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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии
საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

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WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman (Кириллица)**, для текста на грузинском языке следует использовать **AcadNusx**. Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - <http://www.spinesurgery.ru/files/publish.pdf> и http://www.nlm.nih.gov/bsd/uniform_requirements.html В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректур авторам не высылаются, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or computer-printed on a single side of standard typing paper, with the left margin of 3 centimeters width, and 1.5 spacing between the lines, typeface - **Times New Roman (Cyrillic)**, print size - 12 (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf

In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

**Articles that Fail to Meet the Aforementioned
Requirements are not Assigned to be Reviewed.**

ავტორთა საქურაღებოლ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დაიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx**. შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრაფიების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შედეგების ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფხიხლებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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SENTINEL LYMPH NODES DETECTION METHOD IN BREAST CANCER

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Abstract.

Introduction: In 2020 more than 2.2 million cases of breast cancer were registered, and these figures indicate that this disease is very widespread. Lymphatic metastasis is one of the most important causes of local recurrence of breast cancer and is unfavorable factor of prognosis.

The purpose of the work is to improve the algorithm of intraoperative diagnosis of the sentinel lymph node in patients with breast cancer.

Material and methods: Between 2009 and 2016, 400 patients with T1-T3N0M0 breast cancer were operated at the Odesa Regional Clinical Hospital. Two types of dyes – Patent Blue and ICG were used. The patients who had mastectomy with sentinel lymph node biopsy as a rule had a clinical diagnosis of T2-T3N0M0 breast cancer. In group 1, 100 patients had sentinel lymph node biopsy. Staining of lymph nodes was performed using Patent Blue. In group 2, sentinel lymph nodes biopsy was conducted using Patent Blue and another fluorescent dye ICG, which was also administered subdermally.

Results: A total five-year survival rate after axillary lymph dissection and sentinel lymph node biopsy was 91% and 92%, respectively. A five-year recurrence-free survival rate after axillary lymph dissection was approximately 82.2%, and after sentinel lymph node biopsy – 83.9%. Regional recurrence in the sentinel lymph nodes on the affected side were found in only 1.1% of cases. The sentinel lymph nodes were intact in 58% of patients, so, the next lymph dissection was not performed. The affected lymph nodes were observed in 42% of patients.

The time of follow-up ranged from 60 to 180 months. The recurrence was registered in 0.2%. The study revealed no difference in total and recurrence-free survival rate between the groups.

Conclusions: With detected mts lesions of the inguinal (sentinel) lymph nodes, the operation should be continued with an obligatory determination of the second and third order lymph nodes. The extent of surgical intervention is determined on the operating table based on the results of intraoperative histological examination. The fluorescent lymphography method has a high accuracy – 99%, which allows to recommend it for implementation into clinical practice.

Key words. Lymph nodes, sentinel lymph nodes, ICG, Patent Blue, breast cancer. **Introduction.**

The causes of tumors in the human body are still not fully studied and are not clear [1-4]. It is not possible to fully explain why malignant transformation of cells occurs [5-8]. At the same time, it becomes clear that the main mechanisms of cell development are involved in the process of oncogenesis. When

the tumor involves the cells one of the organs, then it spreads throughout the organism, which ultimately leads to death [9-11].

The cancer metastasis regularities are also insufficiently studied [12-15]. Until recently it was believed that malignant cells spread to different ways during cancer lesion of various organs [16-18]. The main route of cancer spreading is by the lymph vessels through which cancer cells enter the lymph nodes surrounding the affected organ [19,20]. Previously it was believed that cancer cells could enter various lymph nodes of the first, second, and third order, and then metastasize to the liver, the lungs, the bones, and other organs [12,21-23]. So, the main doctrine of the surgical treatment of any cancer was considered to be the complete removal of the affected organ with the obligatory removal of all lymph nodes of the first, second, third order, where cancer cells can spread to [24-26].

The treatment doctrine of human cancer has existed practically up to the present time [2,5,27,28]. The better the surgical technique of a surgeon-oncologist, the more radically he performs the operation, i.e., in addition to the affected organ he removes the most part of lymph nodes surrounding this affected organ [29-32]. Modern protocols of the surgical treatment of cancer of different organs require lymph node dissection in at least D2 volume: all lymph nodes of the first and second order must be removed [9,22,33,34]. This requires rather complex and traumatic surgical interventions, after which patients' life quality is significantly reduced, up to disability [12,22,35,36]. The operated cancer patients often experience various complications, postoperative syndromes, that do not allow patients to eat, work and live normally [10,29,33,37].

At the same time, with the accumulation of data on the cancer injury of lymph nodes, it turned out that metastatic spread to lymph nodes is observed in a maximum of 15–20% of patients with early T1/T2 cancer [16,22,24,33,38]. This means that radical removal of lymph nodes was groundless in 80–85% of patients with early cancer [20,25,31,39]. A thorough study of metastasis mechanisms revealed that in melanoma and breast cancer certain first-order lymph nodes are affected, and then, after their damage, cancer cells spread to other lymph nodes of the first and second order [3,12,22,24]. Such lymph nodes, which are affected first and serve as a certain barrier to the further spread of cancer cells, are called sentinel lymph nodes. At the 1990s, leading oncologists formulated the sentinel lymph nodes doctrine [2,3,10,22]. It is considered that if a cancerous lesion is not detected in the sentinel lymph nodes, cancer cells could be hardly detected in the lymph nodes of the second and third order. This logically led to reduction of surgical intervention. If there are no cancer cells in the sentinel lymph nodes, there is no

need to perform extended lymph node dissection [1, 6, 19, 35].

The sentinel lymph node doctrine has received brilliant clinical confirmation in breast cancer and melanoma [5,11,16,24]. If before the main method of treating breast cancer was radical mastectomy, which consisted in complete removal of breast tissue with greater and minor pectoral muscles, simultaneous radical lymphadenectomy of all axillaries, subclavian, and in some cases even intrathoracic lymph nodes, since the 1990s surgical management radically changed according to currently existing protocols [10,21,22,39].

In early breast cancer, sentinel lymph nodes are identified and removed with urgent histological examination [3,6,14,18]. If no cancer cells are detected in the sentinel lymph nodes, the operation is limited to local excision of the tumor, followed by radiation and chemotherapy. In order to avoid deformation of the mammary glands, organ-preserving plastic surgeries are immediately performed, which allow obtaining an excellent cosmetic result. The conducted multicentric studies in different countries have confirmed that the new surgical management of breast cancer is oncologically radical in exactly the same way as the old super-radical interventions [1,5,8,22,29,30,33].

The main non-invasive methods for detecting the affected regional lymph nodes are ultrasound, CT, MRI, especially in young people with a predominance of the glandular component in the mammary glands [1,10,16,37]. Identification of the sentinel lymph nodes is very actual now. The methods of detecting lymph nodes have been significantly innovated [11,20,29,35]. Detection of the sentinel lymph node solves many tasks and gives a great help to surgeons in prescribing further treatment. It reduces the volume of lymph node dissection, minimizes complications, and improves the patient's life quality [22].

Now sentinel lymph nodes detection is used in breast cancer, when clinical examination (palpation, ultrasound and FNAB) reveals no axillary lymph node metastases, and when there is also a need in ductal carcinoma in situ biopsy — such patients have a high probability of the invasive component and need in mastectomy [2,3,5].

The purpose of the study.

To improve the quality of sentinel lymph nodes detection in patients with malignant tumors of the mammary glands.

Materials and methods.

During the period 2009–2016, 400 patients with T1-T3N0M0 breast cancer were operated on the basis of the Odesa Regional Clinical Hospital using two dyes — Patent Blue and ICG. The age of the patients ranged from 35 to 68 years. All patients were divided into two groups.

The patients who had mastectomy with sentinel lymph nodes biopsy were more likely to have T2-T3N0M0 breast cancer. The exceptions were T3-T4 tumors > 5 cm in diameter, or skin and chest wall invasion, as well as palpable axillary lymph nodes, 3 or more affected lymph nodes with sentinel lymph node biopsy.

In the first group, 100 patients had sentinel lymph node biopsy. Lymph node staining was performed using Patent Blue dye.

In the second group, sentinel lymph node biopsy was performed using Patent Blue dye and another fluorescent ICG dye, which was injected intravenously into the arm on the affected side of the mammary gland, along the outflow from the arm to the

mammary gland. This method of lymph nodes staining is based on the effect of the dye luminescence when irradiated with light of a certain wavelength [10,22,26]. After ICG dye injection, green-stained lymph nodes were detected in 15 minutes. This method was originally developed for laparoscopic operations; after the introduction of ICG, the operating field is illuminated with infrared radiation using the Karl Storz endoscopic stand [22].

All the patients with sentinel lymph node involvement at the postoperative period received adjuvant therapy according to ESMO/NCCN recommendations [7,12,31].

All the patients were injected with Patent Blue dye subdermally along the outer edge of the areola, 2 ml of diluted dye in order to allow spreading through the lymphatic system (Figure 1). The time of the standard interval of the stained lymph node appearance was 15–20 minutes. The stained lymph node (lymph nodes) was sent for pathomorphological examination.

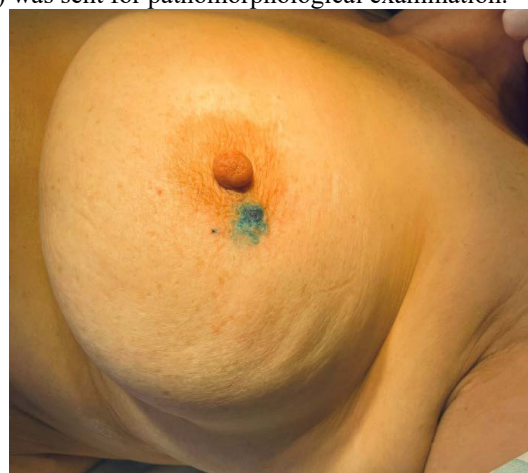


Figure.1. Injection of Patent Blue dye subdermally along the outer edge of the areola.

Intraoperative cytological study of stained lymph nodes (Figures 2 and 3), histological assessment by permanent preparation were performed since there were cases of a false positive result.

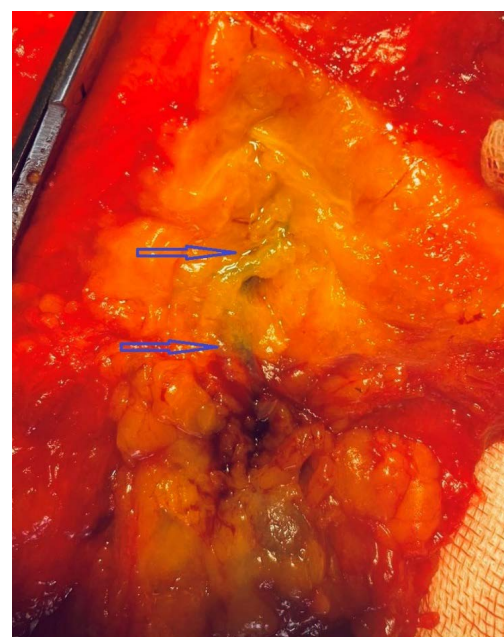


Figure. 2. The stained lymph nodes with Patent blue dye.

Table 1. Group 1 — the main one. Lymph nodes staining with Patent Blue + ICG dye.

n=100	Average number of removed lymph nodes	Lymph nodes without metastasis	Lymph nodes with metastasis	Lymph stasis	Local relapses	Remote relapses
T1N0M0 (n=35)	2	28 (80 %)	7 (20 %)	0	0	1 (2.8%)
T2N0M0 (n=35)	2	22 (62.8 %)	13 (37.2 %)	1 (2.8%)	0	4 (11.4%)
T3N0M0 (n=30)	3	10 (33.3 %)	20 (66.6%)	1 (3.3%)	1 (3.3%)	3 (10%)

Table 2. Group 2 — control. Lymph nodes staining with Patent Blue dye.

n=100	Average number of removed lymph nodes	Lymph nodes without metastasis	Lymph nodes with metastasis	Lymph stasis	Local relapses	Remote relapses
T1N0M0 (n=35)	2	26 (74.3 %)	9 (25.7 %)	1 (2.8%)	0	1 (2.8%)
T2N0M0 (n=35)	3	20 (57.1 %)	15 (42.8 %)	2 (5.7%)	1 (2.8%)	6 (17.4%)
T3N0M0 (n=30)	4	8 (26.6 %)	22 (73.3 %)	1 (3.33%)	3 (10%)	6 (20%)



Figure 3. The stained sentinel lymph node with Patent blue dye.

The pathology examination was performed using standard hematoxylin-eosin staining. The false-negative sentinel lymph nodes were examined using the immunohistochemical analysis. The advantages of this technique are the absence of radiation exposure and simplicity of this method implementation. However, after injection, the dye may remain in tissues for some time. The results of our study have made a breakthrough in the identification and isolation of strategically important lymph nodes at the surgical treatment of breast cancer.

Results and Discussion.

The total five-year survival after axillary lymph node dissection and sentinel lymph node biopsy was 91% and 92% respectively.

The five-year disease-free survival after the axillary lymph node dissection was approximately 82.2%, and after sentinel lymph node biopsy — 83.9%. Regional recurrences in the sentinel lymph nodes on the affected side were detected only in 1.1% of cases; 58% of patients had intact sentinel lymph nodes, which means that the next lymph node dissection was not conducted, and the number of involved lymph nodes was 42%.

The follow-up time ranged from 60 to 180 months. Recurrence was registered in 0.2% of women as isolated metastases to the

axillary lymph nodes. Any case of lymph stasis of the upper extremities was not registered by biopsy.

As a result of the study there was no difference in total and relapse-free survival between the groups (Tables 1 and 2). Our data confirm the improved approach to breast cancer treatment with less need in great surgical treatment.

Our study clearly demonstrates a low recurrence rate of metastasis to regional lymph nodes, and decrease in complications, such as lymphedema and diseases of the upper extremities, when performing sentinel lymph node biopsy as compared with 1–2 level lymphadenectomy.

The results of our research underline that complete axillary lymphadenectomy for staging and prognosis of breast cancer is a thing of the past. The development of new techniques with new approaches of the lymph nodes staining becomes necessary in the practice of an oncologist.

The conducted randomized trials show that five- and ten-year survival was the same as after radical mastectomy with complete lymph node dissection [3,12,24,28,37]. At the same time, the results of treatment improved significantly: the quality of life of operated patients improved, such complications as lymph stasis and edema of the upper extremities disappeared, and the psychological satisfaction of patients who were able to return to a full life increased sharply [13,25,27].

So, modern techniques make it possible to detect lymph nodes with great accuracy in order to diagnose their cancerous lesion, which is a predictor of damage to intact lymph nodes and directly affects the volume of surgical intervention, as well as postoperative and intraoperative complications [17,21,32]. This is now a mandatory procedure in breast cancer, which allows to minimize the volume of surgery [22,26,30].

Our studies show that the sentinel lymph nodes concept is correct for different cancer locations [22]. The accumulated data show that during staining lymph nodes with hematoxylin eosin false negative data can be observed in 5–10% of cases. If immunohistochemistry techniques are used, the indicator can be reduced to 3% [12,26,28]. The use of genetic biomarkers may significantly increase the accuracy of micrometastasis detection in the future. The laws of the growth and spread of cancer cells in the human body, according to the life development philosophy,

should be similar for different tumor locations. That is why the work on identification and study of sentinel lymph nodes is so important [3,5,22,24,26]. In the future, the sentinel lymph nodes concept will radically change the surgical approaches to the treatment of different forms of cancer.

Conclusions.

The simplicity of fluorescent dyes use makes it possible to introduce this method into the daily work of surgical oncologists. The disadvantage of this method is the high cost of equipment and the dye itself. However, the advantages are undoubtedly the absence of radiation exposure and the rapid intraoperative detection of the lymph nodes. This method of sentinel lymph nodes staining can also be used in other oncological diseases, since the method is 100% justified and gives us an opportunity to improve the quality of surgical treatment of cancer patients with minor complications.

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Резюме

Методика определение «сторожевых лимфоузлов» при раке молочной железы

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Цель исследования — повысить качество определения «сторожевых лимфоузлов» у пациентов со злокачественными новообразованиями молочных желез

Ключевые слова: лимфатические узлы, сторожевые лимфоузлы, ICG, Patent Blue, рак молочной железы