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Diagnosis of Deformities in the Knee Joint

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Abstract: Diagnosis of pathological changes in the knee joint in orthopedic pathology is based on clinical and biomechanical examination of patients and on radiation imaging methods, among which radiography plays the main role [9, 18, 22]. Additional methods include lineartomography andultrasound. In addition, special techniques are used-MRI, CT, which allow you to get the most accurate information about the condition of the bones that form the joint, and all the structural elements of the joint.As well as for other joints, a thorough X-ray and additional examination is extremely important, since it plays a role in the correct planning of surgical intervention, especially in the elimination of deformities, for choosing the plane and level of osteotomy, taking into account the mechanical and biomechanical axis [15, 17].

Keywords: diagnosis, deformity, knee joint.

Methods for calculating these parameters and their modern research method shave been the subject of numer ousscientific works [2, 4, 6]. For example, in the work of I. M.Zazirny(2005) Somebiomechanical aspects of the features of knee joint loading are considered, in particular, the analysis of forces and instantaneous impacts for establishing active and passive support loads [13]. In the literature, methods are described in sufficient detail and schemes for determining the mechanical and biomechanicalaxis of the lowerlimb, as well as their changes inknee joint deformities, are presented. To detect varusor hallux valgus deformity in the knee area, radiography of both lower extremities should be performed before surgery (with the entire thigh and lower leg captured with the center at the level of the knee joint). in a straight projection, in a standing position. On the resulting radiographs, it is necessary to draw a line passing through the center of the femoral canal to the center of the knee joint (anatomical axis); after that, a line passing through the femoral head and the center of the knee joint (mechanical axis). The angle between these two linesis called the hallux valgus angle, which is normally 3– Many authors note that the correct assessment of the size of the deformity requires standard X-ray placement, taking into account the position of the knee and ankle joints, and a strict choice of projection [3, 4]. Currently, a lot of attentionis paid to the following opportunities: CT scan and MRI for this purpose [8]. The literature has repeatedly raised the question of the size of the physiological varus. Toidentify differences between infantile varus deformity of the lower leg in eighteen children under three years of age and physiological varus deformity (50 children of the same age) X-ray examinations were performed. All children with infantiletibia had The strain is underestimated if the direction of the X-ray beam is not perpendicular to the frontal plane. To accurately determine the frontal plane, it is necessaryto find sucha lateral projection, which is obtained by superimposing the posterior edges of the femoral condyles on top of each other. After placing the patient in the present lateral position, a second X-ray image is taken on a large film in a plane at right angles to the previous film. Thus, a true frontal plane is obtained,which does not require orientation by the position of the foot or patella, which tends to change. Concomitant flexion deformation does not negate the result. Using this technique, it can be shown tha tconventional methods tend to underestimate the degree of knee joint deformity [9,].From the biomechanics point of view, L. V. Sklyar proposed calculations of the required lengthening value, which directly depended on the degree of deformation [5]. However, determining the

necessary correction in high tibial osteotomy by measuring the angle between the femur and tibia on radiographs is not reliable enough, since the knee can be in different positions. Many authors paid great attentionto identifying the causes of deformities in the knee joint, comparing them with age-related changes in the bones, since the elimination of deformities in childhood should take into account the state of the growth zone [1, 3, 4].It is well known that the cartilage tissue has no vessels and" feeds " diffusely at the expense of the bone vascular network. Accordingly, any inadequate compression can cause biological changes such as neurodystrophic disorders, and thenaseptic necrosis. Especially often this occurs against the background of initially altered cartilage, which in this caseis a dysplasticall yaltered germ zone. The process of ossification and maturation slows down and becomes distorted, as the destroyed cartilage ossifies much more slowly. In the future, "vicious"is closed a circle: the compression factor continues to work, which leads to deformation against the background of impaired ossification and, as a result, insufficiently resistant to compression of the dysplasia zone. Of particular importance are studies on the causes of post-traumatic and other deformities in children. The number of publications on this topic is quite large, and the authors address various problems, including spontaneous correction of deformity in children. Inmany studies, much attention is paid to a thorough analysis of growth in the medial and lateral parts of the tibial metaepiphys is after fracture sextending to the growth zone. After studying the results of conservative treatment of seven children with fractures in the area of the proximal tibial metaphysis and angular deformity 18 months to 11 years after the fracture, the researchers identified hallux valgus deformities in six patients, according to radiography, which progressed during the first year, despite thefusi on of the fracture. Oneto two years after the injury, the deformity slowly regressed as a result of corrective longitudinal growth [38]. According to C. C. Hasler and L. von Laer (2000), impaired growth, with its stimulation after fractures, usually occurs after fractures in the proximal metaphysis of the tibia [9]. If a slightvalgizati on is ignored, impairedgrowth can lead to progressive varus deformity. Partial closure of the growth zone after epiphysis fractures by osteotomy with partial closure of the growth zone. It is necessary to monitor sick children after injury in the area of the germ zone in order to have timely surgical intervention [3]. Incidence of acute hematogenous osteomyelitis in children over the past 20 years, it has not decreased, but the duration of hospital treatment has decreased, as well as the duration of antibiotic treatment [3].

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