

The reaction following operation is rapid and severe, and, in the case of old patients, it may sometimes be preferable to perform castration, as the milder alternative. With the young and middle-aged, however, this course is not to be thought of, as the testicle is seldom injured, although in long-standing cases it is occasionally atrophied. Erysipelas or gangrene may follow the laying open of hæmatocele. An hæmatocele produced by the effusion of blood into a preëxisting hydrocele may usually be treated like uncomplicated hydrocele. Any systemic state predisposing to hæmorrhage requires special management, and all operative interference should be delayed until such blood-dyscrasie have been removed.

#### HÆMATOCELE OF THE CORD.

Pott has described a diffused hæmatocele of the cord coming on during straining at lifting, or at stool, and confined within the tunica vaginalis communis. This form is exceedingly rare. It may occur, also, in connection with general ecchymosis of the scrotum from injury, and calls for the same treatment. The blood will be reabsorbed in time. It has been confounded with hernia, and operated on as such. If the tumor continue to enlarge in spite of position, rest, and cooling applications, a free incision should be made, the clots turned out, the wound washed, and the bleeding vessel sought for and secured.

When an encysted hydrocele of the cord, by accident or dyscrasial disease, becomes an hæmatocele, the same changes take place in the walls of the sac and surrounding tissue as have been described in hæmatocele of the tunica vaginalis. The treatment is also the same, care being always taken to treat the dyscrasial causative condition.

#### FREE BODIES IN THE TUNICA VAGINALIS.

Occasionally little excrescences spring up from the surface of the testicle within the cavity of the tunica vaginalis. They may grow anywhere within the tunica vaginalis, but are more common on the epididymis or around the so-called hydatid of Morgagni. These excrescences have an inherent tendency to grow large at the summit by a deposition of concentric layers of very dense connective tissue, and thus become pediculated. New excrescences may form upon an old one constituting a sort of dendritic vegetation. There is a tendency to a central deposit of calcareous salts early in the formation of these little pediculated balls, which causes an arrest in their growth. After this the pedicle becomes more and more thin, and finally breaks and disappears in some motion given to the testicle. In this way are the free bodies formed. They are found of all sizes, from the head of a pin to a large hazel-nut. They are not encountered in connection with very large hydroceles, although some fluid in the tunica vaginalis usually accompanies them. They may often be felt from the outside, and be liberated at once by an

incision if they cause pain or inconvenience; which, however, they seldom do. Occasionally after tapping a hydrocele great pain has been complained of, which has been found to be connected with the existence of a loose body in the sac. In structure these bodies consist of concentric layers of very dense fibrous tissue, cartilaginous to the feel, surrounding a central nucleus of calcareous matter. An attentive inspection of the surface of the testicle will often show prominences or depressions corresponding to the points where the free bodies had been attached by their pedicles.

### CHAPTER XXIII.

#### DISEASES OF THE TESTICLE.

Hydrocele, acute, chronic.—Diagnostic Table of Chronic Hydrocele with Incarcerated Hernia.—Palliative Treatment.—Radical Treatment.—Congenital Hydrocele.—Diagnostic Table of Congenital Hydrocele and Hernial Tumor.—True and Spurious Hydrocele of Hernial Sac.—Encysted Hydrocele of Testis.—Spermatocele.—Spermatocoele.—Origin of Spermatocele.—Hydrocele of Cord, diffuse, encysted.

**HYDROCELE,**<sup>1</sup> or dropsy of the testicle, consists in an accumulation of serous fluid within the cavity of the tunica vaginalis (simple hydrocele), or within a cyst connected with the testicle (encysted hydrocele). This fluid is usually highly albuminous and of a pale-yellow color, but it may vary through shades of red, brown, green, and black, by the admixture of more or less blood, or blood-pigment, and in old cases the fluid may contain fatty matter and plates of cholesterine, granular bodies, pus, epithelium, and occasionally spermatozoa (spermatocoele). The fluid differs, both in its nature and mode of production, from that of general anasarca. In anasarca the scrotum may be full and the tunica vaginalis empty. The liquid of hydrocele often contains a substance similar to fibrine. On exposure to the air under these circumstances, it will generally deposit in one or several layers. Buchanan, of Glasgow, found that if blood were mingled with the fluid it coagulated, when by contact of air alone it would not do so. Alexander Schmidt produced the same coagulation by adding blood-globules or hæmato-crystalline. The fluid sometimes contains salts and albuminates in a proportion analogous to that of lymph—which never obtains in the fluids of simple dropsies (Virchow).<sup>2</sup>

*Causes.*—In the aged, anæmic, weak, and badly-nourished, there may be a chronic dropsy of the tunica vaginalis, whose cause is simply general hydræmia; there are usually other serous effusions existing at the same time. This condition is a general one, and no special atten-

<sup>1</sup> All forms of hydrocele, including those of the cord, will be considered in this chapter, since they appropriately fall together. <sup>2</sup> *Op. cit.*

tion need be paid to the hydrocele, except the wearing of a suspensory bandage, until the general health is restored, after which it would be proper to undertake a radical cure, if the hydrocele did not spontaneously subside. In exceptional cases when the collection of fluid becomes excessive, palliative puncture may be resorted to. A slight amount of hydrocele exists, as a rule, in conjunction with all diseases of the testicle, especially of the inflammatory sort (orchitis, epididymitis), and not infrequently with syphilitic and tubercular disease of the organ. But in these cases again the hydrocele is only a symptom, and a radical cure should not be attempted. When the disease of the testicle subsides, the hydrocele will get well.

True hydrocele is the result of a secretory irritation of the tunica vaginalis testis, produced usually by mechanical violence, or in sympathy with some irritation of the testicle, cord, or urethra. The mechanical violence most apt to produce it is such as is slight, irritative, and long continued; rubbing, jolting, crushing. In warm climates it is very frequent, on account of the relaxed condition of the scrotum, which exposes the testicle to injury. In Brazil one man in every ten is said to suffer from hydrocele (Hyrtl). Hydrocele may be left behind after an acute inflammation of the testis, and, in those exceptional cases where the communication of the tunica vaginalis with the peritoneal cavity has not been closed after birth, a hydrocele is known as congenital.

#### ACUTE HYDROCELE.

This is an acute peripheral orchitis, coming on in connection with acute epididymitis or orchitis, and needs no detailed account. The condition is analogous to pleurisy. The effusion is rapid, sero-plastic, or sero-hæmorrhagic. The fluid is absorbed, as a rule, while the inflammation of the testicle is subsiding, and no treatment is of any service before that time, unless, possibly, puncture, if the effusion be very large.

It is always caused in a mild degree by the stimulating injections, or other treatment used for the cure of chronic hydrocele, and may occur idiopathically without necessary connection with other inflammatory disease of the testicle, but this is exceedingly rare. Rest with cooling lotions, and acupuncture, if necessary, constitute the treatment.

#### CHRONIC HYDROCELE.

In chronic hydrocele, the effusion takes place slowly, and without pain. The swelling is often only discovered by accident. It commences in the lower part of the testicle in front. It has no tendency to spontaneous subsidence. The accumulation of fluid tends to go on indefinitely, with occasional periods of quiet, until, in some cases, an enormous size is reached. The amount of fluid may be only a few drachms. It seldom exceeds a pint. Curling<sup>1</sup> met with one case which contained forty-eight

<sup>1</sup> "On the Testis."

ounces. Sixty-four ounces were taken from one (personal) case. Mr. Cline is said to have removed as much as six quarts from the historian Gibbon (Sir Astley Cooper). Out of a thousand cases reported by Dr. Dujat, from the Hospital of Calcutta, in eighteen, the quantity drawn off varied from fifty to one hundred and twenty ounces for each case. The mechanical inconvenience of such a tumor in such a position is at once apparent.

When a hydrocele has lasted for a length of time, its walls are liable to a fibrous thickening, which greatly obscures the diagnosis, or they may undergo cartilaginous, or, more rarely, calcareous degeneration. If subjected to irritation, or repeated injury, which can hardly be avoided, these changes are all the more apt to occur. The contents of hydrocele may be mixed with blood, or even become purulent. Secondary cysts may form in or upon the surface of the testicle, surrounded by the fluid of the hydrocele, but this is rare. Long-continued pressure of the fluid, especially when the tunic is thickened and covered with lymph, occasionally, but very rarely, leads to atrophy of the testicle. Points of adherence may exist between the two surfaces of the tunica vaginalis, dividing the cavity into compartments.

*Symptoms.*—Hydrocele is usually pear-shaped, larger below than above; or it may be oval, and, if very large, almost spherical. It cannot be reduced by pressure. Fluctuation can usually be made out. The tumor is generally very tense, the scrotum often stretched and shining. The cord, of natural size and feel, can be grasped above the tumor. The weight is slight compared with the size of the mass. The testicle is usually situated behind, a little below the centre (Fig. 127), and pressure on this point gives rise to the peculiar sensation experienced when the testicle is squeezed. Occasionally the testicle is found below and in front, more rarely in the centre, in front, from plastic adhesion. Its position should always be ascertained before operating on a hydrocele. Dupuytren mentions several cases where this precaution was overlooked, the testicle was wounded and the diagnosis unconfirmed. If the testicle be punctured, as a rule no serious inflammation results. Pressure on a hydrocele does not produce pain; there is no heat or redness of the skin, unless the tumor be large enough to keep it constantly on the stretch. There is flatness on percussion, differing from hernia, and there is no subjective symptom ex-

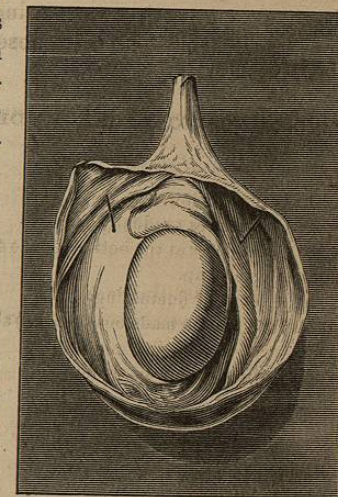


FIG. 127.—(Pott.)

cept a little dragging sensation in the groin and lower part of the abdomen, running up to the back, caused by the weight of the tumor.

*Diagnosis.*—The infallible diagnostic sign is translucency. This is obtained by making the skin tense over the tumor, and viewing a lighted candle, held as near the tumor as possible, through the upper part of the swelling, shading the eye with the hand, or, better still, looking through a cylindrical roll of paper, or a stethoscope. If the room be darkened, translucency may be detected where otherwise the test might fail. Often translucency may be made out by simply making the tumor tense with one hand, shading the eye with the other, and holding the hydrocele between the eye and the window, in the daytime. Translucency is greater in proportion to the slowness of the accumulation, the thinness and whiteness of the walls, and the limpidity of the fluid. If the contents of the tumor are dark-colored, or its walls very dense and thick, there will be no translucency.

In such a case exploratory puncture will decide on the nature of the tumor. A fine exploring trocar should be used, and not an exploring needle, as the fluid will not always run when the latter is used, if the walls of the sac are dense and elastic. Few diseases are easier of detection than simple, uncomplicated hydrocele; few more difficult where many complications exist. Varicocele may complicate hydrocele.

To recapitulate—the symptoms of simple hydrocele are pyriform shape, slow growth, commencing at the bottom of the scrotum, fluctuation, translucency—all with absence of pain.

#### DIAGNOSTIC TABLE—HYDROCELE—INCARCERATED HERNIA.

<i>Hydrocele.</i>	<i>Incarcerated Hernia.</i>
1. Largest below.	1. Largest above.
2. Commences gradually.	2. Comes on suddenly.
3. Commences at the bottom of the scrotum, and grows up.	3. Commences at the external ring and grows down.
4. Is tense or fluctuating.	4. Usually doughy.
5. Cord can be made out (normal) above tumor.	5. Cord cannot be distinguished, or is felt as distinct from tumor.
6. Testicle cannot be found.	6. Testicle can usually be separated from tumor posteriorly.
7. Dullness on percussion.	7. Resonance on percussion (unless hernia be omental).
8. Tumor heavy, but movable.	8. Tumor unwieldy.
9. Reduction impossible.	9. Reduction impossible.
10. Size usually constant.	10. Size varies at short intervals.

Simple hydrocele may be complicated with incarcerated or simple hernia (Fig. 128). For true or false hydrocele of a hernial sac, and congenital hernia with hydrocele, see p. 405, *et seq.* Absence of pain makes diagnosis easy, with all inflammatory diseases. Smoothness of

surface distinguishes it from cancer, cystic or tubercular disease, and translucency from syphilitic disease.

*Treatment of Simple Hydrocele.*—Hydrocele is cured by causing the fluid to be reabsorbed, or by exciting an inflammation within the sac leading to adhesion of the walls and obliteration of the cavity. Absorption occurs occasionally in the young, and, as a rule, in acute hydrocele spontaneously. The treatment is palliative or radical.

*Palliative treatment* consists of *tapping* and *acupuncture*.

*Tapping.*—First be satisfied of the position of the testicle. Then make the skin tense, and plunge in a well-oiled, fine trocar through the anterior part of the tumor, a little above the middle, holding the instrument with the index-finger placed firmly upon the canula at that point up to which it is desired to make it penetrate; introducing it in a direction upward and outward, to avoid the testicle. The canula should fit tightly, else the tunica vaginalis may be pushed before its shoulder. A knowledge of the position of the testicle insures the operator from injuring it. In withdrawing the trocar, push the canula a little farther into the cavity of the sac, and be sure that it is there by freely moving its extremity in every direction. If the end of the canula touch the testicle or cyst-wall, there will be no flow of fluid.



FIG. 128.—(MacLise.)

This simple operation will always efface the tumor at once, but in the majority of instances the sac will begin to refill in a few days, and after some weeks, or at most months, will have regained its previous size. Sometimes the tumor never refills, and the palliative operation thus becomes radical. This rarely occurs except with children, and very recent hydroceles. The chances of obtaining this fortunate result are greatly increased if the inside of the sac be roughly scratched with the point of the exploring-needle or the trocar, after the fluid has been drawn off. If the patient is old, or greatly debilitated, he should always rest for a few days after tapping. The constant stretching of the skin by a large hydrocele renders it prone to take on gangrenous inflammation. Sir Astley Cooper mentions two cases of inflammation with sloughing, followed by death, in old men who took a long walk immediately after the operation. It is well also if the collection of fluid is very large, especially if the patient is old, not to draw it all off at one sitting.

If the testicle has been wounded, the patient will complain of great pain, and blood will flow after the serum has been evacuated. Under these circumstances it is advisable to strap the testicle with adhesive plaster, immediately after the operation, to prevent the further effusion of blood into the sac, as this is favored by the removal of pressure. The

pressure by strapping is said to favor adhesion of the surfaces of the tunica vaginalis. Collodion is recommended by some authors to compress the testicle in this and other conditions, but it will not do for all cases, as its application to the thin and sensitive integument of the scrotum sometimes gives rise to exquisite and prolonged torture.

*Acupuncture.*—This consists in making the skin tense over the tumor, and penetrating the sac rapidly a number of times with a needle, which should be rotated as it is being withdrawn. The serum, in cases so operated upon, gradually escapes into the scrotum (in twenty-four to forty-eight hours), where it does no harm, and whence it is absorbed.

The adult hydrocele will usually fill up after this operation, as it will after tapping, but the hydroceles of children often remain radically cured, especially if the internal surface of the sac be scratched. If the cyst-wall be thick, and the tumor not translucent, neither tapping nor acupuncture will ever effect a cure. Healthy young patients can put on a suspensory bandage, and resume work at once, after tapping or acupuncture.

*Radical Treatment.*—External irritation or stimulation of the skin will often suffice to cure a simple hydrocele in a young child. Tincture of iodine, at about half strength, may be used, or a lotion, recommended by Curling, of hydrochlorate of ammonia ℥j, distilled vinegar ℥iv, water ℥vj; in fact, any mildly stimulating ointment or lotion will do. It is a waste of time to try this treatment upon the adult.

Although chronic hydrocele has been known to subside spontaneously in the adult, yet this termination is of so rare occurrence that practically it may be said never to happen. Sometimes the sac becomes ruptured by accident, inflammation follows, and the cure is permanent. That this is not an inevitable result is proved by a case reported by M. Serres,<sup>1</sup> of a Spaniard, who was accustomed to ride horseback, or perform some other violent exercise, when his hydrocele became uncomfortably large. In this way he had ruptured it thirty times, remaining well for a considerable period after each application of this rather severe treatment. Of the many methods of treating simple hydrocele, only two need be detailed, as they are applicable to all cases, namely, injection and incision, including excision of the tunica vaginalis. A small seton may sometimes be permitted in the case of a child, but for the adult it ranks with tent and caustic, as too severe. Subcutaneous scarification is equivalent to puncture and simultaneous scratching of the inside of the cyst. Of late years galvano-puncture has been greatly vaunted as a radical treatment for simple hydrocele. It is but little better than simple tapping, the advantage being that the puncture made by the negative needle tends to remain patulous for some time after the needle has been withdrawn, allowing the fluid to escape, and that the irritation starting from this point is sometimes sufficient to induce

<sup>1</sup> Quoted by Curling, *op. cit.*

enough adhesive inflammation to close the sac. The *modus operandi* is simple, and consists merely in introducing two needles at opposite points into the tumor, and passing a mild galvanic current, without causing too much pain, for about half an hour, being sure that the points of the needles do not come into contact with each other, or with the testicle. The number of cells used is regulated by the sensations of the patient. No after-treatment is required.<sup>1</sup>

*Injection.*—All simple hydroceles which are translucent, no matter what their age or how great their size, are amenable to treatment and cure by injection. Injection is not applicable to cases where the contents of the tumor are sero-purulent or sero-sanguinolent, or where the tunica vaginalis is extensively thickened, with or without calcareous deposit (*see* Case XXIX.); under these circumstances adhesion cannot be excited by injection; suppuration is more apt to occur, and incision or excision should be resorted to. Hydrocele with syphilitic testis should not be injected. The following type case will illustrate the point:

CASE XXVIII.—A middle-aged, apparently healthy man, presented himself for treatment of a moderately-sized hydrocele. The fluid had already been drawn off by a surgeon, and the cavity injected with iodine. The result had been purely negative. After the hydrocele had been tapped and the fluid evacuated, the testicle was found to be a little over-sized, hard, smooth, and to possess the general characteristics of a syphilitic testis. Further questions made out a syphilitic history. Consequently, no injection was made, but the sac was allowed to refill. A few months of anti-syphilitic treatment cured the hydrocele, as well as the disease of the testicle giving rise to it.

Celsus alluded to injections as a method of treating hydrocele, but Munro, of Scotland, Sir James Earle, and Sir James Ranald Martin, of England, are the names most prominently connected with it. Inflation with air has been employed, and the most varied substances have been used in injections, from distilled water to the strongest acids, hot and cold. Many substances have been employed successfully, such as spirits of wine, port wine, solutions of alum or sulphate of zinc, air, chlorine gas, lime-water (which Curling strongly recommends); but, better than all these, is the tincture of iodine, introduced by Martin. This is stimulating enough without being too irritating, and usually causes no harm if some of it escape into the connective tissue of the scrotum—an advantage which most other injections do not possess. If a mild injection be required, the compound tincture may be employed, diluted one-half with water, otherwise the pure compound tincture should be used.

A hydrocele should never be injected when first seen. Tapping

<sup>1</sup> To test this method, I selected two cases in young healthy subjects, one of spermatocele, the other of simple hydrocele. The testicle was perfectly healthy in both cases, and the wall of the hydrocele very thin. Stöhrer's battery was used, and as strong a current passed as the patients could bear—in the one case sixteen, in the other, eight cells. The current was passed for nearly three-quarters of an hour in each case. In one, a slight, cutaneous slough appeared at the point of entrance of the negative pole. The result in both cases was entirely negative. The tumor subsided to a great extent in a few hours, but refilled rapidly, no permanent benefit ensuing.—KEYES.