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CLINICAL AND ECONOMIC EFFECTIVENESS OF SIMULTANEOUS SURGERY IN PATIENTS WITH COMBINED GYNECOLOGICAL PATHOLOGY

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The problem of simultaneous operations in gynecological practice is quite relevant. The purpose of the study was to determine the clinical and economic efficiency of simultaneous operations in patients with combined gynecological pathology. We performed a retrospective analysis of the results of the surgical treatment of 50 women with a combination of several gynecological diseases, each of which required surgical treatment. Calculations were made according to the following parameters: cost of preoperative examination, pre- and postoperative medical care, operative care, anesthesia care, and postoperative laboratory monitoring. The analysis of the studies shows that simultaneous operations shorten the length of the patient's stay in the hospital and the duration of temporary incapacity by two to three times, increase the economic efficiency of treatment by three times and improve their quality of life. Carrying out simultaneous operations on women with combined gynecological pathology allows a rational use of the material and technical base of the medical institution. Also, it leads to significant financial savings at the hospital and outpatient stages.

Key words: simultaneous operations, reproductive health, hysteroscopic myomectomy, effectiveness of medical care, colporrhaphy.

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КЛІНІКО-ЕКОНОМІЧНА ЕФЕКТИВНІСТЬ СИМУЛЬТАННИХ ОПЕРАЦІЙ У ПАЦІЄНТОК З ПОЄДНАНОЮ ГІНЕКОЛОГІЧНОЮ ПАТОЛОГІЄЮ

Проблема симультанних операцій в гінекологічній практиці є досить актуальною. Метою дослідження було визначення клініко-економічної ефективності симультанних операцій у пацієнток з поєднаною гінекологічною патологією. Проведено ретроспективний аналіз результатів хірургічного лікування 50 жінок із поєднанням декількох гінекологічних захворювань, кожне з яких потребувало лікування шляхом оперативного втручання. Підрахунки проводили за наступними параметрами: вартість передопераційного обстеження, перед- та післяопераційне медикаментозне забезпечення, операційне забезпечення, анестезіологічне забезпечення та післяопераційний лабораторний моніторинг. Аналіз проведених досліджень свідчить, що симультанні операції у два-три рази скорочують терміни перебування пацієнтки в стаціонарі і тривалість тимчасової непрацездатності, у три рази підвищують економічну ефективність лікування і покращують якість їх життя. Проведення симультанних операцій у жінок з поєднаною гінекологічною патологією дозволяє раціонально використовувати матеріально-технічну базу лікувального закладу, а також зумовлюють значну економію фінансових коштів як на госпітальному, так і на амбулаторному етапах.

Ключові слова: симультанні операції, репродуктивне здоров'я, гістероскопічна міоектомія, ефективність медичної допомоги, кольпорафія.

The study is a fragment of the research projects: "Medical and social justification, development and implementation of a modern model of a system of continuous improvement of the quality of integrated medical care in the work of a multidisciplinary health care institution", state registration No. 0122U000232, "Optimization of surgical treatment of patients under a multimodal rapid recovery program based on the improvement of minimally invasive surgical interventions, in particular with the use of nanobiosensor technologies and anesthesiological support", state registration No. 0122U000233.

At the present moment, despite the significant expansion of the arsenal of drugs and many modified schemes of conservative treatment of gynecological diseases, many domestic and foreign researchers, in 45 % of women under 35 years of age, a combination of gynecological pathology that requires treatment by surgical intervention is determined [2, 9]. In connection with this, at present, many scientific studies are being conducted dedicated to increasing the efficiency of the operation of surgical departments, namely: rational use of the bed fund, reduction of economic costs for operations and rehabilitation of patients, reduction of the time of their stay in the hospital and incapacity for work [3].

The medical, social and economic effect at the inpatient treatment stage, in surgical departments, consists of several positions [7, 12]. First of all, it is due to:

a) reducing the patient's stay in the hospital and reducing the risk of intra-hospital infection;
b) effective use of the equipment and intensive use of medical equipment;
c) reducing the risk of intraoperative complications during repeated surgical intervention;
d) reducing the risk of complications during repeated anesthesia;

e) decrease in the concentration of specialized patients in the region served;

f) reduction of the duration of the period of general temporary incapacity;

g) implementation of the possibility of outpatient treatment of patients due to the development and implementation of effective minimally invasive technologies;

h) the possibility of expanding the volume of surgical intervention - to perform several operations simultaneously, "under one anesthesia", for patients with more than one gynecological disease that requires surgical treatment [4].

According to the World Health Organization (WHO), the use of simultaneous surgery in patients with combined gynecological pathology is economically justified and justified, as it has several advantages compared to two isolated ones, namely, a reduced risk of possible complications during repeated anesthesia, a short stay patient in a hospital, the total duration of the period of temporary incapacity for work is shortened, the economic efficiency of the application is high, the patient's working capacity and social adaptation are restored more quickly. Simultaneous operations exclude psycho-emotional experiences in the future repetition of surgical intervention [6, 8].

Considering the above, it can be noted that the problem of simultaneous operations in gynecological practice is quite urgent, and currently there is a need to calculate the economic feasibility of their implementation.

The purpose of the study was to determine the clinical and economic effectiveness of simultaneous operations in patients with combined gynecological pathology that requires surgical treatment.

Material and methods. Our scientific work was carried out through a retrospective analysis of the results of the surgical treatment of 50 women with a combination of several gynecological diseases, each of which required surgical treatment. The results were compared with the same number of patients who underwent isolated laparoscopy, hysteroscopy and/or colporrhaphy operations. All patients underwent surgical treatment at the Inpatient Care Center “State Scientific Institution “Scientific and Practical Center of Preventive and Clinical Medicine" of the State Administration of Affairs” (SSI “SPC PCM” SAA). Types of simultaneous surgical interventions are presented in Table 1.

Table 1

The structure of performed simultaneous surgical interventions in patients of the surgical hospital of SSI “SPC PCM” SAA

Type of performed operations	Number of patients, n = 50	
	abs. number	(%)
Laparoscopic extirpation + colporrhaphy	5	10.0
Surgery on uterine appendages + hysteroscopy, endometrial resection, polypectomy	10	20.0
Laparoscopy, myomectomy + hysteroscopic myomectomy	5	10.0
Laparoscopy, myomectomy + hysteroscopy, endometrial resection, polypectomy	10	20.0
Laparoscopy, myomectomy + colporrhaphy	5	10.0
Laparoscopy, myomectomy + hysteroscopy, myomectomy + colporrhaphy	1	2.0
Laparoscopy, myomectomy + hysteroscopy, endometrial resection, (polypectomy) + colporrhaphy	1	2.0
Hysteroscopy, endometrial resection, polypectomy + colporrhaphy	10	20.0
Hysteroscopy, myomectomy + colporrhaphy	3	6.0
Total	50	100.0

When calculating the economic effect of simultaneous surgery (hereafter EECO) in the patient, taking into account the time of incapacity, the following formula was used [1]:

EESS = PP1* OOP (Iio-Iso)+ OBD2 (OBDio-OBDss)+ SI1 (RGPpp- Iso)+(RGPpp + Iio)*т(N-CoefNWP), where:

PP1 – the average cost of products produced by one employee in one day;

OOP – the value estimate of the output products of the operation;

Iio – the total time of the patient's incapacity for work during the consecutive performance of isolated operations;

Iso – time of disability of the patient during simultaneous surgery;

OBD2 – the cost of one-bed day in the department;

OBDio – total bed day with a consecutive performance of isolated operations;

OBDss – bed day during simultaneous operation;

SI1 – average costs for 1 day of incapacity for work under social insurance;

RGPpp – regional gross product per person per day;

T – rates for medical services;

N – the number of simultaneously performed operations.

K – coefficient of the number of able-bodied (working) patients = 1.

Calculation of the economic effect of simultaneous operations according to this formula [5], taking into account the treatment tariff, corresponding to the volume and duration of the performed simultaneous operation:

EESS = (Rio - Rss)+[(Iio - Iso)(RGPpp + Cds1) CoefGNWP], where:

EESS – economic efficiency of simultaneous operations;

Rio – the rate for treatment, corresponding to the volume and duration, when two consecutive operations are performed (the sum of two tariffs);

Rss – the rate for treatment corresponding to the volume and duration of simultaneous surgery;

Iio – the number of days of temporary incapacity for work (ambulatory + inpatient treatment) in total when performing two isolated operations;

Iso – number of days of temporary disability (for outpatient and inpatient treatment) during simultaneous surgery;

RGPpp – regional gross product per person per day;

Cds1 – cost of a disability certificate for one day;

CoefGNWP – coefficient of the number of able-bodied (working) patients in the group.

According to the statistics center, the average salary in Kyiv in 2021 was UAH 20,518 UAH. We determine the amount of sick leave at the expense of the employer's funds for 1 day, provided that the patient has sufficient work experience and receives compensation in the amount of 100 %. That is, (20 518 × 2)÷61=672.8 UAH. Cds1 is 672.8 UAH

The ratio of the number of able-bodied (working) patients in the group (CoefGNWP) was 1, since all 50 patients from the study sample were officially employed. The term of temporary incapacity is determined by the order of the Ministry of Health of Ukraine dated 11/13/2001 No. 455 “On approval of the Instruction on the procedure for issuing documents certifying the temporary incapacity of citizens” (Registered in the Ministry of Justice of Ukraine on December 4, 2001, under No. 1005/6196) [10].

Regional gross product per person per day (GP) is determined taking into account the country's population and gross domestic product (GDP) [11]. Thus, according to the data of the State Statistics Service of Ukraine, as of 2021, the average was: population of the country – 43,544,250 million, GDP – 131,907 UAH, and for one day per person – 331 UAH (GP).

Results of the study and their discussion. Carrying out simultaneous operative interventions in gynecological patients has several social, medical and economic advantages.

A significant clinical effect in the presence of combined surgical pathology in gynecology can be achieved by optimizing surgical intervention, namely, by simultaneously using two different methods of surgical intervention – endoscopic and classical techniques.

Performing a retrospective (for 2021) analysis of disease histories of patients who underwent surgical treatment based on the Center for Inpatient Care of SSI "SPC PCM" SAA Medical Center (50 people), we found that the risk of complications during simultaneous interventions is significantly lower than during remote operations (Table 2).

Table 2

The structure of the occurrence of complications during simultaneous surgical interventions in patients of the surgical hospital of SSI "SPC PCM" SAA

Type of performed operations	Number of patients, n = 50		
	Bleeding abs. number	Traumatization of adjacent organs abs. number	Infectious complications abs. number
Laparoscopic extirpation + colporrhaphy (simultaneous)	1	0	0
Colporrhaphy	3	1	1
Laparoscopic extirpation	5	2	0
Surgery on uterine appendages + hysteroscopy, endometrial resection, polypectomy (simultaneous)	1	1	0
Surgery on uterine appendages	3	3	1
Hysteroscopy, endometrial resection, polypectomy	3	3	0
Laparoscopy, myomectomy + hysteroscopy, myomectomy (simultaneous)	5	2	0
Laparoscopy, myomectomy	7	3	1
Hysteroscopy, myomectomy	6	2	3

After surgical treatment, including on the pelvic organs, a woman's body undergoes several neurohumoral changes associated, on the one hand, with the removal of the ovaries, on the other hand, with a violation of reverse receptor connections after the removal of the myometrium and endometrium. This

leads to the development of post-hysterectomy syndrome, which consists of vegetative-vascular, psycho-emotional and endocrine disorders similar to climacteric ones.

Regarding economic and social efficiency, the calculation of the cost of treatment included the following components:

– cost of perioperative laboratory and instrumental examination,

– scope of intervention,

– volume and duration of anesthesiological intraoperative and perioperative medication period,

– the amount of material and technical support (approved in the form of acts of the provision of medical services of the Center for Inpatient Care of the SSI "SPC PCM" SAA No. 3425 dated November 25, 2021)

Type of operations performed (one operation for 1 person) and cost of one operation (price including VAT) for 1 person (UAH):

– Laparoscopic myomectomy – 10519.27

– Laparoscopic amputation of the uterus – 10529.03

– Laparoscopic interventions on uterine appendages – 8519.27

– Hysteroscopy polypectomy/ endometrial resection – 5578.66

– Hysteroscopic myomectomy – 7343.0

– Reconstructive and plastic surgery on female genitals (colporrhaphy) – 9575, 0

The cost of treatment, which was carried out using two consecutive operations (Rio) in 1 person, was the sum of two consecutive operations. The rate for treatment for simultaneous surgery (Rss) for 1 person was calculated according to the above algorithm when performing isolated operations.

The total cost of two consecutive operations (Rio) and simultaneous operations (Rss) per 1 person:

– Laparoscopic myomectomy + hysteroscopy polypectomy/endometrial resection – total cost of Rio per 1 person is 16,097.93 UAH (Rss per 1 person – 9,163.21);

– Laparoscopic amputation of the uterus + colporrhaphy – total cost of Rio per 1 person is 20,104.03 UAH (Rss per person – 13,403.00);

– Laparoscopic interventions on uterine appendages + hysteroscopy, polypectomy/endometrial resection – total cost of Rio per 1 person UAH 21,097.93 (Rss per 1 person – 12,403.00 UAH);

– Hysteroscopy, polypectomy/ endometrial resection + colporrhaphy – total cost of Rio per 1 person is 15,153.66 UAH (Rss per person – 10,061.21);

– Hysteroscopic myomectomy + laparoscopy myomectomy – total cost of Rio per 1 person is 17,862.27 UAH (Rss per 1 person –10,063.21);

Reconstructive and plastic surgery on the female genitals, colporrhaphy + laparoscopic interventions on the uterine appendages – the total cost of Rio per 1 person UAH 18,094.27 (Rss per 1 person – 12,094.34).

For example, the clinical component of calculating the economic efficiency of simultaneous operations and the actual performance of reconstructive and plastic surgery on the female genitalia (colporrhaphy) belongs to medium-level surgical interventions. The period of stay in a hospital does not exceed 3 days, followed by outpatient treatment with the possibility of issuing a disability certificate for up to 7 days, with its subsequent extension, depending on the severity of the disease, up to 14 calendar days. That is, the patient can be treated for a maximum of 24 days.

The cost of isolated laparoscopic amputation of the uterus and the calculated maximum and charge of laparoscopic extirpation of the uterus together made up the average cost of the operation, which is 10,529.03 UAH. The duration of temporary disability in isolated uterine extirpation is 17 days on average, which includes 3 days of hospitalization and up to 14 days of extended disability certificate. The total number of days of temporary disability (outpatient + inpatient treatment) when performing two isolated operations (Iio) is 34 days.

The mean cost of simultaneous surgical amputation of the uterus in combination with colporrhaphy is 13,403.00 UAH. It is 1.6 times (or 60.8 %) more profitable than performing two isolated surgical interventions, and the length of stay in treatment is reduced to 3 days, followed by outpatient therapy to 5 days.

EESS = (20,104.03-13,403.00)+[(34-18)(331.0+672.8)1.0] = 6,701.03+16*264.5*1.0=10,933.03 UAH.

So, the data of the conducted study confirm the indisputable economic effect of simultaneous surgical interventions. When conducting calculations, it was established that the total economic effect of treatment for the period studied in this study was, on average, 34,897.89 UAH per patient.

In all cases, simultaneous operations effectively reduce surgical treatment costs for patients with combined gynecological and extragenital surgical pathology. Simultaneous operations can and should be performed in specialized hospitals equipped with modern equipment and in the presence of a

multidisciplinary team of surgeons when two or more diseases requiring surgical correction are detected in women. Carrying out simultaneous operations in women with combined gynecological surgical pathology effectively reduces the volume of infusion and drug therapy, i.e. the costs of operative treatment of patients without significantly prolonging the operation time. It also contributes to the early recovery of motor activity of patients, which reduces the length of stay of patients in the hospital after surgical treatment, has a positive effect on their quality of life and rapid restoration of social activity, shortens the period of postoperative rehabilitation (term of outpatient therapy).

The analysis of the studies shows that simultaneous operations shorten the length of the patient's stay in the hospital and the duration of temporary incapacity by two to three times, increase the economic efficiency of treatment by three times and improve their quality of life. To increase the profitability of surgical departments, it is recommended to calculate the minimum break-even intensity of operations, which is the basis for planning the hospital's operational activities.

The advantage of such surgical interventions is indisputable [2, 3]. They save the patient from several diseases at once, from the risk of repeated operations and related complications, psychological injuries, reduce the total time of the patient's stay in the hospital and subsequent treatment. As a rule, the need for simultaneous operations is very acute since operating in two stages forces the destruction of the results of the earlier perforation of the abdominal wall, which is highly undesirable [6, 13].

It was determined that in all cases, simultaneous operations effectively reduce surgical treatment costs for patients with combined gynecological and extragenital surgical pathology. Simultaneous operations can and should be performed in specialized hospitals equipped with modern equipment and in the presence of a multidisciplinary team of surgeons when two or more diseases requiring surgical correction are detected in women. Carrying out simultaneous operations in women with combined gynecological surgical pathology effectively reduces the volume of infusion and drug therapy, i.e. the costs of operative treatment of patients without significantly prolonging the operation time. It also contributes to the early recovery of motor activity of patients, which reduces the length of stay of patients in the hospital after surgical treatment, has a positive effect on their quality of life and rapid restoration of social activity, shortens the period of postoperative rehabilitation (term of outpatient therapy).

Conclusion

Therefore, a complex methodological approach, which consists of the implementation of new methods of anesthetic support of the patient, the use of the latest technologies of minimally invasive surgical procedures of surgical intervention (simultaneous operations) and the improvement of early postoperative rehabilitation of patients according to Enhanced Recovery after Surgery (ERAS) protocols in a hospital will lead to improved results of treatment of more complex diseases, a reduction in the number of intraoperative and postoperative complications, reduction of the number of intraoperative and postoperative complications, decrease in bed days and the period of inpatient treatment of patients by 20–25 %, as well as the period of postoperative rehabilitation. It will meet the modern requirements of "fast track surgery" and, in general, will lead to significant financial savings, both at the hospital and outpatient stages, a reduction in the costs of the health insurance fund and an increase in the economic and social efficiency of health care.

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TELEROENTGENOMETRIC PARAMETERS OF THE HYOID BONE AND TONGUE IN UKRAINIAN BOYS AND GIRLS WITH AN ORTHOGNATHIC BITE WITHOUT AND TAKING INTO ACCOUNT THE TYPE OF FACE

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In the course of the study, pronounced manifestations of sexual dimorphism (higher values in young men) of teleroentgenometric parameters of the hyoid bone and tongue were established in the Ukrainian population of youth without pathology of the upper respiratory tract with an orthognathic bite, both in representatives without taking into account the type of face and, in most cases, in young men with different types of faces. Also, between young women and young men with different face types, reliable or trends of differences in the values of these parameters were established – young women with a narrow face have smaller values of the VT distance and the TA area than young women with very wide and wide face types; and young men with a narrow face have larger values of the AH-FH, AH-MP and H-VT distances than representatives with very wide and wide face types.

Key words: teleroentgenography, cephalometry, hyoid bone, tongue, young men, young women, orthognathic bite, facial types.

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ОСОБЛИВОСТІ ТЕЛЕРЕНТГЕНОМЕТРИЧНИХ ПАРАМЕТРІВ ПІД'ЯЗИКОВОЇ КІСТКИ ТА ЯЗИКА В УКРАЇНСЬКИХ ЮНАКІВ І ДІВЧАТ ІЗ ОРТОГНАТИЧНИМ ПРИКУСОМ БЕЗ ТА З УРАХУВАННЯМ ТИПУ ОБЛИЧЧЯ

У ході дослідження в українського населення юнацького віку без патології верхніх дихальних шляхів із ортогнатичним прикусом встановлені виражені прояви статевого диморфізму (більші значення в юнаків) величини телерентгенометричних параметрів під'язикової кістки та язика як у представників без урахування типу обличчя, так і, у більшості випадків, в юнаків із різними типами обличчя. Також між дівчатами або юнаками з різними типами обличчя встановлені достовірні або тенденції відмінностей величини даних параметрів – у дівчат із вузьким обличчям менші значення величини відстані VT та ділянки TA, ніж у представниць із дуже широким і широким типами обличчя; а в юнаків із вузьким обличчям більші значення величини відстаней AH-FH, AH-MP і H-VT, ніж у представників із дуже широким і широким типами обличчя.

Ключові слова: телерентгенографія, цефалометрія, під'язикова кістка, язик, юнаки, дівчата, ортогнатичний прикус, типи обличчя.

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The study of the upper respiratory tract from the point of view of cephalometry is a complex task that requires taking into account anatomical formations and organs that, at first glance, are not directly identified with the concept of "respiratory tract".

Among these, the tongue and hyoid bone complex should be considered. Both of them directly affect the physiological functioning of the respiratory tract and at the same time can affect the occurrence and development of their pathology. All this happens due to the direct interaction of the tongue and the