Study on the Rehabilitation Effects of Horticultural Therapy on Finger Motion in Elderly Clients

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Abstract — The effect of rehabilitation for the finger by horticultural therapy was examined. The client made it to the elderly people in the nursing home. They participated in gardening recreation once a week. The main of the activity was assumed watering that used the spray. The rehabilitation for a range of motion of the finger was assumed to be an aim by gripping the spray. The effect of rehabilitation was admitted though it was little as a result of the activity of 8 months. Most client maintained a standard value to range of motion on thumb and index finger. Especially, the effect of improving it from the standard value was admitted as for Flexion. It was suggested that operation that used the spray be effective to the rehabilitation for a range of motion on thumb and index finger.

Keyword — Horticultural therapy, Elderly people, Rehabilitation, Hand and Finger, Range of motion

1. Purpose

Horticultural activities consist of a variety of physical motions that stimulate the minds and bodies of the elderly. It is thus widely and empirically understood that various gardening motions contribute to the maintenance and improvement of physical functions [2, 4, 5]. As a case study, the authors investigated the effects of horticultural therapy on the mental and physical condition of clients in the *Midorinosato* special nursing home in Yokohama, Japan [3]. Although significant effects were not generally found, a slight improvement was detected in some subjects following participation in horticultural activities. [1] Since such activities include various motions of the hands and finger tips, the present study examined the rehabilitation effect of horticultural activity on finger motion in elderly clients.

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2. Subjects and Method

The study subjects were 10 clients of the *Midorinosato* special nursing home who participate in that institution's weekly (Photo.1), 60-minute horticultural activity program (Photo.2) , which began in April 2007 and still continues today. The main motion was gripping a spray can for the purpose of finger rehabilitation (Photo.3, 4). The fingers' range of motion (ROM) was measured to determine the degree of rehabilitation benefit (Photo.5, 6). The first measurement was made in May 2007. Second and third assessments were performed respectively in August and December of the same year, following participation in horticultural activities.

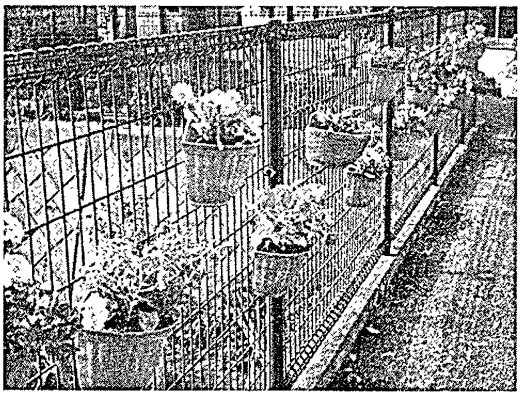

Photo.1 Gardening area at special nursing home *Midorinosato*

Photo.2 Situation of gardening activity

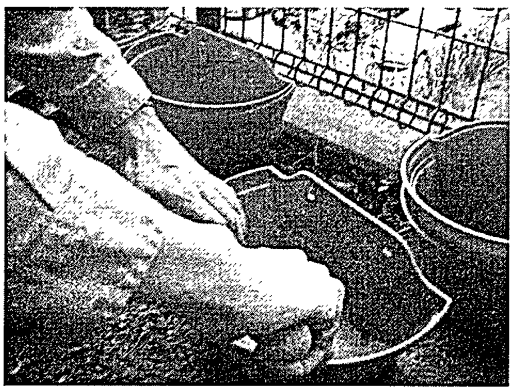

Photo.3 Gardening tool for horticultural therapy

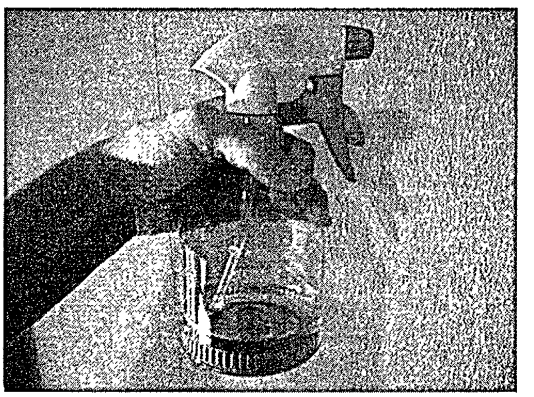

Photo.4 Spray used for watering aiming at rehabilitation

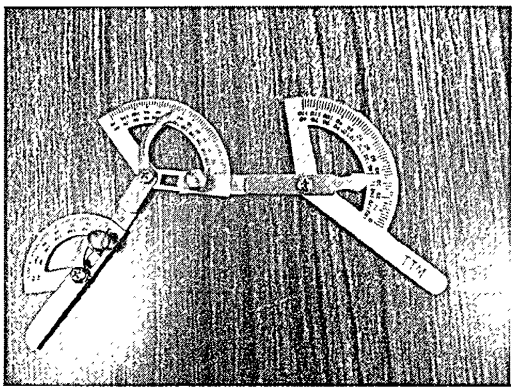

Photo.5 Measuring instrument in range of motion for finger

Photo.6 Situation of measurement for range of motion

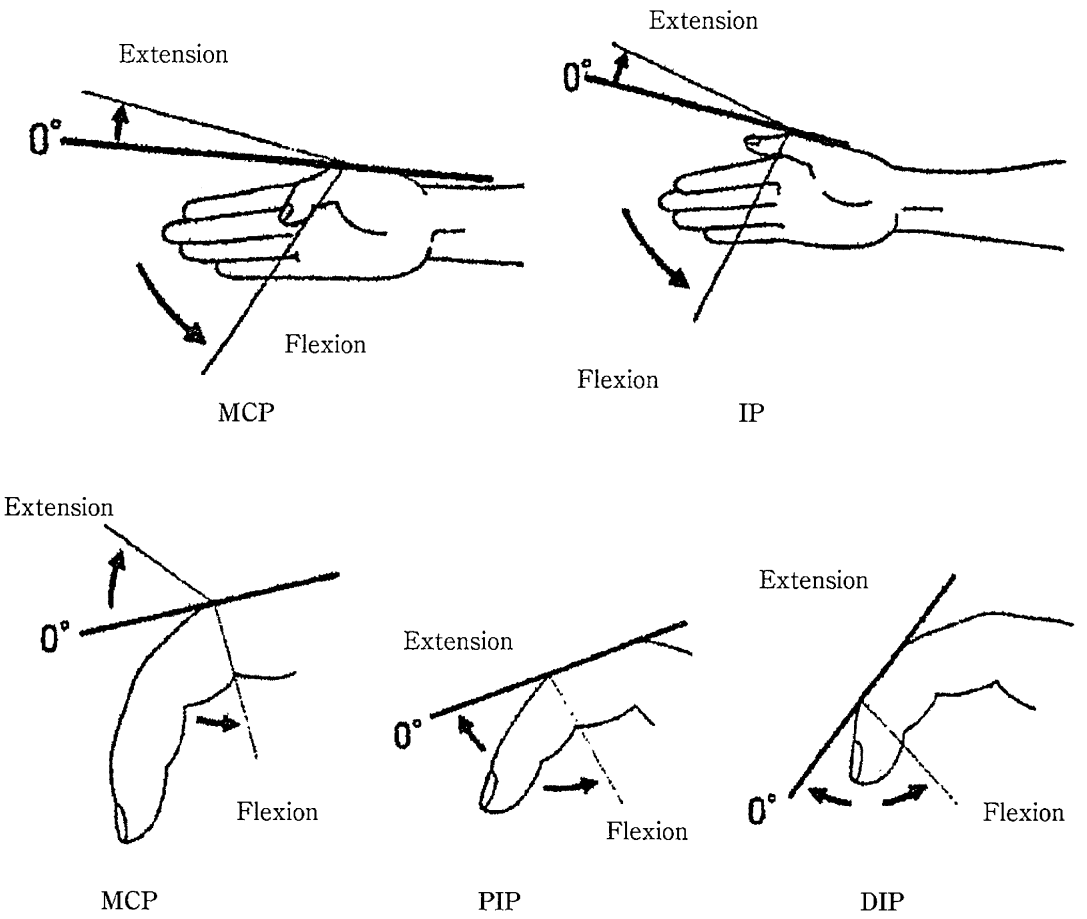

Fig.1 Range of motion at thumb and index finger

3. Results and Discussion

Baseline measurements were classified into standard and declining groups for analysis. Clients in the standard group were encouraged to maintain their current ROM level; those in the declining group were encouraged to improve their ROM level.

3.1 Thumb/flexion, MCP: The standard score is 60. At baseline, the standard score was observed in all clients. Their scores further improved over the long term.(Fig.2).

3.2 Thumb/extension, MCP: The standard score is 10. At baseline, the standard score was observed in a majority of clients. Their scores subsequently remained within the standard range (Fig.3).

3.3 Thumb/flexion, IP: The standard score is 80. At baseline, the standard score was observed in a majority of clients (Fig.4). Their scores further improved over the long term. Conversely, the ROM score did not improve over time in 3 clients who were classified in the declining group at baseline (Fig.5).

3.4 Thumb/extension, IP: The standard score is 10. At baseline, the standard score was observed in all clients. Their scores further improved over the long term(Fig.6).

3.5 Index finger /flexion, MCP: The standard score is 90. At baseline, the standard score was observed in all clients. Their scores further improved in the short term. (Fig.7).

3.6 Index finger/extension, MCP: The standard score is 45. At baseline, the standard score was observed in a majority of clients (Fig.8). Their scores subsequently remained within the standard range. One client who was classified in the declining group at baseline evidenced slight improvement over the long term (Fig.9).

3.7 Index finger/flexion, PIP: The standard score is 100. At baseline, the standard score was observed in all clients. Their scores subsequently remained within the standard range. (Fig.10).

3.8 Index finger/extension, PIP: The standard score is 0. At baseline, the standard score was observed in all clients. Their scores further improved over the long term (Fig.11).

3.9 Index finger/flexion, DIP: The standard score is 80. At baseline, the standard score was observed in a majority of clients (Fig.12). Their scores decreased in the short term. Conversely, the ROM score improved slightly over the long term in 3 clients who were classified in the declining group at baseline (Fig.13).

3.10 Index finger/extension, DIP: The standard score is 0. At baseline, the standard score was observed in all clients. Their scores subsequently remained within the standard range (Fig.14).

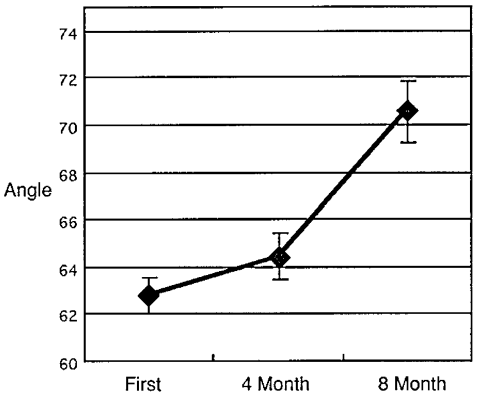

Fig.2 Transition of range of motion;
Standard group (Thumb:Flexion MCP) N=9

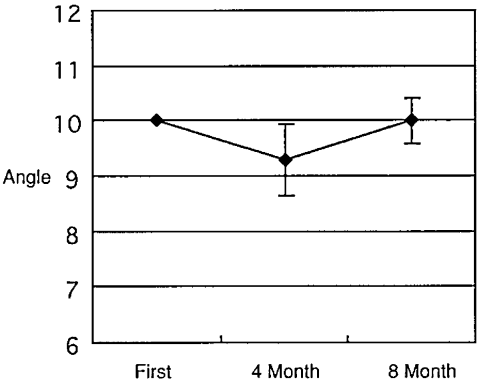

Fig.3 Transition of range of motion;
Standard group (Thumb:Extension MCP) N=7

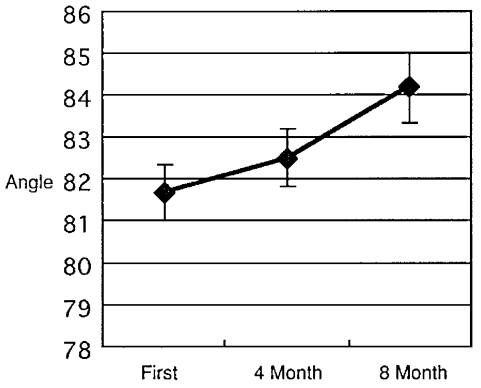

Fig.4 Transition of range of motion;
Standard group (Thumb:Flexion IP) N=6

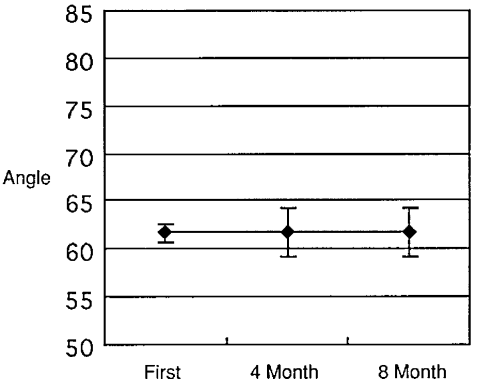

Fig.5 Transition of range of motion;
Declining group (Thumb:Flexion IP) N=3

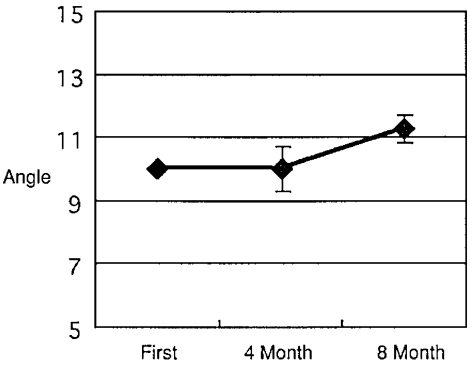

Fig.6 Transition of range of motion;
Standard group (Thumb:Extension IP) N=9

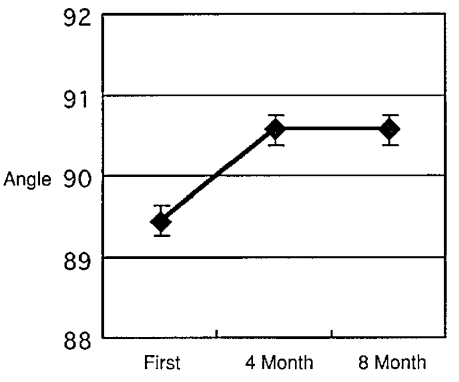

Fig.7 Transition of range of motion;
Standard group (Index finger:Flexion MCP) N=9

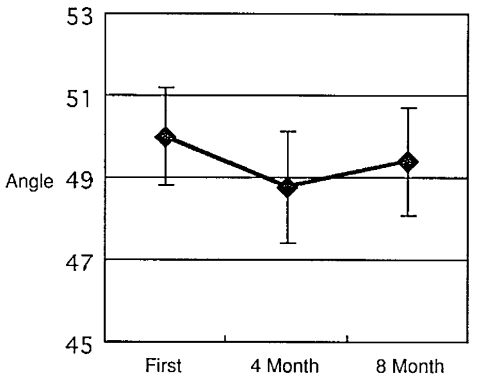

Fig.8 Transition of range of motion;
Standard group (Index finger:Extension MCP) N=8

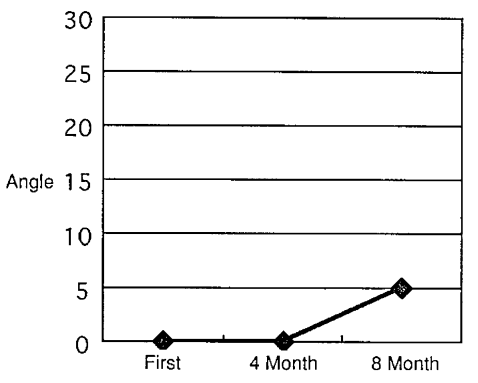

Fig.9 Transition of range of motion;
Declining group (Index finger:Extension MCP) N=1

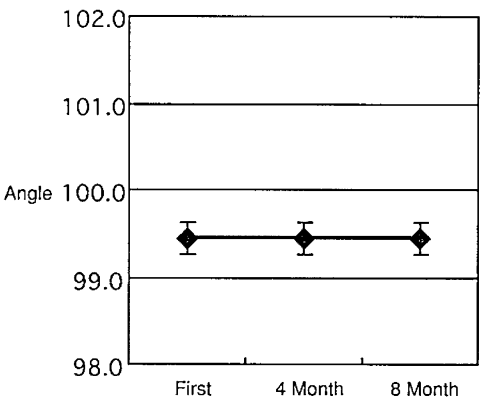

Fig.10 Transition of range of motion;
Standard group (Index finger:Flexion PIP) N=9

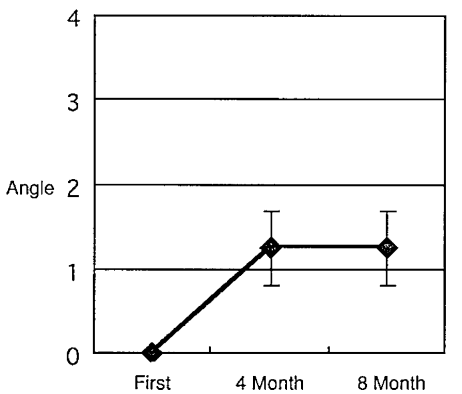

Fig.11 Transition of range of motion;
Standard group (Index finger:Extension PIP) N=8

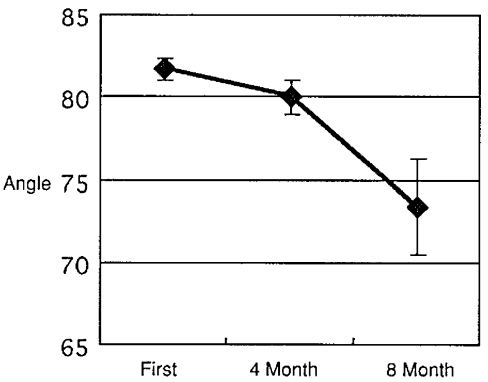

Fig.12 Transition of range of motion;
Standard group (Index finger:Flexion DIP) N=6

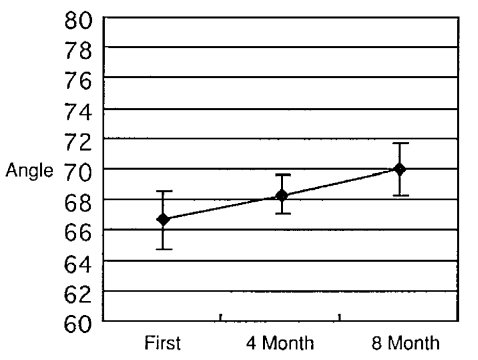

Fig.13 Transition of range of motion;
Declining group (Index finger:Flexion DIP) N=3

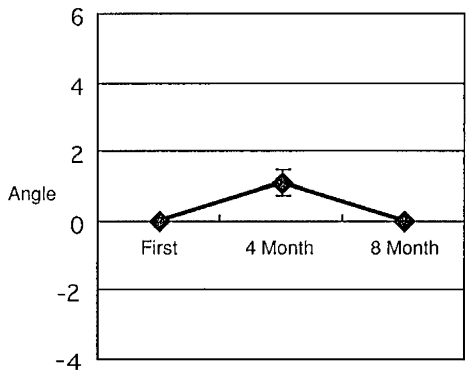

Fig.14 Transition of range of motion;
Standard group (Index finger:Extension DIP) N=9

The results suggest that the ROM scores for the thumb and index finger remained within the standard range in almost all clients. The extension score in particular was found to improve compared to the standard. The practice of gripping a spray can is therefore considered effective for the rehabilitation of thumb and index finger ROM.

Acknowledgments

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