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Diagnosis and classification of hemorrhoids

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In most cases, diagnosing hemorrhoids is not a problem. A typical clinical presentation, accessibility for physical examination, and the absence of the necessity to perform complex and expensive examinations allow a doctor to quickly establish the diagnosis and determine a treatment approach. However, it is essential to recall the diversity of clinical forms of hemorrhoids, take a thorough patient history, and identify the pathogenetic aspects of the occurrence and development of each symptom. Hemorrhoids can be both a cause and a consequence of the development of serious complications, such as anemia, or occur on top of systemic diseases, often masking their clinical picture. Only a thorough assessment of all aspects of the disease and conducting a reasonable differential diagnosis with diseases that have a similar clinical picture can help doctors avoid diagnostic and treatment errors. In order to establish the correct diagnosis, determine the treatment strategy, and analyze the problem in a consistent manner, it is extremely important to have a unified global approach to systematizing the information obtained after studying all aspects of the disease. Therefore, the role of the unified adequate classification of the disease is unequivocal.

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Introduction

The most commonly used classification of hemorrhoids is the one published by Goligher in 1961.¹ Over the years, this classification helped clearly define the place of surgery in the treatment of hemorrhoids. However, in addition to a hemorrhoidectomy as the “gold standard” of treatment, a number of conceptually new methods for the surgical treatment of hemorrhoids, including minimally invasive ones, have been developed recently. Moreover, the current individual approach to the choice of treatment provides an opportunity to use several methods during one surgical intervention, taking into account the severity and characteristics of each hemorrhoid. All of this highlights the dissatisfaction of coloproctologists worldwide with currently existing classifications and substantiates the need for them to be modified.

Diagnosis

Hemorrhoids are one of the few diseases in which the physical examination has not lost its crucial importance. The diagnosis of hemorrhoids is primarily based on the evaluation of complaints, history of the disease, and the results of a physical examination that includes a digital examination of the anal canal and the lower ampulla

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Symptoms	Initial symptoms (%)	Symptoms at the visit to the doctor (%)
Bleeding	76	56
Prolapsed hemorrhoids	39	44
Persistent pain	11	19
Pain after defecation	7	29
Discomfort	8	19
Anal itching	4	12
Perianal edema	3	21
Mucous discharge	2	8

Table 1. The cardinal symptoms of hemorrhoids.
The information is based on a study of 1025 patients with hemorrhoids.

of the rectum, anoscopy, and rectoscopy. All other methods of examination are aimed at differential diagnosis and exclusion of other disorders with a similar clinical picture.

◆ Complaints and medical history

The clinical picture of hemorrhoids is extremely diverse. Common complaints from patients with hemorrhoids include weakness, shortness of breath, dizziness, depression, bleeding, prolapse of tissues from the anal canal, foreign body sensation, and the feeling of incomplete emptying, burning, itching, and pain; however, this list is far from complete. Moreover, it should be kept in mind that any disease of the perianal region, anal canal, or colon can cause the patient to visit a coloproctologist with complaints of “hemorrhoids.” However, the typical symptom complex of hemorrhoidal disease most often consists of recurrent bleeding, usually associated with defecation, and prolapse of hemorrhoids through the anus during or after a bowel movement. All other manifestations of the disease are much less common (Table 1).²⁻⁸

The most common complaint of a patient with hemorrhoids is bleeding, which usually occurs during bowel movements. The most characteristic of hemorrhoidal bleeding is the discharge of blood from the anal canal in the form of frequently falling drops after a bowel movement, separate from the in-

testinal contents. Sometimes the blood can be detected on the feces in the form of strips. In even rarer cases, the blood may stagnate in the rectum, resulting in clots and dark blood discharge. The volume of blood loss can vary significantly from barely noticeable traces to profuse bleeding during each bowel movement. The second most common symptom of hemorrhoids is hemorrhoidal prolapse (Figure 1).

With the development of the disease, the prolapse gradually worsens, requiring a manual reduction into the anal canal at first, which may finally become irreducible. Most often, all other symptoms occur at this stage, forcing the most “resistant” patients to visit a coloproctologist. Sensation of discomfort, moisture in the anal area, itching, burning, foreign body sensation, the feeling of incomplete emptying in the anus, and mucous discharge from the rectum are all symptoms associated with prolapse of the internal hemorrhoids and their movements out of the anal canal and back and with fecal or mucous soiling of the perianal skin. Although patients often find it difficult to describe which symptom – discomfort, burning, or pain – that disturbs them the most, the pain syndrome is not a characteristically permanent symptom of internal hemorrhoids. Most often, these are clinical manifestations of the concomitant anal fissure or anal fistula.

Completely different symptoms occur with external hemorrhoids. Patients may note the presence of soft elastic formations in the perianal region that only rarely cause hygienic inconveniences. The course of the disease changes dramatically with inflammation and thrombosis of the external hemorrhoid that are manifested by the appearance of a dense, painful formation in the anus, pain syndrome of varying severity, and a systemic inflammatory response (Figure 2).

Thrombosis of external hemorrhoids is a serious complication of hemorrhoids. One should never forget about the possibility of expansion of inflammation to the surrounding tissues, including the pararectal connective tissue. The progression of the inflammatory process is an indication for hospitalization of the patient for the purpose of follow-up and address-



Figure 1.
Prolapse of internal hemorrhoids.



Figure 2.
Thrombosis of external hemorrhoid.

ing the issue of urgent surgical intervention. A patient with a thrombosed external hemorrhoid requires an extremely serious response from the doctor. There are published clinical cases describing the development of terrible complications of hemorrhoidal thrombosis, for example, Fournier gangrene, which led to the death of the patient.⁹

Questioning a patient with hemorrhoids should begin with the assessment of his/her general health state. The presence of complaints, such as weakness, shortness of breath, or dizziness should immediately alert the doctor of anemia resulting from chronic blood loss. It is necessary to carefully ascertain the presence of comorbid diseases and analyze regimens of their treatment, focusing on those groups of medicines that can directly or indirectly contribute to the development of hemorrhoidal symptoms and provoke the occurrence of triggering factors, such as constipation (anticoagulants, laxatives, antidepressants, etc). For patients with hemorrhoids, a long history of the disease is typical, with up to 55% of patients who suffer from this disease over 5 to 15 years, which is related to the gradual development of the disease and the absence of motivational factors that, most often, force the patient to consult a doctor.

Table 1 not only shows the rates of major symptoms that often cause a patient to visit a coloproctologist, but also the first manifestations of hemorrhoidal disease. When collecting medical history data in a patient with hemorrhoids, it is extremely important not only to find out how the clinical picture of the disease developed, but also to identify the main factors that could contribute to the development of the disease and to assess their severity at present, as well as the possibility of their modification. This process is necessary for an adequate prediction of further development of the disease, to choose the right strategy for treating a patient, and to determine the algorithms for postoperative rehabilitation, if surgical treatment is warranted. In a patient with hemorrhoids, it is imperative to investigate dietary habits, the amount of fiber in the diet, as well as the presence of constipation or diarrhea.¹⁰⁻¹⁴ One must always remember that even factors that seem to be far from hemorrhoids, such as the level of education, can influence the development of the disease and, therefore, are important when choosing the treatment approach and algorithm of postoperative management.¹⁵

◆ *Physical examination*

Clinical examination of a patient with hemorrhoids should begin with a general examination and assessment of the health state. One should always remember that hemorrhoids could be both a cause and a consequence of the development of systemic phenomena, such as anemia, or occur on top of formidable pathologies, such as liver cirrhosis, cardiovascular diseases, inflammatory bowel diseases, etc.²⁻⁸ The clinical examination of a patient with hemorrhoids is carried out in a gynecological chair in the lithotomy position. During the visu-

al inspection of the perineal region and anus, attention should be drawn to the shape of the anus, its gaping, the presence of cicatricial changes and deformations, and the condition of the skin. Assessments include determination of the grade of external hemorrhoids, the degree of prolapse of the internal hemorrhoid, and the possibility of its manual reduction into the rectum. It is obligatory to examine the anal reflex.

Digital examination of the anal canal and rectum is of paramount importance in a patient with hemorrhoids and not only allows the feasibility and algorithm of further instrumental examination to be determined, but also allows a treatment plan to be prepared. With a digital rectal examination, the sizes and location of internal hemorrhoids, the elasticity and degree of mobility of the internal hemorrhoids, and the presence of concomitant diseases of the anal canal and rectum are assessed. It is also extremely important to evaluate the functional status of the obturative apparatus of the rectum. At the early stages of hemorrhoids or concomitant diseases of the anal canal, there may be a spasm of the internal anal sphincter, while, on the contrary, at the late stages, the anal sphincter muscles are weak, although no clinical manifestations of anal incontinence can be present. An important criterion is the state of the wall of the lower ampulla of the rectum, the mobility of intestinal mucosa at rest and during functional tests (straining and retraction).

Anoscopy is a very important diagnostic procedure in a patient with hemorrhoids, especially in light of the development of minimally invasive surgery for hemorrhoids. The study was performed in the left lateral lithotomy and it included an assessment of the size and degree of internal hemorrhoids, the condition of the mucous membrane covering the internal hemorrhoids, the dentate line with anal crypts, and the state of the mucous membrane of the lower ampulla of the rectum (*Figure 3*).¹¹⁻¹⁶ Rectoscopy should be considered in all patients with hemorrhoids for the assessment of the status of the rectum.

◆ *Additional methods of examination*

Considering that one of the cardinal symptoms of hemorrhoids is bloody discharge from the anus, the most relevant method of examination in this type of patient is a colonoscopy. Only a total endoscopic examination of all parts of the colon (and distal ileum, if possible) allows the presence of other causes of intestinal bleeding to be excluded. If the patient is younger than 40 years old and the clinical picture and physical examination data are typical for hemorrhoids, then the examination of the intestine can be limited to rectoscopy or sigmoidoscopy. However, in case of the slightest doubt in the hemorrhoidal nature of bleeding or the presence of aggravating factors, a colonoscopy should be prescribed to a patient regardless of age.^{11,17-20} According to the Multi-Society Task Force on Colorectal Cancers,¹⁷ the indications for a complete colon evaluation are as follows:

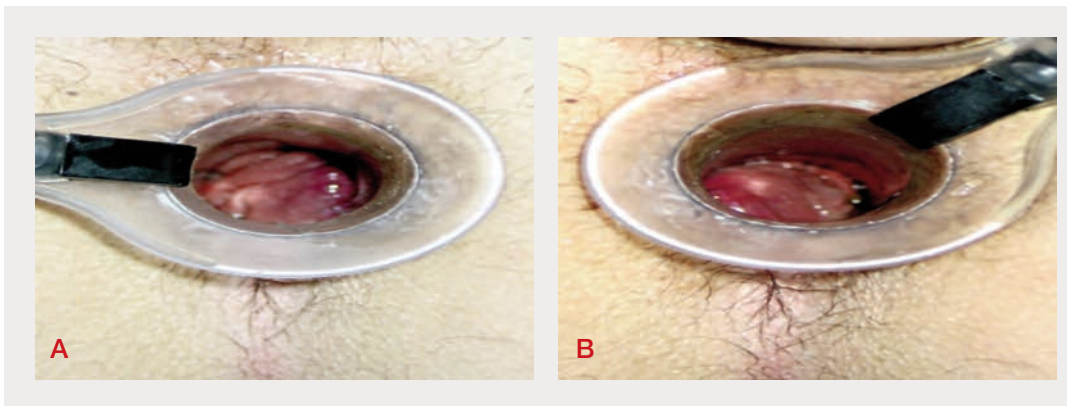


Figure 3.
Anoscopy (in the left side position).
Panel A. Internal hemorrhoid at 3 o'clock position.
Panel B. Internal hemorrhoid at 7 o'clock position.

- Age ≥ 50 years if no complete examination has been done within 10 years.
- Age ≥ 40 years or 10 years younger than the age at the diagnosis of a history positive for a single, first-degree relative with colorectal cancer or advanced adenoma diagnosed when < 60 years old.
- Age ≥ 40 years or 10 years younger than the age at the diagnosis of a history positive for two first-degree relatives with advanced adenomas or colorectal cancer.
- Positive fecal immunochemical testing.
- Positive fecal immunochemical testing-fecal DNA test.

Anorectal manometry is used to evaluate the functional status of the obturative apparatus of the rectum and is indicated in all patients with clinical signs of anal sphincter dysfunction (spasm/weakening), as well as in patients who underwent surgery for diseases of the perianal area or anal canal. This procedure is especially important for planning surgical interventions for hemorrhoids, as this information can help determine the optimal surgical technique (in particular, the need to perform a stage of operation aimed at eliminating spasm of the internal sphincter), to predict the postoperative course, and to warn the patient about the possibility of clinical manifestations of anal incontinence that can arise after removing or reducing cavernous tissue.²¹⁻³³

If physical examination data do not provide an exhaustive picture of the nature of the prolapsing substrate and the external or internal prolapse of the rectum cannot be completely ruled out, or if endoscopic examination reveals a solitary rectal ulcer,^{34,35} a defecography (evacuation proctography) can be considered for the differential diagnosis of hemorrhoids (Table II, page 60).

Classification

Determination of the stage and type of the disease plays an important role in making a decision about the treatment strategy for hemorrhoids. At the initial stages of the disease, the conservative therapy aimed at restoring normal activity of the gastrointestinal tract, eliminating constipation,¹⁰⁻¹⁴ and relieving inflammation, bleeding, and pain³⁶⁻³⁹ can be prescribed. In case

conservative therapy fails, a surgical intervention should be considered. It is exactly at this stage of choosing a surgical strategy, especially in view of the current variety of surgical techniques, when the important role of the “proper” classification of the disease is the most prominent. The simplest classification is as follows: (i) course of the disease: acute vs chronic; and (ii) type of disease: internal, external, or both.

However, given that such a classification cannot reflect all aspects of the disease that need to be determined to choose a treatment strategy, a vast number of more complex classification systems have been proposed throughout the history of studying hemorrhoids. Actually, almost every author who has written about hemorrhoids has created their own classification in accordance with their vision of the issue and tried to systematize hemorrhoids by type, stage, complication, and treatment method.

In 1948, Gabriel, a surgeon at St. Mark's hospital for cancer, fistula, and other diseases of the rectum, proposed a classification of hemorrhoids that some authors currently use (Table III, page 61).³⁹ In particular, Braytsev, in his monograph *Rectal Disorders* published in 1953, suggested that there were four stages of hemorrhoids (Table III).⁴⁰ In 1955, Beique and Siward proposed a “three-step” classification of hemorrhoids that takes into account the complications of disease (Table III)⁴¹; however, this classification is not widespread because it does not reflect all possible complications associated with hemorrhoidal disease. In 1956, Ryzhikh proposed his classification of hemorrhoids, which accounts for the external and internal components (Table III).⁴² In 1978 and 1979, two more classifications were published that later became widespread in the US (Table III).⁴³⁻⁴⁵

Despite the hot disputes on the advantages and disadvantages of these classification systems, a number of medical institutions (Ferguson Clinic in the US and the Royal Prince Alfred Hospital in Australia) generally refused to use any classification for hemorrhoids.⁴⁶ In 1985, Henry and Swash published, in their monograph *Coloproctology and the Pelvic Floor*, a classification of hemorrhoids that included “stage” as

a fundamental concept (Table III).⁴⁷ In the same year, Banov et al published their version for the classification of hemorrhoids (Table III)⁴⁸ that was recommended by the American Society of Colon and Rectal Surgeons and the American Gastroenterological Association for practical use and is actually in use today.⁴⁹ Some authors rely on this classification in their clinical activity.^{1,4,50}

Currently, the most popular and the most used classification by coloproctologists worldwide is the classification of hemorrhoids published by Goligher in 1961 in his monograph *Surgery of the Anus, Rectum and Colon*.⁵¹

Degrees of hemorrhoid formation

Internal hemorrhoids vary greatly in size. In their earliest stages, they merely project slightly into the lumen of the anal canal when the veins are congested at defecation. These are said to be first-degree hemorrhoids. In time, however, the piles tend to form larger swellings that not only protrude into the canal, but also descend toward the anal orifice so that eventually the mucosal surface corresponding to the piles may appear externally while the patient is straining, but return spontaneously to the anal canal when the motion has passed and the defecating effort has ceased. These are second-degree hemorrhoids. At a later stage, the piles prolapse even more readily and not only protrude during defecation, but remain prolapsed afterward until they are digitally replaced within the anus. Further exertion of any kind is liable to force the piles down once more, necessitating further repositioning. Piles that prolapse in this way are classified as third-degree hemorrhoids. Lastly, some very long-standing piles in elderly subjects become so large and develop considerable skin-covered components that they cannot be properly returned to the anal canal, but instead remain as a permanent projection of anal mucosa. These piles, which are irreducible, are known as fourth-degree hemorrhoids. In the past, the term interno-external hemorrhoid has often been reserved for this advanced state of affairs. The main advantage of this classification is that it is convenient and easily reproducible in

practical terms. However, given the current trend for an increase in the proportion of minimally invasive surgical methods for the treatment of hemorrhoids, the classification by Goligher is gradually becoming less relevant, as it does not take into account the characteristics of each internal hemorrhoid, the presence or absence of concomitant prolapse of the mucosa of the lower ampulla of the rectum, or the severity of

Complaints	Possible diseases
Anorectal bleeding	Malignant and benign neoplasms of the anal canal, rectum, or colon Anal fissure Prolapse of the mucous membrane of the rectum Rectal prolapse (external/internal) Ulcerative colitis Crohn disease Hemangioma Endometriosis Rectal injury Solitary ulcer of the rectum
Hemorrhoidal prolapse	Prolapse of the mucous membrane of the rectum Rectal prolapse (external/internal) Fibrous anal polyps Neoplasms of the anal canal and the lower ampulla of the rectum
Pain syndrome	Anal fissure Acute or chronic paraproctitis Neoplasms of the perianal region and anal canal Complicated caudal teratoma Crohn disease complicated by perianal lesions Idiopathic anococcygeal pain syndrome Endometriosis Proctalgia
Anal itching	Rectal prolapse (external/internal) Anal sphincter incompetence Diabetes mellitus Villous tumor of the rectum Chronic paraproctitis Idiopathic anal itching Neoplasms of the perianal region, anal canal and rectum Inflammatory bowel diseases Fungal diseases of the anal canal and perineum Helminthiasis Allergic dermatitis Contact dermatitis (for topical agents) Psoriasis Poor hygiene of the perineum
Mucous or purulent discharge from the anal canal	Rectal prolapse (external/internal) Solitary ulcer of the rectum Anogenital warts Anal fissure Neoplasms of the anal canal and rectum Anal fistula Irritable bowel syndrome Inflammatory bowel diseases
Perianal edema	Acute or chronic paraproctitis Anogenital warts Neoplasms of the anal canal and rectum with perifocal inflammation Diarrhea Perineal pyoderma

Table II. Differential diagnosis of hemorrhoids.

Degree	Gabriel³⁹	<ol style="list-style-type: none"> 1 Hemorrhoids, the veins of the anal canal are increased in number and size, and they may bleed at the time of defecation. They do not prolapse, but merely project into the lumen 2 Hemorrhoids present to the outside of the anal canal during defecation, but return spontaneously into the anal canal where they remain the rest of the time 3 Hemorrhoids protrude outside the anal canal and require manual reduction 4 Hemorrhoids are irreducible and constantly remain in the prolapsed state
Stage	Braytsev⁴⁰	<ol style="list-style-type: none"> 1 Internal hemorrhoid prolapse during defecation, but spontaneously reduce into the anal canal 2 Internal hemorrhoid prolapse during defecation or straining, but cannot reduce spontaneously into the anal canal 3 Internal hemorrhoid prolapse during physical exertion, but cannot reduce spontaneously into the anal canal and remain outside
Degree	Beique and Siward⁴¹	<ol style="list-style-type: none"> 1 Bleeding, development of anemia 2 Internal hemorrhoid prolapse during defecation, development of a fissure 3 Internal hemorrhoid prolapse during defecation that requires manual reduction, development of the hemorrhoidal thrombosis
Stage	Ryzhikh⁴²	<p><i>External hemorrhoids</i></p> <ol style="list-style-type: none"> 1 External hemorrhoids in the form of a node 2 External hemorrhoids with thrombosis 3 External hemorrhoids in the form of fringes <p><i>Internal hemorrhoids</i></p> <ol style="list-style-type: none"> 1 Internal hemorrhoids with bleeding 2 Internal hemorrhoids with recurrences (or in the acute phase) 3 Internal hemorrhoids with hemorrhoidal prolapse 4 Internal hemorrhoids with prolapse of the mucosa of the rectum <p><i>Combined (external and internal) hemorrhoids</i></p>
Degree	Smith⁴³ (American classification of hemorrhoids I)	<ol style="list-style-type: none"> 1 Internal hemorrhoids do not protrude from the anal canal 2 Prolapse of internal hemorrhoids during defecation with their spontaneous reduction into the anal canal 3 Prolapse of internal hemorrhoids during defecation with the need for their manual reduction into the anal canal 4 Prolapsed internal hemorrhoids, often with symptoms of thrombosis
Degree	Salvati⁴⁴ (American classification of hemorrhoids II)	<ol style="list-style-type: none"> 1 Bleeding, without internal hemorrhoids prolapse 2 Prolapse of internal hemorrhoids with their spontaneous reduction into the anal canal and bleeding 3 Prolapse of internal hemorrhoids with the need for their manual reduction into the anal canal and bleeding 4 Prolapsed internal hemorrhoids
Stage	Henry	<ol style="list-style-type: none"> 1 Hemorrhoid maintained with proper level in the anal canal 2 Prolapse with bowel movements, but spontaneously reduce 3 Prolapse out of the anal canal and require manual reduction 4 Prolapsed and incarcerated
Grade	Banov	<ol style="list-style-type: none"> 1 Internal hemorrhoids bulge into the anus without prolapse 2 Internal hemorrhoids prolapse during defecation, but spontaneously reduce 3 Internal hemorrhoids prolapse requiring manual reduction 4 Hemorrhoids prolapsed and irreducible
Stage	State Scientific Centre of Coloproctology, Russia	<ol style="list-style-type: none"> 1 Bleeding only, no prolapse 2 Internal hemorrhoids prolapse, but reduce into the anal canal spontaneously, with or without bleeding 3 Internal hemorrhoids prolapse, but require manual reduction into the anal canal, with or without bleeding 4A Permanently prolapsed hemorrhoids that cannot be reduced into the anal canal, with or without bleeding; the dentate line is visualized 4B Permanently prolapsed hemorrhoids that cannot be reduced into the anal canal, with or without bleeding; the dentate line is not visualized

Table III. Classification systems for hemorrhoids.

external hemorrhoids.⁵² Due to this, attempts are currently being made to either modify the existing classification of Goligher or propose a new one based on the original concept.

Thus, in 2014, an article was published in which a comparison was made between the existing Goligher classification and the single pile hemorrhoid classification developed by Italian coloproctologists. The proposed classification takes into account the total number of hemorrhoids (N), their fibrous change (F), the number of external hemorrhoids and/or displacement of the dentate line (E), and the severity of the external component (S).⁵³

Taking into account the above data, the diagnosis is coded as follows: 3 IIIIFE11 IIIIE7 IIS3, which signifies that the total number of hemorrhoids is 3, the internal node at the 11 o'clock position corresponds to stage 3 of the disease and has a concomitant external component and fibrous changes, the node at the 7 o'clock position corresponds to stage 3 of the disease and has a concomitant external component, the internal hemorrhoidal node at the 3 o'clock position corresponds to stage 2 of hemorrhoids and has a marked external component. This information indicates that there is a need

to modify the conventional classification. However, most of the amended classifications look cumbersome, difficult to use in daily practice, and difficult to interpret.

Since 2013, the State Scientific Centre of Coloproctology (Russia) uses a modified classification of hemorrhoids (*Table III*) that is based on a differentiated approach to stage 4 of the disease, taking into account the conventional classification.^{54,55} This classification distinguishes stages 4A and 4B. At stage 4A, there is a visual boundary between the external and the prolapsed internal component, which is represented by the dentate line. At stage 4B, there is no visual boundary between the external and the prolapsed internal component.

Therefore, the diversity of the proposed and used classifications of hemorrhoids indicates the absence of an "ideal" classification allowing all of the numerous aspects of the disease to be considered. Differentiated approaches to each patient, an introduction of new modern methods of treatment, and the possibility of their combined use, including traditional surgical methods for hemorrhoids, substantiate the need for revision and modification of the current classifications. ■

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