The dependence of viscoelastic parameters of hair on its structure

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Hair is a polymer with a composite structure; that´s why its dependence of the total viscoelastic properties on its physical sizes is not surprising. Cross dependencies of the viscoelastic parameters, especially their dependence on the diameter of the hair, allows construction of a viscoelastic model of the hair structure and identify its elements with the anatomical structural parts of the hair, then find the characteristic viscoelastic parameters for these parts. We measured parameters such as activation energy, the work necessary to break the hair, relaxation times, the Young's modulus, the ultimate strength and elasticity. 600 samples of Caucasian women´s hair have been measured. The demonstration of dependence between these parameters is itself a valuable finding of this pilot study.

Experimental test machine for durability evaluation of bifurcated endovascular stent-grafts: verification of testing conditions

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Bifurcated endovascular stent-grafts are crucial medical devices for mini-invasive treatment of abdominal aortic aneurysm (AAA). After deployment of stent-grafts into the vessel, it is subjected not only to strongly corrosive environment but also to fatigue. This is due to the cyclic alteration of systolic and diastolic blood pressure in an artery. Proposed paper deals with construction and verification of a machine which is able to simulate conditions in the aorta and thus verify durability of the stent-grafts as a whole. Special attention is dedicated to measurement of the pressure development in a silicone model of the aorta.

The ability of vibrational technique to assess initial fixation of implant

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Initial fixation of implant plays a crucial role for long term survival of implant and the overall success of the surgical procedure. The main objective of proposed paper is a preliminary study of ability of the vibrational technique for assessing the initial fixation of implant. The experimental results show a correlation between status of initial fixation of implant and evaluation of frequency response of bone - implant structure. The vibrational method has a potential to assess the initial fixation of implant, but the feasibility, repeatability and sensitivity testing are required.

The values of viscoelastic parameters of hair at different places on the head surface

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Most works do not even consider the dependence of mechanical and viscoelastic parameters on the sampling places on the surface of the head, but it shows that these parameters significantly depend on the sampling places, as has been shown in our work (Šimková et al., 2013). This paper deals with describing this dependence on other viscoelastic parameters such as activation energy, the work necessary to break the hair, relaxation times, the Young's modulus, the ultimate strength and elasticity. The samples were taken from 40 women and the values determined for 600 hair. In addition to the previously found dependence of the hair diameter on the sampling places, dependence of two other parameters has been found.

Risk types of landing in volleyball for ACL injury

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Anterior cruciate ligament (ACL) injuries frequently occur in landing from a jump on one or both legs near full extension (0-30° knee flexion). The aim of the study was identified the type of landings after volleyball block where knee flexion is found under critical value at the instant of first peak of resultant GRF. Subjects were required to land on force platforms using eight types of landing after performing a standing block jump movement. One-sample t-test (critical value 30°) was use for compare between types of landing and critical value 30° of