

Case report



STUDENT VOLUNTEERISM IN THE REHABILITATION OF A CHILD WITH FRACTURA OLECRANI: PRESENTATION OF CLINICAL CASE

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ABSTRACT:

Aim: To monitor the rehabilitation progress of a child with fracturaolecrani with the participation of a student volunteer in the multidisciplinary team.

Methods: K.J. is an 11-year-old child admitted for rehabilitation in the Clinic of Orthopaedics and Traumatology at University Hospital "St. Marina"- Varna. In 2011 K.J. suffered a fracture in the area of the right elbow joint and underwent surgery with the placement of three Kirschner needles. Four years later, the patient suffered the same fracture and underwent surgery with the placement of two Kirschner needles. Oedema, joint deformation, severely limited range of motion, contractures, muscle hypotrophy and psychotrauma, were found after examination by an orthopaedist and a kinesitherapist. The individual kinesitherapeutic approach is focused on reducing oedema; improving activity; preventing complications; stimulating the patient's participation in social activities.

Results: With the help of functional examinations (centimetre measurements, anglemetry and MMT), we established significant restoration of the upper extremity's function and reduction of the oedema. The minimal differences result from the rough operative cicatrix and slight joint deformation. The range of motion is restored to a large extent, as the deficit of 5-10 degrees is not essential in daily activities and could be further restored.

Conclusions: the application of an individual approach in the multidisciplinary team's work, with the participation of a student volunteer, helps build a trustworthy relationship with the child patient. The inclusion of a student volunteer in the multidisciplinary team improves communication with vulnerable population groups and contributes to a faster physical and mental recovery.

Keywords: volunteerism, kinesitherapy, orthopaedics,

INTRODUCTION

Volunteering is an established practice in world history and is performed in accordance with the principles of legality, free choice, equality, personal responsibility and gratuitousness [1]. Despite the increasing popularity of this activity in Bulgaria, it has not yet received legal recognition [2]. Nevertheless, the practice of future doctors and other medical specialists to build their professional knowledge and skills, along with summer internships, student praxis and voluntary labour, has imposed itself on our country [3]. These activities are accomplished in direct contact with the patients under the mentorship of teachers in a real work environment – inpatient, outpatient care and general medical practices.

Effective rehabilitation in vulnerable population groups, including children, undoubtedly requires the multidisciplinary team to take an individual approach [4, 5, 6]. Building a trustworthy relationship between patient and kinesitherapist in children is a communicative challenge, especially during the implementation of the kinesitherapeutic program [7]. The kinesitherapist's communicative and pedagogical skills are of particular importance when working with a child and training it to perform exercises [8, 9].

AIM:

To monitor the rehabilitation progress of a child with fracturaolecrani with the participation of a student volunteer in the multidisciplinary team.

CONTINGENT AND METHODS:

We present the clinical case of an 11-year-old child with communicative problems and a necessity for rehabilitation after a fracture of the olecranon.

CLINICAL CASE

We present the clinical case of 11-year-old K.J., who suffered a fracture in the area of the right elbow joint in 2011. The patient underwent surgery with the placement of three Kirschner needles. Four years later, after a traumatic accident, the child received the same fracture and underwent surgery with the placement of two

Kirschner needles. At present, the patient is entering the Clinic of Orthopaedics and Traumatology at University Hospital "St. Marina"- Varna for rehabilitation treatment after the immobilization period and extraction of the implants, placed for joint correction.

After examination by an orthopaedist and a kinesi-therapist, the following was found: oedema and deformation of the joint, severely limited range of motion, contractures, hypotrophy of the musculature and psychotrauma. The individual kinesi-therapeutic approach is focused on reducing oedema; improving functioning and activity; preventing complications; stimulating the patient's participation in various social activities.

Given the early traumas in K.J.'s childhood, communicative limitations were established during rehabilitation to the extent of refusal to perform kinesi-therapeutic methods. The participation of a student volunteer as the kinesi-therapist's assistant provides a positive psychological impact on the child patient and creates a favourable environment for its motivated participation in the rehabilitation process. The kinesi-therapist worked in a group with the student volunteer and the child patient, showing the kinesi-therapeutic methods, particularly created for K.J. The student volunteer has been previously trained by the leading kinesi-therapist and has participated in the creation of the program. Under the guidance of the leading kinesi-therapist, the student volunteer performed the exercises, and the child participated in the rehabilitation process by the method of imitation, perceiving it as a game. The participation of a student volunteer helped create and strengthen the relationship between the child patient and the kinesi-therapist. As a result, the child overcame its negative attitude, formed on the basis of previous experience, and increased its motivation to participate readily in the individual kinesi-therapeutic program.

RESULTS AND DISCUSSION

The individually prepared kinesi-therapeutic methodology included visits to the kinesi-therapy hall three times a week, and during the rest of the time, the child had to perform the exercises at home under its parents' supervision. Even after the first procedures, together with the student volunteer, we established an increase in motivation to participate in the rehabilitation and an overcoming of the negative attitude developed during the recovery after previous fractures.

The main goals were the quick restoration of the joint's range of motion and the return to daily activities and games. The kinesi-therapist's tasks were selected in fulfilment of the set goals: improvement in joint's range of motion; restoration of muscle strength in the operated extremity; improvement of the child's psycho-emotional state; self-service training; training to perform daily activities; return to play and other age-appropriate physical activities. The means of kinesi-therapy that we included in K.J.'s individual kinesi-therapeutic program were: cryotherapy; massage; respiratory exercises; general development exercises; passive kinesi-therapy; active kinesi-therapy; weight training exercises; joint mobilization

techniques; strength exercises; relaxing exercises. Cryotherapy, which the student volunteer performed at the beginning of each procedure for three weeks, reduced the swelling, which allowed us to include subsequent massage of the entire upper extremity. The applied light massage helped to relax the heightened muscle tone and overcome the contractures. We applied the respiratory and general development exercises as introductory to the subsequent analytical gymnastics. We showed different exercises in different sequences each time during the treatment in order to maintain the child's interest in the program. The duration of the exercises did not exceed 50-60 minutes, as the elbow joint is one of the "capricious" joints in the human body that should not be overloaded. Initially, we applied passive kinesi-therapy (with an apparatus) because the child was relaxed, which allowed us to work in terms of passive range of motion. After achieving a satisfactory passive range of motion, we enriched the program with active exercises, equipment (cane, balls, bands with elastic resistance, reel, wheel for moving the entire extremity, fitball, etc.) and relaxing exercises. The subsequent inclusion of joint mobilization techniques helped to increase the range of motion in the elbow joint. After the second month of muscle recovery, we added strength exercises.

To objectify the achieved results (reduction of oedema, increase in range of motion in the joint and muscle strength), we used centimetre measurements, anglemetry and MMT. We used centimetre measurements until we achieved a reduction of oedema in the joint and improvement in muscle strength. The reduction of oedema in the joint significantly increased mobility, which allowed the enrichment of the kinesi-therapeutic program. The measurements were taken at the level of the middle of the arm and the forearm, where at the beginning, we registered lower values in comparison to the healthy upper extremity due to the hypotrophy of the muscles and through the elbow joint itself, which was swollen (table 1):

Table 1. Centimetre data of the elbow joint (in centimetres)

	<i>1st day</i>	<i>2nd month</i>	<i>4th month</i>
<i>Arm - left</i>	30	30	30
<i>Arm - right</i>	28,5	28,6	29,3
<i>Left elbow joint</i>	28	28	28
<i>Right elbow joint</i>	29,5	28,5	28,3
<i>Forearm - left</i>	26	26	26
<i>Forearm - right</i>	24,5	25	25,3

Within the four months of rehabilitation, we established an increase in the circumference of the right arm by almost 1cm, achieving the necessary symmetry between the two upper limbs at the level of the arm. The same data dynamic was observed at the forearm level. Regarding the circumference at the level of the elbow joint,

there was a reduction in the existing oedema by 1,2cm.

Immediately after the first sessions, conducted in a multidisciplinary team kinesi therapist-patient-student volunteer, we established recovery of range of motion

compared to the end of the previous procedure. We objectified the results by anglemetry, which we performed at the beginning and end of every procedure (table 2):

Table 2. Anglemetry data of the right elbow joint (in degrees)

	<i>1st day</i>	<i>1st month</i>	<i>2nd month</i>	<i>3rd month</i>	<i>4th month</i>
<i>Extension- flexion</i>	0-85-90	0-25-110	0-10-125	0-5-130	0-5-135
<i>Supination-Pronation</i>	5-0-10	65-0-75	85-0-85	90-0-90	90-0-90

The data from table 2 shows a progressive increase in the range of flexion, that almost approaches the norm by the end of month four. During the four month rehabilitation period the patient achieved full range of supination and pronation, which gave the child patient the ability to perform everyday activities.

The table above shows that the contracture has been overcome, and pronation and supination have been completely restored. Thus the dominant upper extremity has regained its functionality for all everyday activities. Manual muscle testing (MMT), as a method for registering muscle strength, was performed after the inclusion of active kinesitherapy in the kinesitherapeutic program. Test data is presented in table 3:

Table 3. MMT data of the right elbow joint (on a scale from 0 to 5)

	<i>2nd month</i>	<i>3rd month</i>	<i>4th month</i>
<i>m. biceps brachii</i>	3 -	4-	4
<i>m. brachialis</i>	3 -	4-	4
<i>m. brachioradialis</i>	3 -	4-	4
<i>m. triceps brachii</i>	3	3+	4-
<i>m. anconeus</i>	3	3+	4-
<i>m. pronator teres</i>	3	4	4+
<i>m. pronator quadratus</i>	3	4	4+
<i>m. supinator</i>	3 -	3+	4-

In the end of the rehabilitation period we observed an increase in the muscle strength grade by 1 point. This change was achieved by the end of month three for m. biceps brachii, m. brachialis, m. brachioradialis, m. pronator teres, m. pronator quadratus and – month four for m. triceps brachii, m. anconeus, m. supinator.

For a relatively short period of time of two months, we achieved progress from the ability to perform movements independently to performing movements against resistance. Apart from the fact that the child achieved the desired and expected from the team of specialists and its parents' results, we also created trust between the parties with the help of the student volunteer. The child attended the kinesitherapy sessions willingly, accompanied by its mother, and even stayed afterwards in the hall to play with fitball balls and even to show exercises to other patients. The active assistance of K.J. in the implementation of the kinesitherapeutic program was achieved thanks to the inclusion of a student volunteer in the multidisciplinary team kinesi therapist-parent-patient).

CONCLUSION

Volunteering trains and motivates young people by giving them the opportunity to develop skills that benefit themselves as well as the society [10]. We observe a serious interest expressed by medical students to continue to participate in this good medical practice. Student volunteers accept voluntary labour as an investment in an individual and social plan. Solving problems related to the shortage of medical staff, overloading of the health system in the summer, etc., can be largely solved by including voluntary student labour. It is important for student volunteers to work in a team together with their mentors, as this guarantees the quality of their clinical training and is a factor that determines their future professional behaviour as medical specialists [11, 12]. Undoubtedly the inclusion of student volunteers in such teams in a real work environment brings positives for the students themselves: forming practical skills and professional competencies for their future work; developing critical thinking; forming a new attitude towards the patients, and perceiving them as people with all their needs [13]. The development of public relations increasingly imposes the need for volunteer labour to receive recognition in Bulgarian legislation.

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