

MANAGEMENT OF THE BLADDER IN NON-TRAUMATIC PARAPLEGIA¹

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INTRODUCTION

DURING the five years 1967-1972, 135 patients with non-traumatic paraplegia were admitted to the Paraplegic Centre and 50 patients referred to the Urological Centre with neurogenic bladder dysfunction. In the paraplegic the duration and quality of life is related to the degree of functional impairment in the urinary tract. Tribe and Silver (1969) showed that, with the exception of metastatic spinal disease, the natural history of paraplegia in the non-traumatic and traumatic cases who had survived the first three months after injury was similar; if death occurs 75 per cent die from complications of renal failure. The management of the bladder dysfunction in the non-traumatic paraplegic is similar to that in the traumatic paraplegic, for the neurological lesion remains static except in malignant disease and multiple sclerosis.

Clinical Material. Amongst the 135 patients with *non-traumatic paraplegia of various causes* 110 (81 per cent) had bladder dysfunction, 20 had renal complications (15 per cent), and the severity of the urinary tract disease made urinary diversion necessary in three patients (two per cent).

MANAGEMENT

In all patients the aim is to prevent death from urological complications and to improve the act of micturition so that discomfort and inconvenience are lessened. The ideal is to enable the bladder to empty completely without a permanent indwelling catheter. The dangers of the uraemia, hypertension and amyloid disease may be removed if the predisposing factors of chronic urinary infection, reflux and back pressure are prevented by elimination of the infected residual urine. Good drainage is important; a catheter may be needed in women, in patients with incontinence or with severe reflux.

The investigation and treatment of these patients has been described by Ross, Gibbon & Damanski (1964). In addition to the history and clinical findings, the following investigations are needed: estimation of the serum creatinine, urine culture, measurement of the residual urine, intravenous pyelogram (I.V.P.) cysto-urethrography, cystourethroscopy and urodynamic studies. The urodynamic studies include cystometry and measurement of the retrograde urethral resistance (Ross & Tinckler, 1959). Repeated assessment is required to determine the type and extent of bladder dysfunction and to find if there is any deterioration

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in the urinary tract. The most valuable investigations are the ratio of the residual urine to the bladder capacity, the cystourethrogram and the urodynamic studies. However, the management is based upon the needs of an individual patient and not on the result of any investigation in isolation.

If the detrusor is weak or obstruction present, the outflow resistance can be reduced by endoscopic surgery to enable the bladder to empty completely, avoiding the use of a permanent catheter. Obstruction may be present at the bladder neck or external sphincter and will be shown by the cystourethrogram and the urethral pressure profile. A spastic obstruction at the external sphincter can be dealt with by endoscopic surgery and any bladder-neck obstruction relieved by resection (Gibbon, 1973). In sacral lesions the two procedures can be combined, and in higher cord lesions with a delay in return of reflex detrusor activity early division of the external sphincter may speed up the rehabilitation of the patient. The findings in the various conditions with an associated bladder dysfunction will be discussed.

MULTIPLE SCLEROSIS AND NEUROPATHY

The protracted and unpredictable course of this condition and the emotional and occasionally uncooperative state of the patient present a challenge to any urologist attempting to relieve the urinary symptoms in multiple sclerosis. Pokanzer *et al.* (1963) found the average reduction of life expectancy for men was 9.5 years, for women 14.4 years in a series of over a thousand cases on Tyneside. Some of these were studied in detail from the urological aspect by Miller, Simpson and Yeates (1965). They found that 78 per cent had bladder symptoms. In 52 per cent the urinary symptoms were multiple and persistent, the commonest were urgency and frequency and over a third had urge incontinence. Repeated episodes of retention of urine were uncommon, occurring in two per cent while only two per cent of patients presented with bladder disturbance initially. The findings in this series are similar; half the patients had urge incontinence. The incidence of retention in this series is high (15/40) and reflects local interest in the neuropathic bladder as many cases of long standing were only referred when urological complications developed. Radiological evidence of chronic pyelonephritis was detected in ten out of the 40 cases, but only four had a raised serum creatinine and blood urea. No urinary tract stones were found. Urodynamic studies showed that uninhibited detrusor contractions present in 30, and 25 of these had marked pelvic floor and limb spasticity. Their symptoms suggested bladder dyssynergia, seven developed acute retention. In these patients with an overactive detrusor, six men were found to have spasm of the external sphincter with urethral resistance pressures as high as 80 cm. of water.

RESULTS OF TREATMENT

Five out of 20 patients with an inhibited bladder had their symptoms of frequency and urgency controlled with amitriptyline or imipramine. Three of these were women whose urge incontinence was cured with the addition of a Lyn Edwards incontinence device. Retention occurred in 15 out of the 40 cases. In six it was a painless retention with overflow and was relieved by the division of the external sphincter. In the nine with acute retention, six had earlier symptoms

of increasing urgency and hesitancy. Amongst the women an Otis urethrotomy was performed with success in all but one case whose retention was not relieved in spite of repeated urethral dilatations to 40F and she had to have a permanent indwelling catheter. Five men had their retention treated by external sphincter division. One woman treated early in the series could not tolerate the urethral catheter and had a suprapubic cystostomy; perhaps now she would be treated by Otis urethrotomy. Progression of the disease made it necessary for 20 patients to have a permanent catheter. All had tried with some success other methods (drugs, anal incontinence device and endoscopic surgery), but as their condition worsened they became more immobile and the catheter was needed. In some of the advanced cases the improvement was striking, for efficient bladder drainage is safer than ineffectual bladder function. The remaining patients with a catheter (10/40) had refused to take either drugs or undergo surgery. Sexual difficulties were common, impotence was found in 20 out of 25 men. Four of the patients with multiple sclerosis died; two with uraemia and chronic pyelonephritis, one with amyloidosis and the other with bronchopneumonia.

PERIPHERAL NEURITIS AND ACUTE MYELITIS

Peripheral neuritis, an acute myelitis of the Guillian-Barré type, transverse myelitis and one case of post-rubella vaccination causing a T8 lesion were the types of acute lesion producing paraplegia in 16 patients. Satisfactory bladder emptying was established in ten without surgery. The remainder were treated by endoscopic surgery with improvement in function.

PROLAPSED DISC LESIONS AND DEGENERATIVE DISEASE OF THE SPINE

These conditions may cause bladder dysfunction. Massive prolapse ('disc paraplegia') is well known as a cause of retention and emphasis on the lack of typical back and leg pain in many cases of bladder dysfunction due to a prolapsed disc was reported by Emmett (1968). In our series of 40 cases (Ross & Jameson, 1971) we commented upon the occult nature of some of these lesions and noted that some were improved by conservative measures. Since our original report we have studied a total of 50 cases and have noted similar findings and in 12 others with degenerative disease of the spine (spondylodis, osto-arthritis and spinal stenosis of varied aetiology). In these patients the presentation was as follows:

Occult-type bladder dysfunction	10
Permanent chronic retention	10
Transient post-operative retention	10
Temporary dysfunction (frequency, urgency)	10
Temporary acute retention preceded by bladder irritability	10
Total of disc cases	50
<i>Spinal Degenerative Disease</i>	
Permanent chronic retention	3
Temporary dysfunction	8
Temporary acute retention preceded by bladder irritability	1
Total	12

We noted that where multiple degenerative disc disease was present a patient may not only present with a painless retention but have an uninhibited bladder with urgency and frequency. Jones and Moore (1973) have confirmed our findings in a similar study. In these patients the uninhibited bladder may result from an irritative arachnoiditis from the trauma of disc disease. Impotence was present in a quarter of the men with lumbar-sacral disc lesions, whilst in patients with cervical disease an uninhibited bladder was more common.

Various spinal conditions were found in the paraplegic patients of which the commonest was tuberculosis. The patients with cervical spondylosis were tetraplegic with a reflex bladder. Two had spasm of the external sphincter which needed division, one had a bladder neck resection. Paget's disease was a cause of paraplegia in two cases, causing an upper neurone-type bladder lesion, none of these patients needed surgery. Ankylosing spondylosis and achondroplasia were other causes of cord compression and one patient became tetraplegic after minor trauma, having a congenital absence of the odontoid process. Although spina bifida is a well-known cause of neurogenic bladder dysfunction, relatively few cases were referred to the paraplegic centre. Eight adults were referred, four women and four men; two of the women had progressive dilatation of the upper urinary tract treated by an ileal conduit but one died of a coronary thrombosis five years after operation. The other two women and the two men were referred with a severe cystitis and were treated conservatively. The remaining men each had a division of the external sphincter.

MALIGNANT DISEASE

Encouraging feature of this group of paraplegic patients has been the long-term survival of life, including those with metastatic spinal deposits and those with primary cord tumours. Three patients had Hodgkin's disease with an average survival of seven years, dying of spread of the disease. These patients were particularly susceptible to staphylococcal septicaemia. The survival of the three with multiple myelomatosis was slightly longer at eight years, the only man who did not survive for more than five years died one and a half years after the onset of the disease with necrosis of the bladder following cyclophosphamide treatment. A man with metastatic thoracic deposits from lung cancer developed a Horner's syndrome and died six months later. The survival of the women with metastatic ovarian cancer was only a few months.

The spinal cord tumours are all alive and in part-time employment.

SPINAL TUBERCULOSIS

Most of the patients with spinal tuberculosis were in the younger age-group, the majority having a history of previous tubercle affecting the lung. A typical history is as follows:

A girl was aged 17 when pulmonary tuberculosis was detected at her first pregnancy in the ante-natal clinic in 1967. In 1969 she developed tuberculous meningitis and had a block of cerebrospinal fluid in the thoracic region and a bypass operation was performed. In the same year she developed a tuberculous pyonephrosis and the left kidney was removed. She had an upper motor neurone bladder and was dry using hourly voiding. Her bladder capacity was 200 ml. and she was helped by urethral dilatation and distension of the bladder under anaesthetic.

MISCELLANEOUS LESIONS

The management of four patients with an extradural abscess and five with an extradural tumour were treated in a similar manner to traumatic cases and do not require special comment. Fourteen patients had vascular lesions, half were of congenital type and presented in the young adult as an acute vascular incident. The other seven vascular lesions are of interest and were caused by spinal artery thrombosis, one following a lumbar aortogram, another after aortic surgery.

The remaining patients referred with a neuropathic bladder had a variety of uncommon conditions. Involvement of the detrusor in poliomyelitis occurs in under half the patients and is thought to be self-limiting (Clarke, 1956). Bladder overdistension has caused a fatal pyelonephritis (Keyes, 1935). Bladder sensation is retained and it is rare for the anal sphincter to be involved. Only one patient presented with urinary difficulties with poliomyelitis; he acquired the disease in 1955 and had cystitis. His urinary tract has remained normal and the initial urgency of micturition resolved after antibiotic treatment.

Another man had motor neurone disease; he voids using suprapubic pressure and the urinary tract is satisfactory. Herpes Zoster can cause detrusor paralysis when the L5 and sacral segments of the cord are affected. Bladder lesions may be seen at cystoscopy (Gibbon, 1956), and sphincter and bulbocavernosus reflexes are present. It responds to conservative treatment. Mention must be made of one rarity although the patient had no urinary symptoms. A patient was referred with myasthenia gravis and a thymic tumour. Cord degeneration may cause a neurogenic bladder. Two patients became paraplegic with pernicious anaemia, one was very spastic and required multiple operations for pressure sores and needed an adductor myotomy. She had coliform urinary infections which were relieved after her sores had been treated. Three other patients were seen in the Urological Centre with a subacute combined degeneration of the cord with bladder dysfunction. All responded to medical therapy. Diabetes can produce a bladder lesion similar to Tabes, but only two patients with a neurogenic bladder and diabetes have been referred for investigation. Four patients with neurosyphilis were referred. One had severe cord compression by a gumma which mimicked a disc lesion. All were middle aged and there was some delay in reaching a diagnosis before referral to a venereologist and a paraplegic unit.

CONCLUSION

The principles of the management of bladder dysfunction in patients with paraplegia of non-traumatic origin differs little from the management in the traumatic patient. However, some general measures affecting the treatment of the cause of paraplegia are of importance and the quality of life can be enhanced even in patients with metastatic disease. Urological management is only part of the general rehabilitation of the paralysed patient.

RÉSUMÉ

Les principes du traitement de la dysfonction vésico-sphinctérienne chez les malades avec une paraplégie d'origine non traumatique ne diffèrent pas, ou peu, des traitements du paraplégique traumatique. Cependant, des mesures d'ordre général affectant le traitement de la cause de la paraplégie elle-même sont d'importance, ainsi que la qualité de la

vie, même chez les malades avec une maladie d'origine métastatique. Le traitement urologique n'est en réalité qu'une partie de la réadaptation de ces malades paralysés.

ZUSAMMENFASSUNG

Die Behandlung der Dysfunktion der Blase bei non-traumatischer Paraplegie unterscheidet sich wenig von der Behandlung von den traumatischen Fällen, obwohl die allgemeinen Maßnahmen in der Behandlung der Ursachen der Paraplegie wichtig sind und das Leben selbst von Patienten mit metastatischer Erkrankung verbessert werden kann. Die urologische Behandlung ist nur ein Glied in der allgemeinen Rehabilitation des gelähmten Patienten.

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