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NEW ASPECTS OF DIAGNOSIS AND TREATMENT OF ACUTE COMBINED INJURIES IN ADOLESCENCE

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Abstract. The article presents a review of the literature, the purpose of which was to evaluate the diagnostic value of arthroscopy along with such additional examination methods as ultrasound, X-ray, magnetic resonance and computed tomography for post-traumatic changes in the intra-articular structures of the knee joint in children.

Keywords: arthroscopy, method, knee joint, treatment, children.

INTRODUCTION: Statistically, injuries to the knee joint account for 10–25% of all injuries to the musculoskeletal system in pediatric patients [1, 2]. Exposure to a traumatic factor on the knee joint can lead to serious pathological changes in intra-articular structures. The age of the patients, features of the anatomical structure of the knee joint, and difficulties in obtaining anamnesis (communication barrier between the child and the doctor) reduce the diagnostic usefulness of the information necessary for choosing the correct approach to the correction of post-traumatic changes in the knee joint [3].

MATERIALS AND METHODS: The most common post-traumatic pathology of the knee joint in children is isolated and combined injuries to the menisci, which account for 50–85% of injuries to the knee joint and occupy a leading position in the structure of intra-articular pathology of the knee joint in adolescence [3].

Due to the lack of contrast of the menisci, the X-ray examination method does not make it possible to diagnose their damage [1].

The ultrasound method for examining menisci is effective and allows diagnosing their pathology with a high degree of reliability. A comparative analysis of ultrasound of the knee joint for injuries and diseases of the menisci with the results of invasive research methods (surgical interventions, arthrography, diagnostic arthroscopy) showed a high sensitivity of 92–95% and specificity of 78–100% of this diagnostic test [2]. However, with acute injury occurring against the background of hemarthrosis, interference is created that prevents the assessment of the condition of the menisci [4]. During ultrasound examination of the lateral meniscus, diagnostic errors are associated with the fact that in the cavity of the lateral part of the knee joint there is a tendon of the popliteus muscle, the image of which partially overlaps the image of the posterior horn of the lateral meniscus and is regarded as its damage [4].

RESULTS AND DISCUSSION: Diagnostic arthroscopy occupies a dominant position among other methods in assessing the condition of the cruciate ligament (CL) [3]. When performing arthroscopy for hemarthrosis, when it is impossible to radiologically diagnose a fracture of the intercondylar eminence of the tibia in the acute period, in addition to detecting damage to the CL, the degree of displacement of the torn intercondylar eminence and the quality of adaptation of the fragment during passive movements in the knee are established joint [2]. Moreover, arthroscopy, according to the authors, in 7% of cases is the only method for identifying this pathology [3]. About 50% of CL injuries are of a partial rupture nature and do not have typical clinical manifestations. In some cases, with complete CL damage, a well-developed infrapatellar fold can simulate preserved CL fascicles on MRI images. And diagnosis in these cases is possible only after endoscopic examination [2].

Patellar dislocation is relatively rare, accounting for 0.4 to 1% of all traumatic joint dislocations. This type of pathology is prone to relapses with subsequent chronicity of the

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pathological condition. In the case of habitual dislocation of the patella, during the child's growth, secondary deformations are formed at the level of the knee joint, which lead to disruption of the biomechanical function of the joint [4]. In 24% of cases, dislocations are traumatic. In 10.4% of cases, dislocations are accompanied by cartilaginous fractures with displacement of the fragment into the cavity of the knee joint. It is possible to determine the presence of a fragment in this case using the X-ray examination method only in 18% of cases. X-ray examination to determine the decentration of the patella is carried out in standard (direct, lateral, tangential) projections with determination of indices and angular parameters of the patella in relation to the femoral condyles.

One of the common problems of the knee joint in adolescence is mediopatellar fold syndrome (MFS), which consists of thickening and fibrosis of the fold as a result of injuries to the knee joint, repetitive stress, and inflammatory processes. Against the background of a thickened fibrotic fold, a mechanical effect is created on other intra-articular structures, which leads to reactive synovitis and thinning of the articular cartilage. Instrumental diagnostic methods (radiography in three projections - direct, lateral and tangential, ultrasound, MRI), as a rule, do not allow us to reliably talk about the presence of MFS. And the clinical manifestations of MFS are in many ways similar to the manifestations of other pathological conditions of the knee joint. It is arthroscopy that makes it possible to make a final differential diagnosis, determine the degree of damage (chondromalacia) of the cartilage and perform the necessary therapeutic manipulation [3].

CONCLUSION: Thus, X-ray examination in the diagnosis of knee joint pathology is highly informative only for certain types of injuries - intra-articular fractures, the presence of foreign bodies, or as a method of functional radiography to determine anterior instability of the knee joint. When assessing radiographs in children, age-related features of bone ossification, timing of the appearance of ossification nuclei, and development options of the epiphyses and patella are taken into account [4].

The ultrasound method for diagnosing pathology of the knee joint is considered by some authors to be quite attractive, which is due to the widespread use of diagnostic equipment, the relative simplicity of the study, absolute non-invasiveness and the possibility of conducting research in real time. However, an analysis of literature sources did not reveal comprehensive data on the effectiveness of using ultrasound diagnostics for knee joint injuries in childhood. According to M.K. Tishchenko, the value of ultrasound examination increases when it is performed in all patients with acute injury to the knee joint, which allows pre-hospital screening assessment of the injury and identification of the presence of synovitis of various etiologies, but to determine further diagnostic tactics, preference is given to MRI and arthroscopy.

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