

B.I. Slonetsky, N.I. Tutchenko, I.V. Verbitsky¹, V.O. Kotsiubenko¹
Bogomolets National Medical University, Kyiv
¹Shupyk National Medical Academy of Postgraduate Education, Kyiv

CURRENT TRENDS AND UNPREDICTABLE CHALLENGES OF AN EMERGENCY ABDOMINAL SURGERY IN UKRAINE

e-mail: ukrpodol@gmail.com

The purpose of the study was to present the results of a comparative analysis of emergency abdominal surgery in Ukraine between 2000 and 2019 and to identify significant dynamic negative and debatable trends that need further reconsideration in order to improve the provision of emergency abdominal surgery. Over the past 20 years, the number of surgeons, including doctors at the research and training institutions of the Ministry of Health of Ukraine has decreased from 8,990 to 7,218 (-19.72%), the employment of full-time positions decreased significantly from 97.4% to 89.79%, the total number of surgical interventions on the digestive organs and abdominal cavity decreased from 344,732 operations to 274,196 (-20.47%), and the number of emergency surgeries decreased accordingly from 261,732 operations to 160,937 (-38.51%) operations. In addition, a third of surgical specialists are doctors of retirement and nearing retirement age, and among retired surgeons who do not leave the practice, 34.4% are of past retirement age (over 70 years).

Key words: abdominal surgery, abdominal cavity organs, emergency surgery.

Б.І. Слонецький, М.І. Тутченко, І.В. Вербицький¹, В.О. Коцюбенко¹ СУЧАСНІ ТЕНДЕНЦІЇ ТА НЕПЕРЕДБАЧУВАЛЬНІ ВИКЛИКИ УРГЕНТНОЇ ХІРУРГІЇ ОРГАНІВ ЧЕРЕВНОЇ ПОРОЖНИНИ В УКРАЇНІ

У даній статті наведені результати порівняльного аналізу ургентної хірургії органів черевної порожнини в Україні між 2000 та 2019 роками і встановлено суттєві динамічні негативні та дискусійні тенденції, котрі потребують подальшого переосмислення з метою покращення надання невідкладної абдомінальної хірургічної допомоги. За останні 20 років чисельність хірургів, включаючи лікарів у НДУ та закладах підготовки кадрів системи МОЗ України зменшилась з 8990 до 7218 (-19,72%), суттєво зменшилась зайнятість штатних посад з 97,4% до 89,79%, зменшилась загальна кількість оперативних втручань на органах травлення та черевної порожнини з 344 732 операцій до 274 196 (-20,47%), а також відповідно зменшилась і кількість ургентних хірургічних втручань з 261 732 операцій до 160 937 (-38,51%) операцій. Крім того третину фахівців хірургічного профілю становлять лікарі пенсійного та передпенсійного віку, а серед хірургів-пенсіонерів, які не полишають практику, 34,4% є глибоко пенсійного віку (понад 70 років).

Ключові слова: абдомінальна хірургія, органи черевної порожнини, ургентні хірургічні втручання.

This work is a fragment of the research project "Development and improvement of diagnostic and treatment tactics in patients with acute diseases of the abdominal cavity complicated by peritonitis", state registration No. 0118U001029.

The development of innovative technologies permitted us to feel unpredictable prospects in medical practice. The relevance of the emergency abdominal surgery problem has existed for centuries, which is associated with the constant implementation into emergency clinical practice of significant achievements of planned surgery [1, 3]. This is exactly its conceptual developments and doctrines that once again reflect global trends in medical practice, and a number of manuals, guides, workshops, congresses and conventions permit to accelerate and improve the conditions for the widespread implementation of randomized trials in daily medical practice to prevent a significant number of complications, mortality and improve the rehabilitation of patients in the postoperative period.

However, the thorny road of seemingly simple solutions is due to a large number of unpredictable, unexpected and often casuistic components. After all, it is quite clear that the state approach to citizens in solving topical medical problems is well-known to everyone and requires an adequate, timely, reasonable and quite understandable and accessible solution. Economic or rather material support of diagnostic and treatment tactics in patients is a very specific problem, which is solved differently depending on the level of the state development, participation and the ratio of state, insurance or other types of material compensation for patients. The development and availability of informational technologies at the present stage permits anyone and anywhere to constantly monitor and highlight the latest achievements of world and medical practice. It is an extremely motivating factor on the one hand, but on the other hand, unfortunately, the big gap between the countries of different systems and systems of the world, which often takes years or even decades to close, is erased.

Current trends in the emergency abdominal cavity surgery in the world and in Ukraine are based on significant achievements of the past with awareness of current challenges and pragmatic development of new sound principles and approaches with their gradual implementation in clinical practice. On the one hand, the

priority implementation of sound world achievements is a fairly simple solution, but in practice, a large number of both subjective and objective factors often not only slows down this process, but even retards it down.

That is why emergency gastroenterological surgery as well as a number of medical problems, is significantly associated with a high risk of fatal consequences depending on the correctness of making lightning, experienced and informed decisions [5].

The purpose of the study was to compare and correlate the results of emergency surgical care in Ukraine in 2000, 2013, 2018, 2019 to identify long-term and short-term dynamics of negative trends in the treatment process, to eliminate them further and to develop positive directions for improving and development the provision of emergency abdominal surgery in the country.

Materials and methods. We have analyzed the reports of the Center for Medical Statistics of the Ministry of Health of Ukraine on the medical field provision, namely emergency surgery of the abdominal cavity, taking into account the total number of general surgeons, their certification level and the key indices of emergency diseases of the abdominal cavity in relation to the period of hospitalization since the disease and the consequences of their treatment.

To identify the features of long-term (twenty years) and short-term (one year, five years) negative trends in the emergency surgery in Ukraine, we have compared and analyzed the generally recognized statistical indices of the quality of emergency surgery in 2000, 2013, 2018 and 2019.

The dynamic changes in relation to doctors (medical positions (surgeons)) in medical and preventive institutions, certification of surgeons) directly providing emergency abdominal surgical care, were analyzed. In addition, the analysis of dynamic changes in the features of the course and consequences of treatment of urgent “seven”, namely: acute intestinal obstruction, acute appendicitis, perforated gastroduodenal ulcer, pinched hernia, acute cholecystitis, acute pancreatitis and gastrointestinal bleeding, was carried out.

Statistical data processing was performed using variable statistics methods on personal computer “Pentium® Dual-Core CPU E6500” using software “Microsoft Office Professional 2013” and “LibreOffice Calc” based on “Microsoft Windows 10 Pro”.

Results of the study and their discussion. The Surgical Service of Ukraine is a powerful and representative component of the medical industry, which consists of 776 secondary and tertiary health care facilities with more than 49,000 surgical hospital beds. Modern various challenges of urgent surgical abdominal pathology are certainly associated with an in-depth analysis of dynamic processes on individual statistical indicators for better prediction and the possibility of wider application of innovative technologies in each patient [1].

Thus, full-time positions for surgeons, including doctors in research institutions and training institutions of the Ministry of Health of Ukraine in 2000 amounted to 8,915 positions, in 2013 – 9,200 (+3.2%) positions, in 2018 – 7,690, 25 (-13.74%) positions and in 2019 – 7,673.75 (-13.93%) positions, which indicated a significant reduction in positions over the past twenty years (table 1).

The explanation for this was a significant decrease in the employment of full-time positions, as the staffing of part-time surgeons in 2000 was 97.4%, in 2013 – 94.26%, in 2018 – 90.69% and in 2019 – 89.79%, and there was a decrease in staffing and individuals from 83.3% in 2000 to 80% in 2013, 77.27% in 2018, 90.69% and up to 76.44% in 2019.

Table 1

Medical positions (surgeons) in treatment and prevention facilities

Staff positions	Employed positions	Individual persons	Difference between		Staffing with	
			full-time and employed positions	full-time positions and individuals	taking into account secondary employment of	individuals (doctors)
2000						
8 915,00	8 680,5	7425	234.5	1490	97.4 %	83.3 %
2013						
9 201,00	8 673,00	7364	528.00 (p*)	1 837,00 (p**)	94.26%	80.0%
2018						
7 690,25 (p*)	6 974,25 (p**)	5,942 (p**)	716.00 (p**)	1 748,25 (p**)	90.69 %	77.27 %
2019						
7 673,75 (p**)	6 890,00 (p**)	5866 (p**)	783.75 (p**)	1 807,75 (p**)	89.79 %	76.44 %

Note: 1. Probability coefficient p *<0.05; p **<0.01. 2. p – probability in comparison with the results of 2000; p1 – probability compared to the results of 2013.

Among the positive trends in surgeons as one of the main specialties of modern medical doctrine in the analysis of doctor's attestations, there is an increase in the total number of doctors with categories (board certified, I, II) from 69% in 2000 to 80.6% in 2013, 84% in 2018 and to 82.4% in 2019, and there is an increase in board certified specialists from 37.03% in 2000 to 50.04% in 2013, 58.52% in 2018 and up to 60.55% in 2019 (table 2).

Table 2

Certification of Surgeons

Total number of doctors (indiv.)	Of these, with categories	categories			% certified to the total number of doctors
		board certified	I	II	
2000					
8.998	6.208	2.299	2.468	1.441	69
2013					
9.002	7.255 (p**)	3.703 (p**)	2.411	1.141 (p*)	80.6
2018					
7.310 (p**)	6.143	3.595 (p*)	1.847 (p*)	701 (p**)	84.0
2019					
7.218 (p**)	5.950	3.603 (p**)	1.733 (p**)	614 (p**)	82.4

Note: 1. Probability coefficient $p < 0.05$; $p < 0.01$. 2. p – probability in comparison with the results of 2000; p1 – probability compared to the results of 2013.

In terms of age, the dynamics of recent years consistently highlights the problem of surgical staff “aging”. A third of surgical specialists are doctors of retirement and nearing retirement age (which is especially evident in district hospitals and clinics), and among retired surgeons who do not leave the practice, 34.4% are of past retirement age (over 70 years).

The analysis of dynamic changes over the last 20 years in Ukraine, the number of surgical interventions on the digestive organs and abdominal cavity revealed a significant decrease from 344,732 in 2000 to 323,250 (-6.24%) in 2013 and to 274,196 (-20.47%) in 2018. A more pronounced trend towards a decrease in the number of emergency surgeries on the digestive and abdominal organs was observed from 2000 to 2019, because in 2000 it amounted to 261,732 operations, in 2013 it was already 215,644 (17.61%), in 2018 163,202 (-37.65%) operations, and in 2019 even 160,937 (-38.51%) operations (fig. 1).

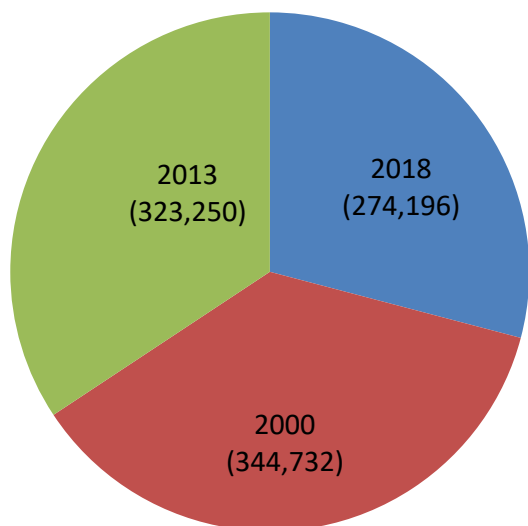


Fig. 1a. Total number of interventions

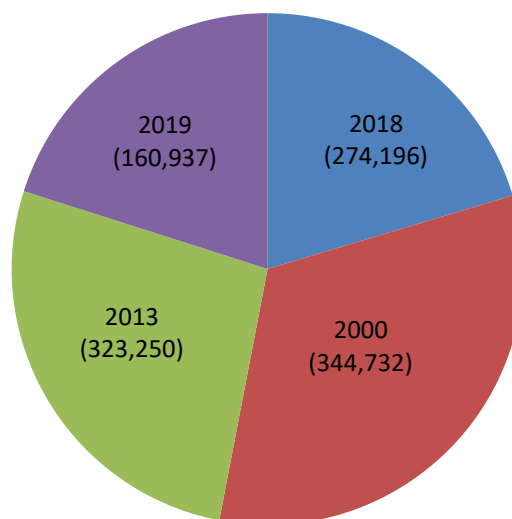


Fig. 1b. Number of emergency interventions

Fig. 1. Number of surgical interventions in patients with digestive and abdominal organs in Ukraine.

From 2000 to 2019 there was observed a significant decrease in hospitalization in Ukraine of patients with acute intestinal obstruction (-24.91%), with acute appendicitis (-54.49%), with perforated gastric and duodenal ulcers (-59%), and a corresponding dynamic decrease in the number of surgeries, as well as an increase in the number of patients hospitalized later than 24 hours after the onset of the disease. There was an improvement in the quality of emergency surgical care for these categories of patients with a significant reduction in postoperative mortality, except for patients with perforated gastric and duodenal ulcers (table 3).

Table 3

Trends in hospitalization and surgical treatment in Ukraine of patients with acute intestinal obstruction, acute appendicitis and perforated ulcer in 2000 and 2019

Acute intestinal obstruction		Acute appendicitis		Perforated ulcer	
2000	2019	2000	2019	2000	2019
Delivered to the hospital					
11.725	8.802 (p**)	110.553	50.317 (p**)	13.063	5.360 (p***)
Delivered to the hospital later than 24 hours					
4.065	4.003	24.397	13.519 (p***)	1.452	1.244 (p*)
Number of surgeries					
8.369	6.314 (p**)	110.118	50.142 (p***)	12.967	5.224 (p***)
Post-surgery mortality (%)					
8.0	4.10 (p**)	0.1	0.04 (p**)	3.4	5.19 (p*)
Postoperative mortality at hospitalization over 24 hours (%)					
14.5	5.86 (p***)	0.2	0.08 (p**)	16.0	13.22 (p*)

Note: 1. Probability coefficient $p < 0.05$; $p^{**} < 0.01$; $p^{***} < 0.01$. 2. p – probability compared to 2000.

Analyzing the trends of hospitalization and treatment in Ukraine of patients with pinched ventral hernias, a decrease of a quarter of the total number of hospitalized patients was found, which led to a decrease in the number of surgical operations and was characterized by a significant reduction in overall mortality by 2.19 times, and mortality at late hospitalization by 3.38 times (table 4).

Special attention is paid to hospitalization and treatment of patients with acute urgent biliary pathology in Ukraine, almost half of the patients were hospitalized 24 hours after the disease. Over the last twenty years, there has been a decrease in the number of hospitalized patients with acute cholecystitis by 16.73%, but despite this, the number of surgeries has increased from 15.526 in 2000 to 18.746 (+20.7%) in 2019.

Table 4

Trends in hospitalization and surgical treatment in Ukraine of patients with pinched hernia, acute cholecystitis, and acute pancreatitis in 2000 and 2019

Pinched hernia		Acute cholecystitis		Acute pancreatitis	
2000	2019	2000	2019	2000	2019
Delivered to the hospital					
14.588	11.140 (p*)	31.159	25.947 (p**)	25.981	27.219
Delivered to the hospital later than 24 hours					
3.036	3.054	13.586	11.828 (p*)	9.937	10.829
Number of surgeries					
14.193	11.009 (p**)	15.526	18.746 (p*)	2.737	2.194 (p*)
Post-surgery mortality (%)					
2.5	1.14 (p*)	1.8	0.38 (p**)	19.9	15.41 (p*)
Postoperative mortality at hospitalization over 24 hours (%)					
7.5	2.22 (p***)	2.5	0.55 (p***)	22.2	17.72 (p*)

Note: 1. Probability coefficient $p < 0.05$; $p^{**} < 0.01$; $p^{***} < 0.01$. 2. p – probability compared to 2000.

A significant increase in the number of hospitalized patients with acute pancreatitis over the past few decades has not been detected, but it should be noted the recent prevalence of conservative tactics. After all, the number of surgeries decreased by 19.83% and was characterized by a decrease in overall postoperative mortality and postoperative mortality in late hospitalization.

Analysis of trends in hospitalization and surgical treatment in Ukraine of patients with gastrointestinal bleeding from 2000 to 2019 revealed a positive trend, because when in 2000 the number of hospitalized was 24.904, in 2013 – 21.879, in 2018 – 18.707, and in 2019, 18.348 patients were hospitalized. The number of patients delivered to the hospital less than 24 hours after the disease has decreased by a third in twenty years from 9.924 in 2000 to 6.653 in 2019. Conservative therapy is quite effective in patients with gastrointestinal bleeding, because the number of operations in 2000 was 4.451, in 2013 2.376, in 2018 1.785, in 2019 – 1.666. In addition, in patients with an increased risk of bleeding or in the presence of its recurrence, surgical interventions were characterized by a decrease in postoperative mortality to 7.38%, and in the late hospitalization of patients to – 9.69%.

Over the last few decades, when comparing the main trends in Ukraine, there has been a significant redistribution of surgical resources and multidimensional dynamic changes in the hospitalization and surgical treatment of patients with acute digestive and abdominal diseases requiring urgent surgical intervention. Only an in-depth analysis of global trends and the possibilities of state medical and social doctrine will contribute to

a better concentration of urgent surgical patients, which will lead to the optimization of diagnostic and treatment tactics and reduce the number of postoperative complications and mortality [8, 9].

A number of problematic issues slow down the development of the surgical service, because due to the depopulation of Ukraine there is a surplus of surgical beds (exceeds the similar indicators of the European Union by 26-67%). Accordingly, the costs of their maintenance increase and the costs of modernization of diagnostic and treatment equipment decrease. Redistribution of patients and irrational staffing causes a reduction in the general surgical burden on the doctor, which leads to loss of professional skills and, as a consequence, leads to an increase in the percentage of medical errors [7, 10]. Performing 20-30 surgical interventions instead of 150-200 annually leads to a deterioration in the qualification and professional level of operating surgeons.

Irrational staffing, caused, among other things, by the low financial and social security of the surgeon, leads to distortions in the supply of doctors of surgical specialties of district hospitals and clinics. The outflow of young professionals, especially from primary and secondary level institutions, is a negative trend that threatens professional devastation. The urgent problem is the lack of "surgical continuity", as a consequence – the low level of professional skills of young surgeons, and the existing compromised system of postgraduate education forms a reverse dissatisfaction with the level and availability of professional applied and intellectual growth of specialists and their progressive improvement. At the same time, the proposed algorithms for transferring the system of attestation and training to the scope of specialized medical associations are systematically ignored and are not considered as alternatives [2, 3].

The lack of vertical and horizontal management and shortcomings in the work of the primary level negatively affect decision-making, prompt response and hospitalization. Wear and tear of the material and technical base, lack of modern medicines and medical devices is a chronic problem of the medical industry and, accordingly, the surgical service.

That is why, at the present stage there is a need for an open economic and tactical rethinking of the results of the existence of the medical field in general and its surgical component. In particular, with the involvement of leading experts, which will collectively develop a short-term (1-5 years) and most importantly long-term (10-20 years) strategy for the development of Ukrainian medicine in terms of national and global development.

Conclusions

1. The provision of urgent surgical care to patients with acute diseases of the abdominal cavity from 2000 to 2019 is carried out by understaffing of the medical field by surgeons: by 16.7% in 2000, 20% in 2013, 22.73% in 2018, 23.56% in 2019.

2. Analysis of the total number of surgical interventions on the digestive organs and abdominal cavity showed a tendency to decrease. In 2013, compared to 2000, by 1.06 times and in 2018, respectively, by 1.26 times, while the number of urgent operations decreased much more significantly: in 2013, compared to 2000, by 1.21 times, in 2018 and 2019 by 1.61 and 1.64 times.

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Стаття надійшла 28.10.2019 р.