

A 20-YEAR-OLD FEMALE PATIENT WITH POSTBURN LOWER EXTREMITIES JOINT STIFFNESS – CASE REPORT

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ПРЕДСТАВЯНЕ НА СЛУЧАЙ НА 20-ГОДИШНА ПАЦИЕНТКА С КОНТРАКТУРИ НА СТАВИТЕ НА ДОЛНИТЕ КРАЙНИЦИ ВСЛЕДСТВИЕ НА ИЗГАРЯНЕ

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<p>Summary:</p> <p>Key words:</p> <p>Address for correspondence:</p>	<p>This case study deals with implementation of physical exercise intended to achieve muscular strength modification, motor function- and psychological improvement. The goal of this case report presentation is to describe the results of an ambulatory rehabilitation program with components of musculoskeletal system exercise in children with severe burn injuries. The subject of our study is a female patient with severe burn injuries, dermatogenic stiffness, muscular hypotrophy and difficult walking with ambulation. Muscular strength and motor function improvements were observed. Patient started to walk without crutches. This research demonstrates the fact that regardless of how extensive the rehabilitation program is, the end results usually are good if physical therapy is integrated into the healing process.</p> <p>burn injuries, stiffness, rehabilitation</p> <p><i>Ardiana Murtezani, M. D., Physiatric Clinic, University Clinical Center of Kosovo, Prishtina, Republic of Kosovo, e-mail: ardianna@yahoo.com</i></p>
<p>Резюме:</p> <p>Ключови думи:</p> <p>Адрес за кореспонденция:</p>	<p>Описва се случай с прилагане на програма с физически упражнения, насочени към изменение на мускулната сила и подобряване на двигателната функция и на психичното състояние. Целта на авторите е да представят резултатите от амбулаторна рехабилитационна програма с компоненти на упражнения за мускулно-скелетната система при деца с последствия от тежки изгаряния. Обект на проучването е момиче с тежки термични травми, кожни контрактури, мускулна хипотрофия и затруднено движение. Установява се подобрение на мускулната сила и на двигателните функции. Пациентката започва да ходи без патерици. Резултатите показват, че рехабилитационната програма е успешна, когато физикалната терапия е включена в оздравителния процес.</p> <p>рани от изгаряне, контрактури, рехабилитация</p> <p><i>Ardiana Murtezani, M. D., Physiatric Clinic, University Clinical Center of Kosovo, Prishtina, Republic of Kosovo, e-mail: ardianna@yahoo.com</i></p>

INTRODUCTION

Postburn rehabilitation starts when the patient is admitted to the hospital and it is a very dynamic process that requires modifications on almost daily bases. While the skin is healing, it is important that a parallel individualized physical rehabilitation program is implemented for the patient.

Individualized physical rehabilitation program consists of dermatogenic stiffness prevention, preservation of normal range of motion in the affected joints, prevention and minimizing the skin hypertrophy and cosmetic deformities, maintenance or enhancement of muscular strength and cardiovascular endurance, functional improvement and normal performance of every day activities [7].

Active exercises should be ordered upon admission. Active exercises and patient participation during functional activities are the best treatment solutions for prevention or reduction of contractures.

For the majority of patients, the most difficult rehabilitation phase takes place right after the wound healing, when contractions/shrinking are generated at the developed skin cicatrices as a consequence of burn injuries.

If the physical therapist is active involved in the rehabilitation team and administers the motion exercise program in correlation with the wound healing process, we can expect less post-rehabilitation problems and immense success in recovery of normal function. The physical therapist needs to be creative, to increase patients' motivation and capacities for exercise. Posttraumatic stress disorder occurs very frequently among postburn patients [2]. Disregarding this problem frequently results in rehabilitation failure [9].

The final goal of rehabilitation for postburn patients does not end with wound healing, but with social reintegration of the patient [9].

The main goal of this case report is to describe and report the results obtained through the comprehensive ambulatory rehabilitation program with locomotor system training components performed for children with severe burn injuries.

CASE PRESENTATION

A 20-year-old female patient A.A. was admitted for treatment to the Department of Physiatry because of walking difficulties as a result of limited range of motion of the right leg joints.

A burn injury with boiling water happened in 1990 when the patient was only three years old. The patients' conservative treatment was stopped in 2004.

On 17th May 2004, she was admitted to the Plastic and Reconstructive Surgery Clinic for surgical intervention in order to correct the functional impediment at the right popliteal and gluteal regions. On 18th May 2004, the surgical intervention was performed: Stiffness correction of the popliteal region with multiple Z-plasty flap technique and cicatrices excision at the right gluteal region with direct suturing were done.

On 14th June 2004, her rehabilitation was continued at the Department of Physical Therapy and Rehabilitation of the Gjakova (Northwest Kosovo) hospital. Patient's needs included assistance as far as self-care and mobility. Active motion angle for the hip joint (fx. 50°, ex. 10°, internal rotation was achievable at 10°, whereas the external for 15°,

abduction was 20° and adduction at only 10°; values for the right knee were, fx. 70°, ex. 40°) motions were very limited and followed by pain. Passive motion was corrected for 3° up to 5° in all planes. Muscular force assessment with manual method was not possible because of limited range of motion and pain. Because of existing problems, the patient started with an adequate rehabilitation program focusing on elongation exercise techniques of the shortened muscles, correction of desmogenic, miogenic and tendon contractures, including muscular strengthening. A walking exercise program was included due to motoric impairment and proprioception. The patient was highly motivated and she had a very supportive family. After eight weeks of intensive rehabilitation treatment we have achieved correction of hip motion to: minimal values for abduction and adduction, whereas fx. and ex. didn't improve. The knee joint also demonstrated poor results; fx. and ex. were corrected for 5° .

On 10th of December 2004, the patient was admitted to the Plastic and Reconstructive Surgery Clinic again due to huge cicatrices in the gluteus region as well as contracture of the left gluteo-femoral region.

On 13th of December 2004 after normal presurgical course, skin external expander technique surgery was performed.

After this surgical intervention, the active motion angle in the left coxo-femoral joint was slightly limited in all planes. At the right C/F joint: fx. 60°, ex. 15°, internal rotation is achievable at 10°, while the external at 15°, abduction was possible at 25° and adduction at 15°, while in the knee joint fx. 80° and ex. 25°.

On January 1st 2005, the patient began the physical therapy rehabilitation program consisting of: thermotherapy, ultrasound therapy, mechanotherapy and kinesitherapy. The duration of sessions was at least 20-40 min including the warm up component of 5 minutes and relaxation of 5 minutes. After 8 weeks of rehabilitation treatment, a slight improvement in motion of C/F joint was evident, mainly fx.75°, ex. 20°, internal rotation 20°, external rotation 25°, abduction was 30°, adduction was 15°, and for the knee joint; fx. 85°, ex. 20°, muscular force of myotomes L2 L4, was evaluated as grade 3, while L5 S2 – as grade 4.

On 18th of April 2005, she was admitted again to the Plastic and Reconstructive Surgery Clinic in Prishtina with the diagnosis of bilateral hypertrophic cicatrices of the lumbar, gluteal and femoral regions. She underwent a surgical intervention consisting of excision and reconstruction with local skin graft and application of external skin expander.

On June 6th 2005, she continued rehabilitation at "Peja Spa" rehabilitation center where during rehabilitation sessions she underwent thorough active assisted exercises for muscles of the gluteus and posterior femoral region on both extremities and walking school. However, after 4 weeks of physical treatment there were no signs of significant improvement in joint motion and muscular strength.

On March 30th 2007, the patient was admitted again to the Clinic due to functional difficulties in gluteus-femoral and popliteal region that prevented full stretching of the right leg. On April 4th 2007, she underwent another surgery consisting of correction of contractures using the multiple Z-plasty surgical technique. Patient was released home on April 10th 2007 with walking difficulties particularly with the right leg.



Fig. 1. Postburn popliteal region contractures (before surgery)



Fig. 2. Desmogenic contracture correction of the popliteal region with Multy Z-Plasty Technique

On June 25th 2007, rehabilitation continued at "Klokot Spa" health resort. The peroneus nerve sustained extensive damage during the surgical intervention.

Electromyography findings proved neurogenic activity with reduction of motor units for the muscles innervated by peroneus nerve. Muscular strength of L2L3 myotomes was graded 4, L4L5S1 myotomes was graded 2+, S2 was graded 3. She was referred to the Ortho-Prosthetic Center in Prishtina to receive a orthotic device, peroneal splint. Six months after carrying the splint and intermittent physical therapy patients' functional recovery was acceptable (hip joint range of motion in fx. was 105° while ex. 25°, abd. 35° add. 20°, external rotation 40° and internal rotation 35°, meanwhile knee fx. 115° ex. 0°). Muscular strength of myotomes L2S2 was graded 4. Repeated electromyography did not register spontaneous pathologic activity. She walked without any orthotic devices.

Table 1. Hip and knee joint ROM results obtained during 2004-2007

Movements of the joints	Initial movement	After 7,5 months	After 10 months	Final results
Hip				
flexion	50°	60°	75°	105°
extension	10°	15°	20°	25°
internal rotation	10°	10°	20°	35°
external rotation	15°	15°	25°	40°
abduction	20°	25°	30°	35°
adduction	10°	15°	15°	20°
Knee				
flexion	70°	80°	85°	115°
extension	40°	25°	20°	0°

DISCUSSION

The subject of this case report is a female patient with severe burn injuries and dermatogenic contractures. This case confirms the successful completion of the implemented motion exercise program as a part of ambulatory rehabilitation plan.

Postburn patients need to start with physical therapy as soon as possible, including proper pain control measures. The main concerns prior to physical therapy implementation are elimination and control of edema as well as preservation of the range of motion [7].

Prevention of desmogenic contracture development can be obtained through proper positioning, use of splints and exercises [2].

Our patient was started on an exercise routine right after surgery, with passive range of motion exercise to preserve the joint movement amplitude. She was encouraged to use the splints in functional position, to preserve the achieved movement amplitude after surgical release and exercise.

Hypertrophic cicatrices at the joint region limited the movement amplitude and function; meanwhile, surgical and therapeutic interventions began to regain them back [6].

Bilateral hypertrophic cicatrices at the hip regions and right knee joint were the most difficult problems to resolve in our patient. Beside the limited range of motion of the affected joint, they also caused skin sensitivity to injuries, cold and sun exposure. In order to heal the cicatrices formations, our patient underwent thorough continuous gentle massage therapy sessions for 5 to 10 minutes, from three up to six times a day, including ultrasound therapy for 5-10 minutes twice a day.

Massage is a clinically accepted intervention that supports the exercise program by softening the affected tissue. When massage is used together with the range of motion exercise, newly formed cicatrices can get extended much more easily in order to correct the contractures [6].

Range of motion exercises in the unhealed region is very painful and the majority of patients don't wish to become subjects of a range of motion improvement interventions because of pain [2].

Passive range of motion exercises were conducted in the very beginning by our patient in order to preserve joint mobility, this was followed by active assisted exercises for all extremity joints, including the unaffected areas. Active exercises were initiated after completion of active range of motion exercises. Topical heating modalities were applied. These included melted paraffin and IR light to increase the tissue elasticity.

As seen in Table 1, considerable improvement of clinical significance could be observed. Our patient went through harsh non-functional contracture of the hip joint fx. 50° and she regained its functionality to walk without crutches and with no pain. The knee joints experienced significant improvement from ex. 40° (later she did stretch her leg completely).

Walking should be initiated as early as possible, as allowed by the patient [7].

Our patient started to walk on the parallel bars walking stripe and then later with orthotic devices. She couldn't tolerate standing on her feet due to static intolerance or pain during free vertical lower extremities positioning. Nevertheless, unassisted walking without accessory helping devices was achieved in the end of the rehabilitation treatment.

Exceptional cooperation between physical therapist and other members of the rehabilitation team resulted in our patients' very good overall rehab success.

CONCLUSION

This case report describes the integration of physical therapy into the treatment regimen for a postburn patient. We have demonstrated that following the integration of a stepwise physical therapy routine, as part of the rehabilitation and healing process, our patient was able to go back to higher levels of functional activities.

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Patient's comments: *“Being a victim of boiling water injury, I couldn't feel all the joys of life. With the help of doctors, nurses and therapists I'm now on healing path. I have decided not to think for a minute about what has happened to me and who is responsible for that, although I would like to be thankful for every day of my life.”*

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