



Evaluation of Factor XII Activity in Women with Recurrent Miscarriages

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ABSTRACT

Scleroderma is a chronic connective tissue disease characterized by skin and visceral involvement. Progressive skin involvement may cause severe joint contractures, muscle weakness, and restrictions in activities of daily living. In this case report, the rehabilitation process of a 33-year-old woman diagnosed with localized scleroderma is presented. She had localized sclerotic changes and severe joint contractures on her left upper extremity including the scapular region. Active range of motion (ROM), muscle, hand pinch, and grasp strengths were measured. The Disabilities of the Arm, Shoulder, and Hand (DASH) questionnaire was used to determine upper extremity functionality. The main elements of this therapy protocol were heated modalities, active stretching and strengthening exercises, and a dynamic orthosis to stretch the elbow contracture. She was supervised by a therapist three times a week. She also conducted a home exercise program and continued to use the orthosis at home. The assessment results obtained at the beginning and one month later were compared to decide on the effectiveness of the therapy. ROMs were improved in general. These gains were as high as 40° at elbow extension and shoulder abduction. Despite slight decreases in pinch strengths, there was 5.6 kg increase in grip strength. A considerable improvement was observed in the DASH score. No change was observed in muscle strength. In this report, it is shown that conventional rehabilitation modalities supported with the use of a dynamic stretching orthosis could be effective in the correction of rigid contractures and could enhance functional status in localized scleroderma patients.

Keywords: Localized scleroderma, rehabilitation, range of motion, grip strength, pinch strength, physical function

Introduction

Scleroderma is a chronic autoimmune disease characterized by skin fibrosis and internal organ involvement (1). Skin involvement may cause severe joint contractures (2). The delayed direction of the patients to rehabilitation, the chronic nature of the disease and the cosmetic changes caused by the disease may negatively affect their compliance to the therapy and their gains. The number of studies in the field of rehabilitation is low due to the low incidence of the disease and difficulty of long-term follow-up (3-5). The aim of this presentation is to report the results of physiotherapy-rehabilitation therapy for the correction of diffuse contractures in the left upper extremity in a patient with localized scleroderma.

Case presentation

A 33-year-old female patient who had been diagnosed with localized scleroderma two years ago was referred to our department due to the diffuse contracture and movement limitations in her left upper extremity. The patient's age, gender, occupation, education level, life roles, and dominant hand were recorded. The patient's general appearance was evaluated after evaluating her familial history, time of the onset of the symptoms and their change in time, the date of diagnosis, the treatments she received, and the other medical problems. Regional sclerotic changes in the skin in a region from the wrist of the left arm to the scapula, different levels of range of motion in the joints (ROM), and apparent

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Figure 1: The appearance of the patient in the first evaluation



Figure 2: Dynamic stretching orthosis for elbow flexion contracture

flexion contracture at the elbow were observed (Figure 1). Active ROM measurements, muscle test, gripping and holding forces were measured in the affected area. ROMs were measured by mechanical goniometer. Muscle strength was assessed through the muscle test, in which the muscles were scored between 0 and 5 in relation to the muscles' resistance to gravity and manual force. Jamar dynamometer and B&L pinchmeter were used for the measurement of grip and holding forces. To assess the level of physical functioning of the patient in the left upper extremity and the severity of the symptoms, The Disabilities of the Arm, Shoulder and Hand (DASH) (6) questionnaire was applied. The DASH Work Model (DASH-W) questionnaire was applied in order to determine the level of disability in the work life. DASH is a 30-item outcome measurement questionnaire in which patients themselves evaluate physical disabilities and symptoms in upper extremity disorders. On the other hand, DASH-W is a 4-item supplement. Scoring is from 0 to 100 in both questionnaires. Higher scores indicate more physical disabilities.

The patient was informed about the therapy options and a written informed consent form was received from the patient. In the evaluation and therapy processes, the ethical rules in the Helsinki Declaration were considered. The main elements of the proposed therapy were the use of heat modalities, exercise and a static progressive stretching orthosis (3, 4, 7-10).

The patient was treated by the therapist 3 times a week. On the other days, she was applied the home program consisting of exercise and orthosis.

In the therapy, moist heat application, massage by rubbing with vaseline on stretched sclerotic areas, scapula mobilization, active ROM exercises, proprioceptive neuromuscular facilitation (grab-loosening and rhythmic stabilization), stretching exercises, and strengthening exercises with elastic band were performed. The tension of the static progressive stretching orthosis to stretch the flexion contracture in the elbow was adjusted by considering the pain limit (Figure 2). The patient was asked to wear the orthosis periodically for a total of 8-12 hours per day. In the second follow-up in the clinic, the patient said that she could not wear the orthosis during the daytime because it restricted her daily living activities. Therefore, she was mainly asked to use it at night. The patient attended the therapy regularly for a month and she declared that she had implemented the home program. At the end of one month, the patient was reevaluated with the same methods initially used and the results were compared. The differences between the first and last evaluation results were taken as a reference to decide on the effect of the therapy. Because contractures were focused on in the therapy, DASH and DASH-W scores were prioritized since they measure changes in ROMs and outcomes. The first and last evaluation results are presented in Table 1-3. The areas showing improvement are highlighted in bold. In Figures 3 and 4, improvements in ROM in which elbow extension was active during treatment process are shown.

Table 1: Comparison of the patient's first and last joint ranges of motion

Joint movements that were measured	First assessment	Last assessment	Difference
Shoulder flexion	170°	180°	+10°
Shoulder abduction	130°	170°	+40°
Shoulder internal rotation	70°	70°	0°
Shoulder external rotation	80°	90°	+10°
Elbow flexion	145°	145°	0°
Elbow extension	-70°	-30°	+40°
Forearm supination	50°	80°	+30°
Forearm pronation	80°	80°	0°
Wrist flexion	60°	90°	+30°
Wrist extension	45°	70°	+25°
Wrist radial deviation	20°	20°	0°
Wrist ulnar deviation	15°	20°	+5°
Cervical flexion	50°	50°	0°
Cervical extension	25°	45°	+20°
Cervical lateral flexion (left)	40°	40°	0°
Cervical lateral flexion (right)	35°	40°	+5°

Table 2: Comparison of the first and last muscle strengths of the patient

Measured movement direction	First assessment	Last assessment	Difference
Shoulder flexion	5	5	0
Shoulder hyperextension	5	5	0
Shoulder abduction	5	5	0
Shoulder internal rotation	4	4	0
Shoulder external rotation	4	4	0
Elbow flexion	5	5	0
Elbow extension	5	5	0
Wrist flexion	5	5	0
Wrist extension	5	5	0

Table 3: Comparison of patient's first and last grip force, holding force, and DASH scores

Measured parameter	First assessment	Last assessment	Difference
Grip force (Left) (kg)	13.33	13.33	0
Grip force (Right) (kg)	15	20.67	+5.67
Holding force (Left) (kg)	10	6.67	-3.33
Holding force (Right) (kg)	10.67	7	-3.67
DASH Score (0-100)*	35.75	16.75	19
DASH-W Score (0-100)*	56.25	18.75	37.5

*High score indicates more physical disability



Figure 3: Improvements in the elbow extension ROM during therapy

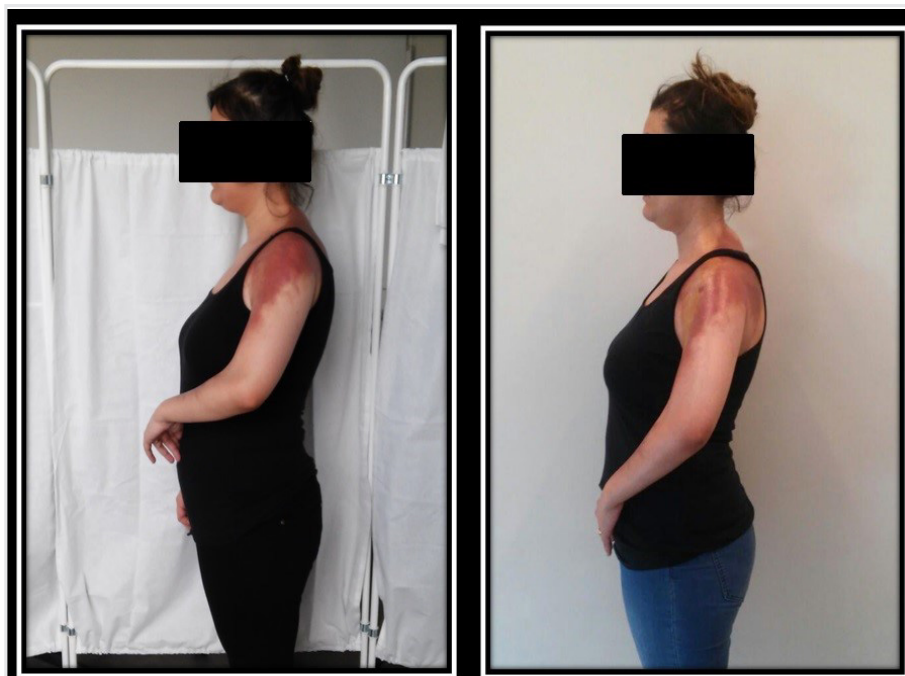


Figure 4: Improvements in the elbow extension ROM during therapy

Discussion

Rehabilitation has an important role in the holistic treatment of scleroderma. It has been shown that different rehabilitation methods lead to positive changes in the physical condition of

patients with scleroderma (3-5, 7, 8). For stretching applications to be effective in these patients, a medium level of stretching should be continued for a long time considering the pain limit (9, 10). This principle can be achieved with a static progressive stretching orthosis. As a matter of fact, the elbow flexion

contracture decreased from 70 ° to 30 ° at the end of a regular one-month follow-up period. The DASH score improved from 37.75 to 16.75, and the DASH-W score improved from 56.25 to 18.75. In these patients, one of the most important problems in therapy is the problems encountered in convenience to the therapy program. Our patient started to disrupt the therapy sessions about one month after the regular therapy and the next follow-ups could not be performed. She suggested her private problems and changes in her daily life routine as a reason for that. The importance of regular participation in the therapy was re-told to the patient and she was invited to therapy. The treatment of the patient was discontinued because she did not make a positive attempt to participate.

Conclusion

In this case report, it was shown that the traditional rehabilitation methods supported by static progressive stretching orthosis may be effective in correcting contractures in a patient with localized scleroderma with rigid contractures. The therapy approach applied in this patient may guiding in the treatment of similar cases. However, the problems encountered in providing continuity of treatment were observed to continue. In the following further studies, this subject should be examined in detail and solutions should be sought.

Informed Consent: Written informed consent was obtained from patients who participated in this study.

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Author Contribution

Concept - Ü.U., T.C., Ş.G.; Design - Ü.U., T.C., Ş.G.; Supervision - Ü.U., T.C., Ş.G.; Resources - Ü.U., T.C., Ş.G.; Materials - Ü.U., T.C., Ş.G.; Data Collection and/or Processing - Ü.U., T.C., Ş.G.; Analysis and/or Interpretation - Ü.U., T.C., Ş.G.; Literature Search - Ü.U., T.C., Ş.G.; Writing Manuscript - Ü.U., T.C., Ş.G.; Critical Review - Ü.U., T.C., Ş.G.

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