

CHAPTER XXII

DISEASES OF THE BLADDER: HERNIA; HYPERTROPHY AND ATROPHY; ATONY AND PARALYSIS; RETENTION AND INCONTINENCE OF URINE; INJURIES

HERNIA OF THE BLADDER (CYSTOCELE)

CYSTOCELE is a disease that confronts the abdominal surgeon rather than the genito-urinary practitioner. It is scarcely recognizable except during herniotomy, and its whole clinical interest centres on the diagnosis of the condition before the bladder is injured by the knife, and on its remedies in case it is so injured.

Abdominal, inguinal (scrotal, sometimes on both sides), crural, perineal, and ischiatic cystocele, and cystocele through the foramen ovale (Lentin), have been noted. In women vaginal cystocele and femoral cystocele are most common; in men, inguinal. Thus among 22 femoral cystoceles collected by Gibson¹ 16 occurred in women, while 70 among his 77 cases of inguinal cystocele occurred in men. Lotheissen² collected 113 cases of inguinal cystocele in men and only 11 in women. He believes that cystocele occurs in 3% of all inguinal herniæ, although the usual estimate is from 1% to 2%. Inguinal cystocele is extraperitoneal in 69.2% of cases, paraperitoneal ("mixed") in 24.2%, and intraperitoneal in only 6.6%. As extraperitoneal cystocele is met with only in direct inguinal herniæ, it is in this class of cases that cystocele is to be especially looked for.

Cystocele is especially common between the ages of 30 and 60. Its pathogenesis, depending partly upon the hernial traction, partly upon dilatation of the bladder, has been studied by Lotheissen, Lambert,³ Cheesman,⁴ and Alessandri.⁵

Diagnosis.—The diagnosis is rarely made before operation. The suspected presence of cystocele is verified by the introduction of a sound into the bladder.

¹ Med. Record, 1897, li, 401.

² Bruns Beiträge, 1898, xx, 727.

³ Bull. méd., 1899, xiii, i, 397.

⁴ Med. Record, 1901, lix, 985.

⁵ Guyon's Annales, 1901, xix, 25, 153, and 325.

Treatment.—The proper treatment of cystocele is herniotomy. If the cystocele is extraperitoneal, it may not be easy to close the abdominal wall firmly over it. Unintentional incision of the bladder during herniotomy is rather a grave complication. Lotheissen collected 65 such cases with 18 deaths. If the condition of the patient permits, the bladder should be closed by one or two layers of Lembert sutures, the efficacy of the line of suture tested by intra-vesical injection, and the radical cure completed. At the end of the operation a catheter should be tied into the urethra. If the patient's condition does not warrant the delay necessary to accomplish a satisfactory suture of the bladder, the organ may be fixed in the external wound after the manner of treatment of a strangulated hernia, and its closure deferred.

HYPERTROPHY OF THE BLADDER

Hypertrophy of the bladder has already been mentioned as a result of stricture of the urethra and hypertrophy of the prostate. Although many authors recognise a spontaneous hypertrophy of old age, clinically, at least, hypertrophy of the bladder is never spontaneous. It is the result of an obstacle to the free outflow of urine through the urethra, or, much less frequently, of severe prolonged inflammation with little obstruction (i. e., stone or tubercle). It is the physiological massing of forces to overwhelm the obstruction or to drive out the irritation. Hypertrophy is contrary to atrophy inasmuch as the former indicates that the bladder is keeping up its fight, the latter that it has been conquered.

Varieties.—Hypertrophy of the bladder may be concentric or eccentric. In the former case the bladder is said to be contracted, in the latter dilated. A *contracted bladder* results rather from irritation than from obstruction. It is the reaction of a vigorous organ to constant calls to urinate when the obstruction to the outflow of urine is slight in proportion to the strength of the bladder (e. g., many strictures in relatively young subjects), or absent (e. g., stone, tubercle), or quite overshadowed by the intensity of the inflammation (e. g., some prostatics). The intensely inflamed mucous membrane will not permit more than a very few ounces of urine to accumulate in the bladder, and the muscle, incessantly summoned to expel these few ounces, finally hypertrophies so that the anatomical as well as the physiological capacity of the bladder is reduced to 100 or 200 c. c., and after the irritant (e. g., stone) has been removed, the concentric hypertrophy persists for many months and is never entirely overcome.

Excentric hypertrophy of the bladder results from obstruction rather than from irritation. The muscle is not called upon to expel small accumulations of urine frequently, but to expel large quantities completely. The effort of contraction leaves its sensibility dulled rather than aroused, and it submits to constantly increasing dilatation before rousing itself to the supreme effort. Meanwhile that effort begins to fail, the urine is not all expelled, and the accumulated residual urine adds its constant weight to dilate the organ more and more. The outcome is *atony*. However hypertrophied the muscle, it fights a losing battle, it gradually weakens, becomes more and more atonied, and finally, if the obstruction continues long enough, becomes almost completely atrophied.



FIG. 90.—CYSTOSCOPIC VIEW OF TRABECULÆ (Nitze).

nied, and finally, if the obstruction continues long enough, becomes almost completely atrophied.

Morbid Anatomy.—Although hypertrophy of the bladder occurs in two forms clinically distinct, and showing the one a contracted bladder, the other a dilated one, yet the essential lesions are quite the same in either case. The wall of the bladder is much thickened; its inner surface is thrown into deep folds by distinct bands of hypertrophied muscular fibres (Fig. 90). Between these raised bands the mucous membrane sinks in little pocket-like depressions. If the process is an old one these pockets may be found quite deep among the muscular fibres (*vessie à cellules, sacculated bladder*) (Fig. 91). These pockets may

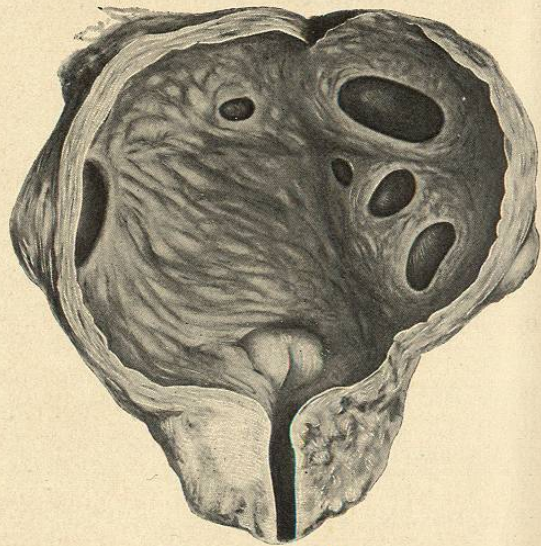


FIG. 91.—SACCULATED BLADDER.
Due to prostatic retention.

be so deep as to contain their own special residual urine, in which case their walls may be ulcerated and they often contain phosphatic stones (*encysted stone*) (Plate IV, Fig. 5). Indeed, the walls of such a sac may finally push themselves quite through the muscular coat of the bladder. The sac then enlarges indefinitely. Its walls are composed merely of the mucous membrane, a thin connective-tissue layer, and the peritoneum. Such a sac, divested of the muscular coat of the bladder, is known as a *diverticulum*. Diverticula have been known to exceed the bladder itself in size.

Microscopically the mucous membrane is seen to be inflamed, thickened, and infiltrated. The muscle of the bladder is greatly hypertrophied, but it is everywhere infiltrated with fibrous tissue, and the actual increase in thickness of the bladder wall is seen to be a fibrous degenerative change rather than a muscular compensation. The older the patient the greater the proportion of fibrous tissue present. These changes have been explained by the French school as a senile sclerosis of the bladder, a part of the general *sclérose urinaire* to which they attribute so many ills. Doubtless there is some measure of truth in this theory; but doubtless, too, the presence of the fibrous tissue is rather an expression of deep-seated inflammation, and an evidence that the bladder is losing ground in its fight; that the worn-out muscle is becoming more and more fibrous with the advance of age—in short, that it is wearing out. The various inflammatory changes associated with hypertrophy of the bladder need not arrest our attention here.

Symptoms.—There are no special symptoms of vesical hypertrophy. It is only a phase of some urinary disease. The contracted, irritable, concentrically hypertrophied organ declares itself by its constant irritability and inability to retain any great quantity of fluid. The patient, dilated, perhaps atonied organ, affected with excentric hypertrophy, shows quite opposite characteristics.

Treatment.—The treatment of hypertrophy of the bladder is the removal of its obstructive and inflammatory causes.

ATROPHY OF THE BLADDER

In rare cases in reduced, soft-fibred, debilitated individuals the bladder may be found weak and thin, apparently atrophied in all its coats, and liable to rupture. Atrophy of the bladder is the terminal phase of excentric hypertrophy (see above), when the fibrous elements have entirely replaced the muscle and have been stretched until the bladder is a mere bag. Such a complete atrophy is extremely rare.

ATONY OF THE BLADDER

Atony of the bladder is, as the name implies, simply a lack of tone in the organ. It is muscular paresis, and is to be clearly distinguished from paralysis, an affection of central and not of local origin. Truly, a stretched muscle which will not contract is paralyzed; but, to avoid confusion, the term atony must be retained, paralysis being only spoken of where there is nerve lesion. In old age every bladder suffers in a mild degree from what may be called physiological atony. A healthy boy can throw a stream from his bladder to a much greater distance than he can when he becomes an adult, even taking into consideration the increased size of the prostate and the enlarged calibre of the urethra, and the same remark holds true of adult life when compared with healthy old age. The bladder, being accustomed to a constant, slight distention, measurably loses its expulsive power with advancing age. Besides this physiological atony, however, there is a pathological form due to overstretching of the muscular coats, either gradual and continued (see above) or sudden and extreme (retention).

Any one may observe the phenomenon of atony in his own person. If the urine be voluntarily retained for some hours after the bladder is full and the natural desire felt, it is necessary, when an attempt is made at passing water, to wait some time, perhaps several minutes, before the stream begins to flow. When it comes, it commences very gradually, and without force, getting stronger as the flow continues; finally, the last drops dribble slowly away. This is the mildest pathological degree of atony, and is caused by temporary paresis of the overstretched bladder. In men of sedentary habits, or in those engrossed with absorbing occupations (students, actors), where the calls of nature are habitually disregarded, this slight degree of atony, often reproduced, may finally lead to permanent lack of the expulsive power. Rarely actual retention may come on, starting in voluntary retention, the bladder having lost its tone so far as to refuse to contract when the opportunity offers. This atony resulting from voluntary retention is, however, rare, and comparatively unimportant. The atony met with clinically occurs with excentric hypertrophy of the bladder (see above) secondary to urethral obstruction, usually by hypertrophy of the prostate.

Symptoms and Treatment.—The symptoms of atony are those already described under the head of chronic complete retention (p. 265). An acute atony may follow a severe acute retention. The *treatment* is that of the exciting cause. The atony itself will disappear

partly or entirely, even though it has existed several years, if the obstruction to urination is completely removed.

PARALYSIS OF THE BLADDER

As atony is common, so is true paralysis of the bladder rare. It occurs only in connection with nerve-lesion, or rarely as a functional nervous affection (reflex urinary paralysis, Brown-Séquad). The causes of paralysis of the bladder are brain disease attended by hemiplegia (rare), partial paralysis from reflected peripheral nervous irritation acting through the spine (exceedingly infrequent), any disease or affection of the spinal cord or nerves (inflammatory, apoplectic, syphilitic, diphtheritic, cancerous, from pressure, Pott's disease, fracture of spine, tumour), especially if such spinal disease be attended by paraplegia, partial or complete. This latter set of causes, which may be summed up in the one word, paraplegia, is by far the most active and efficient. Vesical paralysis may come on gradually, as sometimes in Pott's disease and in certain syphilitic paraplegiæ, or (most commonly) suddenly. In the former case the bladder discharges its contents more feebly from day to day, the change perhaps taking place so gradually that the patient does not notice it. Soon some of the urine is retained, only an excess over a certain fixed quantity being voided.

The paralysis may remain partial or (together with the retention) it may become complete. Very rarely there is paralysis of all the muscles, and true incontinence results; but this is so exceptional that it may be said not to occur. Most commonly, as the paraplegia comes on suddenly, so also does the vesical paralysis, and a bladder, at a given moment perfectly healthy, immediately becomes incapable of contraction. Retention ensues, the urine overdistends the bladder and then overflows, dribbling away. The bladder then becomes inflamed, ulcerated, calculous. It is in some such deplorable condition as this that it usually first receives surgical notice and attention, whereas the whole list of symptoms might have been avoided (except the loss of contractile power) by the application of the proper preventives of cystitis at the proper time.

Treatment.—When a patient, from any cause, becomes wholly or partly paraplegic, his bladder should not be allowed to become distended. The catheter should be passed as soon as the retention is recognised, and reintroduced 3 or 4 times a day, each catheterization being conducted with the most minute antiseptic precautions. Precise, even exaggerated precautions must be taken. The catheter should be boiled, the surgeon's hands scrubbed, the patient's penis

washed, and his fossa navicularis irrigated before the operation, and afterward a few drops of 1:2,000 nitrate-of-silver solution should be left in the posterior urethra and bladder. Urotropin should also be administered. Yet in spite of the most detailed precautions the prognosis is bad; the bladder ultimately becomes infected, as a rule, the kidneys are soon involved, and death is hastened by these complications.

If the patient is not seen until stagnation and overflow have occurred, it is more difficult to keep down the inflammatory outbreak, but the sooner this is attempted the more chance is there of success. After catarrh of the bladder is once established, the treatment becomes mainly palliative; but even here much can be done by the systematic, regular use of the catheter, with thorough washing of the bladder, as in chronic cystitis (p. 395).

RETENTION OF URINE

When, after an attempt at urination, a certain amount of urine remains in the bladder there is said to be partial retention of urine. If no urine at all can be passed, the bladder being full, there is complete retention. This may be caused by any urethral obstruction—inflammatory, spasmodic, or organic—or by paralysis of the bladder. The chief causes of retention of urine are hypertrophy of the prostate, contracture of the neck of the bladder, stricture and spasm of the urethra. The retention caused by hypertrophy of the prostate is the most important of all, and covers, in its various forms, every variety of retention. Guyon¹ recognises an acute complete retention, and three forms of incomplete retention—viz., acute incomplete retention (with distention—amounting clinically to an acute complete retention—and without distention), chronic incomplete retention without distention, and chronic incomplete retention with distention. This last condition is commonly spoken of as chronic complete retention. The retention is not actually complete, for there is overflow; yet the bladder is always absolutely full and distended. These varieties of retention, their causes, symptoms, and consequences, are described with the disease to which they usually owe their origin—i. e., hypertrophy of the prostate.

Diagnosis.—Acute complete retention of urine is often confounded with suppression of urine. In the former case the urine comes down to the bladder but cannot escape from it; in the latter no urine is manufactured by the kidneys. In either case no urine

¹ Leçons cliniques, 3^{ème} édition, 1894, i, 162 *et seq.*

is passed; but with retention the bladder is full, with suppression it is empty.

In suppression there is always resonance over the pubes; in retention, always flatness. The bladder may often be seen and felt, filling up the hypogastrium, perhaps reaching to the navel. Pressure upon it usually causes a desire to urinate. Fluctuation may be made out between the finger in the rectum and the hand upon the hypogastric tumour. The bladder will not burst from retention of urine, unless it be previously ulcerated or subjected to mechanical violence when full (a fall or a blow); after it has been distended for a time, a certain amount of dribbling will take place through almost any obstruction. From the effect of violence, or if the urethra be ulcerated or sensibly weakened behind a stricture, extravasation of urine may occur through the urethral walls.

Treatment.—The treatment has been already considered in relation to stricture and prostatic disease.

INCONTINENCE OF URINE

Incontinence of urine, or enuresis, is that condition in which the urine flows involuntarily out of the bladder as soon as it flows in. Incontinence must be distinguished from overflow. In each instance there is a continual involuntary dribbling; but in the one case the bladder is always empty, in the other it is always full. Enuresis shows that the vessel leaks; overflow shows that the outflow pipe is obstructed. In the adult male dribbling of urine signifies overflow in 9 cases out of 10. With true incontinence the urine flows away without any pain or desire to urinate. Imperative urination, when the inflamed bladder contracts every few minutes with a force that the cut-off muscle cannot oppose, is often spoken of as false incontinence.

Incontinence in Adults.—Stagnation with overflow and false incontinence have been already considered. True incontinence depends upon—

1. Asymmetrical hypertrophy of the prostate, where, after the collection of a little urine, the rest trickles away, there being no distention of the bladder (p. 263).
2. Post-operative enuresis, resulting from overcutting the internal vesical sphincter (p. 308).
3. Paralysis of the sphincter muscle of the bladder (p. 345).
4. Tuberculosis of the neck of the bladder (p. 402).

The treatment of these conditions is detailed elsewhere. It is advisable that the patient should wear a urinal.

Incontinence in Children.—Infants have little or no control over their urination, especially at night, but after they leave off diapers they are expected to stop wetting the bed. There are doubtless few children who fulfil this expectation entirely. Up to the age of five or six an occasional accident may occur to the most normal child. But this is not enuresis. The true nocturnal enuresis of children—for it is only exceptionally diurnal—is not noticed, as a rule, until the child is five or six years old. Then he begins to wet his bed quite regularly, perhaps two or three times every night. He may also lose his urine involuntarily by day, and very rarely the incontinence occurs only by day and not by night.

Etiology.—While the enuresis of childhood may be symptomatic, it is usually idiopathic. Symptomatic incontinence may be due to tuberculosis or stone at the neck of the bladder, or to spinal disease, or it may be a reflex disturbance aroused by congenital stricture, by tight or adherent prepuce, etc. But the majority of cases are idiopathic, and due to a neurotic taint. Such children are, as a rule, shy, overgrown, pale creatures. They are often intelligent and given to quiet reading rather than to boisterous play. The tendency to enuresis often runs through the whole family, and the elders may show other neuroses. Even symptomatic cases often show a neurotic element.

Prognosis.—The prognosis is good. Even the most persistent cases recover spontaneously at the advent of puberty, so that while nothing is more common than enuresis in a child, nothing is more unusual than enuresis in an adult.

Treatment.—Symptomatic incontinence may be eliminated by a thorough examination of the urine, the prepuce, and the meatus, and an exploration of the urethra. The child's habits should be inquired into with an eye to indolence, masturbation, and mental overexertion. Such faults must be corrected, and a life in the open air, with plenty of exercise and not overmuch study, must be insisted upon. Good habits should be encouraged by awakening the child to pass water late at night and early in the morning, using moral suasion, and avoiding the use of fluids towards evening. Besides these means, absolute benefit may be expected from belladonna, commencing at a small dose, perhaps $\frac{1}{10}$ of a grain of the extract, if the child is very young, and increasing gradually until some of the poisonous effects of the drug are noticed. A tonic of strychnin and iron may be useful. Guyon considers faradization quite specific when the urethral muscles are relaxed. He places one electrode in the membranous urethra, the other over the pubes. If the deep urethra is hyperesthetic (which is unusual) instillations of nitrate of silver will do good.

Stumpf has obtained good results by making the child sleep with its head low and its pelvis elevated. Phillips gives antipyrin and arsenic. Perlis reports 156 cases treated with rhus aromatica. He employs the fluid extract and in some cases increases the daily dose to gtt. lxxx. Recovery occurred in 102 cases. Thirteen were unimproved.

Another means which has been employed is sealing the prepuce at night with a drop of collodion. Mechanical appliances, encircling the penis or pressing upon the perineum, have the disadvantage of tending to beget a habit of handling the parts. Hypnotics should never be employed. The results of treatment cannot be predicted with any confidence; but, when all other means fail, tonics and hygiene succeed.

WOUNDS OF THE BLADDER

Wounds of the bladder are not common, since the position of the organ protects it from ordinary accidents, inclosed as it is, when in a state of relaxation, by the bony pelvis. Excepting the violence done by instruments in lithotomy, possibly in lithotrity, or during other operations, the bladder is but little liable to injury except when overdistended. It may be perforated by a fragment of bone in fracture of the pelvis. Rising above the symphysis pubis it becomes exposed to incised, punctured, and gunshot wounds. Wounds of the bladder are exceedingly dangerous to life without being necessarily fatal. Bullets and fragments of shell have entered the bladder without producing fatal consequences,¹ and there formed nuclei for calculus, as have also portions of bone.² Surgical wounds aside, Bartels³ was unable to find among 405 reported wounds of the bladder any incised wound. Lacerations of the bladder not communicating with the external wound are, clinically, ruptures.

Symptoms and Prognosis.—The symptoms of wounds of the bladder are comparable to those of rupture (plus an external wound). The *prognosis* depends upon the presence and severity of the complications, the availability of surgical assistance, and the position of the rupture, whether it is intraperitoneal or extraperitoneal. Bartels collected 131 cases of intraperitoneal wounds, of which only 1 survived, while of 373 extraperitoneal wounds only 85 died.

¹ I have recorded in the New York Journal of Medicine, May, 1865, the case of an adult whose bladder was perforated by a bullet during the New York riots in July, 1863, terminating in complete recovery.—VAN BUREN.

² Consult P. Maltrait, Traumatismes de la vessie, Paris, 1881.

³ Arch. f. klin. Chir., 1877, xxii, 519, 715.