Diagnostic Algorithm for Examination of Patients with Limb Shortening and Deformity before, during and after Treatment to Study Bone Quality

K. A. D'yachkov[1], G. V. D'yachkova[1], A. M. Aranovich[1], T. A. Larionova[1], A. Yu.Vasil'iev[2]

[1] ФГБУ «Российский научный центр «Восстановительная травматология и ортопедия» им. акад. Г. А. Илизарова» Минздрава России, г. Курган
[2] ГБОУ ВПО «Московский государственный медико-стоматологический университет им. А. И. Евдокимова» Минздрава России

Abstract

Radiography, Multislice Computed Tomography (MSCT) and Magnetic Resonance Imaging (MRI) were used to examine 168 patients with lower limb shortening, bone deformity at different stages of limb lengthening using transosseous distraction osteosynthesis with the Ilizarov apparatus. Based on the findings an algorithm for examination of patients with limb shortening and deformity was improved and added at different stages of treatment. The algorithm must include standard polypositional radiography with data processing if needed, using software for quantitative assessment of optical density, updated MSCT and MRI techniques. Indications for MSCT were preoperative measurement of bone density, evidently impaired architectonics; and delayed consolidation, cysts and areas of low density in the regenerate bone during treatment. MRI should be produced after removal of the frame in patients with lengthy fixation period, with the purpose of assessing degree of bone restructuring at the distractional regenerate bone and quality of new bone to plan a programme of rehabilitation.

Key words: Multidetector Computed Tomography, Magnetic Resonance Imaging, Lengthening, Tibia, Radiography, Algorithm.

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Authors

D'achkov Konstantin Aleksandrovich, Ph. D. Med., Leading Researcher of the Laboratory of Radiological and Ultrasound Diagnostic, Federal State Budgetary Institution Russian Institution Russian Ilizarov Scientific Center Restorative Traumatology & Orthopaedics, Ministry of Healthcare of Russia.
Address: 6, ul. M. Ul'yanovoy, Kurgan, 640014, Russia.
Phone number: +7(3522) 45-37-49. E-mail: dka_ doc@mail.ru

D'achkova Galina Viktorovna, M. D. Med., Professor, Head of the Laboratory of Radiological and Ultrasound Diagnostic, Federal State Budgetary Institution Russian Ilizarov Scientific Center Restorative Traumatology & Orthopaedics, Ministry of Healthcare of Russia.
Address: 6, ul. M. Ul'yanovoy, Kurgan, 640014, Russia.
Phone number: +7(3522) 45-26-14. E-mail: dgv2003@list.ru

Aranovich Anna Mayorovna, M. D. Med., Head Trauma and Orthopedics Department № 17 Federal State Budgetary Institution Russian Ilizarov Scientific Center Restorative Traumatology & Orthopaedics, Ministry of Healthcare of Russia.
Address: 6, ul. M. Ul'yanovoy, Kurgan, 640014, Russia.
Phone number +7 (3522) 45-03-39. E-mail: aranovich_anna@mail.ru,

Larionova Tat'yana Adislavovna, Ph. D. Med., Senior Researcher of the Laboratory of Radiological and Ultrasound Diagnostic, Federal State Budgetary Institution Russian Ilizarov Scientific Center Restorative Traumatology & Orthopaedics, Ministry of Healthcare of Russia.
Address: 6, ul. M. Ul'yanovoy, Kurgan, 640014, Russia.
Phone number: +7(3522) 45-44-95. E-mail: dgv2003@list.ru

Vasil'ev Aleksandr Yur'evich, M. D. Med., Professor, Corresponding Member of the Russian Academy of Sciences, Professor of Department of Radiology of Medicine and Dentistry named after A. I. Evdokimov, Ministry of Healthcare of Russia.
Address: 9a, ul. Vucheticha, Moscow, 127206, Russia.
Phone number: +7 (495) 611-01-77. E-mail: auv62@mail.ru