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Effective Pain Management in a Patient with Colon Cancer: A Case Report of Combined Quadratus Lumborum and Transabdominal Plane Blocks

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A B S T R A C T

Cancer-related pain, particularly in cases of advanced colon cancer, presents a significant challenge to healthcare providers. Traditional pain management strategies, including opioids, often prove inadequate or are associated with undesirable side effects. Quadratus lumborum block (QLB) is an emerging regional anesthesia technique offering potential benefits in managing abdominal pain. This case report describes the successful implementation of combined QLB and transabdominal plane (TAP) blocks for effective pain management in a patient with colon cancer. A 53-year-old male patient with a history of colon cancer presented with severe abdominal pain at the site of his stoma radiating to his back. The pain was exacerbated by movement and significantly impacted his quality of life. Despite receiving a multimodal analgesic regimen, including a fentanyl patch and oral medications, his pain remained poorly controlled. After careful consideration, a combined QLB and TAP block was performed using ultrasound guidance. Following the procedure, the patient experienced significant pain relief, with his Numerical Rating Scale (NRS) score decreasing from 7-9 to 1-2 at rest and from 5-6 to 2-3 during movement. He reported no nausea or vomiting and was able to mobilize comfortably. This improvement in pain control facilitated his recovery and enhanced his overall well-being. In conclusion, this case report highlights the potential of combined QLB and TAP blocks as an effective pain management strategy for patients with colon cancer. This approach may offer a valuable alternative or adjunct to traditional methods, particularly in cases where opioid use is limited by side effects or tolerance. Further research is warranted to investigate the long-term efficacy and safety of this technique in a larger patient population.

1. Introduction

Cancer-related pain is a prevalent and debilitating symptom experienced by a significant proportion of patients diagnosed with malignancies. It significantly impacts the quality of life and functional status of individuals with cancer. The prevalence of cancer pain increases with disease progression, with an estimated prevalence exceeding 70% in advanced stages, such as metastatic colon cancer. The etiology of cancer pain is often multifactorial, encompassing tumor invasion, inflammation, nerve compression, and psychological distress. Traditional approaches to cancer pain management primarily rely on pharmacological interventions, including opioids, non-steroidal anti-inflammatory drugs (NSAIDs), and adjuvant analgesics such as antidepressants and anticonvulsants. Opioids have long been considered the cornerstone of cancer pain management, particularly for moderate to severe pain. However, these medications may be associated with significant side effects, including sedation, nausea, constipation, and respiratory depression, particularly with

prolonged opioid use. Moreover, the development of tolerance and dependence can further limit their effectiveness.[1-4]

In recent years, there has been a growing interest in exploring alternative or adjunctive pain management strategies to minimize the reliance on opioids and improve patient outcomes. Regional anesthesia techniques, such as nerve blocks, have emerged as a promising approach for managing cancer-related pain. These techniques involve the administration of local anesthetics in close proximity to nerves, providing targeted analgesia to specific regions of the body. Quadratus lumborum block (QLB) is an ultrasound-guided interfascial plane block that targets the thoracolumbar nerves, providing analgesia to the anterior and lateral abdominal wall. QLB has gained popularity in recent years due to its potential benefits in managing various types of abdominal pain, including post-surgical pain and chronic pain conditions. Studies have demonstrated the efficacy of QLB in reducing postoperative pain and opioid consumption in patients undergoing various surgical procedures, including colorectal surgery, cesarean sections, and abdominal hernia repairs.[5-7]

The transabdominal plane (TAP) block is another ultrasound-guided regional anesthesia technique that targets the nerves supplying the anterior abdominal wall. TAP block has been shown to be effective in managing postoperative pain after abdominal surgery, including laparoscopic cholecystectomy and laparoscopic nephrectomy. The combination of QLB and TAP block may offer a comprehensive approach to analgesia for patients with extensive abdominal pain, such as those with advanced cancer or major abdominal surgery. By targeting both the anterior and lateral abdominal wall, this combined approach may provide more effective pain relief and reduce the need for systemic analgesics.[8-10] This case report presents a patient with advanced colon cancer who experienced significant pain relief following a combined QLB and TAP block.

2. Case Presentation

The patient in this case report was a 53-year-old male who presented with severe abdominal pain. He had a history of colon cancer, initially diagnosed in 2019. The pain was primarily localized at the site of his abdominal stoma, a surgical opening created on the abdomen to divert the flow of feces, and radiated to his back. The patient described the pain as sharp and stabbing in nature, significantly impacting his quality of life. The severity of the patient's pain was assessed using the Numerical Rating Scale (NRS), a widely used tool for measuring pain intensity. The NRS is an 11-point scale, ranging from 0 (no pain) to 10 (worst imaginable pain), where patients are asked to rate their pain intensity. The patient's NRS scores ranged from 7 to 9 during movement and 5 to 6 at rest, indicating severe pain that was exacerbated by physical activity. This level of pain significantly interfered with his daily activities and overall well-being. The patient's medical history was significant for colon cancer, which had been diagnosed in 2019. He had undergone surgery, chemotherapy, and radiation therapy as part of his cancer treatment. These treatments, while aimed at controlling the cancer, can also contribute to pain and discomfort. The patient's medical history provided important context for understanding the complexity of his pain and the challenges in managing it effectively. The patient had a known allergy to sulfonamide antibiotics, a class of antibiotics commonly used to treat bacterial infections. This information was crucial for avoiding the use of these medications in his pain management plan. The patient did not report any other significant medical conditions or comorbidities, which could have influenced his treatment options. A physical examination revealed no significant abnormalities. However, laboratory findings showed leukocytosis, an elevated white blood cell count, which can be indicative of inflammation or infection. The patient also had a prolonged activated partial thromboplastin time (APTT), suggesting a potential issue with blood clotting. These laboratory findings provided additional insights into the patient's overall health status and

potential factors contributing to his pain. A computed tomography (CT) scan of the abdomen revealed a residual mass in the transverse colon, fat stranding, multiple regional lymph nodes, and peritoneal thickening. These findings confirmed the presence of persistent or recurrent colon cancer, which was likely the primary source of the patient's pain. The imaging findings helped to guide the pain management strategy by identifying the specific areas affected by the cancer. Prior to the implementation of the combined quadratus lumborum and transabdominal plane blocks, the patient had been receiving a multimodal analgesic regimen. This regimen included a fentanyl patch, a transdermal opioid medication that provides continuous pain relief, at a dose of 12.5 mcg/hour. He was also taking oral morphine sulfate (MST) 20 mg twice daily, another opioid medication for moderate to severe pain. In addition, he was receiving paracetamol 650 mg every 6 hours, a non-opioid analgesic for mild to moderate pain, and amitriptyline 12.5 mg at night, an antidepressant medication that can also help with pain management. Despite this multimodal approach, the patient's pain remained poorly controlled, highlighting the need for alternative or adjunctive pain management strategies (Table 1).

The procedure for administering the combined quadratus lumborum and transabdominal plane blocks was performed with the patient in the supine position, ensuring their comfort and stability throughout the process. The abdomen was exposed from the umbilicus to the lateral aspect of the body, providing adequate access to the relevant anatomical landmarks and facilitating accurate needle placement. Prior to any intervention, the skin was meticulously disinfected with chlorhexidine gluconate solution, a standard antiseptic agent used to reduce the risk of infection. This step is crucial in maintaining a sterile field and minimizing the potential for complications. Ultrasound guidance played a pivotal role in ensuring the precision and safety of the procedure. A high-frequency linear ultrasound probe was used to visualize the underlying anatomical structures, allowing for real-time identification of muscles, nerves, and fascial planes. This imaging technique significantly enhances the accuracy of needle placement and minimizes the risk of unintended injury to surrounding tissues. The quadratus lumborum block (QLB) was performed first. The ultrasound probe was initially placed on the anterior abdominal wall beside the umbilicus to visualize the three muscle layers: external oblique, internal oblique, and transversus abdominis muscle. These muscle layers form the abdominal wall and are important landmarks for identifying the correct plane for injection. The probe was then moved laterally towards the posterior aspect of the abdomen until the quadratus lumborum muscle was identified in the triangle of Petit. The quadratus lumborum muscle is a deep muscle located in the lower back, and the triangle of Petit is a small triangular space formed by the iliac crest, the latissimus dorsi muscle, and the external oblique muscle. This space serves as a window for accessing the quadratus lumborum muscle and the surrounding fascial plane. Once the quadratus lumborum muscle was identified, a 25-gauge spinal needle was inserted in-plane from anterior to posterior, targeting the fascial plane between the quadratus lumborum muscle and the transversus abdominis muscle. This fascial plane is a potential space between the muscles where the local anesthetic can be deposited to spread and block the thoracolumbar nerves, which provide sensation to the anterior and lateral abdominal wall. After confirming the correct needle placement through negative aspiration for blood, a mixture of 0.375% ropivacaine and 62.5 mg methylprednisolone was injected in a total volume of 20 cc. Ropivacaine is a long-acting local anesthetic that provides numbness and pain relief, while methylprednisolone is a corticosteroid that helps to reduce inflammation and prolong the duration of pain relief. The injection was performed slowly and steadily, ensuring the even distribution of the local anesthetic and minimizing discomfort to the patient. The same procedure was then repeated on the contralateral side to ensure bilateral pain relief. This involved repositioning the ultrasound probe and

needle to target the fascial plane on the opposite side of the abdomen. Following the completion of the quadratus lumborum blocks, the transabdominal plane (TAP) block was performed. The needle was inserted in-plane from lateral to medial, targeting the fascial plane between the transversus abdominis muscle and the internal oblique muscle. This fascial plane is another potential space where the local anesthetic can be deposited to block the nerves supplying the anterior abdominal wall. After confirming the correct needle placement through negative aspiration, 10 cc of 0.375% ropivacaine was injected. The injection was performed slowly and steadily, ensuring the even distribution of the local anesthetic and minimizing discomfort to the patient. Throughout the procedure, the patient's vital signs were closely monitored to ensure their stability and safety. The medical team maintained open communication with the patient, providing reassurance and answering any questions they may have had. The combined quadratus lumborum and transabdominal plane blocks were performed successfully, with no immediate complications. The patient's pain was significantly reduced, allowing for improved mobility and overall comfort. This minimally invasive procedure offered a valuable alternative or adjunct to traditional pain management strategies, particularly in cases where opioid use is limited by side effects or tolerance (Table 2).

Following the successful administration of the combined quadratus lumborum and transabdominal plane blocks, the patient's post-procedure analgesic regimen was carefully tailored to optimize pain relief and minimize the need for opioids. The immediate post-procedure period (0-8 hours) focused on providing a strong foundation for pain control with the use of intravenous ibuprofen and intravenous paracetamol. Intravenous ibuprofen, a non-steroidal anti-inflammatory drug (NSAID), was administered at a dose of 800 mg every 8 hours. NSAIDs like ibuprofen work by inhibiting the production of prostaglandins, substances involved in pain and inflammation. By reducing inflammation, ibuprofen helps to alleviate pain and improve overall comfort. In addition to ibuprofen, intravenous paracetamol was given at a dose of 750 mg every 6 hours. Paracetamol, also known as acetaminophen, is a non-opioid analgesic that works by affecting the body's pain and temperature regulation centers. It is effective in reducing mild to moderate pain and can be used in combination with other analgesics for enhanced pain relief. The combination of intravenous ibuprofen and intravenous paracetamol provided a synergistic effect, targeting different pain pathways and maximizing pain control. This approach aimed to minimize the need for opioids, which can have undesirable side effects such as sedation, nausea, and constipation. The same analgesic regimen was continued for the next 16 hours (8-24 hours post-procedure). This ensured sustained pain relief and allowed the local anesthetic effects of the nerve blocks to take full effect. By maintaining a consistent level of analgesia, the goal was to prevent the breakthrough of pain and reduce the patient's reliance on opioids. After 24 hours post-procedure, both intravenous ibuprofen and intravenous paracetamol were discontinued. This decision was based on the patient's pain assessment and overall clinical condition. The nerve blocks were expected to provide long-lasting pain relief, reducing the need for further analgesics. Throughout the post-procedure period, the patient was closely monitored for any complications or adverse events. The medical team regularly assessed the patient's pain levels, vital signs, and overall well-being. There were no reported complications associated with the combined quadratus lumborum and transabdominal plane blocks or the post-procedure analgesic regimen. The absence of complications highlights the safety and efficacy of this approach for managing pain in patients with colon cancer. By providing targeted analgesia and minimizing the use of opioids, the combined nerve blocks and post-procedure analgesic regimen contributed to the patient's improved pain control, enhanced recovery, and overall well-being (Table 3).

Table 1. Patient demographics and clinical characteristics.

Characteristic	Details
Age	53 years
Gender	Male
Primary diagnosis	Colon Cancer
Pain location	Abdominal stoma site, radiating to back
Pain description	Sharp, stabbing
Pain intensity (NRS)	7-9 during movement; 5-6 at rest
Medical history	Colon cancer (diagnosed in 2019), surgery, chemotherapy, radiation therapy
Allergies	Sulfonamide antibiotics
Comorbidities	None
Physical examination	No significant abnormalities
Laboratory findings	Leukocytosis (29.54 x 10^3/mm^3), prolonged APTT (19.7 seconds)
Imaging findings (CT scan)	Residual mass in transverse colon, fat stranding, multiple regional lymph nodes, peritoneal thickening
Prior analgesic regimen	Fentanyl patch (12.5 mcg/hour), oral morphine sulfate (MST) 20 mg twice daily, paracetamol 650 mg every 6 hours, amitriptyline 12.5 mg at night

Table 2. Procedure for combined quadratus lumborum and transabdominal plane blocks.

Step	Description
1	**Patient Positioning:** The patient is placed in the supine position with the abdomen exposed from the umbilicus to the lateral aspect of the body.
2	**Skin Disinfection:** The skin is disinfected with chlorhexidine gluconate solution.
3	**Ultrasound Guidance:** A high-frequency linear ultrasound probe is used to identify the relevant anatomical structures.
4	**Quadratus Lumborum Block (QLB):**
	a. Probe Placement: The probe is initially placed on the anterior abdominal wall beside the umbilicus to visualize the three muscle layers: external oblique, internal oblique, and transversus abdominis muscle.
	b. Muscle Identification: The probe is then moved laterally towards the posterior aspect of the abdomen until the quadratus lumborum muscle is identified in the triangle of Petit.
	c. Needle Insertion: A 25-gauge spinal needle is inserted in-plane from anterior to posterior, targeting the fascial plane between the quadratus lumborum muscle and the transversus abdominis muscle.
	d. Injection: After negative aspiration for blood, a mixture of 0.375% ropivacaine and 62.5 mg methylprednisolone is injected in a total volume of 20 cc.
	e. Contralateral Side: The procedure is repeated on the contralateral side.
5	**Transabdominal Plane (TAP) Block:**
	a. Needle Insertion: The needle is inserted in-plane from lateral to medial, targeting the fascial plane between the transversus abdominis muscle and the internal oblique muscle.
	b. Injection: After negative aspiration, 10 cc of 0.375% ropivacaine is injected.

Table 3. Post-procedure analgesic regimen and complications.

Time (hours)	Intravenous ibuprofen	Intravenous paracetamol	Complications
0-8	800 mg every 8 hours	750 mg every 6 hours	None
8-24	800 mg every 8 hours	750 mg every 6 hours	None
>24	Discontinued	Discontinued	None

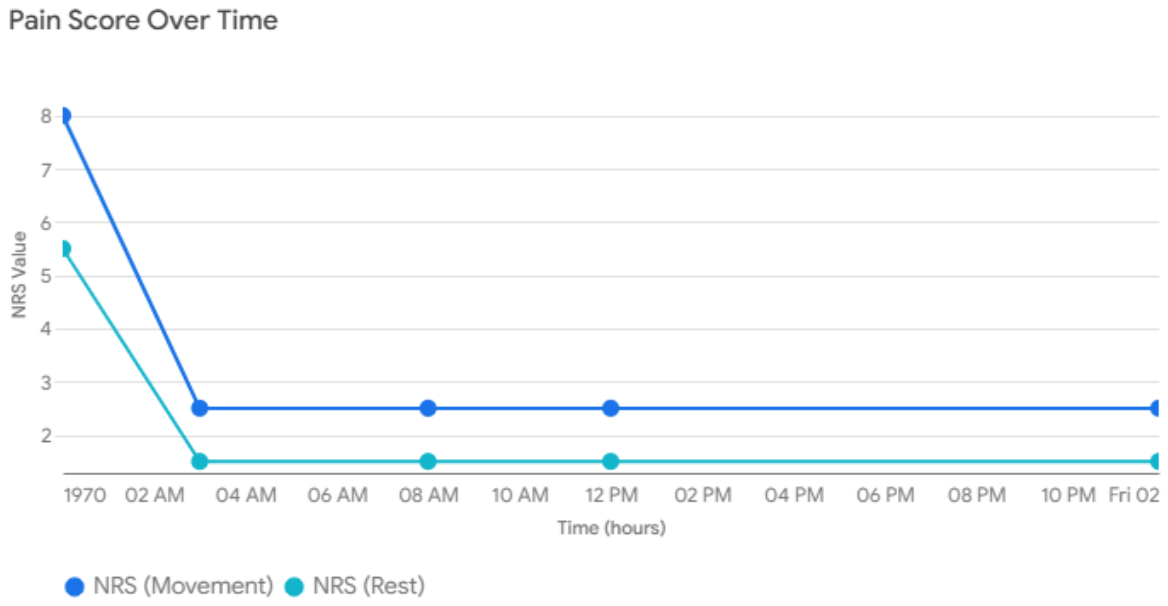

Figure 1. Pain score over time.

3. Discussion

The significant pain relief experienced by the patient following the combined quadratus lumborum (QLB) and transabdominal plane (TAP) blocks is consistent with a growing body of evidence supporting the efficacy of these techniques in managing various types of abdominal pain. Both QLB and TAP block have emerged as valuable tools in the field of regional anesthesia, offering targeted analgesia and potentially reducing the need for systemic analgesics with their associated side effects. QLB is an ultrasound-guided interfascial plane block that targets the thoracolumbar nerves, providing analgesia to the anterior and lateral abdominal wall. The quadratus lumborum muscle, located in the posterior abdominal wall, is a key landmark for this block. The injection of local anesthetic into the fascial plane between the quadratus lumborum muscle and the transversus abdominis muscle results in the spread of the anesthetic, effectively blocking the thoracolumbar nerves. QLB has been shown to be effective in reducing postoperative pain and opioid consumption in patients undergoing various surgical procedures, including colorectal surgery, cesarean sections, and abdominal hernia repairs. The analgesic effects of QLB can extend beyond the immediate postoperative period, providing sustained pain relief and potentially facilitating earlier mobilization and recovery. The efficacy of QLB in managing postoperative pain has been demonstrated in several studies. In a randomized controlled trial, QLB was found to be superior to intravenous opioid analgesia in reducing pain scores and opioid consumption after laparoscopic colorectal surgery. Another study showed that QLB provided effective analgesia for patients undergoing cesarean sections, reducing pain scores and opioid requirements. QLB has also been used successfully in managing chronic pain conditions, such as abdominal wall pain and low back pain. In a case series, QLB provided significant pain relief for patients with chronic abdominal wall pain who had failed conservative treatments. TAP block is another ultrasound-guided regional anesthesia technique that targets the nerves supplying the anterior abdominal wall. The injection of local anesthetic into the fascial plane between the transversus abdominis muscle and the internal

oblique muscle results in the spread of the anesthetic, effectively blocking the anterior branches of the thoracolumbar nerves. TAP block has demonstrated efficacy in managing postoperative pain after abdominal surgery, including laparoscopic cholecystectomy and laparoscopic nephrectomy. It has also been used successfully in other clinical scenarios, such as for pain management during cesarean sections and for chronic abdominal pain conditions. The efficacy of TAP block in managing postoperative pain has been demonstrated in several studies. In a randomized controlled trial, TAP block was found to be superior to placebo in reducing pain scores and opioid consumption after laparoscopic cholecystectomy. Another study showed that TAP block provided effective analgesia for patients undergoing laparoscopic nephrectomy, reducing pain scores and opioid requirements. TAP block has also been used successfully in managing chronic pain conditions, such as abdominal wall pain and postherpetic neuralgia. In a case series, TAP block provided significant pain relief for patients with chronic abdominal wall pain who had failed conservative treatments. The combination of QLB and TAP block may offer a comprehensive approach to analgesia for patients with extensive abdominal pain, such as those with advanced cancer or major abdominal surgery. By targeting both the anterior and lateral abdominal wall, this combined approach may provide more effective pain relief and reduce the need for systemic analgesics. In the case of the patient presented in this report, the pain was primarily localized at the site of his abdominal stoma and radiated to his back, suggesting that both the anterior and lateral abdominal wall were involved. The combined QLB and TAP block effectively addressed both pain components, leading to a significant reduction in pain intensity. The comprehensive analgesia provided by the combined QLB and TAP block may be particularly beneficial in patients with advanced cancer who often experience pain from multiple sources, including tumor invasion, inflammation, nerve compression, and surgical procedures. By addressing both somatic and visceral pain components, this approach may offer a more holistic and effective pain management strategy. The analgesic effects of QLB and TAP block are attributed to the blockade of the thoracolumbar nerves, which provide sensory innervation to the abdominal wall. The local anesthetic injected during these blocks spreads through the fascial planes, reaching the nerves and inhibiting the transmission of pain signals. QLB primarily targets the posterior and lateral branches of the thoracolumbar nerves, while TAP block primarily targets the anterior branches. By combining these two blocks, a wider area of sensory innervation is covered, leading to more comprehensive analgesia. The efficacy of combined QLB and TAP blocks in managing abdominal pain has significant clinical implications. In the context of cancer pain management, this approach may offer a valuable alternative or adjunct to traditional methods, particularly in cases where opioid use is limited by side effects or tolerance. By providing effective pain relief, combined QLB and TAP blocks can improve patient comfort, mobility, and overall quality of life. They may also facilitate earlier recovery and potentially reduce the risk of post-operative complications.[11,12]

Regional anesthesia techniques, such as quadratus lumborum (QLB) and transabdominal plane (TAP) blocks, have emerged as valuable tools in the field of pain management, offering several potential advantages over traditional systemic approaches. These advantages are particularly relevant in the context of cancer pain management, where patients often face complex pain syndromes and may be more susceptible to side effects from systemic medications. One of the primary advantages of regional anesthesia techniques is their ability to provide targeted analgesia, delivering the anesthetic medication directly to the nerves supplying the painful area. This targeted approach minimizes the exposure of the rest of the body to the medication, thereby reducing the risk of systemic side effects. Traditional pain management strategies, such as oral or intravenous opioids, often result in systemic side effects, including sedation, nausea, constipation, and respiratory

depression. These side effects can significantly impact a patient's quality of life and may even lead to dose reductions or discontinuation of the medication, compromising pain control. In contrast, regional anesthesia techniques can provide effective pain relief while minimizing the risk of systemic side effects. This is particularly important in patients with advanced cancer who may be more susceptible to side effects due to their compromised health status. For instance, patients with advanced cancer may have impaired liver or kidney function, which can affect the metabolism and excretion of medications, increasing the risk of side effects. Furthermore, regional anesthesia techniques can be particularly beneficial in patients with comorbidities that may be exacerbated by systemic medications. For example, patients with respiratory conditions may be at increased risk of respiratory depression with opioid use. Regional anesthesia techniques can provide pain relief without the risk of respiratory depression, making them a safer option for these patients. Another advantage of regional anesthesia techniques is their ability to provide long-lasting pain relief, reducing the need for frequent opioid administration. This can help to improve patient comfort and mobility, facilitating earlier recovery and potentially reducing the risk of post-operative complications. Opioids, while effective in managing moderate to severe pain, can lead to tolerance and dependence with prolonged use. This means that patients may require higher doses of opioids over time to achieve the same level of pain relief, increasing the risk of side effects and complications. Regional anesthesia techniques, on the other hand, can provide sustained pain relief with a single administration, reducing the need for frequent opioid administration. This can help to minimize the risk of opioid-related side effects and complications, while also improving patient satisfaction and quality of life. In the case of the patient presented in this report, the pain relief provided by the combined QLB and TAP blocks was sustained for a sufficient duration to allow for the discontinuation of intravenous analgesics after 24 hours. This highlights the potential of regional anesthesia techniques to reduce opioid requirements and promote earlier recovery. The reduced opioid requirements associated with regional anesthesia techniques can also have significant implications for public health. The opioid epidemic is a major public health crisis, and reducing opioid use is a critical priority. Regional anesthesia techniques can play a role in reducing opioid use by providing effective pain relief with minimal risk of side effects and complications. Early mobilization is essential for preventing complications and promoting overall recovery after surgery or in patients with chronic pain conditions. However, pain can be a significant barrier to mobilization, leading to prolonged bed rest and increased risk of complications such as deep vein thrombosis and pulmonary embolism. Regional anesthesia techniques can facilitate early mobilization and recovery by reducing pain and improving mobility. By allowing patients to move more freely and comfortably, these techniques can help to prevent complications, promote healing, and improve overall outcomes. In the context of cancer pain management, early mobilization is particularly important. Patients with advanced cancer may experience fatigue, weakness, and decreased functional capacity due to their disease and treatment. By reducing pain and improving mobility, regional anesthesia techniques can help these patients to engage in physical therapy and other activities that promote physical and emotional well-being. Early mobilization has been shown to have numerous benefits, including reduced risk of pneumonia, improved bowel function, and decreased length of hospital stay. By facilitating early mobilization, regional anesthesia techniques can contribute to improved patient outcomes and reduced healthcare costs. Pain can significantly impact a patient's quality of life, affecting their physical, emotional, and social well-being. Regional anesthesia techniques can improve quality of life by providing effective pain relief, reducing side effects, and promoting earlier mobilization and recovery. By reducing pain, these techniques can help patients to engage in activities they enjoy, maintain their

independence, and improve their overall sense of well-being. They can also reduce the need for opioids, minimizing the risk of side effects and complications that can further impact quality of life. In patients with advanced cancer, pain can be a major source of distress and can significantly impair their quality of life. Regional anesthesia techniques can help to alleviate this distress and improve quality of life by providing effective pain relief and minimizing side effects. Regional anesthesia techniques may also offer cost-effectiveness benefits compared to traditional pain management strategies. By reducing the need for opioids and other systemic medications, these techniques can potentially lower the overall cost of care. Additionally, by facilitating earlier mobilization and recovery, regional anesthesia techniques may shorten hospital stays and reduce the need for rehabilitation services, further contributing to cost savings. While the upfront cost of regional anesthesia techniques may be higher than that of traditional pain management strategies, the potential cost savings associated with reduced opioid use, shorter hospital stays, and decreased need for rehabilitation services may outweigh the initial investment.[13-15]

While regional anesthesia techniques like quadratus lumborum (QLB) and transabdominal plane (TAP) blocks offer numerous advantages, it's crucial to acknowledge and address the potential safety considerations associated with these procedures. Although generally considered safe, complications can arise, and a thorough understanding of these potential risks is essential for responsible and effective clinical practice. The insertion of needles through tissues carries a risk of bleeding, especially if a blood vessel is inadvertently punctured. This risk is heightened in patients with bleeding disorders or those taking anticoagulant medications. Hematoma formation, while usually minor, can occur at the injection site. In rare cases, more significant bleeding can occur, especially if a major blood vessel is inadvertently punctured. This can lead to complications such as compartment syndrome, a condition in which swelling and pressure within a confined muscle compartment compromise blood flow to the tissues. Any procedure that involves breaching the skin barrier introduces a risk of infection. Strict adherence to sterile techniques is crucial to minimize this risk. Infection can occur at the injection site or, in rare cases, can spread to deeper tissues or even the bloodstream. Factors that can increase the risk of infection include compromised immune system, diabetes, and poor hygiene. Although rare, nerve injury can occur during the insertion or manipulation of needles. This can result in temporary or permanent numbness, tingling, or weakness in the affected area. Nerve injury can occur due to direct needle trauma, compression from hematoma formation, or neurotoxicity from the local anesthetic. The risk of nerve injury is higher in patients with pre-existing nerve damage or anatomical variations. In rare cases, local anesthetics can enter the bloodstream and cause systemic toxicity, leading to symptoms such as seizures, cardiac arrhythmias, and respiratory depression. Careful dosing and monitoring are essential to prevent this complication. Local anesthetic toxicity can occur due to accidental intravascular injection, rapid absorption from the injection site, or exceeding the maximum recommended dose. The risk of toxicity is higher in patients with liver or kidney disease, as these organs are responsible for metabolizing and eliminating local anesthetics. Specifically with QLB, due to the proximity of the pleura, there's a risk of puncturing the lung and causing a pneumothorax (collapsed lung). This is why ultrasound guidance and proper technique are paramount. Pneumothorax can lead to difficulty breathing and chest pain. In severe cases, it may require chest tube insertion to re-expand the lung. A thorough pre-procedure assessment is essential to identify patients who may be at higher risk for complications. This includes evaluating the patient's medical history, current medications, and coagulation status. Patients with bleeding disorders, those taking anticoagulant medications, and those with compromised immune systems may be at higher risk for complications. Proper technique and adherence to

sterile procedures are crucial to minimize the risk of complications. This includes using appropriate needle sizes, ensuring proper needle placement under ultrasound guidance, and using sterile techniques throughout the procedure. Proper technique involves using aseptic techniques, such as hand hygiene, skin preparation, and sterile gloves and drapes, to minimize the risk of infection. It also involves using appropriate needle sizes and lengths to reach the desired fascial plane without damaging surrounding tissues. Continuous monitoring of the patient's vital signs, including heart rate, blood pressure, and oxygen saturation, is essential during and after the procedure to detect any signs of complications. Monitoring should continue for an appropriate period after the procedure to ensure the patient's stability and to detect any delayed complications. The use of ultrasound guidance significantly enhances the accuracy of needle placement and reduces the risk of complications. Ultrasound allows for real-time visualization of anatomical structures, enabling the practitioner to avoid blood vessels and nerves and ensure accurate needle placement in the desired fascial plane. Ultrasound guidance also allows for visualization of the spread of the local anesthetic, ensuring adequate distribution and minimizing the risk of local anesthetic toxicity. Before injecting the full dose of local anesthetic, a small test dose can be administered to check for any signs of intravascular injection or local anesthetic toxicity. This allows for early detection and management of potential complications. The test dose should be administered slowly, and the patient should be closely monitored for any signs of toxicity, such as perioral numbness, metallic taste, tinnitus, or seizures. The patient's medical history, including his allergy to sulfonamide antibiotics and prolonged activated partial thromboplastin time (APTT), was carefully considered before proceeding with the procedure. The allergy to sulfonamide antibiotics was not directly relevant to the procedure, but it highlighted the importance of thorough medication reconciliation to avoid potential drug interactions or allergic reactions. The prolonged APTT, which suggests a potential issue with blood clotting, was taken into consideration when assessing the risk of bleeding. The procedure was performed under ultrasound guidance, which significantly enhances the accuracy of needle placement and reduces the risk of complications. Ultrasound allows for real-time visualization of anatomical structures, enabling the practitioner to avoid blood vessels and nerves and ensure accurate needle placement in the desired fascial plane. The patient's vital signs were closely monitored during and after the procedure to detect any signs of complications. This included monitoring heart rate, blood pressure, oxygen saturation, and respiratory rate. The medical team also remained vigilant for any signs of local anesthetic toxicity, such as perioral numbness, metallic taste, tinnitus, or seizures.[16-18]

This case report highlights the potential of combined quadratus lumborum (QLB) and transabdominal plane (TAP) blocks as an effective pain management strategy for patients with colon cancer. The significant pain relief experienced by the patient, the reduction in opioid requirements, and the absence of complications underscore the potential benefits of this approach. These findings have broader implications for the management of cancer-related pain, particularly in the context of the ongoing opioid epidemic and the increasing emphasis on multimodal analgesia. Traditional approaches to cancer pain management often rely heavily on opioids, which can be associated with significant side effects, including sedation, nausea, constipation, and respiratory depression. Moreover, the development of tolerance and dependence can limit the long-term effectiveness of opioids. Regional anesthesia techniques, such as QLB and TAP block, offer a valuable alternative or adjunct to traditional methods, particularly in cases where opioid use is limited by side effects or tolerance. By providing targeted analgesia, these techniques can reduce the need for systemic opioids, minimizing the risk of side effects and complications. In the case presented in this report, the patient had been experiencing severe pain despite a multimodal

analgesic regimen that included opioids. The combined QLB and TAP blocks provided significant pain relief, allowing for the discontinuation of intravenous opioids after 24 hours. This highlights the potential of regional anesthesia techniques to reduce opioid requirements and improve patient outcomes. The findings of this case report contribute to the growing body of evidence supporting the use of regional anesthesia techniques in the management of cancer-related pain. Several studies have demonstrated the efficacy of QLB and TAP block in reducing postoperative pain and opioid consumption in patients undergoing various surgical procedures, including colorectal surgery. This case report adds to this body of evidence by demonstrating the successful application of combined QLB and TAP blocks in a patient with advanced colon cancer who had been experiencing severe pain despite a multimodal analgesic regimen. The significant pain relief and reduction in opioid requirements observed in this case further support the use of regional anesthesia techniques in the management of cancer-related pain. The potential benefits of combined QLB and TAP blocks extend beyond the management of postoperative pain in patients with colon cancer. Patients with advanced cancer often experience chronic pain that can be difficult to manage with traditional methods. Regional anesthesia techniques may offer a valuable alternative or adjunct to systemic opioids in these patients, providing long-lasting pain relief with minimal risk of side effects. In patients with terminal cancer, the focus of care shifts from curative treatment to palliative care, with an emphasis on symptom management and quality of life. Regional anesthesia techniques can play an important role in palliative care by providing effective pain relief and improving comfort. Regional anesthesia techniques are not limited to cancer pain management. They can also be used to manage pain associated with other conditions, such as acute and chronic pain after surgery, trauma, and neuropathic pain.[19,20]

4. Conclusion

This case report highlights the potential of combined QLB and TAP blocks as an effective pain management strategy for patients with colon cancer. The patient experienced significant pain relief following the procedure, with his numerical rating scale (NRS) score decreasing from 7-9 to 1-2 at rest and from 5-6 to 2-3 during movement. He reported no nausea or vomiting and was able to mobilize comfortably. This improvement in pain control facilitated his recovery and enhanced his overall well-being. This approach may offer a valuable alternative or adjunct to traditional methods, particularly in cases where opioid use is limited by side effects or tolerance. The reduced opioid requirements associated with regional anesthesia techniques can also have significant implications for public health. The opioid epidemic is a major public health crisis, and reducing opioid use is a critical priority. Regional anesthesia techniques can play a role in reducing opioid use by providing effective pain relief with minimal risk of side effects and complications.

5. References

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