THE MANAGEMENT OF THE NEUROGENIC BLADDER IN SPINAL CORD LESIONS

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SYNOPSIS

The whole prognosis of the Spinal Cord Injured patient depends on the efficiency of the initial treatment of the paralysed bladder, not only for the early return to a useful life but also for their life expectancy. Bladder management aims at preventing over-distension, minimising local damage and infection of the bladder, and obtaining an adequately emptying bladder, with a low and sterile residual urine.

At the Department of Rehabilitation Medicine, Tan Tock Seng Hospital, bladder training is carried out by the Rehabilitation Physician, in consultation with the Consultant Urologist at the hospital. The current method and management is discussed.

INTRODUCTION

In the rehabilitation of patients with spinal cord lesions, one of the factors that determine long term survival and quality of life, is the urological disability arising from the neurogenic bladder. The aim of bladder management is to achieve maximum voiding and to maintain a low residual urine which is clean and sterile.

EARLY MANAGEMENT

The early management is by indwelling catheterisation. A Foley's catheter size 16 or 18 is inserted and urine allowed to drain continuously. The catheter is changed weekly by strict aseptic, non-touch technique, by the medical officer. In the first two weeks, urine is allowed to drain freely and fluids are encouraged adlib. Approximately 3 Litres per day, is taken orally, and a strict Intake and Output chart is maintained.

A urinary antiseptic is prescribed, e.g. Tab Mandelamine 500 mgm. six hourly with high doses of Ascorbic Acid, or Mixture Ammonium Chloride 10 mls. six hourly. Alternatively Naladixic Acid is used as a prophylactic in a low dosage e.g. 500 mgm. twice a day, with or without Ascorbic Acid. The urine reaction should be acidic, tested daily with litmus paper.

After two weeks, the catheter is clamped and released at two hourly intervals. At this stage, fluids are regulated so as not to overdistend the bladder. The intake of fluids is regulated to 300 mls every two hours. The volume of urine released every two hours should not exceed 300 mls. The total daily intake is approximately 3 Litres per 24 hours. A meticulous record of intake and output is maintained.

If the urine is cloudy with sediment, the patient is put back on continuous bladder drainage. A bladder washout is carried out, once or twice daily with normal saline or 0.5% Acetic acid until the urine is clear. Acetic Acid washouts are preferred when the urine microscopy shows phosphate crystals.

Antibiotics are not prescribed routinely. Urine microscopy is done three times a week, and urine culture and sensitivity twice a week. A mild pyuria without constitutional signs like fever and malaise, or macroscopic change in the urine alone is not an absolute indication for antibiotic therapy. Repeated positive urine cultures with the same organism and significant bacteuria, indicate the use of appropriate antibiotics.

The return of sphincter tone is assessed regularly by checking anal tone, and return of the bulbo-cavernosus reflex. The Ice Water Test (for Detrussor activity) or Cystometry can be used to determine the state of the neurogenic bladder.

BLADDER TRAINING

After a variable period of time, the patient is taught to try and empty his own bladder, according to the following regimes:-

Lower Motor Neurone Lesions

2-6 weeks after the injury, it is usually possible for the patient to void, using manual compression (Credes manouver) and/or straining with the unparalysed abdominal muscles and diaphragm. The patient is trained to do this at intervals of 2-3 hours. Voiding is related to fluid intake.

Upper Motor Neurone Lesions

Bladder contractions are stimulated by suprapubic tapping. The patient is taught to void by "tapping" or to initiate voiding using trigger points. Eventually this reflex action can be trained to occur when stimulation is initiated and not at other times. The patient can do this at 2-3 hourly intervals and remain dry in between.

TRIAL OF VOIDING

A trial of voiding is carried out 5-6 weeks after the injury, or earlier if motor or sensory recovery occurs. The catheter is removed at 6am and the urine output is watched carefully. The patient is made to void, either by tapping, tapping and compression, or compression only, depending on the type of bladder. This is done at 2 hourly intervals i.e. 8am, 10am, 12 noon etc. 300 mls. of fluid are given at 2 hourly intervals, and a strict intake-output chart is maintained.

The patient is watched carefully for bladder distension and signs of autonomic dysreflexia, such as a fall or rise of blood pressure, tremors, headache, sweating and complaints of "feeling unwell". If any of these occurs, the catheter is reinserted immediately. If the patient continues to void every two hours, without any difficulty, the residual urine is checked after 2-3 days.

METHOD OF PERFORMING RESIDUAL URINE TEST

To assess residual urine accurately, the adult bladder should contain more than 250 mls. before voiding. The test should be performed at the time when the patient would routinely empty his bladder. To make sure that the bladder contains at least 250 mls, the patient is asked to drink 500 mls. of fluid, 2 hours before the test. The patient is asked to void completely, and the volume of urine is measured. Catheterisation is performed immediately after voiding. When no more urine can be obtained by suprapubic manual compression, the patient is sat up to drain the urine which pools at the back of the bladder in the recumbent position, unless the patient is not to be sat up. The volume of residual urine is measured.

If the residual urine is more than 100 mls. the catheter should be re-inserted. It should also be re-inserted if the urine is cloudy, foulsmelling or infected. If bladder training fails, the whole procedure is repeated after one week. If 2 attempts at bladder training fail, the patient is referred to the urologist for Panendoscopy and Transurethral resection of the Bladder neck (T.U.R.B.N.) if necessary.

SURGICAL INTERVENTIONS

If patients fail to develop adequate bladder function, they may require surgery to decrease their outflow resistance. The indications for surgery are inability to void at all, a persistently high residual urine especially if associated with urinary infections, and the development of vesico-ureteric reflux or hydroureter and hydronephrosis. The operations used are Transurethral resection of the bladder neck, crushing and removing phosphate encrustations and ileal diversion.

USE OF DRUGS

A number of drugs have been found useful over the years in the management of early bladder function. Diazepam is often used for peripheral muscle spasm and in some patients decreases sphincter resistance.

Baclofen or Lioresal is used more often now. It is a derivative of gamma-aminobutyric acid and depresses monosynaptic and polysynaptic reflex transmission at the spinal cord level. It reduces spasticity without inducing day time sedation.

Ubretid (Distigmine bromide) assists emptying of a neurogenic bladder, but is contraindicated where mechanical obstruction to urinary outflow exists. Ubretid is an anticholinesterase and forms a reversible complex with acetylcholinesterase, thus inhibiting this enzyme and giving rise to increased and prolonged parasympathetic effects, on the bladder.

INVESTIGATIONS

Urine Microscopy is done thrice weekly and culture and sensitivity, twice weekly. Blood counts, blood urea, serum electrolytes and serum creatinine are done monthly. An Intravenous Urogram (IVU) is done after bladder training, 8-12 weeks after admission. A micturating cystourethrogram (M.C.U.) may be done to detect vesico-ureteric reflux, and to serve as a baseline for subsequent follow up.

FOLLOW-UP

On discharge, the patient is followed up at the Spinal Clinic every month, initially and later on at three to six monthly intervals for the rest of their lives. An IVU is done annually, or earlier if there is suspicion of back pressure changes. Urine microscopy and Culture and Sensitivity is done at each visit. Residual urine is checked if necessary. Retrograde infection and back pressure changes may proceed without signs, hence the necessity for radiological investigations.

REFERENCES

1. Don RG, Wong NE: The management of the neurogenic bladder in traumatic spinal cord lesions. Ann Acad Med 1978; 7: 354-8.
2. Rosalie P: Nursing care of paraplegic patients. A Nursing Times Publication. Macmillan Journal Ltd. 1971. 8-10
3. Manual of Urological Procedures, Royal Perth Rehabilitation Hospital, Shenton Park.
4. Guttman L: Spinal cord injuries - Comprehensive management and research. Blackwells 1973.