

Sarkisova Yu.V.

ANALYSIS OF THE DYNAMICS OF CHANGES IN THE STRUCTURE OF THE VITREOUS BODY MATRIX IN THE POSTMORTEM PERIOD ACCORDING TO SPECTRAL-SELECTIVE AUTOFLUOROCRESCENT MICROSCOPY

Department of Forensic Medicine and Medical Law

Bukovinian State Medical University

The methods of estimating the time since death (TSD) used in practical forensic medicine, range from traditional morphological methods, such as assessment of early and late postmortem changes, to methods based on biochemical and molecular changes in the human body. However, each of the modern methods mostly has several external or internal modifying factors or limitations, especially with increasing duration of the postmortem period, which allows to establish the TSD with insufficient accuracy for investigating authorities.

Objective of the study is to develop a set of new, objective forensic criteria for an accurate establishment of TSD by spectral-selective laser-induced autofluorescence microscopy of the human vitreous body (VB) matrix. VB was taken from the anterior chamber of the eye from 60 corpses with previously known TSD from 1 to 48 hours, with the following intervals: 1, 4, 8, 12, 18, 24, 36 and 48 hours. The cause of death was cardiovascular pathology. Exclusion criteria: craniocerebral and eyeball injuries, the presence of any laboratory confirmed exogenous intoxications. A blue LSR405ML-LSR-PS-II semiconductor laser with a wavelength $\lambda = 0.405 \mu\text{m}$ and a power of $W=50\text{mBm}$ at the location of the laser spectral-selective microscope was used to excite autofluorescence. Subsequently, bandpass filters were used.

Experimental measurements of the coordinate distributions of the laser-induced autofluorescence of the VB matrix found dynamic time-dependent changes in the magnitude of statistical moments of the 1st – 4th orders (the value of SM_1 varies from 0.91 to 0.42, SM_2 – from 0.39 to 0.08, SM_3 – from 0.12 to 0.99, SM_4 – from 0.18 to 1.19) in the linear range up to 36 h after death. The detected changes in the values with increasing TSD can be associated with destructive necrotic changes in the composition of the human VB matrix, the fluorescent manifestations of which are accompanied by a decrease in the intensity of radiation in the thick green region of the corresponding spectral range of electromagnetic wavelengths.

Analysis of the obtained data on the time dependences of necrotic changes in the set of statistical moments of the 1st – 4th orders, which characterize the distributions of the fluorescence intensity maps of the human VB matrix, found a high level of accuracy in TSD determining within 20 - 22 minutes at intervals of up to 36 hours after death.

The effectiveness of the method of spectral-selective laser-induced autofluorescence microscopy of the human VB matrix in the determination of TSD is demonstrated. The range of sensitivity of the method is determined up to 36 hours with the accuracy of setting the TSD within 20-22 minutes.

Stelmakh G.Ya.

ANATOMICAL VARIABILITY OF THE VISCERAL BRANCHES OF THE THORACIC AORTA IN THE FETAL PERIOD

Mykola Turkevych Department of Human Anatomy

Bukovinian State Medical University

Due to the progress of perinatal diagnostic methods and the development of surgical interventions in the organs and walls of the thoracic cavity, a multidimensional study of the variations of the branches of the aortic arch during the embryonic period is of great practical value.

The aim of the study was to establish the anatomical variability of the visceral branches of the thoracic aorta in the fetal period of human ontogenesis. An anatomical study was performed on 38 human fetuses of 81.0-375.0 mm parietal-coccygeal length (PCL) using macro microscopic dissection, application contrast of dissected vessels and nerves, and morphometry.

As a result of the investigation, it was found that the bronchial branches depart from the anterior wall of the thoracic aorta at the third and fifth levels of the thoracic vertebrae. From 2 to 4