

## Total rehabilitation for amputees in special conditions

T. STEINBACH

*Orthopaedic Rehabilitation Department, Chaim Sheba Medical Centre, Tel-Aviv*

War may be defined in military, economic, social or demographic terms. From the medical point of view war may be regarded as a sudden "epidemic" of wounds of varying degrees of severity. These injuries necessitate urgent, sustained, and diversified treatment.

The categories of wounded requiring treatment are dependent largely upon local conditions and the types of weapons employed. The experience of our Centre of Rehabilitation is based, unfortunately, on four successive wars in the last 25 years.

With the use of modern sophisticated weapons, a high percentage of casualties are the subject of multiple injuries and in variable psychological conditions. For these patients the treatment can be successful only in a hospital that is equipped to provide intensive care in a variety of specialities.

Whether an amputation occurs as a single injury or as part of multiple trauma, the best treatment can be offered only in a comprehensive Rehabilitation Centre. The rehabilitation of an amputee is not only a surgical or limb-fitting problem but a larger concept in which psychological, social, and professional aspects must be dealt with as quickly as possible by a well-trained team.

The task of our Centre was to perform in this framework the total rehabilitation of the amputees of the last war.

Of the casualties admitted 30 per cent were amputations of the upper limb (16 per cent above-elbow and 14 per cent below-elbow), and 70 per cent of amputations of the lower limb (2 per cent hip disarticulation, 27 per cent above-knee, 5 per cent through-knee, 30 per cent below-knee, 6 per cent Syme's). Eight per cent of all amputees were double (among them one double below-elbow and one double above-

elbow). Two soldiers were triple amputees (below-knee, above-knee, above-elbow). In 50 per cent of the cases the amputation was not the sole injury, for example, among amputations of the upper limb 23 per cent also had eye injuries and diminution of visual feedback.

In 25 per cent of the cases admitted to the Centre, it was necessary to revise the stump to provide a good primary fitting. In all these revisions a myoplastic technique was used. The stump was judged to be in good condition when it healed "per primam", was not abnormally sensitive and was without scars on the weight-bearing areas. It was important that the proximal joint moved freely and that the length of the stump was sufficient to serve as a functional lever.

Upper-limb amputees were fitted with an "Orthoplast" socket and hook. Training in the use of the prosthesis began as soon as local and general conditions permitted and was conducted by an occupational therapist. On completion of the training programme a cosmetic hand was provided and several patients also received special tools to meet their specific vocational needs.

For the lower-limb amputees the Otto Bock modular prosthesis was used in all cases except through-knee and Syme's. Assembled on a plaster of Paris cast it met the necessities of an early fitting in the first week after amputation in all cases where supplementary injury permitted ambulation. The same modular unit was transferred to a plastic or wood socket when conditions of stump healing were satisfactory. No special problems arose in alignment of the prosthesis. Individual training followed by group training was given by qualified physiotherapists.

At admission every patient was examined by a psychologist who provided special care in all cases in which emotional impact or post-traumatic reactions appeared. A third of all cases received counselling, another third psycho-

---

All correspondence to be addressed to: T. Steinbach, M.D., Orthopaedic Rehabilitation Department, Chaim Sheba Medical Centre, Tel-Hashomer, Tel-Aviv, Israel.

therapy either as individuals or in a group. For the remainder, no special care was necessary.

Manifestations of shock and depression in the first phase were found in 10 per cent of cases, aggression and impulsivity in about 15 per cent, neurotic reactions and somatic pre-occupations, in later phases, were discovered in 20 per cent of cases. Only 5 per cent with sociopathic tendencies had difficulties in adjustment. The "phantom pains" (10 per cent), found at the beginning, disappeared slowly after the fitting of prostheses.

The aims of vocational rehabilitation are:

- (1) Introduction of functional activity of the patient with every possible part of his body.
- (2) In upper-limb amputations, transferral of the function of the dominant hand to the nondominant one while training for dexterity, co-ordination and gross movement. Fifty three per cent of amputees lost the dominant hand and 23 per cent had other injuries in the remaining hand.
- (3) Activities and daily living training by use of the prosthesis.
- (4) Training for work tolerance and endurance.
- (5) Vocational evaluation.
- (6) Motivation towards a vocational goal.

It was our policy to introduce vocational counselling as soon as possible after the injury. We found it to be of utmost importance in motivating the patient to think and plan his future, and to evaluate and assess realistically his abilities, potential, aptitudes and interests. In this way, we helped him to prepare a complete rehabilitation plan while he was still in the Centre. For this goal we used not only all the counselling techniques of evaluation, information, interpretation and manipulation of environment, but also had a complete tutoring programme in most high-school and specific vocational subjects. The individual lessons were taught by 26 professional teachers who volunteered their services.

We tried to bridge the gap between the rehabilitation centre and the outside world. Social workers played an important role in dealing with personal, familial, social and living problems. After a period of instruction and training, all the amputees, except those with severe diminution of visual acuity, received driving licences and were independent in transport.

Subsequently most of the amputees were discharged and four months after the beginning of the war the following figures show the vocational rehabilitation plans of our patients.

Vocational Plan	Upper Lower		
	Total	Limb	Limb
	%	%	%
Returning to same job	28	6	22
Returning to same studies	19	10	9
Changing job	18	5	13
Changing studies	31	6	25
Transferred or without precise programme	4	3	1

Contact is maintained with our patients after they are discharged from the Centre. A number of patients may change their plans under the influence of family, friends and other advisers and it is important that the rehabilitation programme retains a degree of flexibility.

A comprehensive rehabilitation programme must be prepared and applied to each patient as soon as possible after they are admitted to the rehabilitation centre.

#### Acknowledgements

The psychologist was S. Gur; the team of limb-fitters was headed by H. Bar Goren; the physiotherapy group was led by N. Elinson; the occupational therapists by R. Goldman and social workers by N. Rosman.

To them I express my deep acknowledgements.