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EDITORIAL

- 3368 Remazolam combined with transversus abdominis plane block in gastrointestinal tumor surgery: Have we achieved better anesthetic effects?
Cao J, Luo XL, Lin Q
- 3372 Immune-related gene characteristics: A new chapter in precision treatment of gastric cancer
Gao L, Lin Q
- 3376 Navigating the labyrinth of long non-coding RNAs in colorectal cancer: From chemoresistance to autophagy
Yu JM, Sun CQ, Xu HH, Jiang YL, Jiang XY, Ni SQ, Zhao TY, Liu LX
- 3382 Importance of early detection of esophageal cancer before the tumor progresses too much for effective treatment
Ono T
- 3386 Early diagnosis of esophageal cancer: How to put “early detection” into effect?
Pubu S, Zhang JW, Yang J
- 3393 Colon cancer screening: What to choose?
Gomez Zuleta MA

REVIEW

- 3397 Research progress on the development of hepatocyte growth factor/c-Met signaling pathway in gastric cancer: A review
Wei WJ, Hong YL, Deng Y, Wang GL, Qiu JT, Pan F
- 3410 Research progress on the effect of pyroptosis on the occurrence, development, invasion and metastasis of colorectal cancer
Wang X, Yin QH, Wan LL, Sun RL, Wang G, Gu JF, Tang DC

MINIREVIEWS

- 3428 Importance of diet and intestinal microbiota in the prevention of colorectal cancer - colonoscopy early screening diagnosis
Jovandaric MZ

ORIGINAL ARTICLE**Retrospective Cohort Study**

- 3436 Analysis of vascular thrombus and clinicopathological factors in prognosis of gastric cancer: A retrospective cohort study
Chen GY, Ren P, Gao Z, Yang HM, Jiao Y

- 3445** Application of fecal immunochemical test in colorectal cancer screening: A community-based, cross-sectional study in average-risk individuals in Hainan

Zeng F, Zhang DY, Chen SJ, Chen RX, Chen C, Huang SM, Li D, Zhang XD, Chen JJ, Mo CY, Gao L, Zeng JT, Xiong JX, Chen Z, Bai FH

- 3457** Effect of perioperative chemotherapy on resection of isolated pulmonary metastases from colorectal cancer: A single center experience

Gao Z, Jin X, Wu YC, Zhang SJ, Wu SK, Wang X

Retrospective Study

- 3471** Microvascular structural changes in esophageal squamous cell carcinoma pathology according to intrapapillary capillary loop types under magnifying endoscopy

Shu WY, Shi YY, Huang JT, Meng LM, Zhang HJ, Cui RL, Li Y, Ding SG

- 3481** Camrelizumab, apatinib and hepatic artery infusion chemotherapy combined with microwave ablation for advanced hepatocellular carcinoma

Zuo MX, An C, Cao YZ, Pan JY, Xie LP, Yang XJ, Li W, Wu PH

- 3496** Serum ferritin and the risk of early-onset colorectal cancer

Urback AL, Martens K, McMurry HS, Chen EY, Citti C, Sharma A, Kardosh A, Shatzel JJ

- 3507** Combining lymph node ratio to develop prognostic models for postoperative gastric neuroendocrine neoplasm patients

Liu W, Wu HY, Lin JX, Qu ST, Gu YJ, Zhu JZ, Xu CF

Observational Study

- 3521** Efficacy of chemotherapy containing bevacizumab in patients with metastatic colorectal cancer according to programmed cell death ligand 1

Kang SW, Lim SH, Kim MJ, Lee J, Park YS, Lim HY, Kang WK, Kim ST

- 3529** Endoscopic detection and diagnostic strategies for minute gastric cancer: A real-world observational study

Ji XW, Lin J, Wang YT, Ruan JJ, Xu JH, Song K, Mao JS

Clinical and Translational Research

- 3539** Targeting colorectal cancer with Herba Patriniae and Coix seed: Network pharmacology, molecular docking, and *in vitro* validation

Wang CL, Yang BW, Wang XY, Chen X, Li WD, Zhai HY, Wu Y, Cui MY, Wu JH, Meng QH, Zhang N

Basic Study

- 3559** Expression and significant roles of the long non-coding RNA CASC19/miR-491-5p/HMGA2 axis in the development of gastric cancer

Zhang LX, Luo PQ, Wei ZJ, Xu AM, Guo T

- 3585** Insulin-like growth factor 2 targets IGF1R signaling transduction to facilitate metastasis and imatinib resistance in gastrointestinal stromal tumors

Li DG, Jiang JP, Chen FY, Wu W, Fu J, Wang GH, Li YB

- 3600** Dysbiosis promotes recurrence of adenomatous polyps in the distal colorectum
Yin LL, Qi PQ, Hu YF, Fu XJ, He RS, Wang MM, Deng YJ, Xiong SY, Yu QW, Hu JP, Zhou L, Zhou ZB, Xiong Y, Deng H
- 3624** Effect of acacetin on inhibition of apoptosis in *Helicobacter pylori*-infected gastric epithelial cell line
Yao QX, Li ZY, Kang HL, He X, Kang M
- 3635** Curcumin for gastric cancer: Mechanism prediction *via* network pharmacology, docking, and *in vitro* experiments
Yang PH, Wei YN, Xiao BJ, Li SY, Li XL, Yang LJ, Pan HF, Chen GX
- 3651** Lecithin-cholesterol acyltransferase is a potential tumor suppressor and predictive marker for hepatocellular carcinoma metastasis
Li Y, Jiang LN, Zhao BK, Li ML, Jiang YY, Liu YS, Liu SH, Zhu L, Ye X, Zhao JM

META-ANALYSIS

- 3672** Efficacy of hepatic arterial infusion chemotherapy and its combination strategies for advanced hepatocellular carcinoma: A network meta-analysis
Zhou SA, Zhou QM, Wu L, Chen ZH, Wu F, Chen ZR, Xu LQ, Gan BL, Jin HS, Shi N

SCIENTOMETRICS

- 3687** Current trends and hotspots of depressive disorders with colorectal cancer: A bibliometric and visual study
Yan ZW, Liu YN, Xu Q, Yuan Y
- 3705** Research status and hotspots of tight junctions and colorectal cancer: A bibliometric and visualization analysis
Li HM, Liu Y, Hao MD, Liang XQ, Yuan DJ, Huang WB, Li WJ, Ding L

CASE REPORT

- 3716** Aggressive fibromatosis of the sigmoid colon: A case report
Yu PP, Liu XC, Yin L, Yin G
- 3723** Jejunal sarcomatoid carcinoma: A case report and review of literature
Feng Q, Yu W, Feng JH, Huang Q, Xiao GX

LETTER TO THE EDITOR

- 3732** Current and future research directions in cellular metabolism of colorectal cancer: A bibliometric analysis
Jiang BW, Zhang XH, Ma R, Luan WY, Miao YD
- 3738** Risk factors for the prognosis of colon cancer
Wu CY, Ye K

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The primary aim of *World Journal of Gastrointestinal Oncology* (*WJGO*, *World J Gastrointest Oncol*) is to provide scholars and readers from various fields of gastrointestinal oncology with a platform to publish high-quality basic and clinical research articles and communicate their research findings online.

WJGO mainly publishes articles reporting research results and findings obtained in the field of gastrointestinal oncology and covering a wide range of topics including liver cell adenoma, gastric neoplasms, appendiceal neoplasms, biliary tract neoplasms, hepatocellular carcinoma, pancreatic carcinoma, cecal neoplasms, colonic neoplasms, colorectal neoplasms, duodenal neoplasms, esophageal neoplasms, gallbladder neoplasms, *etc.*

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Remazolam combined with transversus abdominis plane block in gastrointestinal tumor surgery: Have we achieved better anesthetic effects?

Jing Cao, Xing-Liao Luo, Qiang Lin

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Abstract

Laparoscopic surgery is the main treatment method for patients with gastrointestinal malignant tumors. Although laparoscopic surgery is minimally invasive, its tool stimulation and pneumoperitoneum pressure often cause strong stress reactions in patients. On the other hand, gastrointestinal surgery can cause stronger pain in patients, compared to other surgeries. Transversus abdominis plane block (TAPB) can effectively inhibit the transmission of nerve impulses caused by surgical stimulation, alleviate patient pain, and thus alleviate stress reactions. Remazolam is an acting, safe, and effective sedative, which has little effect on hemodynamics and is suitable for most patients. TAPB combined with remazolam can reduce the dosage of total anesthetic drugs, reduce adverse reactions, reduce stress reactions, and facilitate the rapid postoperative recovery of patients.

Key Words: Transversus abdominis plane block; Remazolam; Hemodynamics; Gastrointestinal tumor surgery; Oxidative stress

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Core Tip: The application of laparoscopy in gastrointestinal tumor surgery can lead to strong stress reactions, severe changes in hemodynamics, and an increased risk of postoperative adverse events. The application of transversus abdominis plane block, combined with remazolam, to treat laparoscopic tumor patients can promote more stable anesthesia, reduce hemodynamic fluctuations, and improve the quality of patient rehabilitation.

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INTRODUCTION

Gastrointestinal malignant tumors are one of the most common malignant tumors in the world, with incidence and mortality rates among the top five of all tumors. Surgery is the preferred treatment method. Laparoscopic surgery has been widely used for the treatment of gastrointestinal tumors due to its advantages of minimally invasive technology, pain relief, improved prognosis, and rapid recovery. Surgical tool stimulation, pneumoperitoneum pressure, and anesthesia, as strong stressors for patients, can cause sympathetic nervous system excitation and lead to severe stress reactions[1]. Laparoscopy with general anaesthesia causes hormonal imbalance, oxidative stress, and immune system suppression. Laparoscopic surgery generates a large amount of CO₂ and pneumoperitoneum pressure, which can lead to hypoxia and desiccation of the peritoneal mesothelial cells, causing a series of acute inflammatory reactions[2]. The peritoneal mucosa of mesothelial cells surround the intestinal organs and female reproductive organs, responsible for immune integrity[3]. Damaged mesothelial cells also indicate damage to immune function. In addition, gastrointestinal surgery often causes more severe pain than other surgeries, which can further exacerbate stress reactions and lead to decreased immunity, thereby affecting prognosis.

THE MECHANISM OF ACTION OF REMAZOLAM AND TRANSVERSUS ABDOMINIS PLANE BLOCK

Transversus abdominis plane block (TAPB) was first proposed by Rafi. TAPB involves injection of a local anesthetic solution into the gap between the transversus abdominis and the obliquus internus abdominis[4]. It corresponds to thoracic and abdominal nerves T7 to T11. TAPB can effectively inhibit the transmission of spinal cord nerve impulses caused by surgical stimulation, reduce sympathetic nerve activity, and not decrease the sensitivity of the immune system. Ultimately, pain is relieved, cognitive impairment, restlessness, and the incidence of postoperative complications decrease, and intestinal barrier function is improved. Meanwhile, due to the combination of TAPB and general anesthesia, the dosage of anesthetic drugs can be reduced, which can reduce the secretion of stress response hormones, alleviate the adverse effects of oxidative stress on the immune system, and thus improve immune suppression. It helps to reduce the incidence of postoperative cognitive impairment, restlessness and negative emotions, and improves the quality of postoperative recovery. Remazolam acts on the central GABA α receptor and is an ultra-short acting benzodiazepine hypnotic drug, which is a safe and effective sedative[5]. Remazolam has a short half-life, rapid onset, fast metabolism, and minimal inhibitory effects on circulation and respiration[6]. Among them, it is worth noting that Remazolam has the least impact on the cardiovascular system and is more easily accepted by the elderly or patients with cardiovascular diseases, reducing hemodynamic fluctuations[7].

EFFECTIVELY IMPROVING THE QUALITY OF REHABILITATION

The manuscript (Application of remazolam transversus abdominis plane block in gastrointestinal tumor surgery) by Liu *et al*[8] analyzed the clinical data of 102 patients with gastrointestinal malignant tumors who had undergone laparoscopic surgery under general anesthesia. Fifty-one patients received general anesthesia including remazolam as the control group. The remaining 51 patients received TAPB combined with remazolam-general anesthesia. By comparing the hemodynamic parameters, stress indicators, pain severity, recovery quality, analgesic effect, and adverse reactions of two groups of patients during the perioperative period, this study aims to explore the effect of TAPB combined with remazolam-general anesthesia on acute stress response and the recovery status of the patients. The heart rate of patients in the observation group was found to be high after leaving the operating room (T3) and 1 min after induction (T1). In addition, the mean arterial pressure in the observation group at T1 was also higher. In terms of stress hormones, the levels of adrenaline and norepinephrine significantly decreased in the observation group 5 min after extubation. This suggests that the combination of TAPB and remazolam under general anesthesia causes a smaller stress response, promoting a more stable hemodynamic response in patients. The reason may be that TAPB inhibits the transmission of spinal nerve impulses caused by surgical stimulation, while remazolam ensures a more stable internal environment, allowing patients to have stable vital sign. In terms of analgesic effect, patients in the observation group had lower VAS

scores at 12 h, 24 h, and 48 h after surgery, and fewer cases of postoperative salvage analgesia. This indicated that TAPB, combined with remazolam-general anesthesia, has a better analgesic effect. On the other hand, the observation group patients also achieved better sedative effects after surgery. However, the incidence of postoperative adverse reactions, nausea, vomiting, itching, or other adverse reactions did not differ between the two groups of patients. This may be due to multimodal analgesia, which reduces the use of anesthetic drugs during the perioperative period and also reduces the side effects of anesthetic drugs. The author integrates the advantages of TAPB combined with remazolam for general anesthesia, and systematically reviews the stress response and postoperative recovery of 102 patients who had undergone gastrointestinal tumor surgery, presenting the clinical application results of this method to readers. It is believed that the author has made an important and timely contribution to the anesthesia management of patients undergoing gastrointestinal tumor surgery. The combination of TAPB and new drugs is likely to facilitate the development of further technologies and methods to alleviate perioperative stress reactions in patients undergoing gastrointestinal tumor surgery. Further, it will aid in improving rehabilitation quality, and in meeting the surgical needs of pain relief and sedation levels. This direction is crucial.

LIMITATIONS OF RESEARCH

Despite presenting us with so many results, the manuscript still has some limitations. This study based on a single center, small sample trial, and the conclusion still needs to be validated by multiple centers and large samples. The author used flurbiprofen ester as a postoperative analgesia, a non-selective cyclooxygenase inhibitor used clinically as a nonsteroidal anti-inflammatory drug. Flurbiprofen ester may cause adverse reactions, such as gastrointestinal ulcers[9]. Therefore, clinicians should consider these contraindications and determine whether flurbiprofen axetil should be applied to all patients with gastrointestinal tumors. On the other hand, it is unclear whether factors such as patient weight, body mass index, and age should be considered when using the same protocol for patient controlled intravenous analgesia for all patients, and whether the same dose should be used. Considering that the patient has had gastrointestinal tumor surgery, adding time getting out of bed, as an indicator, can objectively evaluate the effect of TAPB combined with remazolam general anesthesia on gastrointestinal recovery.

CONCLUSION

This type of nerve block, combined with a new type of general anesthesia drug, is widely used in clinical practice, and its advantages have been considered. This approach provides patients with a smooth anesthesia process, it reduces stress reactions, improves patient prognosis, and embodies the concept of Enhanced Recovery after Surgery. It is hoped that multimodal anesthesia will be increasingly applied in clinical practice to ensure stable perioperative periods for patients.

FOOTNOTES

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