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USING OPTIO-POLARIZATIONAL METHODS AND ARTHROSCOPY IN EARLY DIAGNOSTICS AND TREATMENT OF SEPTIC ARTHRITIS

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The use of optical-laser methods for differential diagnostics of reactive synovitis with deformed gonarthrosis of the 2nd-3rd stage and septic arthritis.

Objective: to improve the differential diagnosis of changes in synovial fluid using a method of laser multiparameterpolarimetry, phaseometry and spectrophotopolarimetry of microscopic images of synovial fluid films. Twelve patients aged 26 to 76, including 7 women and 5 men, participated in the study. The synovial fluid was removed with puncture of the upper spin of the knee before treatment, 1 ml of which was then used to prepare the smear. Investigation of synovial fluid films by the above-described methods was carried out in the Stokes polarimeter scheme, a phase-beam beam of helium-neon laser with a wavelength of 0.6328 μm , a power of 5 mVt and subsequent digital processing of the data.

The average duration of a separate optic-laser study of synovial fluid smear for one patient is 1.5 - 2 hours. The medical informativity of the methods was demonstrated by identifying the sensitivity and specificity of a separate methodology and group of patients. The obtained results indicate that the highest sensitivity and specificity is demonstrated by the method of spectropolarimetry where, respectively, the sensitivity is 92-93% and the specificity of the method is 82-86%. The sensitivity of the laser-microscopic imaging method is 82-83%, and the specificity of 73-76%. The Stokes polarimetry method generally exhibits the lowest sensitivity (43-56%) and specificity (38 - 46%), but is the basis for phasometric and spectropolarymetric studies.

The results obtained in the study of synovial fluid in septic arthritis are presented in Table.

Statistic moments	Polarization		Phaseometry	Spectral
	(azimuth)	(ellipt)		
Average	1,47 \pm 0,27	0,73 \pm 0,08	0,87 \pm 0,13	0,031 \pm 0,005
Dispersion	0,21 \pm 0,037	0,23 \pm 0,037	0,145 \pm 0,023	0,38 \pm 0,063
Asymmetry	0,44 \pm 0,069	1,15 \pm 0,21	2,09 \pm 0,34	0,41 \pm 0,073
Access	1,12 \pm 0,24	0,88 \pm 0,16	2,23 \pm 0,36	3,48 \pm 0,57

Arthroscopic treatment of patients in the early stages of arthritis was performed after the obtained results. The purpose of the treatment of infectious arthritis is the rehabilitation of the hearth of infection and early re-mobilization. Arthroscopic treatment was proposed by JARRET in 1981. The expediency of localization of the process was only within the joint. The task of arthroscopy in infectious arthritis is decompression of mechanical cleansing of the joints by washing the removal of necrotic tissues and fibrin.

Repeated endoscopic lavage - repeated rinsing through an arthroscopic tunnel with a large volume of liquid (not less than 6 -10 liters, control of hydrostatic pressure). Installation of vacuum drainage. Setting of a constant rinse drainage with a suction and subsequent rinsing, if in doctor's opinion, one rinse is not enough.

Comprehensive application of optic-laser techniques for microscopic imaging of synovial fluid films, along with commonly used survey methods, can significantly accelerate objective diagnosis and differentiation of pathological states of joints. Arthroscopic treatment of infectious arthritis in the early stages allows to adequately heal the infection center by lavage. Low invasiveness of the method reduces neuromuscular disorders in the inflamed joint. The need for immobilization is significantly reduced, allowing for quicker rehabilitation and rehabilitation.