

CARE OF THE NEUROGENIC BLADDER IN SPINAL CORD INJURIES

CRITERIA FOR URINARY DIVERSION PROCEDURE AND SPECIAL MANAGEMENT PROBLEMS ASSOCIATED WITH THE DIVERTED SPINAL INJURY PATIENT.

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OPSOMMING

Die talle buitengewone probleme waarvoor pasiënte met rugmurgbeserings te staan kom, toon aan dat hulle voortdurende en multidissiplinêre versorging moet kry.

The carefree independence of a healthy individual has been transformed in a second of time to a future of unknown quality. Total readjustment as to values and future goals are placed alongside physical readjustments made necessary according to the degree of injury.

For patients with spinal cord injuries treatment of their resultant neurogenic bladder may be conservative or surgical. The patient may have a complete or an incomplete lesion of the spinal cord. In the complete lesion, there is no sparing of motor or sensory system below the level of the lesion. In the incomplete lesion, there may be partial preservation of either or both.

On admission to a spinal injury unit, the patient has urinary retention which is initially treated conservatively prior to the onset of reflex detrusor activity and subsequent bladder assessment.

COMPLETE CORD LESIONS

An indwelling urethral or supra-pubic catheter system is used, the size of the urethral catheter being either 14-16 FG. Fixation of the urethral catheter to the anterior abdominal wall is performed in order to straighten the curve at the base of the penile urethra. This is to prevent the formation of the peri-urethral abscess leading to fistula formation. Large quantities of oral or I/V fluid are given.

INCOMPLETE CORD LESIONS

These patients are treated by 6-hourly intermittent urethral catheterisation. If the urinary volume drained is more than 500 mls at this occasion, fluids are restricted. If the patient voids urine spontaneously, the residual volume is checked on three occasions. If satisfactory, then catheterisation is done less frequently and then eventually stopped.

URINARY INVESTIGATIONS

Once the patient is mobilised following initial treatment, full urinary tract investigations are carried out. The tests are done in the following order:

- (a) Cystometrograph (C M G). This investigation is done to assess whether the bladder is an upper motor neurone or lower motor neurone type.
- (b) Intravenous Pyelogram (I V P).
- (c) Micturating Cystourethrogram (C U G). This is done to determine the size, and shape of the bladder and urethra and to detect any abnormalities e.g. reflux, calculi, trabeculation of bladder wall, or signs of obstruction at the external sphincter area or bladderneck.
- (d) Three separate Residual Volume Estimations (R U). Bladder training cannot be commenced if:

- (a) the residual volume is too high,
- (b) hyperreflexia is present,
- (c) there is ureteric reflux,
- (d) there are no sufficiently powerful uninhibited contractions.

Should the investigations contra-indicate it bladder training is not commenced and the urethral catheter left for a further month at which stage the Cystometrograph is repeated.

BLADDER TRAINING

The objective in bladder training is to achieve a "balanced bladder". This means that having voided urine the patient should have a residual volume of LESS THAN 10% of the total capacity in UPPER MOTOR NEURONE type bladders and LESS THAN 20% total in LOWER MOTOR NEURONE type bladders.

The procedure is as follows:

1. The catheter is removed at 07h00.
2. The patient is given one glass of water every ¼ hour before the hour.
3. Every hour on the hour a urinal is offered.
4. Strict intake and output is kept.
5. The patient with the upper motor neurone type bladder is observed closely for symptoms of hyperreflexia etc. and sensory stimuli are initiated on the hour.
6. The lower motor neurone bladder is manually expressed every hour.
7. At 16h00 a catheter is re-inserted, the residual urine measured and recorded and the catheter left in situ overnight.
8. The patient is given copious fluid to drink in order to flush out his kidneys and bladder overnight.
9. The procedure is recommended at 07h00 the following morning.
10. Once the patient has remained dry for a period of one hour the period between voids is lengthened to 2 hours and later to 3 hours.

At this stage the catheter is left out overnight, if the residual volumes are acceptable.

DIFFERENT TYPES OF BLADDER

UPPER MOTOR NEURONE

This bladder results from injury sustained to the cord ABOVE micturition centre which is situated in the CONUS MEDULLARIS. This presents as a small capacity reflex bladder, which is irritable and spastic.

UPPER MOTOR NEURONE BLADDER

in the male (very seldom in the female), if the residual urine volumes remain constantly high and the Cystourethrogram shows a tight external sphincter, it may be sectioned. This procedure is not undertaken for at least six months in complete cord lesions and before a

year in incomplete lesions. In cases of irritable bladder a varying dose of oral Probanthine has sometimes been found useful to increase bladder capacity, and prevent too frequent voiding.

LOWER MOTOR NEURONE BLADDER

The patient is taught manual expression of the bladder. Detrusor contraction may be facilitated by giving Urocholine. A Trans Urethral Resection of the bladder neck is often needed to overcome obstruction at this site due to detrusor hypertrophy.

FOLLOW-UP

Generally this is carried out on an annual basis. Investigations carried out are VOIDING CYSTOURETHROGRAM, INTRAVENOUS PYELOGRAM and RESIDUAL URINE estimations. Even with these conservative measures, over the course of time, problems may arise. The most common of these are infection, bladder neck obstruction, diverticulum of the bladder and stone formation.

Possible indications for diversion:

1. RECURRENT URINARY TRACT INFECTION

A neurogenic bladder never empties completely, there will always be a residual urine and unless this is kept down to acceptable levels and due care is taken to take sufficient oral fluids infection can easily occur and if allowed to do so too often may eventually lead to pyelonephritis and impaired renal function. An indwelling catheter is a foreign body and will always result in a degree of infection. Adequate fluid intake is usually sufficient to keep this at bay.

Common causes of recurrent urinary infection are:

- (a) Overdistention due to blocked catheter, with ensuing retro-ureteric reflux and infection of the upper urinary tract.
- (b) Tight external sphincter as a result of somatic nervous overreaction, with narrowing of the bladder neck, hypertrophy of the bladder wall and retention of urine.
- (c) High residual urine which is the urine remaining within the bladder after voiding as a result of poor emptying either due to inadequate contraction of the detrusor muscle, or to urethral outflow obstruction.

LOWER MOTOR NEURONE

This occurs when the micturition centre itself has been obliterated or peripheral nerves to and from the centre have been injured. The bladder is LARGE, FLACCID and ANTONIC.

2. OBSTRUCTION

Ureteric strictures

In urethral stricture formation the walls of the ureter may become tortuous with increasing thickening. This may lead to reflux.

Reflux

In all the conditions mentioned in 1. and 2. reflux may occur. Recurrent infection and ultimately, hydronephrosis result – hydronephrosis being distention of the pelvis and calyces of one or both kidneys due to obstruction in the downflow of urine into the bladder.

3. INABILITY TO BLADDERTRAIN

The spinal injury patient with an upper motor neurone bladder and complete lesion of the spinal cord occasionally does not achieve a successful balanced bladder. A permanent indwelling catheter may then become necessary. The walls of the bladder become trabeculated and the bladder decreases in size until it becomes an inadequate reservoir. In this situation urinary diversion may become necessary, particularly in females, for whom no adequate incontinence apparatus has been devised.

4. INCONTINENCE IN FEMALES

Whereas incontinence devices exist for the male incontinent, there is virtually nothing of the kind available for the female, other than an indwelling catheter. This is a far from satisfactory situation. Frequent movement from wheelchair to bed, or transference to a vehicle result in social embarrassment owing to leakage. Urinary diversion becomes a preferable alternative.

SPECIAL ORTHOPAEDIC CONSIDERATIONS

In the spinally injured patient with either a complete or incomplete lesion, the complication of scoliosis may occur at any stage, particularly in the growing child. This condition is due to a muscular imbalance in the incomplete lesion or to insufficient muscular support in the complete lesion. The scoliosis may favour the right or the left. If the patient is confined to a wheelchair as most of this category of patient are, the ensuing pelvic tilt causes increased pressure under one buttock with resultant pressure sore formation.

The use of an orthopaedic brace in this condition is only a temporary measure and may need to be followed by surgical stabilisation of the spine. This is of significance to the stomatherapist as this mode of treatment may be compromised by the siting of the existing or planned stoma for urinary diversion. This is particularly so in Dwyers spinal osteotomy.

In the Dwyers procedure, the approach is by a surgical incision through the anterolateral thoracoabdominal cavity. Should the side to be entered coincide with the stomal site, the Dwyers procedure would be greatly complicated.

In the light of a possible scoliosis developing, a multidisciplinary (Orthopaedic, Urological and stomatherapy) approach to a conduit is mandatory.

SITING THE STOMA FOR URINARY DIVERSION

Apart from the usual criteria employed when siting a stoma, (i.e. care to avoid any bony prominences, old scars, creases and the new incision), extra points to take into consideration with the spinal patient are whether or not they are wheelchair patients or if they wear calipers and use crutches. For the wheelchair patient, a site is

chosen when the patient is in the normal sitting position. Finally, awareness of a probable weight gain as the patient is immobile means care to site the stoma high enough to ensure it will be visible above any rolls of fat that may occur.

TYPES OF DIVERSION PERFORMED

The choice lies between using ILEUM or COLON as the diverting conduit. In either case, an anti-reflux procedure may be employed. For the patient having a colonic diversion, screening for diverticular disease by barium enema is necessary pre-operatively. Adequate bowel preparation (ref. Miles & Stevens October 1977) is very important as most paraplegic patients have an atonic bowel and a tendency to constipation.

PROBLEMS UNIQUE TO THE SPINAL CORD INJURY PATIENT WITH A URINARY DIVERSION

A. INVOLUNTARY SPASMS DUE TO REFLEX MUSCLE CONTRACTION

The distressing symptoms occurs with either a complete or incomplete lesion. It is particularly prevalent in a patient suffering from urinary tract infection, loaded bowels or pressure sore. It has been noted to cause temporary obstruction of the conduit and to dislodge an otherwise well applied appliance during a severe spasm. This will necessitate more frequent application with extra reinforcement.

B. SENSATION

A complete transection of the spinal cord results in total loss of sensation below the level of the lesion. Extreme care in securing the appliance is called for as trauma to either the stoma or the surrounding skin cannot be felt. Likewise, a belt too tightly applied may cause pressure sores and remain undetected. Leakage also remains undetected until odour or dampness is apparent at a later stage.

C. MUSCLE CONTROL

In the paraplegic with the loss of motor power in the lower limbs and often the lower trunk, extra strength is developed in the upper trunk to compensate. This assists them to transfer more easily from chair to bed, bath, transport or other places. The abdominal area takes exceptional strain at this time with the excessive movements required to conduct these manoeuvres. To the patient wearing a urinary appliance, extra care in securing the bag to skin is required to withstand this additional strain.

D. PATIENTS WITH HIGH CERVICAL LESIONS

When patients with a lesion above Thoracic 1, with subsequent loss of sensory and motor involvement below this level are selected for urinary diversion, it is important that the stomatherapist ascertains pre-operatively how much the patient will be able to participate in his or her stomal management. A one-piece appliance is selected which allows for the minimal amount of manual dexterity to be employed in its application.

IN SUMMARY

It may be seen from the many special problems encountered by the spinal cord injury patient that the care accorded to them should be continuous and multidisciplinary.

ACKNOWLEDGEMENTS

The authors wish to gratefully acknowledge the help received from Dr. P.J. Fischer, Medical Superintendent, Conradie Hospital, Dr. A.G. Key, Principal Medical Officer, Dr. R. Shrosbree, Senior Medical Officer and Dr. P.J.M. Retief, Urologist, Conradie Hospital Spinal Unit; and nurse Jo Allen for typing the manuscript.