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## Discussion

DR. MARY PRICE (*U.S.A.*). I would like to enquire of Dr. Cibeira in what percentage of his ilial diversion patients did he achieve sterility of urine.

DR. J. CIBEIRA (*Argentina*). In 45 patients the urinary tract dilatation became better but the urine became sterile in only 35 patients and the rest were no worse.

## THE NEUROVEGETATIVE SYNDROME OF VESICAL DISTENSION IN PARAPLEGICS. PREVENTION AND THERAPY

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UNDOUBTEDLY one of the most distressing complications of cord lesions is the neurovegetative syndrome from vesical distension. The subject is by no means a new one: of the writers who have devoted special attention to it I would recall Guttmann and Whitteridge, Munro, Maloudeau, Gilliat, Thompson and Witham. Today, therefore, I merely wish to give a brief summing-up, and in particular to give an outline of the therapeutic methods adopted at the Milan Traumatologic Center.

I would recall briefly that the main characteristics of the syndrome are as follows:

1. It is a syndrome that is noted exclusively in lesions situated at a high level of the cord and above all in tetraplegics.
2. Its clinical manifestations occur following distention of the vesical wall, either due to spontaneous filling with urine from the ureters or to the introduction

of fluid into the bladder via the catheter. Occasionally they appear simply as a result of a catheter through the urethra. These manifestations disappear immediately after the emptying of the bladder.

3. The clinical manifestations are well known, though it is not always the same ones that predominate. They are mainly shivering, pronounced hyperhydrosis, sudden acute headache, pallor and a marked rise in blood pressure.

4. When after inadequate treatment the bladder has been allowed to become small, spastic and sclerotic, it sometimes suffices to introduce a few ccs. of fluid to start up an attack.

5. This being the case, it is clear that we must do everything within our power to prevent the bladder of the paraplegic, and above all that of the tetraplegic, from being transformed into a small spastic and non-extensible bladder.

6. Treatment may be preventive or curative. In our opinion it should be mainly preventive. Above all it is necessary to accustom the vesical wall to periodic distention *right from the start*. This distention must, of course, be appropriate in degree. It is indispensable to maintain this treatment until micturition has been re-established in a satisfactory manner.

7. This can be attained first and foremost by avoiding at all costs treatment by means of the simple indwelling catheter (that is a continuously open catheter), the effect of which is to maintain the bladder in a permanently empty and relaxed state. On the contrary, the bladder must be maintained permanently or almost permanently in a state of movement, phases of filling being alternated with phases of emptying. This can be done by various methods:

- (i) method of catheterisation executed twice or three times a day;
- (ii) method of occluded catheter intermittently opened;
- (iii) tidal drainage. (This is the method normally employed in our department.)

8. The fundamental point is that the bladder musculature should be kept in constant activity. Right from the start the smooth muscular cells must be accustomed to alternating phases of distention and relaxation.

9. For this reason, from the very earliest stages in the treatment of tetraplegics in particular, great care must be taken to avoid transforming the bladder into a small hypertonic-spastic bladder. A possible tendency on the part of the vesical musculature to assume a spastic condition may be evidenced right from the start by frequent cystometries, but often simply clinical observation is enough.

10. In this last case anti-cholinergic drugs such as bantnine and Pervagal and anti-spastic drugs in general will be found very useful from the outset: their action and dosage must be frequently and systematically controlled, and the reaction of the bladder to filling observed.

11. In our department we have adopted the therapeutic concepts outlined above, and we have never observed serious cases of syndromes from vesical distention, provided the treatment was applied at the outset. We have often observed a tendency to the syndrome in initial cases, but they all responded more or less rapidly to our therapy.

12. We also apply a similar type of treatment in cases of paraplegia and tetraplegia where the syndrome of distention has existed for a considerable time. This happens in many cases of tetraplegics who come to us after they have been hospitalised for long periods in other non-specialised hospitals where the danger of

this syndrome is neglected or not known, and where they have been treated over a long period with the simple indwelling catheter. In these cases, too, the treatment is basically the same. The purpose of the therapy is twofold: on the one hand to increase the capacity of the bladder, on the other to accustom it to what may be called cyclic dilatatory gymnastics, by beginning to distend it with quite small amounts (only a few ccs. of fluid) and increasing these amounts gradually over a period. At our hospital this is done in the great majority of cases by means of tidal drainage. We begin with the exit tube at a very low level (2 cm., or even during the first few days, 0 cc.), very gradually increasing the level of the tube curve later. This requires patience, attention and frequent check-ups, but first and foremost active co-operation on the part of the patient, who from the start must inevitably be prepared to endure some discomfort (hyperhydrosis, etc.).

13. It goes without saying that before beginning the treatment it is necessary to establish that no calculosis or vesical incrustations are present, and also that internal and local antiseptic treatment must be practised, because these patients almost always present cystitis. Often before beginning the tidal drainage treatment we execute for some days a continuous washout with antiseptic solutions by means of a Foley catheter from which the balloon has been removed (in this way we obtain a two-way catheter). On other occasions the capacity of the bladder is so small at the outset of the fluid introduced is expelled from the urethra around the catheter: in this case we sometimes adopt the system of binding the penis around the catheter with a piece of soft gauze to prevent such expulsion of urine: naturally the pressure must never have a traumatising effect.

14. We have also noted the efficacy in the distention syndrome of vertebral alcoholisation: when this is executed in cases of serious spasticity in striated muscles we note, almost without exception, an increase in vesical capacity and the disappearance of the syndrome.

Naturally if the syndrome has lasted and has been left untreated for a long time the results are uncertain and partial, and sometimes minimal. They depend first and foremost on the degree of co-operation on the part of the patient.

At all events the fundamental fact is *awareness*, on the part of the medical staff handling paraplegics, of the danger in high cord lesions of treatment with the permanently open indwelling catheter if it is used from the outset and for protracted or very protracted periods, as the method inevitably results in a small spastic bladder, and the neurovegetative syndrome is the unavoidable consequence. And we unfortunately know that in the great majority of cases this is the most widely used method in non-specialised hospitals.

The situation is the more regrettable if we consider that it is precisely in cases of high cord lesions, where the lower neuron has been preserved intact, that with a rational rehabilitation therapy it is possible to achieve a good reflex bladder.