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Research Article

Modern View on Physical Rehabilitation with Ankle Injury

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Abstract

Often there are injuries to the ankle, which require a competent rehabilitation to fully restore their functions. The existing methods of rehabilitation are diverse and require an assessment of their effectiveness.

Objective: To identify the main components of physical rehabilitation for ankle injury.

Methods: In the work methods of description, analysis and synthesis are applied.

Results: The success of this rehabilitation is possible with the simultaneous use of therapeutic physical training, therapeutic massage, physiotherapy and choreography. The therapeutic physical culture allows restoring movements in the ankle joint, reduces swelling of the injured leg, prevents the development of traumatic flat feet, deformities of the foot and curving of the fingers, and restores the functions of the damaged limb and the movement skill. Apply it begin already at the stationary stage, gradually increasing the number of exercises and the number of their repetitions. This ensures a successful increase in the volume of movements in the injured limb. Massage helps accelerate recovery processes at the fracture site and eliminate movement restrictions. Massage should be started 3-5 days after the fracture, gradually increasing its duration and the number of lesions. Its use is acceptable in almost all patients. Good results are shown by the use of physiotherapy, especially by physiotherapy. A wide combination of massage and physiotherapy is acceptable. The restoration of ankle joint functions is well influenced by the combination of massage with mud therapy, apparatus physiotherapy and mechanotherapy. Choreographic elements are used to achieve the maximum possible recovery of lost function of ankle joints. They actively stimulate reparative processes in the damaged limb, increasing the efficiency of the rehabilitation process.

Conclusion: The methods of rehabilitation used in case of damage to the ankle are quite diverse. The decision to apply a particular method to a particular patient must be addressed individually.

Keywords

Ankle joint; Injuries; Rehabilitation; Therapeutic physical culture; Massage; Physiotherapy

Introduction

The development of the society is accompanied by a continuous search for the means of healing the human body [1,2] at any age [3,4]. For this purpose, experimental studies [5-7] and clinical observations [8,9] are actively carried out. With the development of medical science, the need to develop and improve rehabilitation techniques under different conditions becomes clearer [10,11]. To this end, various types of health effects are applied [12,13], based on the increase in muscle activity. They help to significantly restore the physical condition of a person and provide him with the maximum ability to recover and self-service ability [14,15]. There is a fairly large prevalence of ankle injury, which occurs in 13-20% of all injuries [16]. This is largely due to the anatomical and functional features of this joint, which provide a certain predisposition to its damage [17].

Practice shows that in the recovery phase after an ankle injury, physical rehabilitation is necessary. With fractures of the bones forming the ankle joint, the situation is aggravated by the need for a long fixation of this joint, this leads to weakening and atrophy of the muscles, which dictates the need for competent application of rehabilitation effects. It is noted that the earlier physical rehabilitation begins, the faster and fuller will be the recovery of lost functions [18]. In this state, the most appropriate is the integrated use of physical rehabilitation tools, incl. therapeutic physical culture (TPC), therapeutic massage and physiotherapy [19].

After analyzing the available literature, it becomes clear that there is insufficient degree of generalization of information on the most effective methods of physical rehabilitation of persons who have undergone a fracture of the ankle joint [20,21]. The recovery period after injury to the ankles can last up to six months and covers three stages: a stationary stage, an early outpatient stage and a late ambulatory stage [22]. In this regard, it is important to consider the means of physical rehabilitation used for ankle injury, the most effective at all stages of rehabilitation for this pathology.

Objective

To identify the main components of physical rehabilitation for ankle injury.

Therapeutic physical culture in the rehabilitation system

Walking on crutches to the patient is allowed on the 8-10th day without the support of a sick limb. If the fragments are correctly positioned, without an operation, the victim is sent home after a week in the hospital, and after surgical treatment - at the end of the second week. At this stage, in order to improve blood circulation and reduce edema, it is recommended that the injured person receive a periodic lowering of the damaged leg from the bed, and returning it to an elevated position [23].

TPC at an early outpatient stage solves several tasks for rehabilitation: recovery of movement in the ankle joint; reduction of swelling of the injured leg; prevention of the development of traumatic flat feet, deformation of the foot and bending of the fingers; restoration of the function of the injured limb and the skill of movement.

After stopping the fixation, all exercises are performed in a lightweight mode. Exercises with muscle tension alternate with

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muscle relaxation. This period of recovery includes all kinds of movements for the ankle joint. Exercises are performed in the initial lying position, on the abdomen, while sitting; standing on all fours. After skeletal traction, with oblique and comminuted fractures, the first determination of the tolerance of the damaged limb is carried out in 3, 5-4 weeks. When combining a bone fracture with a metal rod, a screw and a beam, the training of the supporting function is started on the 15th-21st day. If the stabilization of the fragments is achieved by means of compression-distraction apparatus, the load with support on the injured leg is given on the 7th-10th day [24].

In the future, the exercises include foot movements, exercises with weights and resistance and with gymnastic objects. Gradually, the occupation is entered the initial position standing upright and on the knees. Other options for walking: on socks, heels, on the outside or inside edge of the feet, forward back, sideways, cross-step, in the semicircle, etc. Positive signs are: absence of pain during palpation in the fracture region and axial load and absence of edema [25].

TPC in the late ambulatory stage solves two main tasks

The final restoration range of the motion of the damaged limb and the normalization of all body functions.

Late outpatient stage begins with the moment of removal of gypsum fixation and lasts until the clinical and functional recovery of the patient. In this period the patient receives exercise therapy in combination with a massage. An increase in the surface of the exposed massage (shin, thigh and buttocks) promotes the restoration of joint function regardless of the localization of the fracture and improves the effect of exercise therapy. The load on the leg can be used after restoring active movements in the ankle in the absence of pain and 2-3 weeks after the immobilization ceases. TPC at this stage of rehabilitation can restore the normal amplitude of movements in the joints, strengthen the strength of the muscles of the entire body, eliminate contractures and prevent flat feet [26].

Therapeutic massage in the rehabilitation system

Massage promotes the acceleration of regeneration processes at the site of fracture and improvement of mobility. Early massage starts from the 3rd-5th day after repositioning for 15 minutes with 3 repetitions of receptions. Massage the diseased limb is possible in a plaster bandage and with superimposed skeletal traction. When a plaster bandage is applied to a limb, vibration reflex-segmental massage is recommended, which is performed in a certain reflex area, which corresponds to the lumbar region of the spine, segment L3-L4. Given the reflex effect of massage, you should massage your healthy leg every day for 3-5 minutes [27].

With a skeletal traction for the heel bone massage is performed on the thigh and shin areas, focusing on the reduction of muscle tone, which can be increased not only at the site of the fracture. In these cases, a gentle vibrating massage lasting 3-5 minutes every other day with a relaxed limb musculature is used (Figure 1). From receptions of manual massage apply alternately uninterrupted and intermittent stroking in the centripetal direction.

If there is swelling of the foot, start with a light suction massage in the direction from the edge to the center. After reduction of the edema, they pass to intermittent stroking according to the type of zigzag movements, avoiding the fracture site [28].

2-3 weeks after the removal of the gypsum, hugging intermittent stroking is performed, with the hands moving towards each other. A

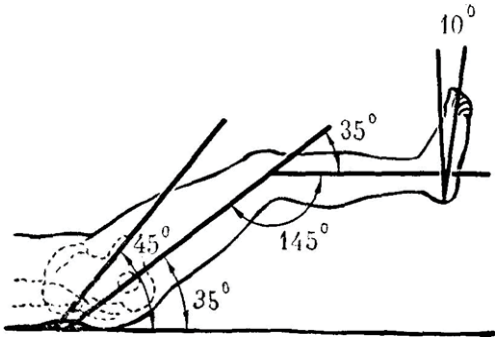

Figure 1: The mid-physiological position of the lower limb for maximum muscle relaxation.

month after the removal of the plaster bandage, a flat deep stroking begins, and then embracing, intermittent, intermittent stroking, slight pinching, continuous kneading in the longitudinal, circular direction and, finally, active mobilization of the ankle joint. All these methods of massage are combined with exercise therapy. To restore the functions of the ankle joint, a combination of massage with mud therapy, apparatus physiotherapy and mechanotherapy has a good effect [29].

The use of physiotherapy in the rehabilitation system

If an ankle is injured, physiotherapy should be prescribed as early as the third day after the fracture. At these times, good results are obtained by applying an electric field of ultrahigh frequency in a continuous mode for 10-15 minutes. It is often applied until the 12th day from the moment of the fracture. Also in these terms low-frequency magnetotherapy is used in pulsed mode for 30 minutes, 10 procedures. Possible the appointment of ultraviolet irradiation of the fracture site, 5 procedures. Laser therapy is a good result. If gypsum is applied to the fracture region, the infrared emission spectrum is applied directly through the gypsum langete, or through the windows cut in the gypsum.

From the 12th day from the moment of the fracture, electrophoresis with calcium or novocaine is applied to the fracture region and segmental departments for 20-30 min, 10-12 procedures or phonophoresis with hydrocortisone. It is also possible to use an ultra-high frequency electric field in a pulsed mode for 12 minutes, 10 procedures. The infrared pulsed laser irradiation of the fracture region for 8-10 minutes, 10 procedures proved to be well established. Often, these patients use general ultraviolet irradiation to normalize metabolic processes in tissues and accelerate the restoration of lesions, with a total of up to 20 procedures [30].

The use of choreography elements in the rehabilitation system

Choreography is not just a dance, it's a great opportunity for full-fledged physical, emotional and aesthetic development. Choreography develops coordination, endurance, musical ear, promotes the development of creative abilities. Also, choreographic elements can be used in physical rehabilitation to achieve full recovery of lost function of ankle joints.

Classes on choreography in case of an ankle joint damage provide with the help of a dance to train the muscles of the lower limbs and strengthen the bone callus. Choreography is based on the repetition of the teacher and the independent exercise of certain

motor movements, expanding the patient's ability to move in a damaged limb. Classes also develop the plasticity of movements and increase interest in them. The choreography should be used as widely as possible, since it simultaneously includes the components of breathing exercises, easy stretching, special exercises for the development of plastics, and all this is accompanied by a bright positive emotional coloring that increases interest in studies. Due to this, choreography can be combined with all types of rehabilitation at an early and late outpatient stage of physical rehabilitation with an ankle injury [31].

Conclusion

The appearance of an ankle injury often leads to a prolonged restriction of mobility, have a negative impact on the leading physiological systems of the body, on health indicators in general and the level of efficiency. Persons with fractures of the ankle require physical rehabilitation at all stages of restorative treatment. In the present work, an overview of available information on the rehabilitation possibilities of the most frequently used variants of the impact on the patient's organism is given. It is shown that if the ankle joint is damaged, regular exercises involving physical therapy, massage sessions, physiotherapy and choreography elements are allowed. For a high efficiency of physical rehabilitation of such patients and the fullest restoration of the functions of a damaged ankle, an individual approach to combining these rehabilitation options is necessary.

References

1. Skoryatina IA, Zavalishina SY, Makurina ON, Mal GS, Gamolina OV (2017) Some aspects of treatment of patients having dislipidemia on the background of hypertension. Prensa Med Argent 103.
2. Zavalishina SY, Medvedev IN (2017) Comparison of opportunities from two therapeutical complexes for correction of vascular hemostasis in hypertensives with metabolic syndrome. Cardiovasc Ther Prev 16: 15-21.
3. Medvedev IN, Lapshina EV, Zavalishina SY (2010) Experimental methods for clinical practice: Activity of platelet hemostasis in children with spinal deformities. B Exp Biol Med 149: 645-646.
4. Medvedev IN, Zavalishina SY (2016) Platelet activity in patients with third degree arterial hypertension and metabolic syndrome. Kardiologiia 56: 48.
5. Glagoleva TI, Zavalishina SY (2017) Aggregative activity of basic regular blood elements and vascular disaggregating control over it in calves of milk-vegetable nutrition. Annual Res Rev Biol 12: 1-7.
6. Skoryatina IA, Zavalishina SY (2017) Impact of experimental development of arterial hypertension and dyslipidemia on intravascular activity of rats' platelets. Annual Res Rev Biol 14: 1-9.
7. Skoryatina IA, Zavalishina SY (2017) A Study of the Early Disturbances in Vascular Hemostasis in Experimentally Induced Metabolic Syndrome. Annual Res Rev Biol 15: 1-9.
8. Skoryatina IA, Medvedev IN, Zavalishina SY (2017) Antiplatelet control of vessels over the main blood cells in hypertensives with dyslipidemia in complex therapy. Cardiovascular therapy and prev 16: 8-14.
9. Medvedev IN (2017) Microrheology of erythrocytes in arterial hypertension and dyslipidemia with a complex hypolipidemic treatment. Russian J Cardiol 4: 13-17.
10. Medvedev IN, Skoryatina IA (2015) The aggregation capacity of neutrophils in patients with arterial hypertension and dyslipidemia treated with fluvastatin. Klinicheskaia meditsina 93: 66-70.
11. Medvedev IN, Savchenko AP, Kiperman YV (2015) Dynamics of the intravascular activity of platelets in young men with high normal blood pressure regularly practicing physical activity. Biol Med 7: 1.
12. Safiulin EM, Makhov AS, Mikhaylova IV (2016) Chess groups for beginner players with musculoskeletal disorders: mastery and participation restraining factor analysis. Teoriya i praktika fiz. kultury 4 : 33-35.
13. Mikhaylova IV, Shmeleva SV, Makhov AS (2015) Adaptive chess educational technology for disabled children. Teoriya i praktika fiz. kultury 7: 38-41.
14. Bonkalo TI, Shmeleva SV, Zavarzina OO, Dubrovinskaya YeI, Orlova YuL (2016) Peculiarities of interactions within sibling subsystem of a family raising a child with disabilities. Res J Pharm Biol Chem Sci 7: 1929-1937.
15. Strelkov VI, Zavarzina OO, Shmeleva SV, Kartashev VP, Savchenko DV (2016) Psychological barriers in college teacher's career «Helping professions». Res J Pharm Biol Chem Sci 7: 1938-1945.
16. Bikbulatova AA, Andreeva EG, Medvedev IN (2017) Platelets' functional peculiarities in persons of the second mature age with spinal column osteochondrosis of the second degree. Annual Res Rev Biol 21:1-9.
17. Bikbulatova AA, Andreeva EG, Medvedev IN (2018) Microrheological properties of erythrocytes in persons of the 2nd mature age with osteochondrosis of the 2nd degree. Annual Res Rev Biol 23: 1-8.
18. Skoryatina IA, Zavalishina SY, Makurina ON, Mal GS, Gamolina OV (2017) Some aspects of treatment of patients having dislipidemia on the background of hypertension. Prensa Med Argent 103: 3.
19. Kotelnikov GP (2006) Traumatology and orthopedics. Moscow: GEOTAR-Media 400.
20. Hootman JM, DicSk R, Agel J (2007) Epidemiology of collegiate injuries for 15 sports: Summary and recommendations for injury prevention initiatives. J Athl Train 42: 300-320.
21. Krosshaug T, Slauterbeck JR, Engebretsen L, Bahr R (2007) Biomechanical analysis of anterior cruciate ligament injury mechanisms: three-dimensional motion reconstruction from video sequences. Scand J Med Sci Sports 17: 498-510.
22. Serova NY, Nikishov SO, Keshishyan RA, Sidorov SV, Vorobyov DA, et al. (2011) Complex treatment of damages of a musculoskeletal system at children. After treatment and sanatorium treatment. Present stages of postoperative after treatment. Materials of the international congress. Moscow, 91-92.
23. Stepanenkova EY (2008) Theory and technique of physical training and development of the child. Moscow: Publishing center "Akademiya", 145.
24. Yepifanov VA, Yepifanov AV (2009) Recovery treatment at damages of a musculoskeletal system. Moscow: Geotar-med, 480.
25. Vorobyeva NV (2017) Physiological Reaction of Erythrocytes' Microrheological Properties on Hypodynamia in Persons of the Second Mature Age. Annual Res Rev Biol 20: 1-9.
26. Grebova LP (2006) Medical physical culture at disturbances of a musculoskeletal system at children and teenagers. Moscow: Publishing center "Akademiya", 176.
27. Dubrovsky VI, Dubrovskaya AV (2005) Medical massage. Moscow: Geotar-med, 504.
28. Verbov AF (2002) Bases of medical massage. Rostov N/Dona: Phoenix, 320.
29. Krasikova IS (2009) Baby massage and gymnastics for prophylaxis and treatment of disturbances of a posture, scolioses and a platypodia. SPb: CORONA Century, 320.
30. Kabarukhin BV (2010) Types of after treatment: Physical therapy, physiotherapy exercises, massage. Rostov N/D: Phoenix, 557.
31. Kondakov V (2009) Hostess of the empire of dance. Holiday 1: 32-33.

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