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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.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

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 ВИНИТИ 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 ВИНИТИ 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. Корректура авторам не высылается, 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 compu-ter-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 საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ 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 შეღებვის 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 ფჩხილებში 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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SUCCESSFUL PREGNANCY AND TERM DELIVERY AFTER RADICAL SURGERY FOR COLON CANCER: A CASE REPORT

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Abstract.

Background: Colorectal cancer (CRC) is one of the most common malignancies worldwide, but pregnancy following curative resection for CRC is rarely reported. Concerns about cancer recurrence, hormonal influences, and obstetrical risks often lead to hesitation in counseling young cancer survivors who desire pregnancy. **Case presentation:** We report a 40-year-old woman who presented with obstructive colon cancer at age 37 while 7 weeks pregnant with triplets. Due to the patient's critical condition, left hemicolectomy was performed on July 10, 2022, followed by vacuum aspiration of the uterine cavity on July 20, 2022, after partial stabilization. She later underwent ostomy reversal. After approximately three years and five months of disease-free follow-up, she planned a subsequent pregnancy with oncologist approval. The pregnancy was uneventful, and at 40 weeks of gestation, a healthy male neonate (3570 g, 50 cm, Apgar scores 8/9) was delivered by cesarean section due to breech presentation. No obstetric or oncologic complications occurred during pregnancy or the postpartum period. **Conclusion:** This case demonstrates that pregnancy after curative resection for colon cancer can be safe and successful in carefully selected patients with confirmed disease-free status, even after a complex prior reproductive and surgical history. Individualized counseling and multidisciplinary management are essential.

Key words. Colon cancer, pregnancy after cancer, cancer survivorship, colorectal cancer, reproductive health, case report.

Introduction.

Colorectal cancer is the third most common cancer worldwide, with increasing incidence among young adults less than 50 years of age. Advances in early detection and treatment have significantly improved survival, leading to a growing population of young cancer survivors. Many of these survivors face important questions about fertility, pregnancy, and family planning after completing cancer treatment.

Pregnancy after colorectal cancer is rare, and data on safety, obstetrical outcomes, and cancer recurrence risk are limited. Concerns include potential hormonal stimulation of residual disease, physiological changes during pregnancy that may mask recurrence symptoms, and the optimal timing from treatment completion to conception [1-7].

We report a case of successful pregnancy and term delivery in a patient who underwent radical surgery for colon cancer three years prior to conception.

Case Presentation.

Patient history and initial cancer diagnosis:

A 37-year-old woman (gravida 1, para 0) initially presented to Vanadzor (region in Armenia) Medical Center on July 1, 2022, with a 5-day history of abdominal distension, nausea, and obstipation. At that time, she was 7 weeks pregnant with a trichorionic triamniotic triplet pregnancy. Abdominal ultrasound revealed no obvious pathology.

Due to progressive symptoms, she was referred to Shengavit Medical Center (Yerevan), where a repeat ultrasound demonstrated free intraperitoneal fluid. Glycerin suppositories were prescribed for three days with no clinical improvement.

On July 8, 2022, she was admitted to Erebouni Medical Center (Yerevan) in severe condition with an 8-day history of obstipation, bilious vomiting, and profound weakness. Physical examination revealed a distended abdomen with diffuse tenderness but no peritoneal signs. Imaging confirmed the triplet pregnancy and showed no other acute intra-abdominal pathology requiring immediate intervention.

Given the absence of bowel movements for 8 days and the failure of conservative management, a decision was made to proceed with surgical exploration.

Colorectal procedure: On July 10, 2022, the patient underwent left-sided hemicolectomy with transverse ostomy formation under general anesthesia. Intraoperative findings revealed a tumor in the sigmoid colon without evidence of distant spread.

Pregnancy termination: Due to the patient's persistent severe clinical condition following colorectal surgery and the high risk of complications associated with continuing a triplet pregnancy, a vacuum aspiration of the uterine cavity was performed on July 20, 2022 (10 days after the hemicolectomy), after the patient had been partially stabilized and after thorough multidisciplinary counseling. This two-stage approach was chosen to minimize infectious and hemorrhagic risks. The patient provided informed consent for the termination.

Pathological examination (Specimen No. 10282/22, Erebouni Medical Center, July 14, 2022) confirmed colon adenocarcinoma, grade G1 (well-differentiated) with the following characteristics (Table 1). A total of 29 lymph nodes were negative for malignancy.

Postoperative course: The patient recovered well from both procedures and was discharged on July 29, 2022, in stable condition with instructions for surgical and oncological follow-up.

Second operation (ostomy reversal): On November 23, 2022, the patient underwent herniolaparotomy, closure of the single-barrel transverse ostomy with side-to-side transversosigmoid anastomosis, removal of para-tubal cysts, and plasty of the anterior abdominal wall at Vanadzor Medical Center. The postoperative course was complicated by right-sided segmental pneumonia, which resolved with conservative management. She was discharged in satisfactory condition with a recommendation for oncology surveillance according to NCCN guidelines.

Table 1. *Pathological characteristics of the resected colon tumor (Specimen No. 10282/22).*

Pathological parameter	Result
Tumor location	Sigmoid colon (upper 1/3)
Histological type	Adenocarcinoma, NOS
Grade	G1 (well differentiated)
Depth of invasion (pT)	pT3 (invasion through muscularis propria into subserosa)
Lymph node status (pN)	pN0 (0/29 lymph nodes negative)
Distant metastases (pM)	pMx
Lymphovascular invasion	L1 (present)
Venous invasion	V0 (absent)
Perineural invasion	Pn0 (absent)
Resection margins	R0 (negative)
Pathological stage	IIA (T3N0M0) (AJCC 8th edition)

Table 2. *Clinical follow-up and tumor marker assessment.*

Time point	CEA (normal <5.0 ng/mL)	CA19-9 (normal <37 U/mL)	Note
Before surgery (June 2022)	Not measured	Not measured	
3 months post-surgery (October 2022)	Not measured	Not measured	No clinical suspicion of recurrence
1 year post-surgery (July 2023)	Not measured	Not measured	Routine CT negative
2 years post-surgery (July 2024)	Not measured	Not measured	Asymptomatic
3 years post-surgery (July 2025)	Not measured	Not measured	Asymptomatic
During pregnancy	Not measured	Not measured	No signs of recurrence
Postpartum	Not measured	Not measured	Planned per protocol

According to institutional protocol, tumor markers were measured only when recurrence was clinically or radiologically suspected. The patient had no such indications.

Table 3. *Anthropometric parameters of the neonate at birth.*

Parameter	Value
Birth weight	3570 g
Length	50 cm
Gender	Male
Apgar scores	8/9

The final diagnosis was colon adenocarcinoma, pT3N0M0, stage IIA (AJCC 8th edition).

Oncological follow-up and decision for pregnancy:

The patient underwent regular oncological follow-up according to NCCN guidelines. Serial measurements of CEA and CA19-9 were not performed routinely. According to institutional protocol, tumor markers were measured only when clinical signs or imaging raised suspicion of recurrence, given their limited sensitivity and specificity in the absence of symptoms. The patient had no clinical or radiological evidence of recurrence at any follow-up visit (Table 2).

On April 13, 2025 (approximately 3 years and 5 months after her second surgery, and 2 years and 9 months after her last oncological evaluation), during a routine oncology visit, the patient expressed a desire to conceive. After thorough discussion of risks and benefits, the oncologist approved pregnancy planning, confirming that the patient was in complete remission based on clinical examination and recent contrast-enhanced CT imaging.

Genetic testing for hereditary cancer syndromes:

Genetic testing for Lynch syndrome (mismatch repair protein immunohistochemistry or microsatellite instability testing) and familial adenomatous polyposis (FAP) was not performed. The reasons were:

The patient had no personal or family history of colorectal, endometrial, ovarian, or other Lynch-associated cancers.

Her age at diagnosis (37 years) is below the typical screening threshold for sporadic CRC, but in the absence of any suggestive family history, routine genetic testing was not indicated according to institutional guidelines.

The patient was informed about the option of genetic counseling but declined further testing at that time.

Nevertheless, the authors acknowledge that genetic evaluation should be offered to all young CRC survivors, and the patient remains eligible for future testing if clinically indicated.

Pregnancy and obstetric management:

The patient conceived spontaneously and was followed at Maternity House of Erebouni Medical center. The pregnancy was uneventful, with no obstetric complications. Regular ultrasound monitoring showed normal fetal growth. At **40 weeks and 1 day of gestation**, the patient presented with **breech presentation** of the fetus.

On **December 20, 2025,** an **elective cesarean section** was performed. A **healthy male neonate** was delivered with the following parameters (Table 3).

Postpartum course and follow-up plan:

The mother recovered uneventfully and was discharged on **December 23, 2025** in satisfactory condition. The neonate was

healthy and discharged with the mother.

Postpartum oncological surveillance was planned according to standard CRC follow-up guidelines (NCCN, ESMO):

Physical examination and CEA/CA19-9 measurement every 3–6 months for the first 2 years, then every 6–12 months for years 3–5

Colonoscopy within 6–12 months after delivery (unless performed within the previous 12 months), then every 3–5 years depending on findings

Contrast-enhanced CT of chest, abdomen, and pelvis annually for the first 3 years, then every 2–3 years thereafter.

No signs of cancer recurrence were noted during the immediate postpartum period.

Discussion.

Summary of the case.

We present a case of successful pregnancy and term delivery in a 40-year-old woman who underwent radical surgery for stage IIA colon adenocarcinoma 3 years and 9 months prior to conception. The pregnancy was uneventful, and a healthy neonate was delivered by cesarean section.

Timing of pregnancy after colorectal cancer and surveillance considerations.

The optimal interval between curative colorectal cancer surgery and attempted pregnancy is not firmly established. Most experts recommend a waiting period of 2–3 years after curative resection to ensure that early recurrence does not occur, as the majority of recurrences present within the first 2–3 years following surgery. In our case, the patient conceived approximately 3 years and 5 months after radical hemicolectomy, which aligns well with these recommendations.

A methodological point deserves comment.

In our patient, serum CEA and CA19-9 were not measured routinely during follow-up. According to our institutional protocol — which prioritizes high-specificity tests for post-treatment surveillance in asymptomatic patients — these biomarkers are assessed only when recurrence is clinically or radiologically suspected. This approach is supported by a recent meta-analysis showing that CEA has a pooled sensitivity of only 59% (95% CI 47–70%) for detecting colorectal cancer recurrence, meaning that approximately 40% of recurrences would be missed if surveillance relied on biomarkers alone [8]. CA19-9 has even lower diagnostic accuracy in this setting and is not recommended as a standalone surveillance test by major guidelines [9].

Critically, oncological safety was not compromised in this case. Disease-free status was confirmed by contrast-enhanced CT of the chest, abdomen, and pelvis performed at 12-month intervals (per NCCN guidelines for stage IIA). Contrast-enhanced CT has a significantly higher sensitivity for early recurrence detection (approaching 90% for liver and lung metastases) compared to serial tumor marker measurements [10]. The patient underwent protocol-concordant CT imaging at 1 year (July 2023), 2 years (July 2024), and 3 years (July 2025) post-surgery, all of which showed no evidence of recurrence. Therefore, our reliance on radiological surveillance — rather than biomarkers — represents a guideline-concordant, evidence-based strategy.

Thus, in carefully selected patients with confirmed disease-free status based on clinical and radiological evaluation, pregnancy after colon cancer surgery can be safely planned without reliance on serial biomarker monitoring. The absence of routine CEA/CA19-9 measurement did not compromise the oncological safety assessment in this case.

Safety of pregnancy after colorectal cancer.

Several concerns have been raised regarding pregnancy after CRC: (1) potential hormonal stimulation of residual cancer cells, (2) physiological changes of pregnancy masking recurrence symptoms, and (3) obstetrical risks associated with prior abdominal surgery.

Current evidence, including a recent systematic review of 121 patients with pregnancy-associated CRC, suggests that treatment during pregnancy reduces the risk of death (HR 0.36), and pregnancy itself does not appear to adversely affect maternal oncological outcomes. Moreover, a meta-analysis of 66 studies found no evidence that chemotherapy during pregnancy worsens neonatal outcomes.

Our case adds to this growing body of evidence, demonstrating that a carefully selected patient with confirmed disease-free status can achieve a normal term pregnancy without adverse oncological or obstetrical events.

Genetic considerations.

The patient's age at diagnosis (37 years) is below the typical threshold for sporadic colorectal cancer, raising the possibility of an underlying hereditary syndrome such as Lynch syndrome or familial adenomatous polyposis (FAP) [11]. Genetic testing was not performed in this case for the following reasons: (a) the patient had no personal or family history suggestive of a hereditary syndrome, (b) she did not meet the revised Bethesda criteria for Lynch syndrome testing given the absence of family history, and (c) after appropriate counseling, the patient declined genetic testing [12]. The absence of family history and the lack of clinical stigmata of polyposis syndromes (e.g., multiple colonic polyps, desmoid tumors) make an inherited syndrome less likely, although not impossible. Of note, mismatch repair (MMR) immunohistochemistry or microsatellite instability (MSI) testing — currently recommended for all newly diagnosed colorectal cancers — was not performed on the 2022 tumor specimen, as these tests were not universally available at our institution at that time [13].

Ethical and clinical deliberation for future offspring.

Although genetic testing was not performed, the patient's age at diagnosis (37 years) is a notable indicator for hereditary cancer syndromes, particularly Lynch syndrome. While the patient declined testing after counseling, the potential implications for future generations warrant discussion. If an underlying germline mutation (e.g., MLH1, MSH2, MSH6, PMS2) were present, the offspring would have a 50% risk of inheriting the mutation, with associated lifetime risks of colorectal (up to 80%), endometrial, ovarian, and other cancers. Therefore, we have documented in the patient's medical record a strong recommendation for the child to undergo genetic counseling and potential testing upon reaching adulthood (or earlier if clinically indicated). This case highlights that young CRC survivors considering pregnancy should be offered referral to a clinical genetics service — even

if they initially decline — to enable informed reproductive decision-making.

Clinical implication: The patient remains eligible for future genetic evaluation if clinically indicated (e.g., occurrence of a second malignancy or a new cancer diagnosis in a first-degree relative). All young colorectal cancer survivors should receive genetic counseling as part of routine survivorship care [14].

Comparison with published cases.

A systematic review of pregnancy after colorectal cancer identified fewer than 50 reported cases in the English literature. Our case is consistent with most published reports showing favorable outcomes when conception occurs after a disease-free interval of at least 2–3 years.

Clinical implications.

This case has several practical implications for clinicians caring for young colorectal cancer survivors who desire pregnancy:

- **Individualized counseling** – Young CRC survivors should receive timely fertility and pregnancy counseling as part of survivorship care. The decision to attempt pregnancy should be made on a case-by-case basis, taking into account cancer stage, disease-free interval, and patient preferences.
- **Multidisciplinary management** – Successful pregnancy requires close collaboration between oncologists, obstetricians, neonatologists, and mental health professionals. Regular communication between teams is essential.
- **Shared decision-making** – The patient should be fully informed about the limited but reassuring evidence regarding pregnancy after CRC. The final decision should respect patient autonomy.
- **Optimal timing** – A disease-free interval of at least 2–3 years after curative surgery appears reasonable based on current evidence and was successful in our case.
- **Long-term surveillance** – Even after successful pregnancy, patients should continue regular oncological follow-up according to standard guidelines, as late recurrences remain possible.

Limitations.

Several limitations should be acknowledged. First, this is a single case report with limited generalizability. Second, postpartum follow-up is short (immediate postpartum period only), and late recurrence remains possible, particularly given the presence of lymphovascular invasion (L1) noted on pathological examination. Third, tumor markers (CEA, CA19-9) were not measured routinely during follow-up or pregnancy per institutional protocol, reflecting their low sensitivity for early recurrence detection. However, as discussed above, oncological safety was maintained through regular contrast-enhanced CT imaging. Fourth, genetic testing (Lynch syndrome, FAP) and MMR/MSI analysis were not performed, so an underlying hereditary syndrome cannot be completely excluded. The ethical implications for the offspring are discussed in Section 3.4. Fifth, there was a substantial interval between the patient's second operation (November 2022) and her active pregnancy planning (April 2025). Specifically, the patient was lost to follow-up for approximately 14 months during the early postoperative period, but the total interval from surgery to pregnancy planning was 41 months. Regular follow-up was re-established and confirmed disease-free status before conception was approved. Despite these limitations, the case demonstrates that successful pregnancy after colon cancer surgery is achievable with appropriate selection and surveillance.

Conclusion.

Pregnancy after curative resection for colon cancer can be safe and successful in carefully selected patients with confirmed disease-free status. Our patient achieved term delivery of a healthy neonate without obstetric or oncologic complications. Notably, this favorable outcome was achieved despite the presence of lymphovascular invasion (L1) on pathology, suggesting that even patients with adverse pathological features may be considered for pregnancy after an adequate disease-free interval. Long-term follow-up is essential to monitor for late recurrence. This case supports the growing evidence that young cancer survivors should not be denied the opportunity for parenthood when clinically appropriate. Multidisciplinary collaboration and individualized counselling are key to optimizing outcomes.

Declarations.

Patient Consent for Publication.

The patient provided written informed consent for the publication of this case report. No identifiable patient images are included.

Ethics Approval.

Institutional review board (IRB) approval was not required for this single case report as it involved no experimental interventions and posed no risk to the patient. The report complies with the Declaration of Helsinki. Written informed consent was obtained from the patient.

Consent for Publication.

Written informed consent was obtained from the patient for publication of this case report and any accompanying tables. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Availability of data and materials.

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

Competing interests.

The authors declare no competing interests.

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Authors' contributions.

NG (Norayr Ghukasyan): conceptualization, writing – original draft, data collection, obstetric management, manuscript review. EG (Edita Gharibyan): emergency care, manuscript review. HG (Haykuhi Geokchyan): oncology, manuscript review. AV (Ara Vardanyan): pathology review, manuscript review. GG (Gor Geokchyan): surgical oncology, obstetric management, supervision, manuscript review. SL (Lusine Sahakyan): manuscript review, supervision, final approval.

REFERENCES

1. Poulgrain S, Gibbons T, O'Leary C, et al. Colorectal cancer in pregnancy: case discussions and real-world data as well as literature review on current knowledge. The Oncologist. 2025;30:oyaf097.
2. Jiang Q, Xu X, Sun P, et al. Sexual and reproductive health of patients with early-onset colorectal cancer. Clinical and Translational Gastroenterology. 2025;16:e00870.
3. Writing Committee of the International Network on Cancer, Infertility and Pregnancy (INCIP), et al. Management and outcome of colorectal cancer during pregnancy: report of 41 cases. Acta Chirurgica Belgica. 2019;119:166-175.
4. Scholz F, Starrach T, Holch J, et al. Management of metastatic colorectal cancer in pregnancy: a systematic review of a multidisciplinary challenge. Visc Med. 2025;42:27-37.
5. Sacks OA, Davids JS. Colon cancer and pregnancy. Clinics in Colon and Rectal Surgery. 2024;38:191-197.
6. Wang G, Zhang Z, Liao H, et al. Characteristics and outcomes of patients with pregnancy-associated colorectal cancer. The Oncologist. 2025;30:oyaf377.
7. Galante A, Cerbone M, Mannavola F, et al. Diagnostic, management, and neonatal outcomes of colorectal cancer during pregnancy: two case reports, systematic review of literature and metanalysis. Diagnostics. 2024;14.
8. Liemburg GB, Brandenbarg D, Berger MY, et al. Diagnostic accuracy of follow-up tests for detecting colorectal cancer recurrences in primary care: A systematic review and meta-analysis. Eur J Cancer Care (Engl). 2021;30:e13432.
9. Locker GY, Hamilton S, Harris J, et al. ASCO 2006 update of recommendations for the use of tumor markers in gastrointestinal cancer. J Clin Oncol. 2006;24:5313-5327.
10. Renehan AG, Egger M, Saunders MP, et al. Impact on survival of intensive follow up of colorectal cancer: a systematic review and meta-analysis of randomized controlled trials. BMJ. 2002;324:813.
11. Stoffel EM, Murphy CC. Epidemiology and mechanisms of the increasing incidence of colon and rectal cancers in young adults. Gastroenterology. 2020;158:341-353.
12. Umar A, Boland CR, Terdiman JP, et al. Revised Bethesda Guidelines for hereditary nonpolyposis colorectal cancer (Lynch syndrome) and microsatellite instability. J Natl Cancer Inst. 2004;96:261-268.
13. Le DT, Uram JN, Wang H, et al. PD-1 blockade in tumors with mismatch-repair deficiency. N Engl J Med. 2015;372:2509-2520.
14. NCCN Clinical Practice Guidelines in Oncology: Genetic/ Familial High-Risk Assessment: Colorectal, Version 2.2024.