

URINARY INCONTINENCE

By

RAM SWAROOP VYAS

Urinary incontinence is defined as inability to control the evacuation of urine.

Incontinence can be divided into : (1) physiological (2) true (3) false and (4) stress incontinence.

Physiological incontinence is a characteristic feature of infancy which is a result of the incomplete development of the nervous system and its inability to exercise a conscious control over the sphincter guards.

True incontinence arises out of the disorganisation of the function of the organs involved in 'micturition reflex'.

Flase incontinence is due usually to some mechanical obstruction impeding the flow of urine through the urethra, as is seen in enlarged prostate and stricture urethra.

Stress incontinence or orthostatic incontinence is a condition which accompanies increased intra-abdominal pressure, following a damage to the sphincters and supporting muscles as a result usually of child bearing.

True incontinence is often met and the condition is important because of its long and permanent nature.

Physiology of Micturition

Physiologically micturition process is the result of co-ordinated activity of the voluntary and involuntary nervous system. The voluntary control is exerted through the medium of the external sphincter and distal urethra which derive their afferent and efferent fibres from the pelvic nerve of somatic nervous system. The activity of the posterior urethra, internal sphincter and bladder is not directly placed under the conscious control as they are supplied by visceral nervous system. When both these systems fail to work in harmony the problem of true incontinence appears.

There are about two million nephrons which are continuously at work, elaborating urine approximately at the rate of 1 C.C./minute in a normal adult. This urine is conducted via the ureters by peristaltic waves with a frequency of 1-5 per minute (speed 20-25 mm/second) into the bladder which acts as a reservoir. We are not aware of this dribbling and accumulation process that continuously goes on inside the bladder unless the cortex is informed by the bladder which it does so when the filling reaches a certain level. It indicates that the bladder is ready for evacuation, should the cortex permit. The resulting reflex action is called "micturition reflex".

Micturition reflex in itself is a very complex process as is evidenced by the fact that even if the cortex is not ready for the act, the bladder do not become stubborn. It co-operates with the cortex and continues to accommodate the urine. But at the same time, it keeps the cortex intermittently informed lest it might forget the situation and cause the bladder to give way. This is prevented by its two essential properties—tonicity and rhythmic contractions.

In the initial stage of filling, the wave of contractions are absent and the sphincters remain tonically contracted. As it fills up the stretch receptors in the bladder wall are stimulated and generate impulses which are conducted to the sacral segments of the perineal nerve. The afferent nerve root of the thoracolumbar division then takes the charge and relaxes the bladder wall and constricts the internal sphincter, thereby helping better filling. Owing to this fact, the hypogastric nerves have been called by Cannon as the "Nerves of filling". This process goes on and the tone of the bladder is automatically adjusted to accommodate the incoming urine.

Like other viscera bladder is

incapable of adjusting its tone in such a way that a large volume of urine may collect with relatively small increase in intra-vesicle pressure. It thus differs in its behaviour from a rubber bag in which the tension is directly proportioned to the volume of its contents. When about 300-400 C.C. of urine is collected in the bladder with a resulting pressure of about 15-18 cms. of water, the efferent nerves from the first and second lumbar segments discharge impulses which results in the desire to micturate. Up to this stage filling tension is very light and the tone adaptation is perfect. Here the micturition reflex comes into operation.

Once a micturition reflex begins, it is a self regulated process. That is, the initial contractions of the bladder cause a further increase in reflex contraction of the bladder, the cycle thus repeating itself again and again with the result that the cortex is constantly being aware of the need. The desire to micturate results in the conduction of impulses causing the bladder to contract and sphincters to relax.

But on the contrary if by involuntary effort the onset of micturition is delayed, contractions become stronger, the pressure rises sharply and further adaptation fails. By the time an additional quantity of 300-400 c.c. of urine has accumulated the pressure will have risen to 100 cms. of water. No further conscious inhibition is possible beyond this stage. The intermittent contractions have by now become strong enough to overcome the resistance of the sphincter and thus micturition begins.

Pathology of Incontinence

In cases where the bladder is completely denervated it behaves like an inert rubber bag. The power of tone adaptation is lost and micturition starts much earlier than in a normal bladder. Although micturition starts, yet the act is not

complete. Only partial emptying of the bladder takes place and some residual urine is always left behind whereas with normal bladder the act of micturition is a complete process. The normal act of micturition depends on the integrity of nerves and the nerve centres. When the nervous mechanism fails, true incontinence ensues.

The micturition reflex is a completely automatic cord reflex but it can be inhibited or facilitated by centres in the brain. These include (a) a strong facilitatory centre in the upper pons. (b) a strong facilitatory centre in the hypothalamus (c) a moderately strong inhibitory centre in the mid brain (d) several centres in the cortex that are mainly inhibitory but at times become excitatory. Any damage to or disorder of these higher centres result in the loss of control of the act as is seen in injuries, infection or tumours of the brain.

Incontinence also results from cerebral clouding where again the excitatory centres fail to function. It may result from infection of the urinary tract; bacteria in the urine cause irritation of the mucosa of the bladder and stimulate the urethra-bladder reflex abnormally.

Damage to the sphincters of the bladder from instrumentation, surgery or accidents, scarring following urethral infections and lesions involving the sphincters or relaxation of the perineal structures may cause urinary incontinence. The latter cause is seen occasionally following child-birth. The problem is local in nature and does not involve the nervous system.

Disturbance of the urethra-bladder reflex may also occur in cases of obstruction to the spinal nerve tract above the sacral level of the spinal cord where the pudendal nerves synapse. This will cause incontinence because the transmission of the impulse to void does not reach the central nervous system and thus no conscious control is exercised. This form of incontinence may be seen in cord tumours, cord injuries, compression of the cord from fractured vertebrae, herniated disc, metastatic tumour of vertebrae or post operative oedema of the spinal cord. This can result in two types of responses as in neurogenic

bladder. The bladder may be spastic causing inability to retain urine or flaccid causing the bladder to overflow. In both the cases, incontinence is the result.

Problems of Incontinence

Sometimes the abnormal condition of incontinence is curable; sometimes it is not. Whether it is temporary or permanent, it is a major nursing problem.

The conscious patient who becomes unable to control urinary function suffers from embarrassment and discomfort. He feels humiliated even though intellectually he understands the reason for the lack of control. He is over sensitive to the reaction of others.

In overflow incontinence, the bladder remains partially full, even though the patient has urinated. Stasis of urine in the atonic bladder is dangerous, because it invites infection, which travels up the urinary tract into the pelvis of the kidney.

In patients, who are not put on an adequate drainage system, bed wetting is another serious problem. Urea splitting organisms, among them *Micrococcus Ureae* cause the urea in the urine to react with water. An end product of this reaction is ammonia which causes both the odour of urine and skin damage. The formation and spread of decubitus ulcers is aggravated in bed-ridden patients in whom devitalised skin offers practically no resistance to infection. Changing of linen adds much to the physical discomfort of the patient. Much time and energy has to be expended by those who care for the incontinent patient. Difficulties in providing an adequate supply of clean linen is almost a universal problem in our homes and hospitals.

An indwelling catheter may be inserted into the bladder. This procedure is not free from disadvantages, especially if it remains for a long time. As a foreign body, it causes irritation of the urethral and bladder mucosa which in turn predisposes to urethritis and cystitis. Indwelling catheters not attached to a close drainage system have proved to be a source of staphylococcal infection in the urinary tract. Many men may

develop epididymitis because the ejaculatory ducts open into the prostatic urethra and the organisms easily enter at this point and proceed along the vas deferens to the epididymis. Since it is a painful infection, it may be complicated by epididymal strictures, causing sterility.

Prolonged use of a catheter also leads to the formation of bladder stones. This is because the urine, instead of maintaining its usual acidity, becomes alkaline as a result of urinary tract infection. This encourages inorganic materials like calcium and urates to settle out. A bladder which is drained continuously also loses its muscle tone and normal capacity.

Sometimes the catheter may slip out accidentally or the disoriented patient may himself pull out the catheter. The more often a catheter is inserted, the more likely the patient is to develop urinary tract infection. If the bladder is already irritated, it becomes a fertile field for bacterial growth.

Incontinence due to relaxation of the sphincters and the perineum present even more serious problems. It is more so in cases of women who have vesicovaginal fistulae leading to great emotional strains.

Handling of soaked linen may be very unpleasant, particularly to those unaccustomed to the management of such cases. Incontinence may be objectionable to family members that they may like the patient to stay in hospital. The nurses will need a great deal of help in learning ways to control their own reactions as well as in understanding the patient's feelings.

Nursing an incontinent patient is an uphill task. The nurse who finds a convenient way to keep the patient clean and dry, who is able to give moral and spiritual support to the patient, and who is able to teach the family members how to do this may be instrumental in solving the problems associated with incontinence effectively. Such a nurse remembers that: "The aim of nursing is to keep the individual's day as normal as possible—to keep him in the stream of life, to the extent that it is consistent with the physician's therapeutic plan" (Henderson, Virginia).

(Contd. on page 146)