



INVESTMENTS IN EDUCATION DEVELOPMENT

with deformities around the knee joint region. Hemi-epiphysiodesis (HE) was indicated to growing children suffering from the knee joint deformities caused by idiopathic, metabolic, neuromuscular, genetic skeletal disorders. Partial permanent medial or lateral HE of distal femoral physis and/or proximal tibia one was done in a cohort of 28 patients aged 10.4 – 15.95 years. Totally were made 47 medial and 10 lateral hemi-epiphysiodesis. Average age of surgery was 13.27 ± 1.31 years. Valgosity was indicated to HE in children with both the idiopathic cases (obesity, hypermobility) and in multiple exostoses, bone dysplasias (BD), etc. In patients with valgosity the average T-F angle was $13.62^\circ \pm 4.08^\circ$ measured before surgery, the angle was normalized to $4.4^\circ \pm 1.39^\circ$. The evaluation showed that intermalleolar distance was decreased from $8.1 \text{ cm} \pm 2.63 \text{ cm}$ to $0.91 \text{ cm} \pm 1.29 \text{ cm}$. Varosity was indicated to HE in children with bone dysplasias (achondroplasia, pseudoachondroplasia, hypophosphatemic rickets etc.). Average T-F angle in these cases was $-13.63^\circ \pm 2.29^\circ$ measured before surgery, the angle was changed to $-9.75^\circ \pm 2.36^\circ$. Intercondylar distance was decreased from $3.38 \text{ cm} \pm 1.25 \text{ cm}$ to $2.2 \text{ cm} \pm 1.68 \text{ cm}$. In the right time indicated modified drilling HE by Macnicol results to excellent correction of tibio-femoral angle. Worse results were gained in patients with bone dysplasias and varosity of the knee joints due to difficult prediction of remaining growth and late carrying out of the HE. In BD cases we begin to use so-called „guided growth method” which uses the special 8-plates in last two years. The correction of the biomechanical axis of legs by HE is a mini-invasive surgical procedure that is indicated with the aim not only to prevent premature osteoarthritis of the knee joints but it improves the posture, walking stereotype and visual aspect, too.

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Laboratory of Biomechanics of Extreme loading is a research and educational experimental place by the Department of Anatomy and Biomechanics of Faculty of Physical Education and Sports of Charles University. Since its opening in 2004, the laboratory is focused on the study of kinematic and dynamic parameters of different human movement activities, which are followed by research of rheological properties of native and artificial tissues and materials. The laboratory has at disposal devices designed by own development (rheometer, microtester, analytical work and sports equipment...) that complement and extend the capabilities of owned commercially available top-technologies (Kistler, Qualisys, Dewetron...). These technical background along with a stable staff base consisting primarily of the staff and PhD students of the Department of Anatomy and Biomechanics allows to apply an advanced biomechanical approach also in matters of forensic and injury biomechanics. An important component of the work of the lab is represented by huge grant activities and large contract research. The laboratory is also effectively used in support of Bc., Mgr. and especially of Ph.D. studies both for demonstrations in teaching process and by solving the theses topics.