

Environmental Control and Social Integration of a High-lesion Tetraplegic Patient: Case Report*

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Summary

In the rehabilitation of high lesion tetraplegic patients, we should always aim at re-integration into the family. For these patients electronic devices and some Aids for Daily Living (ADL) assistance are of the utmost importance.

Key words: *High tetraplegic patients; ADL assistance; Electronic devices.*

Case report

A 23-year-old patient was admitted to our rehabilitation unit 6 years ago with a traumatic compression of C3, resulting in a complete C4 neurological lesion. Fortunately his diaphragm was still intact so that he was not dependent on artificial respiration. He developed several intercurrent problems such as urinary tract infections, hypoxia and, in particular, severe spasticity (which was controlled with phenolizations and anterior radicellotomy from C4 to C8).

He stayed in hospital for 12 months, but then was eager to go home.

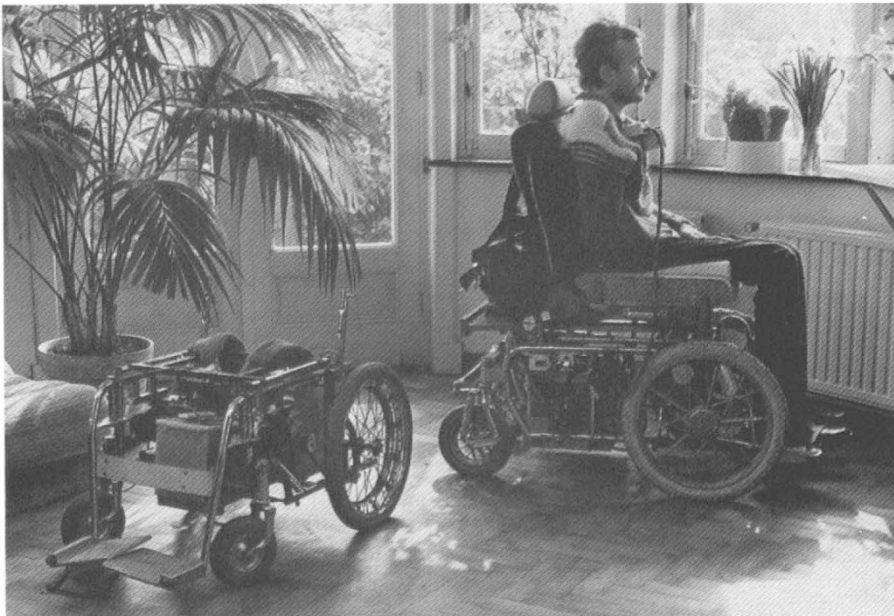
ADL-assistance

A high cervical cord lesion is all too often associated with total patient dependence. In the early stages the patient considers himself useless, and a burden to his environment (Burnham, 1978). He is dependent on others for such fundamental acts as feeding, dressing, taking care of the bowels and bladder control. But as his remaining abilities are maximised, he regains his self-esteem by assuming the responsibility for himself and his life style.

Our patient was looking forward to living at home, but did not wish to depend on his girlfriend's assistance too much.

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Twice a day a nurse, paid by social security, calls to assist him with ADL. At his own expense he further appeals to volunteers to help him out of bed or to assist him in any other way. This is a satisfactory solution as it permits the patient to function as an individual, impossible in an institution or residential setting (Richards, 1978), and it somewhat relieves the burden on the other members of the household. However, an even better solution is a Focus-project, which permits handicapped people to live independently among able-bodied people, with wheelchair-adapted houses and with ADL assistance 24 hours a day, paid for by the community instead of by the patient himself (Buijk, 1980). Our patient is an active member of the group of people who are starting a new Focus-project in Ghent.



Wheelchair (Figure)

The seat is important and must be comfortable. The feet should rest flat on the footplates, the elbows and forearms on the arm supports without the shoulders being hunched. Sometimes elevated footrests are necessary, especially if the legs become oedematous. The backrest should be adjustable from a vertical to a horizontal position (Crewe, 1979). A correct position will not compromise the circulation and will ensure better breathing, because the diaphragm can work effectively (McKenzie, 1973). Combined with a suitable antidecubitus cushion, a correct position prevents pressure necrosis and deformation of the body. It also prolongs the time the wheelchair user can remain seated. The seat was individually adapted, and had a foam cushion. (Gillott, 1983).

He was provided with an electronically powered wheelchair with a chin control (MEYRA-Germany). The switchbox with handles rests on the shoulders. The switches are operated by the neck muscles. Since such an extensively used

electronic wheelchair can be subject to defects, a spare electronic wheelchair is necessary. This convertible chair has several advantages:

1. The choice of a chassis is wider.
2. It is less expensive than two complete wheelchairs.
3. The general appearance can be improved.
4. It is more practical because it is easier to transfer the seat with the patient; it is more comfortable and the correct position can be maintained.

A third (mechanical), wheelchair is also indispensable to reach places inaccessible to an electric wheelchair.

Mouthstick

A light-weight mouthstick was constructed by a dental mechanic. The mouth-piece is strengthened with a light-metal frame. It protects the teeth and must allow speech when in place, and must not obstruct the tongue or palate (Dingemans, 1978). The stick itself consists of an aluminium tube with a rubber button at its end.

A second mouthstick permits the patient to write and turn pages.

Computer

Since a high-level tetraplegic is unable to use simple devices (Berard, 1979), our patient was provided with a personal computer, which was not too sophisticated or expensive. Such a home computer is now an economic reality and gives many patients a certain degree of independence. It also has a vocational and recreational function (Andrews, 1979). The computer is used for text processing, storage and 'recalling data, addresses and diary', since the patient does secretarial work for the Focus-project. All information and letters can be typed through the printer and all data can be stored on magnetic discs. The computer can be programmed in basic and the patient can program his machine and develop his own software. For someone who is physically very disabled this provides useful mental stimulation. Using very simple programmes named Menu, it is possible to control an interphone through which the patient can communicate with people in the house, garden or at the front door. Use of the telephone is possible by either dialling the number himself or using the programmed telephone numbers. He uses the door-switch to let visitors in. He can operate the television, tape-recorder, and radio. The computer can also be operated with the voice but the patient prefers the mouthstick.

Adaptations to the house and car

The adaptations to the house are relatively cheap. The working area is close to the computer table, especially for writing and reading, the dining-room in which an electric wheelchair can move around easily, the electric bed and inclined plane.

Conclusion

Even high-level tetraplegics can live an almost normal social life, provided they

are given the opportunity to live at home. Home care is feasible with the use of electronic devices, ADL assistance and some adaptations to the house.

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