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ESMO GYNAECOLOGICAL CANCERS

FLUORESCENT DETECTION OF EPITHELIAL CELLS IN ASCITIC FLUID IN OVARIAN CANCER IN THE "LIQUID BIOCHIP" FORMAT

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Abstract.

Most often, the first clinical manifestations of ovarian cancer occur due to the formation of ascitic fluid in the abdominal cavity, with cytological examination of which it is possible to obtain morphological confirmation of the process. However, the existing subjective factors of assessing the cytological picture of the drug lead to the need to use an integrated approach to assessing ascitic fluid, including the use of immunocytochemical examination (ICC). At the same time, the ICC method itself requires detailed compliance with the protocol and the time of the reaction, which makes it difficult to use it in the study of flushes obtained during surgery. Using a fluorescent label to detect protein expression, it is possible to significantly accelerate the reaction time and use the ICC method during surgical interventions.

The aim of the work is to evaluate the diagnostic informativeness of using a "liquid" biochip to determine the expression of EpCAM protein in ascitic fluid cells in the detection of ovarian cancer using a fluorescent label compared with the traditional method of ICC research.

Materials and methods.

40 samples of intraoperative flushes obtained from patients with suspected ovarian cancer performed during surgical intervention of the State Medical Institution NO City Hospital No. 35, Nizhny Novgorod in 2021-2022 were analyzed. All fluid samples were examined cytologically. Using the test system in “liquid biochip” format (RUSCELL LLC, Russia), an ICC study was conducted, the results of which were visualized using a Zeiss Primo Star microscope (Carl Zeiss, Germany), as well as additionally each sample of the resulting liquid was examined using a "liquid" biochip with a fluorescent EpCAM protein imaging label.

Figure 2. Results of cytological examination before using the test system in the "liquid biochip" format

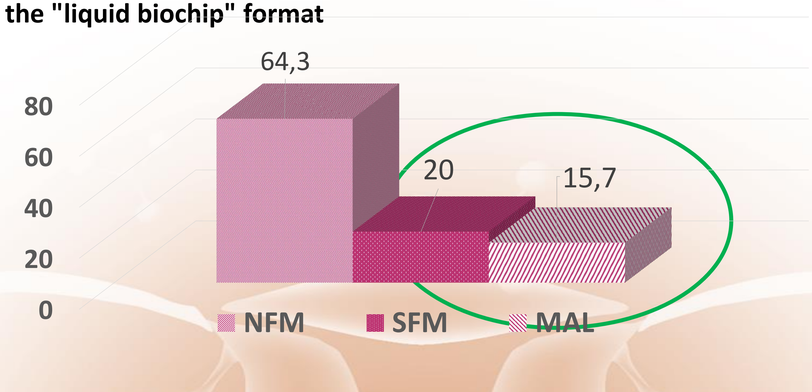
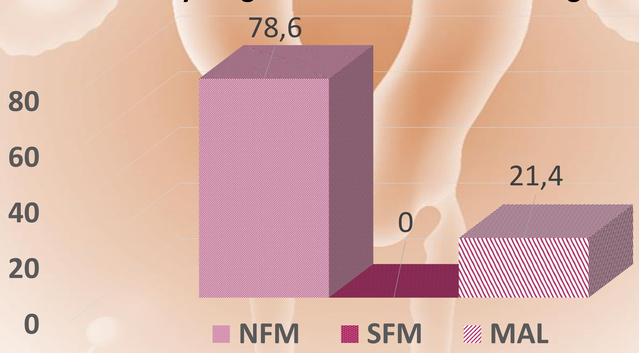


Figure 3. Results of cytological examination after using the "liquid biochip"



Results.

According to the results of cytological examination, the following data were obtained: absence of malignant cells (NFM) – 64.3%, suspicion of the presence of malignant cells (SFM) – 20%, malignant nature of cells (MAL) -15.7%. An additional ICC study of the expression of the EpCAM protein using a test system in the "liquid biochip" format led to changes in diagnostic results within the following categories: NFM - 78.6%, MAL – 21.4%. At the same time, the time to achieve stable results when using the traditional ICC method was 110 minutes, and when using a "liquid" biochip – 35 minutes.

Conclusion.

The use of an integrated approach in the form of cytological and ICC studies of effusion fluids in OC allows to increase the detectability of malignant tumor cells in intraoperative flushes by 1.4 times due to a decrease in the number of conclusions related to the SFM category. The use of a fluorescent label reduces the waiting time for the result by 3.1 times in comparison with the traditional ICC technique and contributes to the introduction of this study into the practice of surgical hospitals.

An example of using a test system in the format of a "liquid biochip" in the cytological diagnosis of the nature of ascitic fluid (clinical case):

Patient A., 56 years old. The diagnosis at admission is ovarian cyst. Ascites. Ultrasound examination of the abdominal cavity and pelvis - determines the level of free fluid in the central part of the abdominal cavity, the volume of formation of the right ovary. Laparocentesis was performed with the intake of 1000 ml of ascitic fluid. In cytological examination of exudate, the nature of cellular changes is suspicious of the grain-quality nature (SFM). When the reaction is set up on a test system in the format of a "liquid biochip", a positive expression of the memebrane antigen EpCAM is noted. The result of histological examination of the surgical material is serous ovarian cancer T3bNoMo.

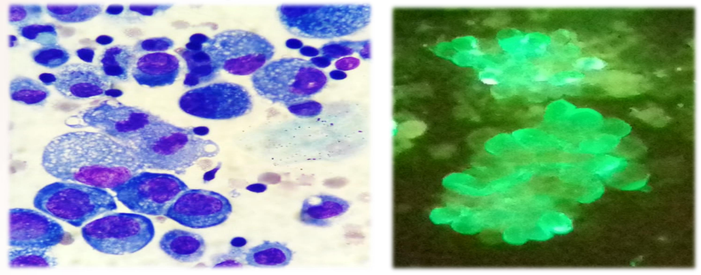


Figure 4. A) Cytological picture of ascitic fluid during traditional examination (conclusion - SFM); B) Cytological picture after additional application of the test system in the "liquid biochip" format (conclusion - MAL).
color: A) according to Romanovsky, magnification x1000, B) fluorescent immunocytochemical examination (label Alexa FLUOR -488), magnification x 400

Keywords
ovarian cancer, immunocytochemical diagnostics, effusion fluids, SER1, fluorescence, FITC

The authors declare that there is no conflict of interest

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