**Study of the features of microcirculation of uterine tissues during myomectomy using laser Doppler flowmetry and fluorescence spectroscopy**

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Currently, there is an active search for ways to improve the quality of assessing the functional state of the pseudocapsule and the surrounding muscle tissue during laparoscopy to address the issue of the advisability of preserving the pseudocapsule and preventing the development of relapses in the postoperative period. The use of optical technologies, which are currently being successfully implemented in minimally invasive surgery, is one of the ways to solve this problem.

The purpose of this study is to evaluate the possibility of a multimodal approach in gynecological practice by integrating the methods of fluorescence spectroscopy (FS) and laser Doppler flowmetry (LDF) into a standard laparoscopic myectomy procedure to study the features of microcirculatory processes in uterine tissues.

The measurements were carried out using a fiber optic system specially adapted for this task, implementing the FS and LDF method, including the LAKK-M diagnostic complex and a laparoscopic fiber optic probe. To register optical signals, the probe was inserted into the pelvic cavity through the instrumental channel. The probe has a rigid part with a diameter of 3 mm, which provides comfortable control and good fixation at the point under study. LDF and FS signals were recorded in the tissues of the endometrium, myometrium, myomatous nodule, and pseudocapsule. The study point was chosen for each woman based on the convenience of performing the main gynecological operation and was at least 1 minute. The fluorescence spectra excited at wavelengths of 365 and 450 nm were sequentially recorded in the FS channel.

Processing of the data obtained showed that perfusion in the tissues of the myometrium and endometrium is a variable parameter (8.7 ± 2.5 p.u and 7.8 ± 3.1 p.u , respectively). The high value of blood microcirculation parameter in these tissues, as well as the amplitude of myogenic and cardiac oscillations, confirms an idea that a characteristic feature of the blood circulation of the uterus is the vasomotor nature of blood movement through microvessels.

The recorded average perfusion values in the pseudocapsule were significantly lower and had statistically significant differences with the average perfusion values of the myomatous nodule (5.4 ± 1.3 p.u and 8.5 ± 2.6 p.u ).

A significant increase in the fluorescence signal at an excitation wavelength of 365 nm in the myomatous nodule (0.6±0.4 a.u) relative to the same values in the pseudocapsule is due to the content of more collagen in the myomatous nodule.

The conducted pilot experimental studies confirm the possibility of using optical diagnostic technologies while performing myomectomy. That will allow the surgeon to obtain additional diagnostic information about the perfusion and metabolic characteristics of uterine tissues.