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Research Progress on Perioperative Thirst Management in Patients Undergoing Gastrointestinal Tumor Surgery

Jie Liu [1], Mingzhe Li [2, *]

[1] School of Nursing, Qilu Medical University, Zibo, Shandong 255300, China
[2] Shandong Cancer Hospital, Jinan, Shandong 250000, China

[*] **Corresponding author**: Mingzhe Li (Email: 10981927652@qq.com)

Abstract: This article provides an overview of the thirst issue faced by patients undergoing gastrointestinal tumor surgery during the perioperative period and its management strategies. Gastrointestinal tumors are one of the most common types of cancer globally, with surgical resection being the preferred treatment method. Postoperative thirst is a commonly overlooked issue in perioperative management, yet it significantly impacts patient recovery and satisfaction. By optimizing preoperative fluid intake, adopting combined anesthesia techniques, and implementing real-time fluid replenishment strategies, patients' thirst can be effectively alleviated. Furthermore, early postoperative oral fluid intake and multimodal pain control strategies are equally crucial for improving patients' quality of life and accelerating the recovery process. This article presents a series of evidence-based recommendations aimed at improving perioperative management for patients undergoing gastrointestinal tumor surgery.

Keywords: PICC Catheterization; Intracavitary Electrocardiographic Monitoring; P Wave; Characteristic P Wave; P Wave Changes.

1. Introduction

Gastrointestinal cancers are one of the most common types of cancer globally, encompassing multiple organs from the esophagus to the rectum. According to the World Health Organization (WHO), gastric cancer and colorectal cancer are the fifth and third most common cancers worldwide, with 1,089,000 and 1,931,590 new cases reported annually, respectively [1]. Surgical resection is often the preferred treatment for these tumors, especially when the tumor is in a resectable stage. Perioperative management is crucial for improving surgical success rates and shortening recovery times. Among these, postoperative thirst is a commonly overlooked issue, yet its impact on patients is profound. Thirst not only increases patients' discomfort but may also affect their overall recovery. Studies have shown that postoperative thirst is one of the most commonly reported discomforts among patients after surgery, with incidence rates ranging from 25% to 80% in different studies. Fluid management strategies during surgery directly affect the degree of postoperative thirst [2]. For example, prolonged preoperative fasting and intraoperative restricted fluid intake increase the likelihood of patients feeling thirsty after surgery. Additionally, the use of certain types of anesthetics, such as opioids like morphine, may exacerbate thirst due to their side effect of reducing saliva secretion. Given that thirst can significantly affect patients' postoperative satisfaction and recovery quality, it is particularly important to conduct in-depth research on perioperative thirst management in patients undergoing gastrointestinal tumor surgery [3]. By optimizing fluid management protocols and exploring new pain control strategies, patients' thirst symptoms can be effectively alleviated, thereby enhancing their overall postoperative recovery experience.

2. Mechanism of Thirst in Patients Undergoing Gastrointestinal Tumor Surgery

Patients undergoing gastrointestinal tumor surgery often experience significant thirst post-operation, primarily due to the interplay of several complex physiological and pathological processes. The prolonged preoperative fasting and water deprivation directly lead to a deficiency of water in the body, as patients are required to refrain from consuming any food or liquids for several hours before surgery to avoid vomiting and aspiration pneumonia during the procedure [4]. This restriction on water intake, coupled with potential blood and fluid losses during surgery, significantly reduces the total fluid volume in the body. Furthermore, anesthetic and analgesic drugs used during surgery may also inhibit saliva secretion, further exacerbating xerostomia. For instance, certain opioids exert their effects by suppressing the central nervous system, and this suppression may also affect the salivary glands, reducing saliva production. Xerostomia not only causes discomfort for patients but may also increase the risk of infection and affect oral hygiene.

The loss of fluids during surgery and the impact on hormonal balance, especially the regulation of antidiuretic hormone, are also important factors. An increase in antidiuretic hormone prompts the kidneys to reabsorb more water to maintain body fluid as much as possible. Although this process helps maintain blood pressure and blood volume, it also increases the osmotic pressure in the body, leading to a sense of thirst[5]. The sense of thirst in patients undergoing gastrointestinal tumor surgery is not simply a lack of water, but a combination of various factors before and after surgery. These include preoperative fasting and water deprivation, changes in physiological fluids during surgery, the effects of medications, and the impact of surgery on hormones in the

body. These factors work together to cause patients to feel significant thirst after surgery. Therefore, in perioperative management, considering these factors comprehensively and taking corresponding measures are key to alleviating patients' thirst and promoting their recovery.

3. Perioperative Thirst Management Strategies for Patients Undergoing Gastrointestinal Tumor Surgery

3.1. Preoperative Preparation

In the preoperative preparation for gastrointestinal tumor surgery, rational fluid management is extremely important, especially in terms of reducing intraoperative and postoperative complications and enhancing patient satisfaction, which cannot be overlooked. Traditional medical guidance typically advises patients to refrain from consuming any form of fluids and food for at least 8 hours before surgery, aiming to reduce the risk of aspiration during surgery and prevent serious complications such as aspiration pneumonia[6]. However, according to the latest research and guidelines from the American Society of Anesthesiologists (ASA), it is safe for adult patients to consume clear fluids (such as water, fruit-free juice, and green tea) within 2 to 3 hours before surgery. Multiple studies in recent years have supported this view. Research has shown[7] that a study involving 1,200 adult patients undergoing non-emergency surgery revealed that allowing patients to consume a limited amount of clear fluids before surgery significantly improved postoperative thirst, anxiety, and overall discomfort compared to patients who were completely fasting. Specific data indicated that the average postoperative thirst score (using a visual analog scale, 0-10 points) for patients allowed to consume clear fluids was 3.2 points, whereas it was 7.8 points for patients who were completely fasting, with a significant difference ($p < 0.001$). Furthermore, the postoperative recovery satisfaction scores for this group of patients were also significantly higher than those for the completely fasting group ($p = 0.002$), indicating that appropriate fluid intake within a short period of time can effectively enhance patients' postoperative comfort and satisfaction. In addition, preventive fluid management, especially the preoperative administration of electrolyte-containing sports drinks, has been proven to have a positive effect on maintaining electrolyte balance and improving postoperative recovery. In a randomized controlled trial, researchers administered electrolyte-containing sports drinks to one group of patients within 4 hours before surgery, while the other group maintained traditional complete fasting. The results showed that the incidence of postoperative nausea and vomiting was significantly lower in the electrolyte drink group compared to the control group (18% vs. 36%, $p = 0.04$), and the frequency of postoperative analgesic demand was also lower ($p = 0.03$)[8]. These studies suggest that appropriately adjusting preoperative fluid fasting regulations is not only safe but also significantly enhances patients' postoperative experience. Therefore, medical practice should consider adjusting preoperative fasting strategies based on the latest research evidence and guidelines to optimize patients' perioperative management and postoperative recovery. In this way, we can not only enhance patient satisfaction but also reduce the burden on the healthcare system to some extent and improve overall medical efficiency.

3.2. Intraoperative Management

In the intraoperative management of gastrointestinal tumor surgery, the choice of anesthesia and real-time fluid replacement strategy play a crucial role in alleviating postoperative thirst and facilitating patient recovery. Proper anesthesia selection can significantly reduce intraoperative and postoperative discomfort, including thirst, while precise fluid management is a key factor in ensuring rapid postoperative recovery for patients.

3.2.1. The Impact of Anesthesia Selection on Thirst

Anesthetic drugs, especially opioids such as fentanyl and morphine, are known to affect saliva secretion, thereby increasing the risk of postoperative thirst. In a study involving patients undergoing major gastrointestinal surgery, researchers compared postoperative thirst levels in patients who received general anesthesia alone with those who received combined epidural and general anesthesia. The results showed that patients who underwent combined anesthesia reported significantly lower levels of postoperative thirst (on a scale of 0-10) compared to those who only received general anesthesia, with mean scores of 2.3 and 5.6, respectively. This difference was statistically significant ($p < 0.01$). Based on the advantages of combined anesthesia, healthcare teams can further implement a series of nursing measures to optimize patients' postoperative recovery processes[9]. Firstly, an active fluid management strategy is essential. Early postoperatively, fluid replacement should be adjusted according to the patient's physiological state as much as possible to compensate for intraoperative fluid loss and prevent dehydration, which is crucial for alleviating thirst. Healthcare professionals should regularly monitor the patient's fluid status and electrolyte balance to ensure timely adjustments to the fluid replacement regimen. Additionally, advance planning for postoperative oral care is crucial. Since opioids may cause xerostomia, appropriate oral moisturizing measures should be provided postoperatively, such as using high-moisture oral moisturizers, assisting patients with regular oral cleaning, and using sugar-free gum or candies to stimulate saliva secretion. These measures can effectively alleviate discomfort caused by xerostomia[10].

Medical staff should also educate patients on the potential sensation of thirst and its causes post-surgery, and inform them on how to alleviate these symptoms through self-management. Patients should be encouraged to promptly notify nursing staff when they feel thirsty, so as to receive corresponding support and treatment as soon as possible. Lastly, the selection of anesthesia methods should also be based on the specific circumstances of the patient, taking into account their medical history, preoperative health status, and the complexity of the surgery. Through such comprehensive nursing measures and anesthesia strategies, postoperative thirst in patients can be minimized, enhancing their comfort and satisfaction, thereby facilitating a faster recovery.

3.2.2. Real-time Liquid Replenishment Strategy

The purpose of a real-time fluid replacement strategy is to maintain electrolyte balance and stable blood volume during and after surgery, reducing complications during the postoperative resuscitation period, such as thirst, hypotension, and renal dysfunction. By using dynamic monitoring tools (such as pulse contour analyzers) to assess real-time fluid requirements, fluid management can be performed more precisely. In a study involving intraoperative real-time fluid adjustment, patients were randomly divided into two groups:

one group received a traditional fixed fluid replacement regimen, while the other group had their fluid replacement adjusted based on real-time monitoring data[11]. The study found that patients who received real-time adjusted fluid replacement had significantly lower thirst scores in the early postoperative period compared to those in the fixed fluid replacement group, with mean scores of 3.1 and 6.2, respectively, with a statistically significant difference ($p < 0.05$) [12].

By optimizing anesthesia methods and implementing precise fluid management strategies, patients' intraoperative and postoperative discomfort, especially thirst, can be effectively reduced. This not only improves patients' postoperative experience but also helps shorten hospital stays and enhance overall treatment outcomes. Therefore, medical teams should consider these factors to optimize perioperative management, enabling patients to recover to their optimal state as soon as possible after surgery.

3.3. Postoperative Management

In the postoperative management of gastrointestinal tumor surgery, effective oral fluid resuscitation strategies and pain control are crucial for alleviating thirst and promoting rapid recovery. These measures not only enhance patient comfort and satisfaction but also reduce the incidence of complications, thereby improving overall treatment outcomes.

3.3.1. Strategy for Early Oral Fluid Resuscitation

The strategy of early postoperative oral fluid resumption is an important component of modern perioperative management, widely applied to accelerate the functional recovery of the digestive system and shorten hospitalization duration. Traditionally, patients are required to fast and refrain from drinking water for a long period of time after surgery to prevent vomiting and aspiration pneumonia. However, modern research has shown that early oral fluid intake can be safely applied to most patients. For example, a study on patients undergoing colorectal surgery found that those who started consuming small amounts of clear liquids frequently immediately after surgery had an average reduction of 1.5 days in overall postoperative recovery time compared to those who were traditionally fasted until bowel sounds returned ($p < 0.05$), and the postoperative complication rate, including thirst and gastrointestinal dysfunction, was significantly lower[13]. In addition, early oral fluid intake can significantly improve patients' quality of life and reduce postoperative discomfort. In another study, patients who started consuming oral fluids immediately after surgery had significantly lower thirst scores on the first postoperative day compared to those who delayed oral fluid intake, with average scores of 2.0 and 4.5, respectively, and this difference was statistically significant ($p < 0.01$) [14].

3.3.2. Pain Control and its Impact on Thirst Sensation

Pain control is another crucial aspect of postoperative management, directly impacting patients' comfort and recovery speed, and indirectly influencing their sensation of thirst. Postoperative pain can activate the stress response, leading to increased secretion of antidiuretic hormone, which in turn enhances water retention in the body, resulting in thirst. Therefore, effective pain management not only directly reduces pain but also alleviates thirst by mitigating the stress response. In a study involving the use of multimodal pain control strategies, including local anesthesia, non-steroidal anti-inflammatory drugs (NSAIDs), and minimizing opioid use, researchers found a significant reduction in postoperative reports of thirst and overall discomfort among patients who implemented this strategy [15]. Patients undergoing multimodal pain management had an average postoperative thirst score of 2.2, whereas those solely relying on opioids had an average score of 4.7, with this difference being statistically significant ($p < 0.001$).

In summary, early postoperative oral fluid resumption and effective pain control are key strategies for optimizing postoperative recovery in patients undergoing gastrointestinal tumor surgery. These measures not only significantly improve patients' physiological responses and accelerate the recovery process, but also enhance their overall satisfaction and quality of life. Therefore, medical teams should continue to optimize these strategies to ensure that patients receive the best possible care and support after surgery.

4. Conclusion

The manuscript should include a conclusion. In this section, summarize what was described in your paper. Future directions may also be included in this section. Authors are strongly encouraged not to reference multiple figures or tables in the conclusion; these should be referenced in the body of the paper.

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