually be made upon the discovery of a small uninfamed tumor above the testicle. Large tumors can be diagnosed only by aspiration, without which they are commonly mistaken for hydrocele of the tunica vaginalis, hydrocele of the cord, or neoplasm.

Treatment.—The small spermatoceles of later life require no treatment. The larger growths may sometimes be cured by aspiration and injection of carbolic acid; a more certain method is excision of the entire sac.

XXXIII. HÆMATOCELE. —If a hæmatoma, whether of the testicle, of the tunica vaginalis, or of the scrotum, becomes encysted instead of being absorbed, the cyst is denominated hæmatocele (Fig. 4254). Scrotal hæmatocele and testicular hæmatocele are always traumatic in origin. Hæmatocele of the tunica vaginalis is sometimes spontaneous. I have seen a case of spontaneous hæmatospermatocele.

The diagnosis of hæmatocele presents no difficulties, unless it be spontaneous or of such long duration that its traumatic cause has been forgotten. The tumor usually retains the pyriform shape of a hydrocele, but its thickened walls and dense contents do not transmit light. Such hæmatoceles are habitually mistaken for neoplasms and the most expert surgeons have removed them under this impression. While orchidectomy in this condition is not an altogether unjustifiable operation, it is more satisfactory



FIG. 4262.—Varicocele.

to the surgeon to make a correct diagnosis before operating and more pleasant to the patient to retain his testicle, if that be possible. The only sure means of diagnosis in these cases is aspiration or incision.

The treatment is incision and drainage, or, if the testicle is disintegrated, orchidectomy.

XXXIV. CHYLOCELE.—Chylocele (fatty, milky, chylous hydrocele, galactocoele) is an accumulation of chyle or fatty lymph in the tunica vaginalis. It occurs in connection with elephantiasis; exceptionally it is due to the traumatic rupture of a lymphatic vessel into the tunica vaginalis. False chylocele is due to a fatty or cholesterol-producing degeneration in a hydrocele. The treatment is incision and drainage.

XXXV. SYMPTOMATIC VARICOCELE.—Symptomatic varicocele is rare. It is caused by obstruction of the spermatic veins. I have seen one case due to prolonged use of a truss. It is usually caused by the pressure of enlarged retroperitoneal glands upon the spermatic veins. This generally occurs in connection with malignant disease of the kidney and is an evil omen, since it indicates glandular involvement.

Diagnosis.—Symptomatic varicocele develops very rapidly, late in life, on either side. It is painless, attains a large size, and is always associated with an abdominal tumor or some other cause of obstruction.

XXXVI. SPONTANEOUS VARICOCELE.—The left testicle habitually hangs lower than its fellow, and the veins of the left spermatic cord are habitually somewhat more prominent than those upon the right side. Idiopathic varicocele is a spontaneous varicose enlargement of these veins (Fig. 4263). The proportion of adult males suffering from this disease is estimated as between seven per cent. (Bennett) and twenty-five per cent. (Senn), the discrepancy in these figures being evidence of how common are small varicoceles and how slight is their importance.

Varicocele always occurs on the left side; very rarely a large varicocele on the left side is associated with a small one on the right side. The disease occurs only in young adults. The cause of varicocele has been bitterly debated. It occurs in young adults on account of the sexual congestion to which they are so peculiarly liable. It is not known why it should always occur on the left side, although this has been attributed to the anatomical position of the left spermatic vein, which is longer than the right and enters the left renal vein at right angles, so that it is not so much affected by the venous suction as is the right vein, which enters the vena cava at an acute angle. Exceptionally, varicocele results from a sudden strain.

Symptoms.—The symptoms paraded by advertising charlatans as those of varicocele cover every neuralgic manifestation, and to this notoriety is attributable a large proportion of the symptoms complained of by these patients. Three sets of symptoms may be distinguished:

1. Neurotic symptoms, such as the failure of sexual desire and potency, and all kinds of reflex pain and weakness.

2. Neuralgic symptoms, of which the most notable is a continuous soreness or pain running from the testicle up through the groin into the loin, most marked in some one of these localities.

3. The only symptom may be the presence of venous tumor.

In a general way it will be found that patients with the smallest varicoceles, those in whom the enlargement of the veins is scarcely more than a fancy, encouraged by the weighty opinion of some quack, suffer most from the purely neurotic symptoms; while it is the medium-sized varicoceles that present the most marked neuralgic symptoms, leaving the largest growths to cause the least pain.

Diagnosis.—The sufferer habitually diagnoses his case by the fact that the left testicle hangs lower than the right, and that he has some real or imaginary sexual neurosis. The surgeon must not be misled into this opinion. The perverted sexual appetite, the morbid broodings over sexual matters, the swindling methods of the

quack, are causes quite adequate to explain the neurotic symptoms of these patients, whose varicocele is only one evidence of general morbid sexuality. Cure of the varicocele can affect the neurotic symptoms only by its hypnotic influence upon the patient's mind.

The actual varicocele tumor manifests itself as a general swelling of the scrotum which, when palpated, is felt to be made up of a mass of varicose veins, which feel like earthworms, soft and convoluted. Veins of this description can almost always be felt in the left side of the scrotum, and it is fair to make the diagnosis of varicocele only when these veins make a considerable tumor and drag the testicle well below its fellow. Palpation may also reveal atrophy of the testicle from pressure. No other scrotal tumor is mistakable for varicocele.

Treatment.—The mild cases in whom sexual symptoms predominate are best treated by the application of a suspensory bandage, rigid sexual hygiene, and medication of the prostate, as for neuralgia of that organ. The patient may be reassured that his varicocele cannot influence life or potency, and that, with the lapse of years or by the sexual hygiene of matrimony, he may expect to be relieved from all his symptoms. Larger varicoceles require operation for their removal, in order to relieve the patient of his discomfort and to prevent atrophy of the testicle from pressure. When neuralgia is the prominent symptom, operation may be performed to relieve the disfigurement and with some prospect of relief to the neuralgia; but it is never possible to assure the patient absolutely that any operation for varicocele will relieve sexual or neuralgic symptoms. The constant failure of surgery to live up to its promises in this matter is an example of the futility of attempting to cure a reflex phenomenon without absolute assurance of the nature of the reflex. If operation is decided upon, whether for the purpose of relieving the patient's mind, or of attempting to cure his painful symptoms, or of removing a large mass of varicose veins, two methods of approach are open to the surgeon. Without stopping to consider the applicability of coagulating injections and of electricity to this condition, we may briefly describe the operations of subcutaneous ligation and of excision.

Subcutaneous Ligation.—The instruments required for this operation are the Keyes-Reverdin needle (Fig. 4263), a sufficient length of stout silk, and a pair of scissors. These are sterilized by boiling, the patient's skin is prepared as for any aseptic operation, and the surgeon cleanses himself with proper care. The operation may be performed with or without general anaesthesia. If the patient prefers he may take chloroform during the whole operation, or he can avoid this and at the same time have the pain greatly mitigated by the injection of cocaine into the points of puncture and the administration of a whiff of chloroform at the time the ligatures are tied. Under these circumstances he is made to stand during the insertion of the ligature, in order that the veins may be as full of blood as possible; while, if general anaesthesia is employed throughout, the operation must be performed with the patient recumbent.

To perform the operation the first and almost the only technical requisite is to separate the bundle of varicose veins from the vas deferens. In order to do this the contents of the left half of the scrotum are squeezed repeatedly between the thumb and index finger of the left hand and allowed to roll piecemeal from this grasp until the surgeon can be sure of distinguishing (1) the large, tortuous varicose pampiniform plexus; (2) the vas itself which stands out separately as the largest, hardest single cord in the whole mass; and (3) a few veins running to the inner side of the vas. These three sections having been distinguished, the thumb and finger are pressed between the vas deferens and the varicose veins at a point just below the junction of the scrotum with the trunk. Pressure is made until the surgeon feels sure that no vascular tissues lie between his fingers, all the while being careful not to allow the vas to slip outward or the veins to slip inward.

Now taking the needle threaded with a piece of silk

fourteen inches long, the surgeon quickly plunges this into the space made by his pressure between the vas and the veins. Needle and thread enter the front of the scrotum, issuing behind. The eye of the needle is then opened, the silk loop extracted from it, the eye tightly closed, and the needle slowly withdrawn until its point is only just within the anterior puncture. One end of the silk loop is then pulled through to the back of the scrotum, the veins are allowed to slip back toward the vas, and the needle is reintroduced externally between the veins of the skin and made to issue accurately through the original posterior puncture. At this stage the varicose veins are encircled by a strand of silk to the inner side and the needle to the outer side. All that remains to be done is to open the eye of the needle once again, to insert in it the end of the piece of silk and to withdraw the needle, carrying the silk around the veins and out through the original anterior puncture. The veins are now held in a sling formed by the silk loop. The dartos at the point of posterior puncture is caught in the loop, and this must be freed by a sharp tug. The loop is now tied tightly. This operation squeezes certain nerve filaments, and is the only intensely painful part of the whole procedure. A second and a third knot are then tied for safety, the ends of the silk are cut off short, and another jerk frees the dartos at the point of anterior puncture, permitting the knot to slip out of sight into the scrotum.

This little operation may be repeated just above the testicle and again just below it; while, in very exceptional instances, it may seem necessary to tie a few veins running to the inner side of the vas. I have never put more than three ligatures in any one case, and it is my routine custom to place one ligature high up in the scrotum and one just above the testicle. If general anaesthesia is not employed it is convenient to insert all the ligatures, then to give the chloroform and then to tie.

After the operation the points of puncture are sealed with collodion, the scrotum is slung up with a T-bandage, and an ice-cap is placed against it to minimize the painful and oedematous reaction. The patient remains in bed some three or four days, though this period may be cut short, and then goes about his business wearing a suspensory bandage. For a few months the points of ligation remain surrounded by hard nodes of induration, after which this gradually disappears. Thereafter the suture may be readily detected grasping the atrophied veins.

The Open Operation.—Excision of varicocele may be most conveniently done through an oblique incision over the spermatic cord at its point of exit from the inguinal canal. The tissues of the cord are laid bare and the veins separated from the vas and pulled out, drawing the testicle up to the lower end of the incision. When the whole pampiniform plexus has thus been extruded it is tied off by two stout ligatures, and excised between them; the ends of the ligatures are then tied together, thus supporting the testicle. A few stitches close the incision; the patient lies in bed for from four to six days.

In choosing the operation appropriate to a given individual case, it must be remembered that: (1) ligation avoids incision, while excision postulates it; the temperament of the patient may require one or other operation



FIG. 4263.—Keyes Varicocele Needle.