

## **ORIGINAL DIAGNOSTIC METHOD OF THE EARLY POSTOPERATIVE COMPLICATIONS IN THE ABDOMINAL SURGERY**

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**Summary. Original diagnostic method of the early postoperative complications in the abdominal surgery**

Results of the monitoring of optical density of the venous blood plasma of 120 patients with acute surgical pathology, carried out at the pre-operational and post-operational periods, were presented. It was revealed that the development of the intra-abdominal post-operational complications is accompanied by the rise of the optical density of the venous blood plasma at the wave length  $\lambda = 280$  nm over 0,58 UA. It is important that such rise goes before the clinical and laboratory manifestations of the complications, which allows to conduct their early diagnostics.

**Key words:** optical density of the venous blood plasma, diagnostics, post-operational complications

### Rezumat. Metodă de diagnostic originală a complicaţiilor postoperatorii precoce în chirurgia abdominală

Au fost prezentate rezultatele monitorizării pre- şi postoperatorii a densităţii optice a plasmei din sângele venos a 120 de pacienţi cu patologie chirurgicală acută. A fost stabilită că dezvoltarea complicaţiilor postoperatorii intraabdominale este asociată de sporirea densităţii optice la lungimea de undă  $\lambda = 280$  nm peste 0,58 UA. Este important că această modificare survine înainte de manifestările clinice şi de laborator ale complicaţiilor, fapt ce permite diagnosticarea precoce ale acestora.

**Cuvinte-cheie:** densitatea optică a plasmei din sângele venos, diagnostic, complicaţii postoperatorii

### Резюме. Оригинальный способ диагностики ранних послеоперационных осложнений в абдоминальной хирургии

Представлены результаты мониторинга оптической плотности плазмы венозной крови 120 пациентов с острой хирургической патологией, проведенного до операции и в послеоперационном периоде. Выявлено, что развитие интраабдоминальных послеоперационных осложнений сопровождается увеличением оптической плотности плазмы венозной крови на длине волны  $\lambda = 280$  нм более чем 0,58 ЕД. Существенно, что такое увеличение предшествует клинической и лабораторной манифестации осложнений, что позволяет проводить их раннюю диагностику.

**Ключевые слова:** оптическая плотность плазмы венозной плазме, диагностика, послеоперационные осложнения

### Introduction

Rate of the postoperative complications remains high. And their early diagnostics is a difficult problem [1-5]. It is already for a long time that it is founded mainly on the clinical and laboratory values which are not sufficiently informative [2,6,7]. There is an acute problem of the early postoperative inflammatory-destructive intra-abdominal complications, development of which noticeably aggravates the main disease, prolongs the time of the patient's stay at the hospital, and augments the cost of the medical treatment [1,3,4,7]. That's why the search of the new, more thorough and informative methods of diagnostics of the early post-operational complications is topical.

### Material and methods

The material of the research constitute 128 patients with the surgical pathology of the abdominal cavity organs: 103 patients with uncomplicated run of the postoperative period, among them: with acute appendicitis (n=33), acute cholecystitis (n=34),

perforated ulcers (n=9), intestinal obstruction (n=11), uncomplicated inguinal hernias (n=7), chronic calculous cholecystitis – 9 patients and 25 patients with postoperative complications, among which: failure of stitches (n=9), abdominal cavity infiltrates with abscess formation (n=13), eventration – 3 cases. Twenty-five healthy donors have formed the control group.

All the patients at the postoperative period were provided with the examinations of the spectra of absorption of venous blood plasma on the standard spectrophotometer SF-4A with the following determination of the spectra of plasma passing in the area of wave lengths 255-320 nm.

### Results and discussion

On the ground of the data received during the donors' examination was constructed the weighted diagram of the spectral dependence of optical density on the length of measure wave (**Fig.1**). It was discovered that while  $\lambda = 280$  nm maximum value

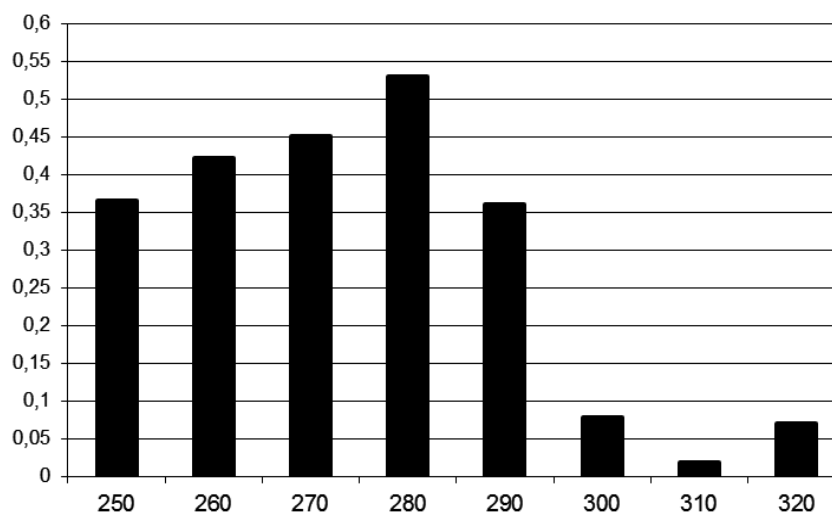


Fig. 1. Spectral dependence of the optical density of venous blood plasma of the donors on the length of measure wave

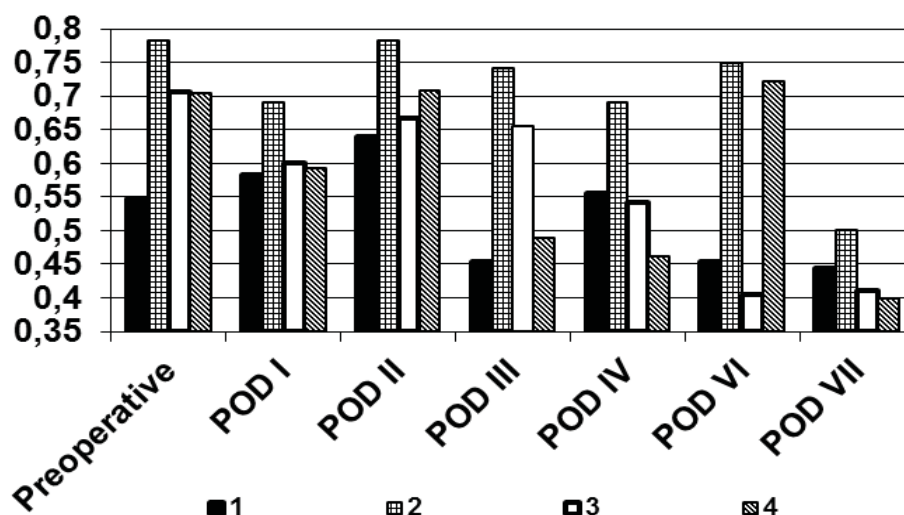


Fig. 2. Dynamics of the parameters of the optical density of venous blood plasma of the patients with uncomplicated post-operative period

Note: 1 – acute appendicitis, 2 – perforating ulcer, 3 – intestinal obstruction, 4 – acute cholecystitis.  
POD – postoperative day

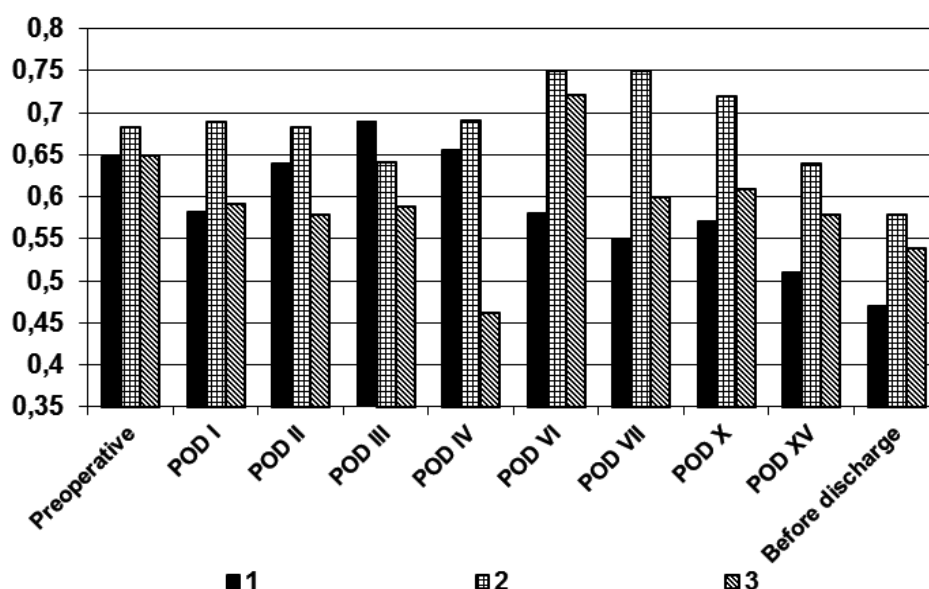


Fig. 3. Dynamics of the parameters of the optical density of venous blood plasma of the patients with post-operative complications

Note: 1 – failure of the stitches, 2 – abdominal cavity infiltrate, 3 – eventration.

of the optical density, that reaches 0,57 UA (unit of activity), takes place.

It was revealed that the optical density of blood plasma of the patients with uncomplicated run at the postoperative period during the first three days after surgery was increasing over 0.58 UA, and then it was decreasing and remaining at that level until the patients' discharge from the hospital (Fig. 2).

Patients with intra-abdominal infiltrates and failure of the stitches showed the repeated rise of the parameters of optical density over 0.58 UA, which appeared 1-2 days earlier than the clinical manifestation of the complications (Fig. 3).

In the process of treatment of the detected complications the values of the optical density fluctuated with different regularities. However before the patients' discharge, after the carried out complex treatment, the parameters of the optical density decreased.

Certain rise of the parameters of the optical density values was noticed with the patients with eventration, but its absolute values were somewhat lesser.

Cited quantity of the observations and distinctions of the complications don't give an opportunity to make final conclusions concerning the diagnostic worth of the method. Though received data bear witness to the prospects of its application.

Our research confirmed the possibility of using optical exploration for diagnostic in abdominal surgery [5]. We need to note that unlike the many modern high-tech ways [2-4,7], this research – method is cheap, easy in using and does not need much time.

### Conclusions

1. Development of the postoperative abdominal complications is accompanied by the rise of the optical density of the venous blood plasma at the wave length  $\lambda = 280$  nm over 0.58 UA.

2. Changes in the parameters of the optical density appear earlier than laboratory and clinical manifestations of the complications that allows to suspect and purposefully diagnose them in time.

3. Given value can be applied for the objectification of the control for the run of the post-operational period.

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