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Mechanism-oriented three-level classification of treatment methods for chronic hemorrhoidal disease. Review

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Objective – to synthesize current approaches to the treatment of chronic hemorrhoids and to develop a mechanism-oriented classification of treatment methods that integrates the pathophysiological mechanism of action of interventions, the anatomical target of treatment, the degree of surgical invasiveness, and the organ-preserving potential of the procedures.

A comprehensive analysis of current literature on the pathogenesis of hemorrhoidal disease and its treatment modalities was conducted. The principal pathophysiological mechanisms underlying the disease, major therapeutic strategies for their correction, and corresponding clinical intervention technologies were systematized. Based on a conceptual analysis, a model of the interrelationships between pathogenic mechanisms, therapeutic strategies, and clinical treatment methods was constructed, forming the foundation for the proposed classification system. A mechanism-oriented classification of treatment methods for hemorrhoidal disease was developed, integrating pathophysiological mechanisms, therapeutic strategies for their correction, and clinical intervention technologies within a unified conceptual framework. The main therapeutic strategies identified include symptom control, induction of fibrosis of hemorrhoidal cushions, reduction of arterial inflow, intratissue remodeling, reconstruction of anal canal anatomy, and radical excision of pathologically altered tissues. Within each strategy, corresponding clinical treatment methods were systematized, allowing diverse modern technologies to be interpreted as specific implementations of a limited number of fundamental therapeutic mechanisms.

Conclusions. The proposed classification enables systematic organization of contemporary treatment methods for hemorrhoidal disease according to their underlying pathophysiological mechanisms and integrates them within a unified conceptual model. This approach provides a methodological basis for a more consistent interpretation of modern treatment technologies and may be applied in future comparative clinical studies.

Keywords
hemorrhoidal disease, hemorrhoids, mechanism-based classification, treatment strategies, minimally invasive procedures, hemorrhoidectomy.

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Hemorrhoidal disease (HD) is one of the most common disorders of the anorectal region and remains a significant medical and social challenge in modern coloproctology. According to epidemiological studies, clinically significant manifestations of hemorrhoids occur in 25–40 % of the adult population over a lifetime, while the annual number of medical consultations related to HD in developed countries reaches millions of cases [12, 19, 44]. The high prevalence of the disease, its chronic relapsing course, and its negative impact on patients' quality of life account for the sustained clinical interest in optimizing treatment strategies [46, 47].

Despite the long history of HD research, current clinical practice is characterized by substantial heterogeneity in treatment approaches, particularly for grades I–III chronic HD. Contemporary clinical guidelines describe a wide spectrum of conservative, minimally invasive, and surgical interventions; however, a unified classification system for these methods is still lacking [5, 8, 15, 58, 61]. In most recommendations, treatment modalities are

grouped primarily by degree of invasiveness, setting of performance, or clinical indications based on the Goligher classification, which does not always reflect the underlying pathophysiological targets of the interventions [10, 18, 21, 23, 60].

Historically, the development of surgical treatment for HD has progressed from radical excisional procedures to organ-preserving and minimally invasive techniques. Classical hemorrhoidectomies, particularly the Milligan–Morgan and Ferguson procedures, have long been considered the «gold standard» for the treatment of advanced forms of the disease, providing the lowest recurrence rates but being associated with significant postoperative pain, prolonged recovery, and a risk of complications [38, 52].

Further advances in understanding HD pathogenesis have led to the emergence of organ-preserving techniques aimed at correcting specific components of the pathological process without complete removal of the cavernous vascular tissue. These methods include Doppler-guided dearterialization, stapled hemorrhoidopexy, and intratissue energy-based ablation technologies [6, 11, 20, 29, 32, 33, 40, 53, 62]. In parallel, outpatient minimally invasive procedures have been actively developed, enabling the treatment of a substantial proportion of patients in a day-care setting [2, 50].

As a result, a broad spectrum of treatment options for HD has emerged, ranging from conservative therapy to high-tech energy-based interventions. However, this diversity itself creates a methodological challenge—namely, the absence of a unified classification system that would allow for accurate comparison of different treatment technologies and determination of their role within an overall therapeutic strategy.

Current concepts of HD pathogenesis are based on a combination of hemodynamic and mechanical mechanisms, including impaired venous outflow in the cavernous tissue, arteriovenular shunting, and weakening of the supporting ligamentous apparatus of the anal cushions [1, 31]. From a pathophysiological perspective, most contemporary interventions can be considered as targeting one of several principal therapeutic mechanisms: induction of fibrosis of the hemorrhoidal cushions, reduction of arterial inflow, intratissue remodeling of the cavernous vascular tissue, reconstructive restoration of anal canal anatomy, or radical excision of pathologically altered tissue.

The diversity of modern treatment methods for HD, along with differences in their underlying pathophysiological mechanisms of action, necessitates their systematization within a unified classification framework.

Objective – to synthesize current approaches to the treatment of chronic hemorrhoids and to develop a mechanism-oriented classification of treatment methods that integrates the pathophysiological mechanism of action of interventions, the anatomical target of treatment, the degree of surgical invasiveness, and the organ-preserving potential of the procedures.

This study was conducted as a narrative literature review with elements of conceptual synthesis. The aim of the analysis was to systematize contemporary treatment methods for chronic HD and to develop a mechanism-oriented classification of interventions.

A literature search was performed in the PubMed/MEDLINE, Scopus, and Web of Science databases. In addition, current clinical guidelines of professional societies, including ASCRS, ESCP, and SICCR, were analyzed [8, 15, 58, 61]. Combinations of the following keywords were used: hemorrhoids, hemorrhoidal disease, surgical treatment, minimally invasive procedures, hemorrhoidectomy, dearterialization, laser hemorrhoidoplasty, radiofrequency ablation, stapled hemorrhoidopexy, classification, pathophysiology.

The analysis included original studies, systematic reviews, meta-analyses, and clinical guidelines addressing treatment methods for HD. Particular attention was paid to studies describing the mechanisms of therapeutic action of various interventions, their anatomical targets, clinical indications, and their role within contemporary stepwise treatment strategies [5, 8].

The classification was developed based on three interrelated principles:

1. The dominant mechanism of therapeutic action.
2. The anatomical target of the intervention.
3. The level of technological implementation of the method.

The integration of these criteria formed the basis of a three-level classification model.

Results

The findings allowed for the synthesis of relationships between the main pathophysiological mechanisms of HD, therapeutic strategies for their correction, and clinical treatment methods. A conceptual model of these relationships is presented in Figure.

The presented figure illustrates that most contemporary treatment methods for HD can be interpreted as implementations of a limited number of fundamental therapeutic strategies aimed at correcting key components of the disease pathogenesis. Specifically, different interventions may target the induction of fibrosis of the hemorrhoidal cushions, reduction of arterial inflow, intratissue remodeling of the cavernous vascular tissue, reconstruction of

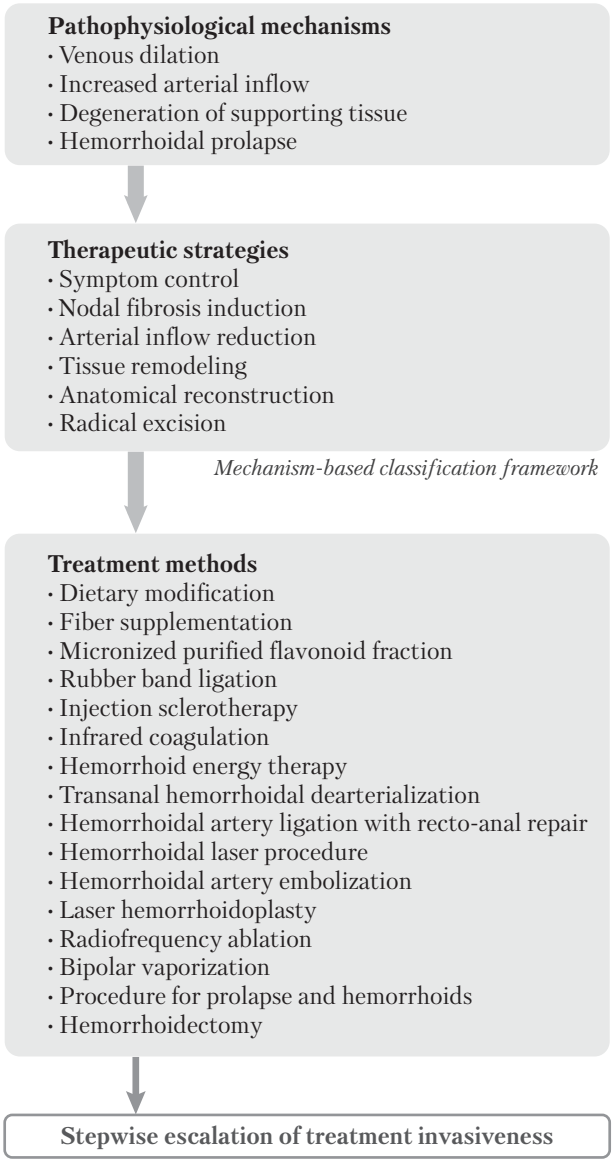

Figure. **Conceptual relationship between the pathophysiology of hemorrhoidal disease, therapeutic strategies, and treatment methods with stepwise escalation of treatment invasiveness**

anal canal anatomy, or radical excision of pathologically altered tissue.

Such a mechanism-oriented approach allows different technological solutions to be viewed not as isolated procedures, but as variants of implementing shared therapeutic strategies. This provides a basis for the systematization of modern treatment methods for HD within a unified pathophysiological framework.

The proposed classification is based on a three-level structure. At the first level (Level 1), treatment methods are systematized according to the primary therapeutic strategy. At the second level (Level 2), technological groups of interventions that implement the respective strategy are identified. At the third level (Level 3), specific clinical methods are presented. This approach allows for the integration of different technologies within a unified pathophysiological treatment model while preserving the flexibility for further expansion of the classification as new methods emerge (Table).

Clinical positioning of surgical methods within the proposed classification

The proposed mechanism-oriented classification enables systematic positioning of contemporary surgical methods for HD treatment according to their point of impact on the disease pathogenesis. In this context, different interventions can be viewed as implementations of several principal therapeutic strategies: induction of fibrosis of the hemorrhoidal cushions, modulation of arterial inflow, intratissue remodeling of the cavernous vascular tissue, reconstruction of anal canal anatomy, or radical removal of pathological tissue. This approach not only allows for the systematization of various technological solutions but also facilitates a clearer understanding of their role within the modern treatment algorithm for hemorrhoids.

Methods for inducing fibrosis of the hemorrhoidal cushions

This group includes outpatient minimally invasive procedures aimed at localized injury of the hemorrhoidal cushion, followed by fibrosis formation and fixation to the underlying tissues. The most common representatives of this category are rubber band ligation [3, 8, 24, 30, 61, 65], sclerotherapy [15, 18, 41], and infrared coagulation [28, 42]. These methods are primarily used in hemorrhoids of grades I–II and, in selected cases, grade III without significant prolapse. Their main advantages lie in their minimal invasiveness and the feasibility of outpatient application; however, their effectiveness in addressing prolapse remains limited.

Sclerotherapy occupies a distinct position within this category, as its primary mechanism differs somewhat from that of rubber band ligation (RBL) or coagulation-based methods. In sclerotherapy, the agent is injected into the submucosal layer adjacent to the hemorrhoidal cushion, causing chemical endothelial damage, aseptic inflammation, vascular obliteration, and subsequent fibrosis formation. Therefore, from a pathophysiological perspective, it is more appropriately classified not as a method of intratissue remodeling, but as an intervention inducing fibrosis of the mucosal–submucosal layer with a fixation effect. In most contemporary guidelines, RBL, sclerotherapy, and infrared coagulation (IRC) are effectively grouped under the category

Table. **Proposed three-level mechanism-oriented classification of treatment methods for chronic hemorrhoidal disease**

Level 1: Therapeutic strategy	Level 2: Technology group	Anatomical target	Mechanism of therapeutic action	Level 3: Methods
Conservative treatment	Pharmacological and non-pharmacological therapy	Functional factors (defecation disorders, venous tone, inflammation)	Symptom control	Dietary therapy, normalization of bowel habits, MPFF, topical agents
Induction of fibrosis	Office-based minimally invasive procedures	Mucosal–submucosal layer of hemorrhoidal cushions	Formation of fibrosis or vascular obliteration	RBL, IS, IRC, HET
Hemodynamic modification	Dearterialization technologies	Arterial branches of the superior rectal artery	Reduction of arterial inflow	THD, HAL-RAR, HeLP, HAE
Tissue remodeling	Energy-based intratissue ablation methods	Cavernous vascular tissue of hemorrhoidal cushions	Controlled intratissue coagulation and fibrosis	LHP, RFA, BPV
Anatomical reconstruction	Reconstructive procedures	Rectal mucosa and hemorrhoidal cushions	Restoration of anatomical position	PPH/SH
Radical tissue removal	Excisional procedures	Hemorrhoidal tissue and adjacent mucosa	Radical excision	Hemorrhoidectomy (Milligan–Morgan, Ferguson), LigaSure hemorrhoidectomy, Harmonic hemorrhoidectomy

Note. MPFF – micronized purified flavonoid fraction; RBL – rubber band ligation; IS – injection sclerotherapy; IRC – infrared coagulation; HET – hemorrhoid energy therapy; THD – transanal hemorrhoidal dearterialization; HAL-RAR – hemorrhoidal artery ligation with recto-anal repair; HeLP – hemorrhoidal laser procedure; HAE – hemorrhoidal artery embolization; LHP – laser hemorrhoidoplasty; RFA – radiofrequency ablation; BPV – bipolar vaporization; PPH/SH – procedure for prolapse and hemorrhoids/stapled hemorrhoidopexy.

of office procedures, supporting the validity of this classification approach [8, 21, 61].

Methods of arterial inflow modulation

The second group includes interventions aimed at reducing the arterial blood supply to the hemorrhoidal cushions. These include transanal hemorrhoidal dearterialization, Doppler-guided hemorrhoidal artery ligation with mucopexy [22, 33, 52, 59], and the hemorrhoidal laser procedure [9, 17, 57], as well as endovascular embolization of hemorrhoidal arteries [34, 63]. Despite differences in technical modifications and instrumentation, all these methods share a common pathophysiological principle–reduction of arterial inflow to the cavernous vascular tissue, resulting in a gradual decrease in the volume of hemorrhoidal cushions and regression of symptoms.

In clinical practice, these methods are most commonly applied in grades II–III hemorrhoids and are characterized by relatively low postoperative pain and rapid recovery. It is particularly important to emphasize that transanal hemorrhoidal dearterialization (THD) and hemorrhoidal artery ligation with recto-anal repair (HAL-RAR) do not represent distinct pathophysiological categories but rather variants of a shared therapeutic strategy. THD/HAL provides dearterialization as the primary hemodynamic component, while HAL-RAR complements it with mucopexy to address mucosal prolapse.

Although reduction of arterial inflow ultimately also leads to a decrease in hemorrhoidal cushion volume and fibrosis formation, these methods are classified as a separate group in the proposed system because their primary point of application differs. Office-based procedures directly target the mucosal–submucosal layer of the hemorrhoidal cushion, whereas dearterialization techniques modify its arterial blood supply. This difference in anatomical target justifies their distinct positioning within the classification.

Methods of intratissue remodeling of cavernous vascular tissue

A distinct category comprises energy-based intratissue ablation technologies, including laser hemorrhoidoplasty [25, 26, 54], radiofrequency ablation [20, 56], and bipolar vaporization [4]. Unlike office-based procedures or dearterialization techniques, these interventions directly target the internal structure of the hemorrhoidal cushion. The formation of a controlled zone of coagulative injury within the thickness of the cavernous vascular tissue leads to its gradual fibrosis and volume reduction without tissue excision. This characteristic defines the role of energy-based technologies as an organ-preserving approach that combines adequate clinical effectiveness with relatively low invasiveness.

Reconstructive interventions

Reconstructive treatment methods are primarily aimed at correcting mucosal prolapse and restoring the normal anatomical position of the hemorrhoidal cushions. The most well-known representative of this group is the procedure for prolapse and hemorrhoids/stapled hemorrhoidopexy, introduced by Longo [32]. The mechanism of action of this procedure involves circumferential resection of the rectal mucosa and submucosa, followed by cranial fixation of the hemorrhoidal cushions. Despite favorable short-term outcomes in terms of prolapse control and pain reduction [55], the use of this method is limited by the potential for specific complications and a risk of recurrence in the long term [43, 45].

Excisional surgical interventions

Excisional hemorrhoidectomy remains the most radical method for HD treatment. Classical procedures, such as the Milligan–Morgan and Ferguson techniques, achieve the lowest recurrence rates, as they involve complete removal of the pathologically altered cavernous vascular tissue [52, 64]. The use of modern energy-based instruments, including LigaSure and the Harmonic scalpel, has reduced intraoperative blood loss and somewhat decreased postoperative pain; however, it does not fundamentally alter the radical nature of the procedure [26, 36, 37]. In current guidelines, excisional operations are generally considered the treatment of choice for grade III–IV hemorrhoids or in cases of failure of organ-preserving approaches [8, 15, 61].

Thus, the proposed mechanism-oriented classification allows different surgical methods for HD treatment to be interpreted as implementations of several fundamental therapeutic strategies that differ in their point of application within the disease pathogenesis. This approach provides a logical framework for the comparative evaluation of various treatment technologies and supports a more evidence-based selection of surgical strategy depending on the clinical scenario.

The proposed classification reflects not only the mechanisms of therapeutic action of different interventions but also, to some extent, the evolution of surgical treatment for HD. Historically, hemorrhoid therapy has progressed from symptomatic control and local fibrosis induction to methods aimed at modulating the hemodynamics of hemorrhoidal cushions and intratissue remodeling of cavernous vascular tissue. The emergence of energy-based technologies reflects the modern trend toward organ-preserving treatment, whereas excisional hemorrhoidectomy remains a radical option reserved for more advanced forms of the disease.

Discussion

In this study, a mechanism-oriented classification of treatment methods for chronic HD was proposed, integrating the pathophysiological mechanisms of the disease, therapeutic strategies for their correction, and contemporary clinical interventions within a unified conceptual framework. This approach allows diverse technological solutions to be interpreted not as isolated procedures, but as implementations of fundamental therapeutic strategies.

Despite significant progress in HD treatment over recent decades, the need to systematize existing treatment methods remains relevant. Analysis of current clinical guidelines and scientific literature indicates that most authors primarily focus on comparing individual techniques, whereas the issue of their positioning within a unified classification system is addressed only fragmentarily or remains largely overlooked [15, 35].

The most commonly used classification of treatment methods into conservative, minimally invasive, and surgical categories has limited analytical value, as it does not reflect the underlying mechanisms of therapeutic action. Within such frameworks, methods with fundamentally different points of application to the pathological process may be grouped together, thereby complicating the comparative analysis of treatment outcomes.

In a large network meta-analysis by Simillis et al., which included 98 randomized controlled trials and over 7,800 patients, substantial heterogeneity in clinical outcomes across different hemorrhoid treatment methods was demonstrated, partly attributable to the lack of a unified pathogenetic classification system [50]. Similar conclusions have been reported in other studies, highlighting the difficulty of directly comparing the effectiveness of different interventions due to significant methodological and clinical heterogeneity [14, 40, 48, 51].

The findings indicate that, despite the diversity of technical approaches, most contemporary HD treatment methods implement only a limited number of fundamental therapeutic mechanisms. This observation formed the basis for the proposed mechanism-oriented classification, in which interventions are systematized according to their dominant pathophysiological effect and anatomical target.

From a pathogenetic perspective, most interventions can be regarded as implementations of several principal therapeutic strategies: induction of fibrosis of the hemorrhoidal cushions, modulation of arterial inflow, intratissue remodeling of the cavernous vascular tissue, reconstruction of anal canal anatomy, or radical removal of pathological tissue. This approach allows different technological solutions to be integrated

within a unified pathophysiological treatment model.

An important feature of the proposed system is that it accounts not only for the mechanism of therapeutic action but also for the anatomical target of the intervention. In particular, office-based procedures primarily target the mucosal–submucosal layer of the hemorrhoidal cushions, dearterialization techniques act on the arterial branches supplying the cushions, whereas energy-based technologies directly affect the cavernous vascular tissue of the hemorrhoidal nodes. It is this combination of mechanism and anatomical target that makes the classification more robust to the emergence of new technical modifications.

A separate explanation is required regarding the position of sclerotherapy within the classification. Formally, it differs from RBL or coagulation-based methods, as its primary effect is achieved through chemical endothelial injury followed by vascular obliteration. However, the ultimate clinical outcome of this intervention is the formation of fibrosis in the mucosal–submucosal layer and fixation of the hemorrhoidal cushion. For this reason, in the proposed system, sclerotherapy is grouped together with RBL, IRC, and hemorrhoid energy therapy within the category of fibrosis-inducing methods, rather than being classified as an energy-based technology or placed in a separate category.

Particular attention should also be given to the group of methods aimed at reducing arterial inflow to the hemorrhoidal cushions. This category includes THD, HAL-RAR, hemorrhoidal laser procedure, and hemorrhoidal artery embolization. Despite differences in technical execution, all these interventions share a common pathophysiological principle – reduction of arterial blood supply to the cavernous vascular tissue, resulting in a gradual decrease in the volume of hemorrhoidal cushions and regression of symptoms. This approach allows different technological modifications to be interpreted as variants of a single therapeutic mechanism, facilitating their comparison in clinical studies and supporting a more rational development of treatment algorithms.

Particular attention should be given to the identification of intratissue energy-based ablation methods as a distinct category within the classification. Unlike office-based procedures, which are aimed at direct induction of fibrosis of the hemorrhoidal cushions, or dearterialization techniques that modify arterial blood supply, energy-based technologies – such as laser hemorrhoidoplasty, radiofrequency ablation, and bipolar vaporization – operate through a mechanism of intratissue remodeling of the cavernous vascular tissue. This distinctive feature justifies their consideration as an independent pathophysiological group of interventions, occupying an intermediate position between dearterialization techniques and excisional surgery, and reflecting the modern trend toward organ-preserving HD treatment.

The proposed classification also allows for clearer positioning of different treatment methods within the framework of a contemporary stepwise treatment strategy, in which therapy begins with the least invasive methods and progressively advances to more radical interventions in cases of insufficient effectiveness.

In this context, conservative treatment and office-based procedures occupy the initial stages of therapy, dearterialization techniques and energy-based technologies constitute the group of organ-preserving surgical interventions, while excisional hemorrhoidectomy remains the radical treatment option for advanced forms of the disease or in cases of failure of less invasive approaches.

An important factor influencing the choice of treatment method is also the economic accessibility of technologies. A substantial proportion of modern minimally invasive procedures require specialized equipment and disposable materials, limiting their applicability in healthcare systems with constrained resources [7, 27].

In this regard, the proposed classification distinguishes the principle of therapeutic action from the specific technical implementation of each method. This provides a basis for using alternative technological solutions that achieve the same therapeutic mechanism but may differ in cost and availability.

The proposed mechanism-oriented classification allows for a formalized description of individual treatment methods by combining three key characteristics: therapeutic strategy (S – therapeutic strategy), anatomical target of intervention (T – target of intervention), and mechanism of action (M – mechanism of action). Each of these parameters may be assigned a specific index reflecting a particular variant of the strategy, target, or mechanism. In a simplified form, this approach can be represented as a conceptual formula:

$$\text{Method} = S_i + T_j + M_k,$$

where S_i denotes a specific therapeutic strategy, T_j the anatomical target of the intervention, and M_k the mechanism of therapeutic action. The combination of these parameters reflects the pathophysiological essence of a given intervention.

For example, rubber band ligation can be described as a method that implements the fibrosis-induction strategy (S), targets the mucosal–submucosal tissue of the hemorrhoidal cushion (T), and operates through mechanical induction of ischemic necrosis followed by fibrosis (M). In contrast, dearterialization techniques (THD or HAL-RAR) differ in their parameter combinations. These methods

primarily target the arterial branches of the superior rectal artery, aiming to reduce arterial inflow to the hemorrhoidal cushions.

Such a formalized approach does not constitute an independent clinical classification; however, it may be considered a conceptual tool for the standardized description of treatment methods within the proposed system and may potentially facilitate the integration of new technologies in the future.

The proposed mechanism-oriented classification has certain limitations. First, it is conceptual in nature and is based on the synthesis of literature data regarding the mechanisms of action of various interventions. It is not intended as a clinical decision-making algorithm and does not define specific indications for individual procedures. In addition, some contemporary technologies may simultaneously engage multiple therapeutic mechanisms, complicating their unambiguous assignment to a single category. Further clinical studies are required to evaluate the practical value of the proposed classification system for the comparative analysis of the effectiveness of different treatment methods for HD.

The proposed mechanism-oriented classification not only systematizes contemporary approaches to HD treatment but also, to some extent, reflects the evolution of surgical methods – from the induction of fibrosis of hemorrhoidal cushions to technologies aimed at modulating hemodynamics and achieving intratissue remodeling of the cavernous vascular tissue. Future research should focus on standardizing the technical parameters of organ-preserving methods and on comparative evaluation of their clinical effectiveness, with long-term treatment outcomes taken into account.

Declaration of interests

The authors declare that they have no conflict of interest.

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Ethics approval and written informed consent statements

This study is based on the analysis and conceptual synthesis of previously published data. No human participants, animals, or patient data were involved; therefore, ethical approval and informed consent were not required.

Authors contributions

L. Y. Markulan conceived the study, developed the conceptual framework and classification, performed literature analysis, prepared the figures and tables, and wrote the first draft of the manuscript; L. S. Bilianskyi contributed to the methodological design and interpretation of the classification system and critically revised the manuscript; V. I. Voloshyn contributed to the literature review, discussion development, and final manuscript editing.

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Механізм-орієнтована трирівнева класифікація методів лікування хронічної гемороїдальної хвороби. Огляд

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Мета — розробити механізм-орієнтовану класифікацію сучасних методів лікування гемороїдальної хвороби на підставі їхнього впливу на ключові патофізіологічні механізми захворювання.

Проведено аналіз сучасних літературних джерел, присвячених патогенезу гемороїдальної хвороби й методам її лікування. Узагальнено патофізіологічні механізми розвитку захворювання, основні терапевтичні стратегії їхньої корекції та клінічні технології втручань. На основі концептуального аналізу сформовано модель взаємозв'язку між патогенетичними механізмами, терапевтичними стратегіями та клінічними методами лікування, що стала підґрунтям для розробки класифікаційної системи. Запропоновано механізм-орієнтовану класифікацію методів лікування гемороїдальної хвороби, яка інтегрує патофізіологічні механізми захворювання, терапевтичні стратегії їхньої корекції та клінічні технології втручань у межах єдиної концептуальної моделі. Виділено основні терапевтичні стратегії лікування: контроль симптомів, індукція фіброзу гемороїдальних подушок, редукція артеріального притоку, внутрішньотканинне ремоделювання, реконструкція анатомії анального каналу та радикальне видалення патологічно змінених тканин. У межах кожної з цих стратегій систематизовано відповідні клінічні методи лікування, що дає змогу розглядати сучасні технології як варіанти реалізації обмеженої кількості базових терапевтичних механізмів.

Висновки. Запропонована класифікація дає змогу систематизувати сучасні методи лікування гемороїдальної хвороби відповідно до їхнього патофізіологічного механізму дії та інтегрувати їх у межах єдиної концептуальної моделі. Такий підхід створює методологічну основу для послідовнішої інтерпретації сучасних технологій лікування й може бути використаний для порівняльних клінічних досліджень.

Ключові слова: гемороїдальна хвороба, геморой, механізм-орієнтована класифікація, лікувальні стратегії, малоінвазивні процедури, гемороїдектомія.

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