

## THE PATIENT AND BLADDER MANAGEMENT

By HERBERT S. TALBOT, A.B., M.D., F.A.C.S.

*Spinal Cord Injury and Urology Veterans Administration Hospital,  
West Roxbury, Massachusetts*

THERE could be no better place than this, no better time than today for looking back over the long way we have come in the care of spinal cord injury patients and taking stock of our successes and our failures. On other occasions we have perhaps too pridefully dwelt upon the accomplishments of the last four decades as compared with the barren yield of as many millennia preceding. That is all very well, but let us now with more humility address ourselves to the problems yet unsolved, and with more modesty not to history but to the immediate needs of today and tomorrow.

For my contribution to this endeavour, I turn to the care of the urinary tract, beginning with management of the bladder dysfunction, for this was the facet to which my interest in spinal cord injury was first joined; it remains a major, if not my only, preoccupation with respect to my own patients. The importance of this aspect of treatment, however, transcends my own interest and qualifications. When Munro undertook his pioneering work, he achieved a remarkably high rate of survival largely because of his success in controlling urinary tract infection (Munro, 1952). Yet, a generation after his first reports, this remains the major factor in morbidity and mortality among our patients. There has been improvement, of course, and the bright promise of intermittent catheterisation has lightened the shadow, but not dispelled it entirely. In what follows I shall not presume to present a survey but, rather, to offer an interpretation of what may be done in the way of bladder management, expressed chiefly in terms of meeting the needs of the individual patient.

Man has no more characteristic trait than his unending longing for perfection, this 'divine discontent' which separates him so sharply from other creatures of whom Whitman said, 'Not one is dissatisfied'. We find this admirable, even heroic, since it is a search foredoomed for most of us to failure. It may, however, show a less endearing aspect as when one becomes so absorbed in his own efforts as to derogate or disregard those of others, so sharply intent upon the road he is travelling that he sees nothing along the way, or even that there may be another way; and we must sadly acknowledge with Blake,

'The errors of a wise man make your rule,  
Rather than the perfections of a fool.'

It is, perhaps, inevitable that many of the matters we study should be controversial, but they have too often turned adversarial as well. Variant opinions have been allowed to become polarised when, in fact, they might usefully have complemented each other. And always there have loomed before us the opposite but equally dangerous pitfalls of over-simplification on the one hand and excessive complexity on the other, the latter encouraged by the availability of intricate methods of investigation.

The most important thing about the human bladder is that it is part of a man. Its function is to serve him, and the study of its dysfunction must begin with an analysis of how and why it fails in that service. This in turn depends upon an understanding of the mechanisms involved, the extent to which they are vulnerable to injury or disease, the manner in which their disorganisation is reflected by distortion of functional patterns and, finally, the means of restoring these patterns to provide satisfactory service to the individual. In all this it must be remembered that man's needs are those arising from the particular conditions of human life; they are not those of the experimental animal, nor can they be represented by a mechanical model, however ingenious. This is not to derogate the importance of investigations by these means, but to remind us that the mechanisms they reveal, or suggest, are only the components of a function, not the thing itself. With micturition, as in many other situations, man has transformed a physiological function into a pattern of behaviour. We must appreciate both.

Our understanding of these mechanisms is based upon a body of knowledge which is considerable but admittedly still incomplete. Most of it was available three decades ago, although there has been significant accomplishment more recently, particularly in the study of the part played by the sympathetic system and the importance of the afferent components (Bors, 1958). Increasingly sophisticated methods of investigation have, on occasion, clarified areas of obscurity. They have also, in some instances, added to our confusion, providing facts that seem definite but which we are at a loss to interpret, an example of what Henry James called 'The fatal futility of Fact'. Obviously, more remains to be done. When, if ever, we have all the pieces, we shall be in a better position to put them together neatly.

Meanwhile, with every regard for the excitement and value of disinterested research, let us not forget the predicament of the clinician who, with what we know now, or think we know, must face the needs of an individual with neurogenic vesical dysfunction. And, since the variety of men is infinite, so will he have to be prepared for variety and flexibility in his approach to diagnosis and treatment. No greater disservice can be done the patient than for us to allow ourselves to become preoccupied with attacking or defending particular procedures, investigative or therapeutic. Scores of these have developed since the end of World War II. Yet the wonder is not that there have been so many, but that, considering the complexity of the problem, there have not been more. If we are fairly to review accumulated experience, not only our own but that of all those who have laboured in these vineyards, it must be conceded that there is none of these procedures which may not, in one situation or another, be relevant; with equal certainty, there is none that is universally applicable. But as Thomas Jefferson is supposed, on second thought, to have said of all men being born equal, some are more equal than others. Some methods have seemed to those with most experience to be generally useful while others are rarely justifiable.

Generalisations are dangerous, but a general rationale of approach—a philosophy of treatment if it may be so dignified—is not only desirable but necessary in so complicated a matter as this. The details cannot be reduced to an easy formula, but the principles governing their application should be capable of simple enunciation. The patient with a spinal cord injury has much to contend with besides his bladder dysfunction, even taking into account the danger of renal infection and ultimate renal failure to which it may lead. The attending urologist, therefore, either from his own experience or guided by another's, must orient his plan of

treatment so that it becomes part of the whole plan for this patient. Emergencies may arise, of course, requiring immediate steps that take precedence over other therapeutic considerations. Distension must be relieved, an obstructing ureteral calculus must be removed, acute pyonephrosis must be drained. These and like situations which need not be enumerated, call for intervention about which there is seldom any argument. Our concern here is with the long-term approach, the basic principles which shall govern our attempt to manage the bladder problem in such a manner as to safeguard the patient's well-being and facilitate his total rehabilitation.

Every urologist knows that he does not see the whole patient through the cystoscope. The most obvious lesion for which there is the readiest consensus as to treatment still requires consideration in terms of the patient's general condition, the presence of other disease, his mental and emotional state, and so on. One finds too frequently a tendency to consider the bladder as though it existed in a vacuum or, at best, as an experimental preparation. As I review in my mind countless papers about and discussions of bladder care for these patients, I recall no more than a handful of references to accompanying disorders or problems which will be affected by the proposed treatment, which will in turn influence its efficacy, and in company with which it will have to be evaluated. But let me at once dispel any misapprehension that may here develop. These extra-urinary factors must be carefully weighed in terms of their long-term validity; they may not be cited as justification for short-cuts in treatment that find no other justification. For instance, in a discussion of early supravescical diversion through an ileal conduit, a proponent of this approach rationalised it, at least in part, on the ground that he was dealing with a group of patients who had to be got out of the hospital as soon as possible. Socio-economic factors provide a constant background influencing our decisions, but they must not be invoked in support of procedures for which no other indication exists.

On the other hand, consider the patient who is found, during a periodic follow-up examination, to have developed an excessive residual urine and for whom a transurethral resection is recommended. He requests a postponement of several months because he cannot take leave from his job at this time without impairing his image of reliability in spite of disability. He has no symptoms and no other objective evidence of trouble. Shall we agree to the postponement and, if so, shall we put him on catheter drainage during the interval? And if we do this and he returns a few months later to report that he has now got used to the catheter and would like to keep it, what then do we advise? Obviously, whatever the ultimate decision, the guiding principle must be that we are treating not the bladder but the whole man, and that we must consider all the elements of the problem before judging which comes first.

To a degree at least equal to and usually surpassing that which obtains in other patients, the 'urological workup' in a patient with spinal cord injury is not in itself a sufficient basis for decision. This, perhaps, more than any other single factor, accounts for the discrepancy often noted between the views of those who practice urology, seeing an occasional spinal cord injury patient, and those who take care of spinal cord injury patients, including their urological treatment. To mention only a few of the special circumstances that have a bearing upon the management of the bladder there is, first of all, the level of the lesion, not only in respect to whether there is upper or lower motor neuron involvement of the bladder innervation but also as regards the patient's ability to use his hands, and the con-

dition of his abdominal muscles and those of the pelvic floor and perineum. The status of sexual function must not be overlooked, yet here again is a matter of paramount importance to the individual, almost totally disregarded except by those who have had experience with large groups of these patients. This is due mainly to sheer ignorance. Scores of patients have been admitted to my service who, in hospitals where they were previously treated, were solemnly advised by those who should have known better that their sex lives were over. Yet, as we are aware, most of these patients are potent and many are fertile. One of mine recently asked for a vasectomy because he had fathered eight children since his injury. It seemed a reasonable request. Granting that such philoprogenitive capacity is unusual, it is still a major obligation to conserve whatever sexual function remains, with particular concern, obviously, for younger patients. This may raise difficult problems and require, perhaps, compromise with an arbitrarily established aim of bladder function. In terms of sexual intercourse, the patient who cannot void at all and who has learned how to remove and insert a catheter, is better off than one who voids and has no residual urine, but is partially incontinent. The former might be a candidate for a transurethral resection but, having been told the whole story, may prefer to stay with his catheter. Another objection to this procedure is the possibility that it may, however carefully performed, cause obstruction of the ejaculatory ducts.

Vulnerability to pressure ulcers and the manner of their treatment when they are present are of major consequence in planning bladder care. A well-established pattern of micturitional function may be thrown awry by any type of surgical intervention or by any intercurrent injury or illness. No single method of management is proof against such disruptive episodes and a consequent need to be modified or even abandoned. The disturbance of calcium metabolism, although it originates elsewhere, bears heavily upon the urinary tract and may demand special attention. Phenomena of automatic dysreflexia, ranging from the trivial to those dangerous to life, have an important bearing upon the degree to which it is even permissible to attempt bladder training. The occasional patient who develops hypertension with a bladder content of 100 ml. or even less can generally be managed only by constant drainage. On the other hand there are those in whom the catheter itself produces dangerous or uncomfortable dysreflexia. Such a patient, who could get along neither with nor without a catheter, is the only one in my experience thus far for whom I found it desirable to fashion a substitute bladder out of a segment of ileum. The result was very satisfactory but I do not recommend this as the only approach to such a problem.

The various forms of striated muscle spasm exhibited by so many of these patients exert an important influence upon bladder function and in determining the course of treatment. Powerful contractions involving the lower half of the body may trigger detrusor contraction and totally disrupt any attempted pattern of regular emptying. On the other side of the coin, when spasm particularly affects the muscles of the urogenital diaphragm, voiding may be obstructed. This is not the occasion for discussing the treatment of this complication, but only for emphasising the necessity for it as part of bladder management. By the same token, when spasm is the particular problem under consideration, the probable effect of any projected procedure upon bladder and sexual function must be thoroughly evaluated.

It is misleading to refer to a polarisation of opinion, dividing radicals from

conservatives, interventionists from non-interventionists, those who make ileal conduits from those who do not. There is little doubt that the most experienced in the care of these patients, who have made this care their major if not their sole interest, are less inclined to drastic intervention. Yet they are prepared to intervene boldly, when they find this warranted, to try new techniques based on long evaluation of previous efforts, and to perform, in specific instances, those very operations which they have rejected for general application. Every type of simplification is hazardous, not least that of attaching labels to various choices of treatment.

A basic precept of rehabilitation is to seek out the surviving components of a disorganised function and attempt, by one means or another, to reorganise them into some sort of satisfactory pattern. None is wasted; rather, they are developed, strengthened, reconditioned to their utmost capacity. This concept lies behind the success of musculo-skeletal rehabilitation, and it has guided those who attempt to restore the useful pattern of micturition by the various methods grouped under the head of bladder training. A description of these is beyond the scope of this discussion. They vary from fairly elaborate rituals to simple habit training, but whatever the method, success depends upon a knowledge of normal and pathological physiology. For this reason, we must welcome every investigative effort, seek out the significance of every new fact or relationship, however seemingly remote from practical application. The variety of such efforts, now and recently under way, and the interest they have aroused are evidence of a general appreciation of this need and this purpose.

From the beginning of the present era of treating spinal cord injury there have been two obvious trends in handling the associated bladder dysfunction.

With the first, the possibility of a satisfactory restitution of bladder function is brushed aside and some type of adventitious drainage instituted early. This may be accomplished through the bladder itself, by an old-fashioned cystostomy or the more recently developed vesicostomy, or by supravescical diversion through an ileal conduit. It does not appear to me that the claims made for these procedures have been substantiated. A cystostomy, it is said, will avoid urethral complications. This is true but these complications can also be obviated by the avoidance of prolonged indwelling catheterisation and, in fact, reduced to a low incidence even when it is necessary. Twenty years ago, when I first became interested in vesico-ureteral reflux, I observed to my surprise that it was not less frequent among patients draining through a cystostomy than through a urethral catheter. During a recent period of about a year I received eight patients who had been subjected to suprapubic cystostomy. All, of course, had infected urine and four developed reflux within a few months of the procedure, a higher incidence than that observed among patients who had been on Foley catheter drainage for similar, or even longer, periods.

As to vesicostomy, I can say little for I have never been tempted to do this operation myself nor have I had a patient upon whom it was done previously. Its proponents have yet to demonstrate by adequate follow-up reports that it yields results better than or comparable to those reported from major centres which follow a more conservative course.

There is, indeed, an occasional indication for supravescical diversion. This may occur when conservative bladder management has failed to result in a satisfactory pattern of micturition, or when, although this has been achieved, the integrity of the upper urinary tract is threatened. The latter eventuality will be

discussed in connection with the salvage of kidney function. In the present state of our experience I cannot accept this drastic intervention as being applicable to the primary management of neurogenic vesical dysfunction.

The second trend is followed by those who aim at the restoration of a useful pattern of reflex micturition, and I count myself among them. Our obligation as we see it is not to prove a theory, nor to popularise an operation, nor even to accumulate statistics of success. It is rather to handle each patient so as best to meet his needs, to watch him diligently for evidence that might suggest a change in approach, to be ready to adopt any method or procedure which may then serve his interests best. Extensive experience has shown that a great majority of these patients do well when managed physiologically. They require little or no surgical intervention and that of a relatively minor character, calculated to facilitate the restoration of the bladder, not to replace it. A process of education is involved, demanding careful explanation by the physician and the comprehension and co-operation of the patient. Although there are occasional happy exceptions, the development of a good bladder takes time, usually to be counted in weeks or even months. The patient must realise that the result is worth the effort and this presupposes full confidence in his doctor, the feeling that they know what needs to be done and that they are working together to do it. William James once wrote that '... a great mistake of my past life ... is an impatience of results'. Any patient—or any doctor—may be forgiven for wanting results quickly. This may be a factor in the thinking of those who turn early to surgical intervention. The fallacy lies in their assumption that the structural changes they make—which are usually irreversible—can be expected uniformly to provide predictable and permanent functional results, comparable to those obtained by the patient application of purely functional measures. Surgeons do not often turn to poets for advice but we might profit from a few lines by Emily Dickinson

‘Surgeons must be very careful  
When they take the knife!  
Underneath their fine incisions  
Stirs the culprit,—Life!’

The life processes may respond better to patient persuasion than abrupt alteration.

The best means yet proposed for combining adequate drainage with encouragement of the development of reflex micturition is intermittent catheterisation, developed at Stoke Mandeville and described by Guttmann and his associates (Guttmann & Frankel, 1967; Walsh, 1968). By employing the most meticulous technique, it is possible to catheterise patients three or more times a day for weeks or even months, until reflex micturition begins, the urine remaining sterile throughout in a majority. An obvious disadvantage is that a considerable distension of the bladder may occur during the interval between catheterisations. This may be avoided by controlling fluid intake and shortening the interval to as little as four hours with a view to preventing accumulation of more than 450 ml. The method demands not only an exacting technique but very close observation of the patient, including accurate recording of fluid intake and output, all of which requires an adequate and thoroughly trained staff such as may be available only in a well-organised centre. When patients reach such centres only after urinary tract infection has already become established, the likelihood of success is diminished, although Bors has shown that even in such cases good results may be obtained

(Bors, 1967). My own experience has been such that I seldom employ intermittent catheterisation on patients who have had indwelling catheters in place for two months or more. Within that period, it remains the method of choice unless there are particular contra-indications.

For the others, or for those who have not yet started reflex micturition after a six- or eight-week trial of intermittent catheterisation, I turn to tidal drainage which remains, in my opinion, a useful modality in properly selected cases (Talbot, 1963). It provides a repetitive pattern of reflex activity which exerts what I consider to be a conditioning effect, although not all agree that this is so. In the present confusing state of opinion as to what a conditioned reflex may be or whether, in fact, there really is such a thing, I am not inclined to argue the matter. It is sufficient to report that after weeks, or perhaps even months, of tidal drainage a majority of patients so treated have developed a consistent and useful pattern of reflex micturition. All will have had bacilluria when they were started and all but a few still show it at the end. A few more may turn up with sterile urine during the weeks or months after removal of the catheter.

The shorter his exposure to an indwelling catheter and the sooner he is free from the need of catheterisation, the better the patient's chance of leaving the hospital with sterile urine. There are a number, however, as many as a quarter of the total in my experience, who do not reach a catheter-free state. In most of these, this results from complications in the upper urinary tract, to be mentioned later. A few, for reasons known or unknown, simply cannot void and must adapt themselves to a catheter life. This is less than ideal but not necessarily catastrophic. Scores of patients have gone on in this fashion for years without upper or lower tract complications in spite of persistent bacilluria. The hazards of infection are ever present, of course, but somehow they are eluded. From time to time, considering such a patient, one is tempted to make yet another try at getting rid of the catheter. I have no rule of thumb about this but, older and I hope wiser than I used to be, I am now disinclined to try to change things when the patient and his catheter have lived happily together for two years or more. Once, years ago, I made the attempt on a patient who had been on constant catheter drainage for ten years. It was a success and all went well for about a year. He then entered upon a series of complications which led me to resolve not to try such a *tour de force* again. Inability of a patient to develop reflex micturition is not of itself an indication for diversion. The patient with an infected urinary tract draining into a bag on his belly enjoys no essential advantage in hygiene or convenience over the one who is maintained with a well-cared for indwelling catheter, an alternative which should always be considered before a major intervention is undertaken. In some, the deliberate establishment of total incontinence, whether by endoscopic resection or membranous urethroplasty, may provide a satisfactory solution.

The greater our experience with these patients, the more humble we become. The advances of the past 30 years only remind us of how far we have still to go. Now that many of them achieve longer life spans—approaching the normal, in fact—we can and must judge our results in terms of prolonged follow-up studies. We are justified in continuing what has worked well; we must be alert to discover what may work better, but the new must be subjected to the same test of time. What has been accomplished thus far results from the conjoined efforts of many disciplines, the results always being evaluated by those who see the whole man. Only by continuing in this fashion can we continue to make progress.

## REFERENCES

- BORS, E. (1958). Some new myologic and neurological concepts of the human urinary bladder. *Journal of the International College of Surgeons*, **30**, 324-340.
- BORS, E. (1967). Intermittent catheterization in paraplegic patients. *Urologia internationalis*, **22**, 236-249.
- GUTTMANN, L. & FRANKEL, H. (1967). The value of intermittent catheterisation in the early management of traumatic paraplegia and tetraplegia. *Paraplegia*, **4**, 63-84.
- MUNRO, D. (1952). *The Treatment of Injuries to the Nervous System*, p. 82 *et seq.* Philadelphia: Saunders.
- TALBOT, H. S. (1963). Management of neurogenic vesical dysfunction. *Bulletin of the New York Academy of Medicine*, **39**, 71-89.
- WALSH, J. J. (1968). Intermittent catheterisation in paraplegia. *Paraplegia*, **6**, 168-171.