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INFLUENCE OF INVASIVE SURGERY ON THE HEMOSTASIS SYSTEM IN PATIENTS WITH ULCERATIVE COLITIS

Abdiev Kattabek Makhmatovich
Associate Professor of the department of Hematology
Samarkand State Medical University
Ashurov Shavkat Iskandarovich
Samarkand regional medical multidisciplinary center
Head of department proctology
Kilichev Rashid Negmatovich
Resident doctor, Proctology Department, Samarkand Regional Multidisciplinary Medical Center
Gadayev Ganisher Khusanovich
Resident doctor, Proctology Department, Samarkand Regional Multidisciplinary Medical Center Samarkand, Uzbekistan

Abstract: Ulcerative colitis (UC) is a chronic inflammatory disease of the intestine that affects the large intestine and rectum. Although medications and lifestyle changes are often used to treat the disease, severe cases may require surgical intervention. Invasive operations, such as colectomy, widely used in patients with severe or uncontrollable UC, can have a profound impact on various physiological systems, including the hemostasis system. This article aims to study the impact of invasive surgery on the hemostasis system in patients with ulcerative colitis, focusing on the involved mechanisms, possible complications, and methods of postoperative management to reduce risks.

Keywords: Ulcerative colitis, invasive surgery, hemostasis system, coagulation, postoperative complications.

Introduction

Ulcerative colitis is characterized by chronic inflammation of the inner lining of the large intestine, leading to symptoms such as abdominal pain, diarrhea, and rectal bleeding. Although medical management focuses on controlling inflammation, patients with refractory disease or suffering from complications such as toxic megacolon or perforation may require surgical intervention, usually colectomy. Hemostasis, that is, the body's ability to prevent bleeding and maintain blood fluidity, is very important during and after surgical procedures. In patients with UC, especially in those undergoing invasive surgery, the balance of the hemostasis system can be disrupted both due to the inflammatory process of the disease and due to surgical trauma. This disruption can pose a significant risk in the postoperative period, including massive bleeding or thrombosis.

Invasive surgery can affect various components of the hemostasis system, including platelets, blood clotting factors, and fibrinolysis. Inflammation associated with UC can lead to changes in these components, and surgical stress can exacerbate these changes. In addition, pre-existing comorbidities, nutritional deficiencies, and medications used to treat UC can play a role in the patient's hemostatic function after surgery. Understanding the delicate balance of hemostasis in surgically treated patients with UC is important for optimizing perioperative care and preventing adverse outcomes.

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Pathophysiology of ulcerative colitis and its effect on hemostasis.

Ulcerative colitis is an autoimmune disease that mainly affects the mucous membrane of the large intestine. Chronic inflammation leads to damage to the epithelial lining, which disrupts normal regeneration of the mucous membrane and can increase the risk of bleeding. Studies have shown that in patients with UC, changes in blood clotting profiles, including an increase in the level of fibrinogen and von Willebrand factor involved in the hemostatic process, are most often observed. UC-associated inflammatory mediators, such as cytokines and acute phase reactants, contribute to the hypercoagulation state.This can predispose patients to both bleeding and thrombotic complications, especially when they undergo invasive surgical procedures.

Influence of invasive surgery on the hemostasis system in patients with UC

Surgical intervention, in particular, invasive procedures such as colectomy, are usually performed in patients with severe UC. However, trauma resulting from surgery can lead to significant physiological stress, which further complicates the hemostasis system. Coagulation factors often increase in the immediate postoperative period, and platelet aggregation may increase due to the inflammatory reaction caused by the operation. On the other hand, bleeding can also be exacerbated by the surgical site, which may be friable and prone to bleeding, especially in patients with active disease.

In addition, the possibility of impaired liver function in patients with UC, especially in those with liver disease as a result of prolonged use of drugs such as corticosteroids, can further complicate postoperative coagulation. Another factor to consider is the use of anticoagulant drugs that may be prescribed to patients with UC who have comorbidities such as deep vein thrombosis (DVT) or pulmonary embolism (PE). These drugs can have an additional effect on the hemostasis system and increase the risk of intraoperative bleeding.

Methods of postoperative management and improvement of hemostasis in patients with UC To reduce the risk of postoperative bleeding and thrombosis, careful management of the hemostasis system is necessary. To prevent excessive bleeding during the perioperative period, blood transfusions and blood coagulation factor concentrates can be administered. In addition, careful monitoring of platelet count, prothrombin time, and fibrinogen levels during and after surgery helps identify patients at risk of bleeding or thrombosis.

Nutrition plays an important role in the regulation of postoperative recovery and hemostasis. Patients with UC may suffer from a deficiency of vitamin K, which is important for the synthesis of blood clotting factors, as well as essential nutrients such as iron and other microelements that promote wound healing and support immunity. Proper nutrition and complementary nutrition help optimize hemostatic function and reduce the risk of complications.

Another important aspect of postoperative care is the early mobilization of patients to reduce the risk of venous thromboembolism (VTE), a common complication in surgical patients. In addition, the use of anticoagulants may be aimed at balancing the need for thromboprophylaxis with the risk of bleeding, depending on the individual risk factors of the patient.

Pathophysiology of ulcerative colitis and hemostasis alterations

Ulcerative colitis (UC) is a chronic, relapsing, inflammatory bowel disease that affects the colon’s mucosal lining, causing ulcers, bleeding, and increased intestinal permeability. In UC, the immune system attacks the gastrointestinal tract, triggering an inflammatory response that leads to increased production of cytokines and acute-phase reactants. These inflammatory mediators not only exacerbate the symptoms of UC but also have a significant effect on the body’s hemostasis system, creating a hypercoagulable state.

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Hemostasis, which is the body's ability to stop bleeding through clot formation and the regulation of blood flow, is often altered in UC patients. Increased fibrinogen levels, which is a key protein involved in clotting, are common in UC patients due to inflammation. Elevated von Willebrand factor, which plays a role in platelet adhesion and aggregation, is also frequently observed. These changes can predispose patients with UC to thrombotic events, which are further complicated when the patient undergoes surgery.

A disrupted hemostasis system may lead to complications such as both thrombosis and excessive bleeding. A hypercoagulable state coupled with surgical trauma, as well as the potential for vessel fragility and poor wound healing, places UC patients at increased risk for postoperative bleeding and thromboembolic events.

Surgical interventions and hemostasis in UC patients

Invasive surgeries, particularly colectomy, are commonly performed in severe UC cases when medical treatment fails. However, surgical procedures in UC patients carry unique risks due to the inflammatory nature of the disease. The trauma of surgery can disrupt the body's delicate hemostatic balance, particularly in the colon's damaged and inflamed tissues. Surgical procedures such as colectomy can exacerbate the inflammatory response, making it difficult to control bleeding during the operation.

Surgical stress itself can activate clotting pathways, leading to the release of procoagulants, platelet activation, and the potential for thrombosis. Moreover, UC patients often have comorbidities that further complicate hemostasis, such as nutritional deficiencies (particularly vitamin K), liver dysfunction, and the use of immunosuppressive medications, including corticosteroids, which are common in managing UC. These factors can impair the liver's ability to synthesize clotting factors and affect platelet function, increasing the risk of postoperative bleeding.

Another concern is the possible use of anticoagulants in UC patients with additional risk factors, such as deep vein thrombosis (DVT) or pulmonary embolism (PE). Anticoagulants can make managing hemostasis during and after surgery more challenging, as they increase the risk of both bleeding and clotting disorders.

Postoperative hemostasis and management

In the postoperative phase, managing hemostasis in UC patients requires vigilance, as bleeding and thrombosis are major concerns. Monitoring coagulation parameters, such as prothrombin time (PT), activated partial thromboplastin time (aPTT), and fibrinogen levels, is crucial to identify any potential clotting issues early. Platelet count should also be closely observed, as platelet activation can increase due to the inflammatory response.

In cases where significant bleeding is noted during or after surgery, the patient may require blood transfusions, as well as clotting factor concentrates. These interventions aim to restore blood volume and replace any deficient clotting factors, particularly in patients with active UC who might have an impaired ability to produce these factors due to liver dysfunction or malnutrition.

Anticoagulation management: The use of anticoagulants post-surgery requires careful balance. For patients with UC who are at risk of venous thromboembolism (VTE), low-molecular-weight heparin (LMWH) or other anticoagulants may be prescribed as prophylaxis. However, the potential for bleeding must be considered, especially in the context of surgical wounds. Anticoagulants must be carefully managed to avoid excessive bleeding while still offering thromboprophylaxis.

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Nutritional support: Nutritional management is another essential aspect of postoperative care. UC patients often suffer from deficiencies in vital nutrients, including vitamin K (which is essential for the synthesis of clotting factors), iron, and other vitamins and minerals necessary for proper immune function and wound healing. Replenishing these nutrients through intravenous supplementation or tailored enteral feeding can improve the patient's recovery and help stabilize the hemostasis system.

Early mobilization and physical therapy: Early postoperative mobilization is recommended to reduce the risk of venous thromboembolism. UC patients who undergo surgery may have a reduced ability to move due to abdominal pain or weakness, which can increase the risk of deep vein thrombosis. Early ambulation and physical therapy are critical in preventing these complications. Compression stockings and intermittent pneumatic compression devices may also be used to help promote blood circulation.

After discharge, UC patients who have undergone surgery require careful monitoring for long-term complications related to hemostasis. Regular follow-up visits should include assessment of nutritional status, liver function, and coagulation parameters. The risk of developing thrombotic events may persist even after discharge, so long-term anticoagulation therapy may be necessary for some patients, depending on individual risk factors.

Managing UC post-surgery also involves addressing the inflammatory component of the disease. It is essential to continue medical therapies that control inflammation and prevent disease relapse, as inflammation can further influence the coagulation system and complicate recovery.

Conclusion

The impact of invasive surgery on the hemostasis system in patients with ulcerative colitis is a complex issue, requiring careful preoperative assessment, intraoperative monitoring, and postoperative observation. The inflammatory nature of the UC can predispose patients to altered coagulation, which can be exacerbated by surgical trauma. Understanding the underlying mechanisms and risks, healthcare workers can take appropriate measures to reduce the likelihood of bleeding or thrombotic events, thereby improving patient outcomes. Further research is needed to improve perioperative strategies and improve understanding of the relationship between ulcerative colitis, surgery, and hemostasis.

Refences:

1. Abdiyev, K., Maxmanov, L., Madasheva, A., & Mamatqulova, F. (2021). Business games in teaching hematology. Общество и инновации, 2(6), 208-214
2. Abdiev, K. M., Makhmonov, L. S., Madasheva, O. G., & Berdiyarova, M. B. The main causes of anemia in patients with diseases of the colon. Scientist Of The XXI Century, 12;
3. Abdiev K.M, et al. Modern methods of treatment of hemorrhagic syndrome at an early stage in patients with idiopathic thrombocytopenic purpura // Ученый XXI века — 2021, — № 1-1—P.41–44 (72);
4. Ruziboeva, O. N., Abdiev, K. M., Madasheva. A. G., & Mamatkulova, F. K. (2021). Modern Methods Of Treatment Of Hemostasis Disorders In Patients With Rheumatoid Arthritis. Ученый XXI века, 8.
5. Gazkhanovna, M. A., Makhmatovich, A. K., & Utkirovich, D. U. (2022). Clinical efficacy of extracorporeal and intravascular hemocorrection methods in psoriasis. ACADEMICIA: An International Multidisciplinary Research Journal, 12(2), 313-318.