Improvement Measures of ADL in Patient with Rheumatoid Arthritis

by

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Introduction

About one third of the rheumatoid arthritis (RA) patients are chronic progressive type and suffered multiple joints of the extremities which disturbed various activities of daily living (ADL) and quality of life.

For these patients, adequate orthoses, walking aids and self-help devices are often effective for improve their ADL.

Material and method

We prescribed several kinds of self-help devices, foot orthoses and walking aids for a patient with RA. As an evaluation of ADL before and after above prescription, Functional Independent Measure (FIM) score was used. FIM consists of six major activity items such as selfcare, excretion control, transfer, locomotion, communication and social recognition. And they are further divided to eighteen items. We evaluated each items from one point to seven points according to patient’s disabilities, therefore total full score of above eighteen items were 126 points.

Case

The case was 61-year-old woman who had a history of pain in the bilateral elbow joints since about ten years ago. She was diagnosed as having RA at age 55, and had been treated with various medications.

In April 20, 1994, she was admitted to our hospital for the purpose of controlling the active inflammation of RA.

At the time of admission, her RA stage was IV in Steinbrocker’s stage classification, and the class was 3 in Steinbrocker’s class classification. At the time of admission, she had difficulty to walk because of pain and muscles weakness at multiple joints of lower extremities.

In May 6, 1994, she was referred to our rehabilitation center for the purpose of ambulation and ADL exercises.
Physical examination at that time showed swan-neck deformities of multiple fingers, hallux valgus deformities, pes planovalgus deformities and painful planter callus formation at fore-foot bilaterally. ROM of bilateral shoulders and elbows were moderately limited. MMT of upper extremities were fair level and lower extremities were poor to fair level. Hand grip power were 3 kg at right and 2 kg at left.

The patient's ADL was evaluated with FIM. In FIM score of selfcare at admission, eating was 7/7, grooming and toileting were 4/7, dressing was 3/7, and cleaning was 1/7. In transfer activities, bed-chair to/from wheelchair were 3/7, and locomotion was 1/7. Total FIM score at admission was 87/126 (Table).

**Results**

(1) Self-help devices, orthoses, walking aids

1) Self-help devices

We made a long handle brush, a towel with roop, a reacher and a socks aid for improve

| Table. Scores of Functional Independent Measure (FIM) of the patient |
|------------------|-------------------|------------------|
|                  | at admission  | at follow-up     |
| Selfcare         |                |                  |
| A. eating        | 7              | 7                |
| B. grooming      | 4              | 6                |
| C. cleaning      | 1              | 6                |
| D. dressing (upper body) | 3   | 6                |
| E. dressing (lower body) | 3   | 6                |
| F. toileting     | 4              | 4                |
| Excretion control|                |                  |
| G. bladder control| 7         | 7                |
| H. bowel control | 7              | 7                |
| Transfer         |                |                  |
| I. bed, chair, wheel chair | 3 | 6                |
| J. toilet        | 6              | 6                |
| K. tub, shower   | 5              | 5                |
| Locomotion       |                |                  |
| L. ambulation, wheel chair | 1  | 5                |
| M. stairs        | 1              | 1                |
| Communication    |                |                  |
| N. cognition     | 7              | 7                |
| O. expression    | 7              | 7                |
| Social recognition|            |                  |
| P. social interchange | 7     | 7                |
| Q. problem solution| 7             | 7                |
| R. memory        | 7              | 7                |
| TOTAL SCORE      | 87/126         | 107/126          |
her selfcare activities (Fig. 1).

The reacher was very effective for putting on and off the footwear and clothes.

2) Orthoses

We prescribed footwears and orthopedic shoes which suit her deformed feet. For painful plantar callus, we made metatarsal pads to insole of the footwears. Pain at walking was disappeared and she could walk comfortably with these orthoses (Fig. 2, 3).

3) Walking aids

We made a pair of special platfoam crutches which made of carbon fiber rod (Fig. 4). The crutches were very light in weight and were easy to handle.

(2) Points of ADL score at admission and at follow-up

Evaluation of ADL change with FIM score were performed. Selfcare activity was improved from 22/42 at admission to 35/42 at follow-up, in transfer from 14/21 to 17/21 and in locomotion from 2/14 to 6/14 respectively. Therefore, total score was improved from 87 points at admission to 107 points at follow-up.

Discussion

The patients with RA are usually treated with medical management, surgical treatment and physical therapy. But it was often difficult to recover maximum function by only these thera-
Fig. 2 Foot orthosis with metatarsal pads
A.B: Metatarsal pads can detach easily and move to more appropriate location.
C: Pain in walking decreased with the foot orthoses.

Fig. 3 Orthopedic shoes which have wide toe box and metatarsal pads. The shoes is very light in weight and acceptably cosmetic.

Fig. 4 A pair of platform type crutches which made of carbon fiber rods. Weight of one crutch was only 200g.
pies\textsuperscript{1}). In order to improve patient’s function, orthoses and self-help devices are often effective. In this case, to use these orthoses, walking aids, self-help devices were very effective and total FIM score was increased as much as 20 points. In selfcare activities, grooming improved by using a long handle brush, cleaning improved by using a towel with roop, dressing improved by using a reacher and socks aid. We thought, the patient became easy to stand up with prescribed orthoses, and increase of muscular strength of body by rehabilitation exercise improved transfer activities.

Decrease of gait pain with our orthoses and increase balance at walking with walking aids improve her locomotion activity.

RA patients often had disability of upper extremities and lower extremities at same time. Various foot deformities of the patients would cause gait pain and disability of ADL in lower extremities\textsuperscript{2,3}). Walking aids are helpful to improve locomotion activity. However, most of patients with RA have difficult to handle crutch because of their joints deformities, limitation of ROM, pain and decrease of muscular strength in upper extremities.

Yamashita et al\textsuperscript{4}) reported that the cane of light weight, platfoam type crutch and adjust to grip shape improved walking faster, longer distance and increase balance. We thought carbon fiber rod which we used for the crutch of this case was the one of suitable material in decrease weight and with satisfactoric strength.

For the RA patients with disability of ADL, we initially evaluate the ADL precisely, and then prescribed appropriate orthoses, walking aids and self-help devices to each patients if indicated. These approach is effective for improve their ADL.

**Conclusion**

1) We made orthoses, walking aids and self-help devices for a RA patient who had disability of ADL.
2) The patient’s ADL was improved from 87 points to 107 points in FIM score after using these things.
3) The patient was very pleased to these our approach.

**References**

慢性関節リウマチ患者に対するADL向上の工夫

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【目的】慢性関節リウマチ（以下 RA）患者は関節機能障害によりADLが困難となることが多い。今回重度のdisabilityを有するRA患者に装具、クラッチ、自助具を作製しADLの向上をみたので報告する。

【方法】61歳女性のRA患者で両足底に有痛性腱板があり歩行困難であったので、パッド付きの靴型装具を作製した。歩行補助具としてはカーボンファイバー製の軽量クラッチを作製した。ADL用にリーチャー、ソックスエイドなどの自助具を作製しADL訓練を行った。

【結果と考察】靴型装具とクラッチにより歩行能力が増し、自助具により不可能であったADLが可能となっ
た。FIMスコア（126点満点）は87点から107点へ向上した。RA患者では適切な装具、歩行補助具、自
助具はADL向上有用である。