TREATMENT IN GENERAL PRACTICE

This article is one of a series on the management of some diseases of the nervous system met with in general practice.

THE CARE OF THE PARAPLEGIC PATIENT

BY

PROFESSOR HENRY COHEN, M.D., F.R.C.P.

The care of a patient paralysed in both lower limbs demands a knowledge of the cause, type, and extent of the disease responsible; accurate diagnosis must precede rational treatment, and to this end clinical, radiological, blood, and spinal fluid examinations, including manometry, must be carried out.

Aetiological Factors

The cause may be: (1) removable; (2) transient; (3) irremovable.

1. Removable causes include extramedullary tumour, gumma, subacute combined degeneration, etc., and here the appropriate surgical, anti-syphilitic, or anti-anaemic measures can be instituted; but the patient will still require care until the damaged area of the cord has recovered its function.

2. Transient causes, being self-limited in whole or in part, but in which no specific therapy is available, include such conditions as myelitis and disseminated sclerosis: here the patient must be cared for in anticipation of maximal recovery until the cause is no longer active and its effects have passed.

3. With irremovable causes, such as laceration due to injury or gunshot wounds and the permanent residua of other diseases of the cord, no recovery of function can take place, but comfort can be achieved and grave painful complications avoided by careful treatment.

The type of paraplegia, whether upper motor neurone (for example, compression in the dorsal region) or lower motor neurone (for example, poliomyelitis, alcoholic peripheral neuritis), is of importance from the orthopaedic standpoint, as in the latter local treatment to the affected muscles is essential, and aims at the prevention of overstretching by appropriate splinting and the maintenance of their nutrition by adequate physiotherapy. Finally, the extent of the lesion—that is, the degree of paralysis, sensory disturbance, and lack of control of bladder and rectum—must be determined.

Practically, it will suffice to consider in detail the treatment of a patient completely paralysed and anaesthetic below the waist with loss of control of both bladder and rectum, for the lesser degrees of cord involvement can be treated on similar though modified lines. Such a patient is extremely susceptible to two complicating infections—of the skin and of the urinary tract. If either of these occurs the essential cord lesion is aggravated by the resulting chronic toxæmia or septicaemia, for the damaged area of spinal cord is a *locus minoris resistentiae*, and recovery will thus be retarded or prevented.

Care of Skin

The patient should lie between smooth sheets on a warm water-bed, the greatest care being taken to avoid rucks in the bedclothes. The lower limbs should be protected by a cradle, so that they are not directly touched by

the bedclothes, and the cradle should be sufficiently high to allow full flexion of the lower limbs, so that if involuntary flexor spasms occur there is no chafing of the knees. Hot-water bottles should not be placed in the bed unless so fully protected that, should they be displaced and lie against the anaesthetic skin, they will not be sufficiently hot to burn the patient. A daily bath with soap and water should be given, after which the skin should be thoroughly dried and then hardened by massaging eau-de-Cologne or methylated spirits gently into it, especially over pressure points (the lower vertebrae, sacrum, tuber ischii, heels, great trochanters). If the skin is inflamed alcohol may prove too irritating, and for it should be substituted a boric acid lotion (a saturated solution of boric acid in cold water containing about 15 grains to the ounce). After this friction is completed and the skin thoroughly dry, a dusting powder should be applied of bismuth subgallate or

R	Acid. borici ...	...	...	...	1 part
	Zinc. oxidi ...	...	...	...	2 parts
	Pulv. amyli ...	...	...	...	3 parts

The pressure points mentioned above should be specially protected by small pads, rings, or bandages, so that the pressure is taken diffusely by the surrounding parts: for example, the heel can be made to lie in the hollow of a soft ring; the feet should be supported by a bolster; and, if marked adduction of the thighs is present, the knees and heels should be kept separated by a pillow or ring. Skin nutrition will be improved by gentle passive movements of the limbs and by altering the position of the patient every few hours, but care must be taken to avoid chafing the skin; the patient must be lifted and not dragged across the bed. A rope or chain overhanging the bed will allow the patient to raise himself, but with this there is always a danger of dragging and chafing the buttocks or lower limbs.

Sometimes, despite the greatest care, bed-sores develop, or are present when the patient is first seen. If they are of the "black blister" type the serous content should be aspirated and the skin left intact as a protective covering; if ulceration has supervened compresses of the boric lotion mentioned above or of hydrogen peroxide (10 volumes) should be applied for ten to fifteen minutes twice daily and the part then dressed with unguentum hydrargyri ammoniatum or a zinc paste:

R	Zinc. oxidi ...	...	...	...	} equal parts of each
	Talc ...	...	...	...	
	Adipis lanae ...	...	...	...	
	Paraff. moll. alb. ...	...	...	...	

If deep sloughs appear they should be removed by curetting. Pus should be evacuated, the gangrenous edges of the ulcer should be cut away, and the surface cleaned with a 1 per cent. solution of silver nitrate; then a dry antiseptic dusting powder should be applied, such as iodoform or a powder consisting of equal parts of chloretone and boric acid.

Care of Bladder

If the spinal cord is suddenly and completely severed there is retention of urine, the bladder distends until overflow dribbling results, and there is absolute constipation. In a period varying from twenty-five days to a few weeks this is gradually replaced by automatic or

reflex emptying of the bladder and occasionally of the rectum, emptying of the organ being more or less complete with a certain degree of distension—the adequate stimulus. But this second and desirable stage will not arise if gross sepsis of the skin or urinary tract supervenes, and the bladder will remain permanently paralysed. The most important factor facilitating urinary sepsis is over-distension of the bladder. So long as there is no automatic emptying the bladder should be catheterized every six hours with the strictest aseptic precautions. The operator should scrub up as for a surgical operation; the meatus should be cleaned and the anterior urethra irrigated with a 1 in 4,000 solution of oxycyanide of mercury before the catheter is passed; the bladder should be completely emptied, and after each alternate catheterization—that is, twice daily—150 c.cm. of the solution of oxycyanide of mercury at a temperature of 100° F. should be allowed to run into the bladder gently (not irrigated under pressure) and then drawn off. In my experience a tied-in or self-retaining catheter increases the danger of urethritis and cystitis. Between catheterization the penis should be inserted into a swan-necked bottle urinal, so that if involuntary micturition occurs soiling of the bed and skin is avoided. As a prophylactic against urinary infection it is customary to give a mixture containing hexamine and acid sodium phosphate, but a more stable mixture and a better acidifier is:

R. Ammon. chlor. gr. xx
Hexaminae gr. x
Extract. glycyrrhizae liq. ℥ xxv
Aquam ad. 3 ss
3 ss four-hourly in a wineglass of water.

If infection takes place the nature of the invading organism and the reaction of the urine should be determined. If the urine is alkaline the acid mixture suggested above should be continued and the bladder irrigated three to four times a day with a 1 in 4,000 solution of oxycyanide of mercury at 100° F., but not more than 150 c.cm. of the solution should be introduced at any one time, in order that over-distension of the bladder be avoided. Alternative solutions worthy of trial are (a) a half-saturated solution of boric acid, and (b) brilliant green, 1 in 2,000 solution. If the reaction of the urine is acid the following alkaline mixture should be given at four-hourly intervals, and the dose adjusted so as to maintain the urine alkaline.

R. Potass. citrat. 5 i
Tinct. hyoscyami ℥ xx
Infus. buchu 5 ii
Aquam ad. 3 i

The bladder should be washed out with a solution of sodium bicarbonate (1 drachm in half a pint of water), normal saline, or a solution of silver nitrate, 1 in 2,000. If the urinary infection tends to persist despite simple treatment on the lines described above, or if a pre-existing urethral stricture renders catheterization difficult, a suprapubic cystotomy with continuous drainage and irrigation of the bladder through the suprapubic stoma should be performed.

Care of Bowels

With the bladder, so with the rectum, the aim is to achieve automatic emptying. A simple aperient—for example, a teaspoonful of liquid extract of cascara or two teaspoonfuls of confection of senna—is given each night, and a simple rectal washout of one pint of normal saline the next morning. The rectum may leak for half an hour to one hour, and it is well to leave the patient for an hour on a special large-sized indiarubber air-cushioned bed-pan; after this an absorbent pad must be applied to avoid soiling the skin. It is necessary to avoid too strong purgation, for this sometimes leads to sloughing

of the rectal mucous membrane. Occasionally abdominal distension supervenes and causes much local and respiratory discomfort; this can often be relieved by passing a rectal tube; turpentine and other strong enemata are best avoided lest they lead to sloughing of the mucous membrane. If, in spite of the rectal tube, distension persists, 1 c.cm. of prostigmin (Hoffman-La Roche), containing 1/2 mg. of the active substance, or 1 c.cm. of pituitrin should be given subcutaneously or intramuscularly and repeated in four to six hours if necessary.

Excessive Sweating and Muscular Spasms

In many cases of severe damage to the spinal cord paroxysms of excessive sweating and sudden painful involuntary spasms of the paralysed limbs occur below the level of the lesion, and can be excited by almost any stimulus that sends afferent impulses into the spinal cord below the lesion—for example, by stroking the skin of the lower limbs, or injecting fluid into bladder or rectum. The excessive sweating is serious, because the moisture increases the risk of skin sepsis. The muscular spasms are not only painful but they are extremely disturbing to the patient and interfere with sleep. In both instances, therefore, the afferent stimuli which tend to produce these reflexes should so far as possible be avoided by attention to the details outlined above. Atropine sulphate, 1/100 grain, once or twice daily, will sometimes help to control the sweating. The painful spasms of the legs are often relieved by radiant heat applied for twenty minutes daily, but sedatives are frequently necessary, and the most satisfactory are luminal, 1/2 grain, with hyoscine hydrobromide, 1/200 grain, thrice daily; or the following mixture:

R. Tinct. gelsem. ℥ xx
Tinct. stramon. ℥ x
Sod. brom. gr. x
Liq. arsenicalis ℥ ii
Aquam chlorof. ad. 3 ss
3 ss t.d.s.

If pain is severe 10 grains of aspirin thrice daily should be prescribed. Opium preparations are best avoided.

Physiotherapy

Apart from passive movements of the paralysed limbs, which are important in maintaining the circulation, gentle massage to the legs, back, and abdomen should be given, but no electrical treatment is indicated. Voluntary movement should, however, be encouraged.

When the paraplegia results from a lesion of the anterior horn cells (for example, poliomyelitis), cauda equina (for example, injury or radiculitis), or peripheral neuritis, the same general principles of treatment apply, but the limb must be carefully splinted, so that affected muscles are not over-stretched—an orthopaedic problem.

Conclusion

The general care of the paraplegic patient is of as great importance as the removal of the cause of the paraplegia; only meticulous attention to detail will prevent a fascinating and live problem from becoming a dead failure. But physical treatment is not all; it is of the utmost importance to surround the patient with an atmosphere both encouraging and optimistic, to provide him with suitable mental interests, and, if possible, with an occupation that will help him forget the more tragic aspects of his disability. As soon as he is able he should be taken out of doors and provided with some form of auticycle, so that he may be his own master. The individual case presents its individual problems, and methods can often be devised for the individual to increase his comfort.