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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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CLINICAL RESULTS OF DELORME'S AND ALTEMEIER'S PROCEDURES IN RECTAL PROLAPSE

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Abstract.

Aim of study: Rectal prolapse is a complex multifactorial pathology, accompanied by pronounced anatomical and functional disorders that significantly impair patients' quality of life. In surgical practice, the two most popular methods are the Delorme and Altemeier procedures, and the choice between them remains a matter of debate.

The objective of the study was to identify risk factors, indications, and contraindications to both procedures and to analyze their short- and long-term results.

Materials and methods: The study included 73 patients who had undergone Delorme's or Altemeier's procedure in 2011–2024, of whom 41 were observed prospectively. A comprehensive clinical and instrumental analysis was carried out, and functional results and the frequency of complications and recurrences were assessed.

Results: The observed complications were predominantly moderate and amenable to conservative correction. The average recurrence rate was 12%, lower than most published data. The main risk factors included chronic constipation, sedentary lifestyle, non-compliance with the prescribed diet, and age over 60.

Conclusion: The functional results were satisfactory, with the improvement of fecal incontinence, the normalization of bowel movements, and the elimination of urological conditions.

The study confirms the high effectiveness and safety of both methods, emphasizing the importance of proper preoperative risk stratification and comprehensive postoperative management in reducing the recurrence rate and improving patients' quality of life.

Key words. Rectal prolapse, Delorme's procedure, Altemeier's procedure, recurrence, chronic constipation, levateroplasty, fecal incontinence, functional results, risk factors.

Introduction.

Rectal prolapse (RP) is characterized by a set of pronounced clinical manifestations: external prolapse of a significant part of the organ, fecal and flatal incontinence, chronic constipation, recurrent bleeding, mucous secretions, the formation of ulcers on the prolapsed segments due to constant trauma, and maceration of the perineal skin. These conditions heavily worsen the physical and psycho-emotional state of the patient and require technically complex and time-consuming surgical interventions. The constantly present bulge in the anal region and foreign body sensation are major factors that significantly impair patients' quality of life.

Current surgical practice utilizes two main types of surgical interventions: perineal and intra-abdominal.

Perineal operations are aimed at removing the excessively prolapsed segment of the intestine, correcting functional disorders (urinary and fecal incontinence and constipation), restoring daily activity and, above all, improving the patient's quality of life [1-4].

Abdominal operations are performed to anatomically reduce RP and subsequently securely fixate the rectum to pelvic musculoskeletal and ligamentous structures. Although these interventions show lower recurrence rates and better functional results, they are fraught with an increased risk of damage to the genital nerve. This complication is particularly critical for young patients, as it can lead to impaired fertility in women and erectile dysfunction in men. Moreover, abdominal operations are more technically complex and demanding on the surgeon's qualifications while also significantly raising the cost of treatment with laparoscopic and robotic technologies [5,6]. Nevertheless, perineal procedures are considered a preferred option for patients over 50 years of age and those at high operative risk [7].

Despite the accumulating evidence from randomized clinical trials, there is still no conclusive evidence to the superiority of abdominal or perineal procedures. The functional results, relapse rates, and long-term effects of interventions remain a matter of debate [4].

Summarizing the above, RP is a multifactorial pathology associated with impaired anatomical fixation, degeneration of the pelvic floor muscles, ligamentous insufficiency, and functional intestinal disorders. Despite the variety of proposed surgical procedures, there are still no clear, clinically justified criteria for choosing between Delorme's and Altemeier's procedures, which are particularly important for patients with a significant segment of the intestine prolapsing.

In addition, research data indicate varying recurrence rates (from 4 to 30% depending on the method), ambiguous functional outcomes, and no strict risk stratification protocols [8]. These gaps emphasize the need to comprehensively analyze the factors affecting the choice of operative approach, clarify respective indications and contraindications, and assess long-term results. The current study is of high clinical relevance due to its focus on optimizing treatment for RP, increasing the effectiveness of surgical care, and improving patients' quality of life.

Research Goal.

The purpose of the study was to identify risk factors and clear indications and contraindications to Delorme's and Altemeier's procedures and to study their immediate and long-term results in patients with a significant size of the prolapsing part of the rectum.

Materials and Methods.

The study covered 73 patients of both sexes (59 women and 14 men) who had undergone Delorme's or Altemeier's procedures in the period from 2011 to 2024 at the Clinical Medical Center of Baku city and the Training and Surgical Clinic of Azerbaijan Medical University (Baku city). The average age of the patients was 55.2 ± 1.9 years (42–74 years).

Prospective observation was conducted on 41 patients (27 women – 65.85%; 14 men – 34.15%) aged 26–85 years old (average age 52.1 ± 2.6 years). All these patients were diagnosed with complete rectal prolapse.

Complete postoperative data suitable for comparative analysis were available for 38 patients, including 24 patients in the Delorme group and 14 patients in the Altemeier group. Long-term follow-up data were complete for 32 patients (Figure 1); therefore, these patients were included in the analysis of recurrence and functional outcomes presented in Tables 2 and 3. The reduction in the number of patients included in the final analysis was due to incomplete follow-up in a proportion of patients and the fact that some patients were still under ongoing postoperative observation at the time of data analysis. Only patients with complete clinical and follow-up data were included in the final statistical evaluation. Written informed consent was obtained from all patients for participation in the study and surgical treatment. In addition, written informed consent for publication of clinical photographs was obtained from the patients whose images are presented in Figures 2–7.

Preoperative evaluation included a set of functional and imaging methods used after history taking and physical examination:

- irrigography;
- colonic semi-liquid barium enema with dynamic fluoroscopy;

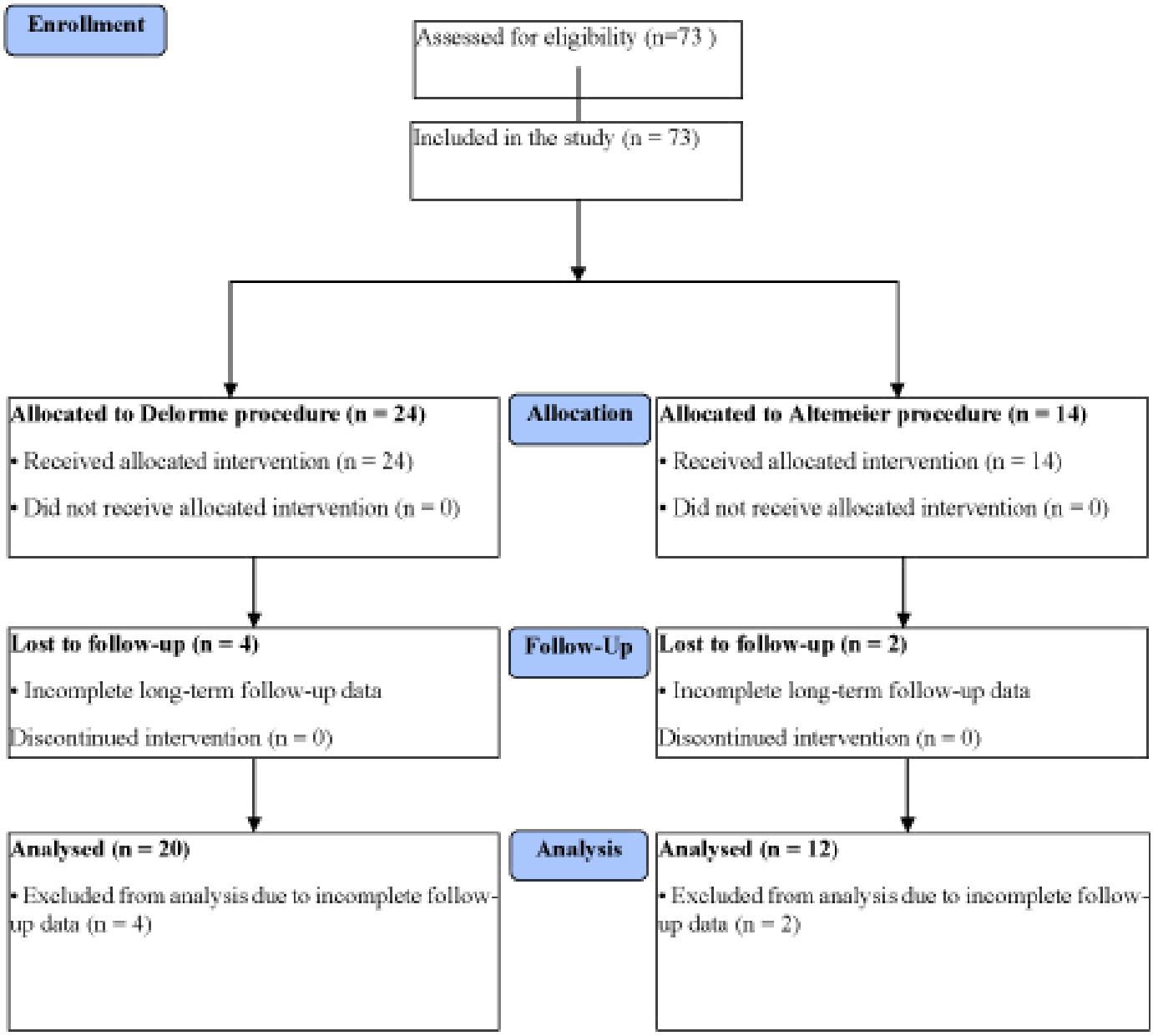

Figure 1. *Flow diagram of patient inclusion, follow-up, and analysis.*

- transrectal ultrasonography;
- radiological or magnetic resonance defecography;
- colonoscopy with video documentation;
- anorectal manometry.

The parameters of anal sphincterometry, including the force of voluntary contraction, basal tone, and pressure during straining, were determined in accordance with indications.

The patients were divided into two groups:

Group 1 (Delorme) – rectal prolapse ≤ 5.5 cm.

Group 2 (Altemeier) – rectal prolapse > 5.5 cm.

In Group 2 patients, the duration of the condition ranged from 6 to 37 months (14.4 ± 3.1 months on average). Three patients were admitted with recurrence after prior abdominal surgery (Kümmell–Zerenin operation – 2 patients, other abdominal procedures – 1 patient).

The length of the prolapsed segment of the rectum was 5.5–18 cm (11.4 ± 1.9 cm on average) (see Figure 2).

Preoperative preparation included:

- cleansing enemas;
- antibiotic prophylaxis (metronidazole, cephalosporins);
- general restorative treatment;
- medical treatment of concomitant diseases.

All interventions were performed under general or spinal anaesthesia in the gynaecological position [9,10].

Delorme's procedure steps. After treating the surgical field and the lumen of the straightened rectum with antiseptic solutions, epinephrine solution is injected into the submucous layer (1:200000). The prolapsed segment of the intestine is brought out. A circular mucosal excision is performed 1 cm above the anopectinate line to expose the muscle layer, followed by a circular excision of the muscle to the indicated level (see Figure 3).

Muscle plication to the mucocutaneous border was performed with corrugated sutures, accompanied by anterior and posterior levateroplasty. The sutures were made from resorbable material

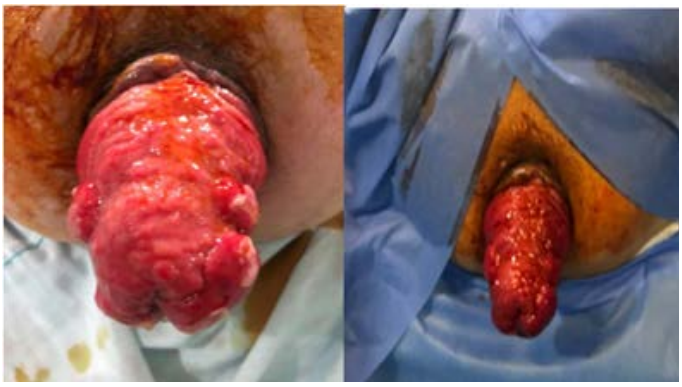

Figure 2. *Complete rectal prolapse (over 10 cm).*

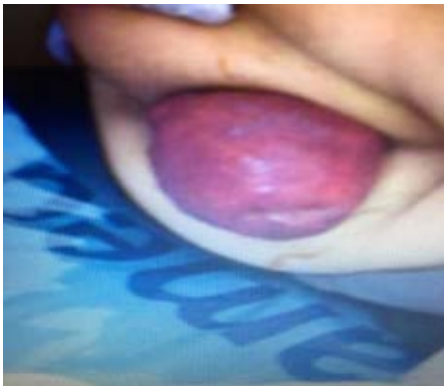

Figure 3. *Rectal prolapse under 5 cm.*

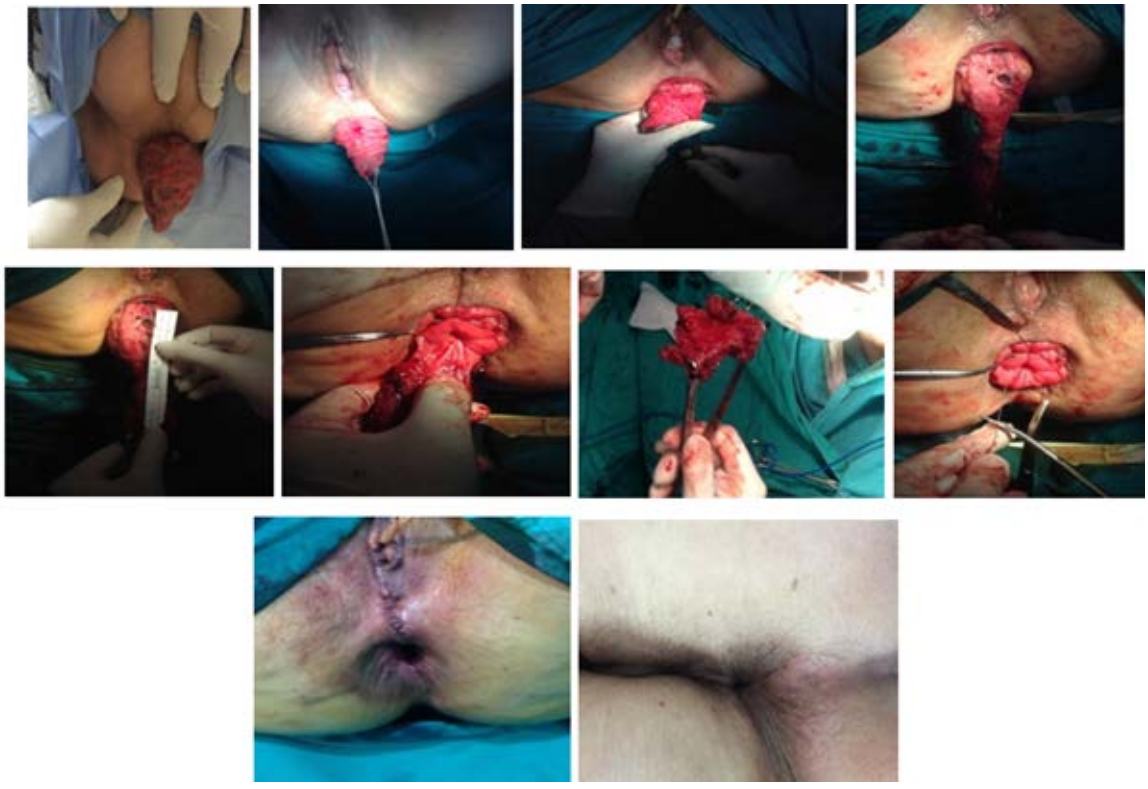

Figure 4. *Steps of Delorme's procedure and the view of the wound after healing.*

(vicryl 3/0). The operative steps of Delorme's procedure are illustrated in Figure 4.

Altemeier's procedure steps. The anus is fixed at the level of the dentate line. At a distance of 1–3 cm from it, an external rectal incision is made with a bipolar coalescer or a LigaSure system. A resection line is positioned at the top of the prolapsed segment, and a circular excision is performed, including the peritoneal membrane.

The externalized segment of the rectum, its inner part, and part of the prolapsing sigmoid colon are resected. Excess tissue and peritoneal leaflets are excised in the pelvic area. The sigmoid colon is brought without tension to the perianal zone and fixed with triangular provisional sutures between its wall and perianal skin.

Additional tension-free sutures are then applied at a distance of 5–6 mm on the intestine and 3–4 mm on the skin, eliminating the disparity between the tissues. Over the course of the intervention, the muscles of the sphincter apparatus are not injured, and the anatomy of the created neorectum is preserved (see Figures 5 and 6).

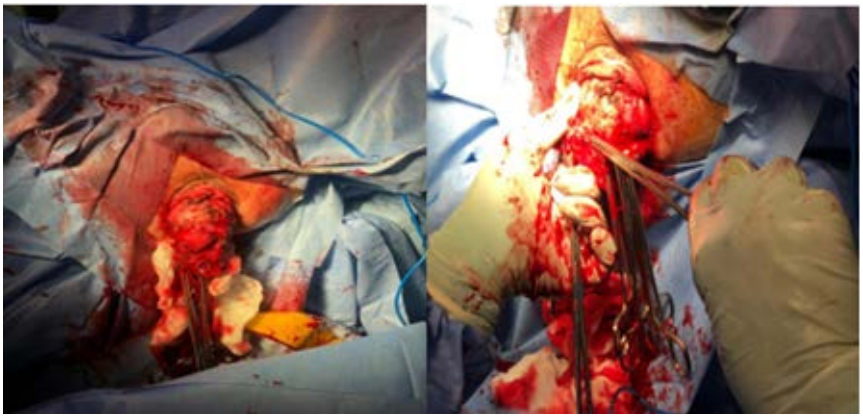

Figure 5. *Steps of Altemeier's procedure.*

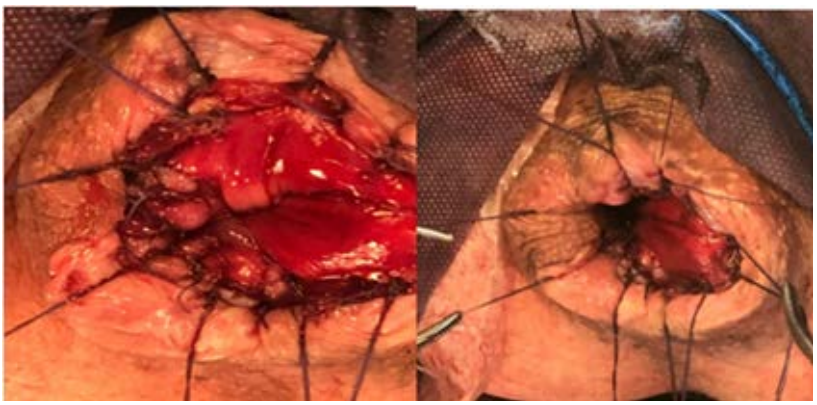

Figure 6. *Final step of Altemeier's procedure – the anastomosis.*

Figure 7. *View of the anal region 2 weeks after surgery.*

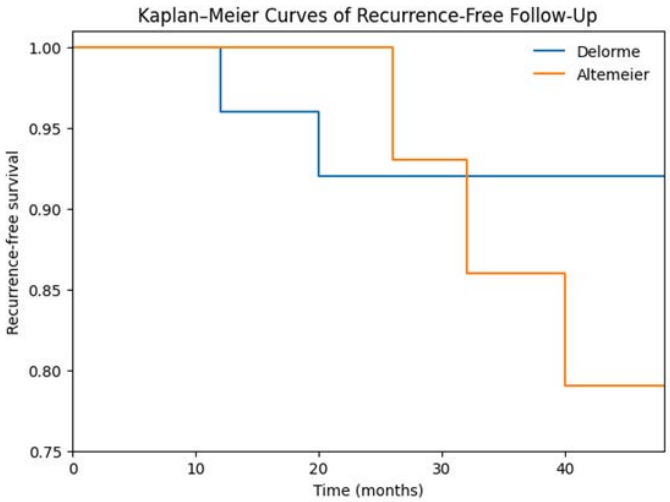

Figure 8. *Kaplan–Meier curves of recurrence-free follow-up in the Delorme and Altemeier groups.*

Postoperative observation. A total of 27 patients were under outpatient supervision with follow-up lasting from 6 months to 4 years. Another 3 patients had been operated on in the last 4–6 months and were under ongoing observation.

Postoperative follow-up ranged from 6 months to 4 years. In the Delorme group, the median follow-up was 24 months (IQR 12–36), whereas in the Altemeier group it was 26 months (IQR 14–38). Recurrence-free follow-up was assessed using Kaplan–Meier analysis.

Statistical data processing was performed in SPSS version 19.0. Quantitative variables were analyzed using the Mann–Whitney test, and categorical variables using Pearson's χ^2 test. Recurrence-free follow-up was assessed using Kaplan–Meier analysis. Due to the limited number of recurrent events, multivariable regression analysis was not considered sufficiently robust for formal reporting

Results and Discussion.

Upon admission, all patients complained of protrusion and foreign body sensation in the anal region, constipation (19 (59.4%)), fecal and flatal incontinence (12 (37.5%)), and urinary incontinence (11 (34.4%)). Pronounced perianal skin maceration was observed in 25 patients (78.1%), and 21 (63.6%) also had ulceration of the prolapsed part of the colon. Concomitant genital prolapse was found in 17 women (53.1%). Three women had undergone open (2) and laparoscopic hysterectomy. Four patients (2 women and 2 men) had previously gone through the intraperitoneal Kummel's procedure (posterior promontory rectopexy) and posterior rectopexy with a strip of polypropylene mesh pulled through the retroperitoneal tunnel. In terms of risk, 17 patients (53.1%) were classified as ASA II, and 15 (46.9%) were assigned the ASA III category.

Complications after Delorme's procedure were distinguished into two groups (Table 1): general and local.

As can be seen from Table 1, among the general complications, long-term constipation responsive to laxatives was observed in 5 patients; frequent diarrhea – in 2 patients; congestive and reactive pneumonia – in 2 patients; and prolonged subfebrility – in one patient. Local complications included wound suppuration (n=3), anal incompetence of Grade II (n=3) and Grade I (n=4), ischuria (n=2), pollakiuria (n=2), anodermal dehiscence (n=1), and perioperative subcutaneous hematomas. The same complications, but with a more serious and prolonged course, occurred after Altemeier's procedure. Among the general complications, constipation was observed in 7 patients, cases of diarrhea in 2, and difficult-to-treat subfebrile conditions in 3. Local complications included wound suppuration in 4 patients and wound dehiscence and subcutaneous hematoma in 2. Because the integrity of the sphincter apparatus was preserved, there were no cases of anal incompetence (fecal and flatal incontinence).

Both general complications required treatment with physiotherapy procedures and an appropriate diet prescribed by specialist doctors (pulmonologist, therapist, nutritionist, etc.). The local complications did not require surgery or reoperation. Local treatment involved the application of antiseptic solutions, gels, and hydrophilic ointments and sometimes physical treatment methods (ultrasonic cavitation, CO2 laser irradiation of the wound surface). There were no deaths.

The average length of hospital stay was 5.7 ± 0.4 days (from 3 to 18) after Delorme's procedure and 7.2 ± 1.9 days (from 6 to 23) after Altemeier's procedure. The quality of life and the degree of sexual activity (dysfunction) were assessed with our own questionnaire and the Wexner Score.

It was established that recurrence of rectal prolapse was most strongly associated with chronic constipation. Sedentary lifestyle, non-compliance with the prescribed diet, and age over 60 years were also identified as clinically relevant factors potentially contributing to recurrence (see Table 2). Middle-

Table 1. *General and local complications after Delorme's and Altemeier's procedures.*

Complication	Delorme (n=24), n (%)	Altemeier (n=14), n (%)
General complications		
Constipation	5 (20.8%)	7 (50.0%)
Diarrhea	2 (8.3%)	2 (14.3%)
Pneumonia	2 (8.3%)	—
Subfebrile condition	1 (4.2%)	3 (21.4%)
Local complications		
Wound suppuration	3 (12.5%)	7 (50.0%)
Anal incompetence, Grade I–II	7 (29.2%)	—
Ischuria	2 (8.3%)	—
Pollakiuria	2 (8.3%)	—
Wound dehiscence	1 (4.2%)	2 (14.3%)
Subcutaneous hematoma	1 (4.2%)	2 (14.3%)

Table 2. *Recurrences and risk factors.*

Factor	Patients with recurrence, n (%)	Note
Total recurrence rate	4/32 (12%)	Delorme — 2 (8.3%), Altemeier — 2 (14.3%)
Chronic constipation	4/4 (100%)	$p < 0.001$
Age >60	3/12 (25%)	
Sedentary lifestyle	3/4 (75%)	
Non-compliance with the diet	2/4 (50%)	
Early recurrence (≤6 months)	0/32 (0%)	–
Late recurrence (>6 months)	4/32 (12%)	Associated with constipation and lifestyle

Table 3. *Postoperative functional results.*

Indicator	Patients, n (%)	Note
Fecal incontinence ↓ Grade 1–2	26/32 (81.3%)	The Wexner score
Restored bowel movement regularity	22/32 (68.7%)	
Elimination of urological conditions	7/32 (21.9%)	Ischuria, pollakiuria
Anal stricture	0/32 (0%)	—
Sphincter apparatus preservation	32/32 (100%)	After Altemeier's and Delorme's procedures with levateroplasty

Note: *Only chronic constipation showed a statistically significant association with recurrence in Kaplan–Meier analysis ($p < 0.001$).*

aged patients did not experience recurrence in the present series. Among patients over 60 years old, 3 experienced recurrence within 6 to 12 months after surgery. No statistically significant differences were found between the quantitative variables. Kaplan–Meier analysis showed that prolonged constipation was the factor most strongly associated with recurrence ($p < 0.001$). Kaplan–Meier analysis demonstrated the recurrence-free follow-up over time, showing a gradual decrease in recurrence-free survival, primarily associated with prolonged constipation (Figure 8).

Early recurrence (under 6 months post-surgery) was mainly associated with inadequate choice of operative methodology and unqualified execution. In our series, there were no cases of recurrence in the early stages.

Late recurrences were defined as those occurring more than 6 months after surgery. They were associated with prolonged constipation that did not respond adequately to conservative treatment and dietary correction, the duration of prolapse, the size of the prolapsed rectal segment, concomitant somatic diseases, and persistence of the preoperative lifestyle and dietary habits after surgery [11,12]. No recurrence was observed in patients who underwent posterior and/or anterior levateroplasty. This favorable outcome has also been reported in other studies [13-15]. A randomized trial involving 82 patients conducted by Youssef et al. [16] showed that complete anterior and posterior levateroplasty reduced the recurrence rate from 14.28% to 2.43%. The assessment of recurrence risk factors in our series showed that recurrence was most strongly associated with chronic constipation ($p < 0.001$, Kaplan–Meier analysis). Sedentary lifestyle, non-compliance with the prescribed diet, concomitant somatic diseases, age over 60 years, and a larger prolapsed segment were also considered clinically relevant contributors, although these associations should be interpreted with caution. Early recurrence (within 6 months) was not observed in our series, whereas late recurrence (>6 months) occurred in patients with prolonged constipation and irregular follow-up.

The study of changes in functional symptoms (Table 3) showed a reduction in the severity of anal incontinence by 1–2 grades in most patients with preoperative sphincter insufficiency, improvement in bowel function in 22 patients (68.7%), and elimination of ischuria and pollakiuria. In terms of fecal incontinence, the most pronounced improvement was observed in patients who underwent levateroplasty in addition to Delorme's procedure. No anal strictures were observed.

The obtained results confirm that a key factor in the successful outcome of Delorme's and Altemeier's procedures is comprehensive patient management, including the correction of functional disorders, prevention of constipation, and adherence to a diet, subject to quality execution of the operation.

An important limitation of the present study is that the assignment to Delorme's or Altemeier's procedure was based exclusively on the length of the prolapsed rectal segment (≤5.5 cm or >5.5 cm). As a result, the two groups differed in baseline anatomical severity and were not fully comparable. The present findings should be interpreted primarily as the outcomes of two surgical approaches applied in different clinical situations rather than as evidence of superiority or equivalence of one procedure over the other.

In conclusion, Delorme's and Altemeier's procedures have proven to be safe and have very low mortality (no lethalities in our study) and a low recurrence rate (12%) after up to 4 years of observation. Recurrences were found to be associated not with the choice and quality of the surgery but with prolonged constipation, inadequate treatment of concomitant diseases, sedentary lifestyle, and obesity. Other research suggests higher recurrence rates, from 10% to 40%, associated with difficulties in choosing the method of surgery, the quality of its execution, general surgeons performing the operation, etc. [9,16-19]. The more favorable results of our study can be explained by the fact that in our clinics, the operations were performed exclusively by a specialized coloproctology team consisting of highly qualified surgeons.

Conclusion.

Delorme's and Altemeier's procedures are effective, safe, and function-preserving surgeries for complete rectal prolapse. Both operations have proven highly effective and safe in the treatment of complete rectal prolapse. Delorme's procedure is preferred for milder prolapses and reduces the severity of complications, especially when combined with levateroplasty. Altemeier's procedure is effective with larger sizes of the externalized segment, preserving the anatomy and function of the sphincter. The leading predictors of recurrence are prolonged constipation, a sedentary lifestyle, non-compliance with the diet, and age over 60. A comprehensive approach to patient management ensures optimal functional and anatomical results with minimal recurrence rates.

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