

REHABILITATION AND CONVALESCENCE AFTER SURGERY

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ABSTRACT. Six week's pre-operative physical training by female gallstone patients resulted in an improvement in their general condition and physical working capacity. The effect of the training disappeared in the course of the first postoperative week, however. It seems, that, from a general clinical point of view, the patients carrying out preoperative exercise were affected less by surgical trauma than was a control group. Physical training both before and after operation apparently resulted in a rapid recovery of working capacity, which was reflected in greater activity and psychologic stability, and fitness for return to normal work. It would seem that a suitable programme of physical training before and after an operation tends to shorten the period of convalescence.

Technological progress in various fields of our social life and the development of private motor-ing have led to a decrease in physical activity. In recent years, however, intensive propaganda via mass media throughout the world has been made on behalf of physical training, which is regarded as important from the aspect of military service as well as for the well-being of the individual. The beneficial effect of physical training in the prevention and cure of illness must also be considered in this light. Among other medical arguments is the general clinical experience that fitness promotes resistance to the effects of accidents and operations. Physical training has been recommended in such conditions as obesity, coronary artery disease, peripheral vascular disease, vasoregulatory asthenia and schizophrenia.

When patients are to undergo an elective surgical procedure it is of prime importance that their pre-operative condition be so good that recovery will not be marred by complications. Physical activity should be regarded as an essential component of all pre-operative therapy. Unnecessary rest or confinement to bed before an operation may

well increase the risk of postoperative complications such as atelectasis and thrombosis.

At the University Hospital at Uppsala investigations on the possibilities and the effect of using ambulant physical training in surgical patients have been carried on for several years. The general aim has been to get the patients into optimal physical condition before operation, so as to diminish the risks associated with surgical trauma. The intention has also been to build up stamina against postoperative fatigue and so facilitate return to work at the end of convalescence. Naturally, the majority of patients show a completely normal postoperative recovery; but the question is, can recovery be accelerated by suitable physiotherapy, for example, physical training, breathing exercises and ultra-early postoperative ambulation? This treatment implies a form of surgical rehabilitation that should be begun in good time before the planned operation.

SELECTION AND METHODS

Female gall-stone patients aged 20-50 years were invited by mail to take part in ambulant physical training before their operation. Other patients with radiologically confirmed gall-stone disease were offered both pre- and post-operative training, or were placed in a group where no training was to be carried out. In the selection consideration was given to age, weight and height. Before training began the patients underwent an exercise test on a bicycle ergometer to determine the physical working capacity. The test was carried out in accordance with the principles followed at the Laboratory of Clinical Physiology, Karolinska Hospital, Stockholm. Likewise, the pulmonary function (by spirometry) and blood volume (by the alveolar carbon monoxide method) were determined on certain occasions, before and after the operation. Pre-operatively, all the patients undergoing training were required to perform breathing exercises. Some of them were also given

intercostal blocks to advance ambulation and improve post-operative breathing.

Physical training

The chosen training groups began their training 6 weeks before the planned operation. Training was conducted by a physiotherapist on 2 evenings a week, and it took place in a gymnasium situated in the hospital grounds. Each training session consisted of 30 minutes' running and gymnastics to music. It was essential that large muscle groups should be exercised and that the effect on the circulation should be optimal. Special exercises were performed to strengthen the abdominal and back muscles (Mossfeldt's technique). The intensity of training was low to start with but was gradually increased. The patients took part in 10-12 training evenings out of a maximum of 12 before their operation. During the convalescent period (4 weeks) training was begun 10 days after the operation, when at least 5 training evenings were prescribed. Exercises involving the abdominal musculature were avoided in the first training sessions so as not to interfere with wound healing (the operation had included an oblique incision at the right hypochondrium—Kocher's incision).

RESULTS

The material comprised 92 patients, 63 of whom were given some form of physical training; the remaining 29 composed a control group. The physical working capacity (W_{170} , the absolute work load at a pulse rate of 170 beats per minute and in a circulatory steady state) in these 92 patients was initially 550 kpm/min (range 200-900), a value that is regarded as low for a Swedish woman today. When the series was divided according to age, 20-34 years and 35-50 years, the younger women proved to have a lower initial working capacity. No difference was found between women who had only gall-stones (cholelithiasis) and those in whom this condition was

complicated by chronic cholecystitis. In both groups the W_{170} was initially about 550 kpm/min.

After 4 weeks' physical training the majority of the patients noticed that routine work at home, in shops or at the office was easier than before. At this time there was on average an increase in physical working capacity, as measured on the bicycle ergometer, of 20 per cent, and this remained up to the time of operation. This increase was more rapid for patients with a low than high working capacity. During the first postoperative week the level reached before operation returned nearly to the initial level. Surgical trauma and lowered physical activity during convalescence thus greatly affected the physical working capacity. At the time of the physical assessment 4 weeks after operation no essential difference in physical working capacity was found between the group receiving only preoperative training and the control group (about 8 per cent above the initial value).

Patients receiving both pre- and postoperative training showed the most rapid recovery of working capacity during convalescence. Four weeks after operation the physical working capacity of these patients was 20-25 per cent above the initial value. Twelve patients out of fifteen in this group stated that they were able to return to their ordinary work after 3 weeks' convalescence instead of 4, which is considered more normal.

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