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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии
საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

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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.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

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. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შედეგის 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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NAVIGATION SURGERY FOR INTRAOPERATIVE SENTINEL LYMPH NODE DETECTION USING ICG IN BREAST CANCER PATIENTS

R.P. Nikitenko, O. I. Romak, A.N. Kvasha, E.A. Koichev, K.O. Vorotyntseva.

Odesa National Medical University, Odesa, Ukraine.

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 method of intraoperative diagnosis of the sentinel lymph node in patients with breast cancer.

Material and methods: Between 2016 and 2021, 200 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, 100 patients, sentinel lymph nodes biopsy was conducted using 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 axillar (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. Breast cancer, sentinel lymph node, ICG.

Introduction.

In 2020, more than 2.2 million cases of breast cancer were registered, and these figures indicate the high prevalence of this disease [1-3]. Soon approximately every twelfth woman will be diagnosed breast cancer [4-7]. Breast cancer is the leading cause of cancer-related death in women. In recent decades, significant progress has been made in breast cancer treatment [8-11]. The possibilities of the current surgery in breast cancer treatment

directly depend on severity of lymph nodes involvement [11-13]. Breast cancer occurs in the cells that line epithelium of the milk ducts (85%) or lobules (15%) of the glandular tissue of the breast. At first, the tumor growth is limited to a duct or a lobe (a preinvasive cancer, cancer at place – in situ), where it does not cause any symptoms and has a minimal potential for metastasis. Lymphatic metastasis is one of the most important causes of local recurrence of breast cancer and an unfavorable factor of prognosis [5,7,14,15].

There is not any method that can definitely detect lesions of regional lymph nodes (LN) in patients with breast cancer [1,2,10]. The main criterion which testifies to metastatic lesion of LN is its size [5,7,16,17]. At the same time, the size of lymph nodes does not always indicate to its involvement in the tumor process or intactness [9,15,18]. There are reports that LNs less than 5 mm in diameter were affected in 15% of patients [2,16,19].

Introduction of the sentinel lymph nodes staining technique to the surgical practice changed radically the extent of the surgical approach [4,19,20]. This technique served as a breakthrough in the detection of sentinel lymph nodes in patients with breast cancer. Staining of sentinel lymph nodes in breast cancer allows to minimize most of the complications, as well as to reduce surgical injury [2,3,6,14,17]. Breast cancer treatment can be very effective and increase the survival rate to 90% or higher, especially if the disease is detected at an early stage. The treatment usually includes surgery and radiation therapy to control disease in the breast, lymph nodes, and surrounding areas, as well as systemic therapy, endocrine therapy (hormone therapy), chemotherapy, and, in some cases, targeted therapy (using antibodies).

Aim.

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

Materials and Methods.

Between 2016 and 2021, 200 patients with T1-T3N0M0 breast cancer were operated on at the Odesa Regional Clinical Hospital. Two types of dyes – Patent Blue and ICG were used. Age of patients 35–68 years. All the patients were divided into two groups. All patients gave written informed consent, and the local ethics committee approved the study.

Patients who had mastectomy with sentinel lymph node biopsy more often are diagnosed T2-T3N0M0 breast cancer. The exceptions were T3-T4 tumors, tumors > 5 cm in diameter, or invasion to the skin and chest, palpable axillary lymph nodes, 3 and more affected lymph nodes detected by sentinel lymph node biopsy.

The preoperative examination protocol included: digital mammography in two projections (Figure 1), ECG, general, biochemical blood test, coagulogram, and trepan biopsy with histological examination and subsequent immunohistochemistry with ER, clone6F11, PR, clone16, Her-2 examination, breast and lymph nodes ultrasound, computed tomography (CT) of the chest, abdominal cavity and pelvic organs. Preoperative preparation met the standard.

In the group 1, 100 patients had sentinel lymph node biopsy. Staining of lymph nodes was performed with Patent Blue dye.

In group 2, sentinel lymph node biopsy was performed in 100 patients using fluorescent dye ICG, which was also administered subdermally. This method of staining lymph nodes is based on the dye luminescence effect when exposed to a certain wavelength light [3,6,12,20]. After ICG introduction, green colored lymph nodes were determined in 15 minutes (Figure 1). All the patients with the sentinel lymph nodes lesions had adjuvant therapy at the postoperative period according to the ESMO/NCCN recommendations [10,11,16].

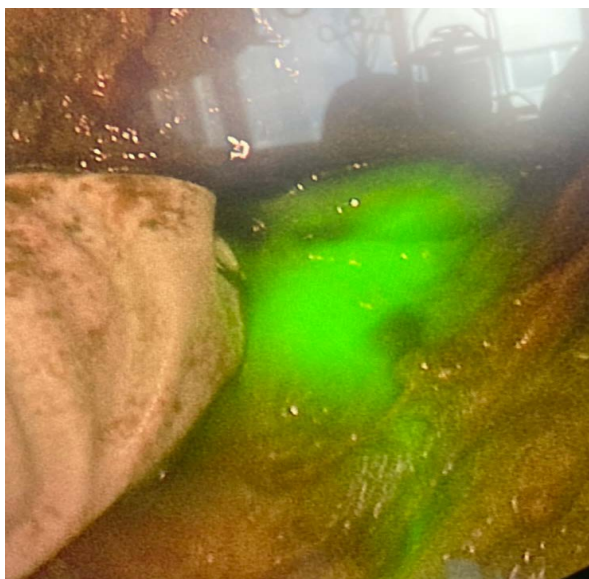


Figure 1. The lymph node stained with ICG.

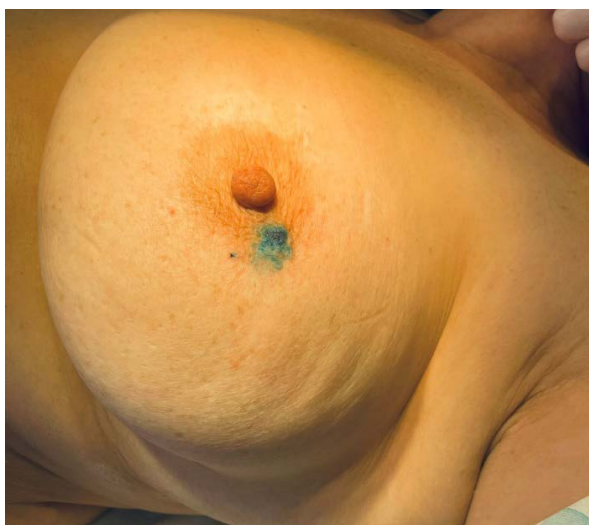


Figure 2. Subdermal injection of Patent Blue along the outer edge of the areola.

All the patients were injected with Patent Blue dye subdermally along the outer edge of the areola, in amount of 2 ml of diluted dye in order to give an opportunity to spread through the lymphatic system (Figure 2). A standard time period of the stained lymph node appearance was 15–20 minutes. The stained lymph node (nodes) was sent for pathomorphological examination (Figure 3).

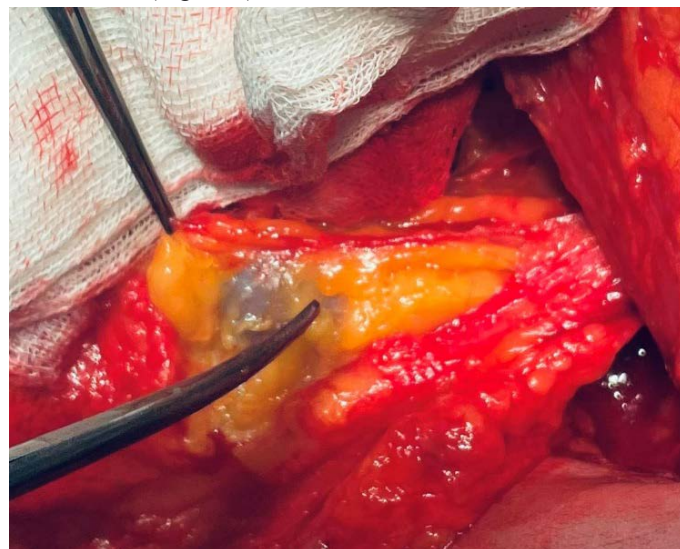


Figure 3. The removed lymph node stained by Patent Blue.

Cytological examination of stained lymph nodes was performed intraoperatively. Histological evaluation using permanent preparations was conducted, because false-positive results were observed.

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

Results.

In the past all the cases of breast cancer were treated surgically by mastectomy. Today, mastectomy is also performed in case of multifocal growth. Currently, most cases of breast cancer can be treated with a more sparing technique – lumpectomy or sectorial resection, but with an obligatory sentinel lymph node biopsy. In these cases, it is usually followed by the radiation therapy in order to minimize the chance of recurrence. 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 near 82.2%, and after sentinel lymph node biopsy – 83.9%. Regional recurrences 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 the patients, therefore, the subsequent lymph dissection was not performed. Metastatic affected lymph nodes were found in 42% of patients.

Table 1. Group 2 – control. LN painting by Patent Blue.

n = 100	Average number of removed LN	LN without mts	LN with mts	Lymphostasis	Recurrence is local	Recurrence is remote
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%)

Table 2. Group 1 – main. LN painting by ICG.

n = 100	The average number of removed LN	LN without mts	LN with mts	Lymphostasis	Recurrence is local	Recurrence is remote
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%)

The follow-up period ranged from 60 to 180 months. Recurrence was registered in 0.2% of women as isolated metastases to the axillary lymph nodes. Biopsy revealed no cases of upper extremity lymphostasis. As a result of the study, there was no difference in total and recurrence-free survival rate between the groups (Tables 1 and 2).

Our data confirm improvement of surgical approach of breast cancer. The study proved low recurrence rate, a decrease in complications such as lymphedema and disease of the upper extremity when performing sentinel lymph node biopsy as compared with the 1st-2nd order lymphadenectomy. Our research highlights that the complete axillary lymph dissection for staging and prognosis of breast cancer is a thing of the past. Mastering new technologies with new approaches to lymph nodes staining becomes necessary in the practice of an oncological surgeon.

Statistical analyses were performed using program Statistica 10.0.

Discussion.

The vast majority of drugs used for the treatment of breast cancer are already included in the WHO List of Essential Medicines [3,4,10,14]. So, significant global improvements in breast cancer control can be achieved by implementing the proved measures. Therefore, we show in our work that the sentinel lymph node detection is a qualitative indicator in staging and improving the life quality of patients with breast cancer after surgery.

The sentinel nodes detection with ICG dye can reduce the severity and number of complications [6,9,17]. All known methods of the sentinel lymph nodes detection by the sentinel lymph node concept determine one function – show the way of lymphatic drainage from the tumor to the regional nodes [7,18,21]. In our study, the sentinel lymph node detection was at a high level and made up 100%. The false negative results rate when summing all the groups was 9%. So, detection of the sentinel LN is an effective method for the disease staging, as well as a prognostic factor and a guideline in the further management of breast cancer [5,10,14].

Conclusions.

1. ICG is a universal fluorescent dye that provides the surgeon with additional complete information about the individuality

of the patient's anatomy and individuality of the surgical intervention, allows to effectively and quickly determine the scope of the surgical intervention, and thereby reduce the number of complications.

2. If mts lesions of the axillar (sentinel) lymph nodes are detected, the operation should be continued with an obligatory determination of the second and third order lymph nodes.

3. The extent of surgical intervention is determined on the operating table according to results of intraoperative histological examination.

4. The diagnostic algorithm with ICG in breast cancer treatment allows in the vast majority of cases to avoid o traumatic operations in favor of organ-preserving operations with sentinel lymph node biopsy.

5. The fluorescent lymphography method has a high accuracy of 99%, which makes it possible to recommend it for implementation into clinical practice. The frequency of sentinel lymph nodes detection in breast cancer patients is 98% in the control group, 100% – in the main group. The sensitivity of the method is 91.6% in the main group, and 96.67% – in the control group. The specificity is no more than 97.5% – 100%, the false negative response was 3.5% in the control group and 9% – in the main group, $p > 0.05$. The predicted value of a positive result is 91.6% in the main group, 100% – in the control group. The predicted value of a negative result is 97.5% in the main group, 98.5% – in the control group.

Prospects for further research.

Identification and targeted examination of sentinel LN in breast cancer patients is a promising technology of the future. In this regard breast cancer should be considered as an example of a disease, which treatment techniques can be used in other diseases management.

Conflict of interest statement.

The author declares no conflict of interest.

Research work (state registration No 0119U003578): Development and implementation of new methods of intraoperative diagnosis of sentinel lymph nodes for gastric and uterine cancer

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