

CASE REPORT

Abdominal wall blocks for emergency ileostomy operation in a patient with COVID-19 pneumonia: a case report

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Abstract The anesthesia method to be administered during emergency surgical procedures for COVID-19 (Coronavirus Disease 2019) pneumonia patients carries great importance for both patient and surgical team. Regional blocks are generally used to ensure postoperative analgesia after abdominal surgery with general anesthesia. In this case, involving a patient receiving anti-coagulant treatment due to COVID-19 pneumonia with planned emergency operation, the aim was to present the anesthesia management with rectus sheath and transversus abdominis plane block combination for the ileostomy operation. Due to the administered blocks, the patient was not given general anesthesia. Hence, transmission was reduced by minimizing aerosol formation in terms of protecting health personnel and worsening of the patient's pneumonia was prevented. The case is discussed in terms of regional anesthesia techniques offering a good alternative in appropriate cases for both employee and patient safety in the present day, when the whole world is affected by the COVID-19 pandemic.

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Introduction

During anesthesia administration, airway interventions cause aerosol production which exposes the health team to the risk of Coronavirus Disease 2019 (COVID-19) transmis-

sion during both intubation and extubation. The probability of an acute respiratory tract infection being transmitted to the health specialist during tracheal intubation is known to increase 6.6 times compared to those without tracheal intubation performed.¹ For COVID-19 pneumonia, it is necessary to avoid anesthesia management involving airway interventions due to aerosol production to benefit both the patient and health employees. For this reason, Regional Anesthesia (RA) techniques may be safer. In fact, instead of

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paraneuraxial blocks requiring position changes, it may be more appropriate to choose a block among RA techniques (e.g., rectus sheath block) which does not require position changes. A block which has least effect on respiratory problems should be chosen, if possible, for the patient's benefit. In this case, we aimed to present the Rectus Sheath (RS) and Transversus Abdominis Plane (TAP) block administered instead of general anesthesia or Central Neuraxial Anesthesia (CNA) for emergency ileostomy operation of a patient with COVID-19 pneumonia who developed ileus.

Case report

A 70-year-old male patient treated with lymphoma diagnosis for 1 year with known hypertension and Chronic Obstructive Pulmonary Disease (COPD) was admitted to a tertiary referral hospital with respiratory symptoms. At admission (day 6 of onset), the patient was suffering from cough, fatigue, headache, dyspnea, and intermittent fever. The diagnosis of COVID-19 was made by Reverse-Transcription Polymerase Chain Reaction (RT-PCR) positivity, and the treatment for COVID-19 was initiated. Pulmonary radiological imaging found consolidated areas consistent with COVID-19 and the patient was administered $4 \text{ L} \cdot \text{min}^{-1} \text{ O}_2$ with a mask, and peripheral oxygen saturation was 95% (Fig. 1). With nausea-vomiting, abdominal pain complaints and no discharge of gas or feces in the last three days during monitoring on the infection ward, the general surgery clinic was consulted. Abdominal Computed Tomography (CT) identified a suspicious mass in the terminal ileum which probably caused the ileus tableau. Non-operative medical treatment was considered a priority due to the COVID-19 infection and pneumonia. The patient had a Nasogastric Tube (NT) inserted for drainage. With progression of abdominal distension at the end of the 4th day and no opening of the passage, emergency ileostomy operation was planned (Fig. 1).

Monitored for COPD and COVID-19 pneumonia, it was considered appropriate not to administer general anesthesia to prevent harm to pulmonary condition and to reduce transmission risk for the surgical and anesthesia teams and production of aerosols in the environment. The patient was also assessed as high risk for CNA due to receiving $1 \text{ mg} \cdot \text{kg}^{-1}$ enoxaparin treatment daily and the decision was made to administer regional blocks accompanied by Ultrasonography (USG). The patient was informed about the type of anesthesia and written consent was obtained from the patient for the publication of this case report.

The patient received no premedication, and a surgical mask was used with nasal $4 \text{ L} \cdot \text{min}^{-1} \text{ O}_2$ support in a negative-pressure operation room with necessary isolation precautions. The all-initial respiratory symptoms of the patient, whose peripheral oxygen saturation decreased to 85% without oxygen support, were similarly ongoing at the scheduled surgery date. Standard monitoring was applied for EKG, noninvasive blood pressure monitoring and peripheral oxygen saturation in sterile conditions. Then real-time USG (SonoSite M-Turbo) guidance was used with a 10–5 MHz linear probe and the in-plane technique with an 80-mm B Braun Stimuplex peripheral block needle to administer right lateral TAP blockage. The USG probe was placed on the midaxillary line between the iliac crest and subcostal margin and after

imaging the triple muscle layer of the abdominal wall of the External Oblique Muscle (EOM), Internal Oblique Muscle (IOM), and Transversus Abdominis Muscle (TAM), firstly 25 mL 0.25% bupivacaine was administered between the fascia of the IOM and TAM (Fig. 2). Then the probe was placed on the right side of the umbilicus and the same needle was used to inject 15 mL 1% lidocaine between the Rectus Abdominis Muscle (RAM) and posterior sheath for RS blockage (Fig. 2). It took 10 minutes to complete both blocks. Sensory blockage was observed to develop 15 minutes after the block procedure with the pin-prick test, and then surgery began without administering any sedative or analgesic medication. During right paramedian incision of the abdominal anterior wall, the patient felt the sensation of touch but stated he did not feel any pain. However, the patient stated he felt pain during the peritoneal and intestinal manipulation stage and was administered $0.25 \text{ mg} \cdot \text{kg}^{-1}$ ketamine and $0.5 \text{ mcg} \cdot \text{kg}^{-1}$ fentanyl by the intravenous route. Twenty minutes later, he described pain again and the same dose was repeated. During the operation, which lasted 65 minutes, there was no hemodynamic instability, complications, or any other negative events. The Richmond agitation-sedation scale was monitored at 10-minute intervals and varied from 0 to 2. On the postoperative 7th day, the patient was discharged home with symptoms and findings related to ileus and COVID-19 regressing and without complications.

Discussion

During the COVID-19 pandemic, situations requiring emergency surgery are at least as important as the ARDS tableau developing linked to COVID-19 and may have mortal progression if not treated. Emergency surgical interventions in the shadow of this pandemic require a multidisciplinary approach to determine and manage indications correctly. In this case, priority was given to non-operative medical treatment for the ileus tableau; however, with no benefit seen, the decision to operate was made due to indications. Considering the COVID-19 tableau of the patient, the general surgery clinic decided to open a diverted loop ileostomy proximal of the mass instead of resection with the aim of avoiding surgical stress, which may be caused by a major operation.

Due to the risk of aerosol production, airway management of COVID-19 patients undergoing emergency surgery operations comprise a great risk for health workers. For this reason, it is recommended that the use of CNA or RA techniques are more appropriate instead of general anesthesia in order to minimize aerosolization and exposure in COVID-19 patients. In accordance with the literature, general anesthesia was not chosen to reduce the transmission risk to the health team and due to the patients' COPD and pneumonia tableau. Thus, airway instrumentation was avoided and negative effects that may affect the current lung infection were prevented.

According to guidelines, patients receiving low molecular weight heparin (like enoxaparin), or similar anticoagulant treatment are not recommended to have both CNA and RA techniques.² In cases using the treatment dose of enoxaparin to protect against thromboembolic complications of COVID-19, regional blocks for TAP and RS were chosen as it is more

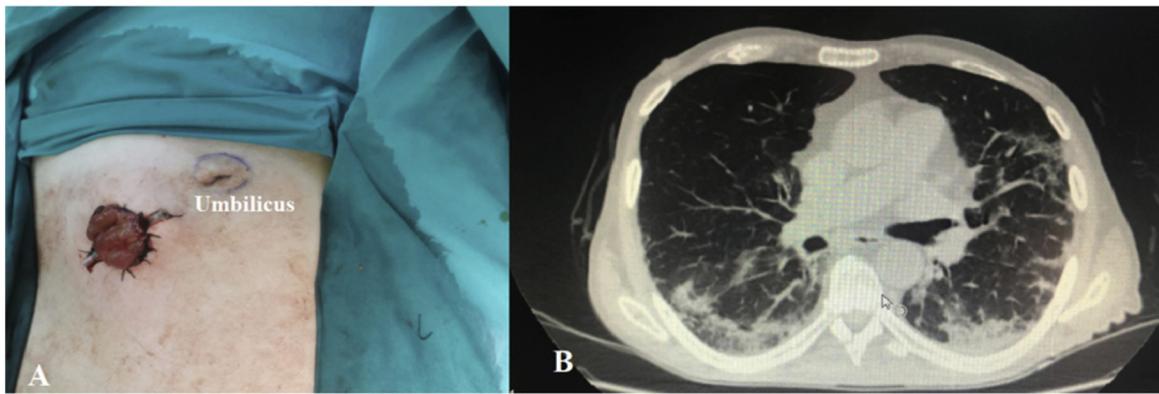


Figure 1 Postoperative appearance of ileostomy on the abdominal anterior wall of the case (A) pulmonary computed tomography image compatible with COVID-19 of the case (B).

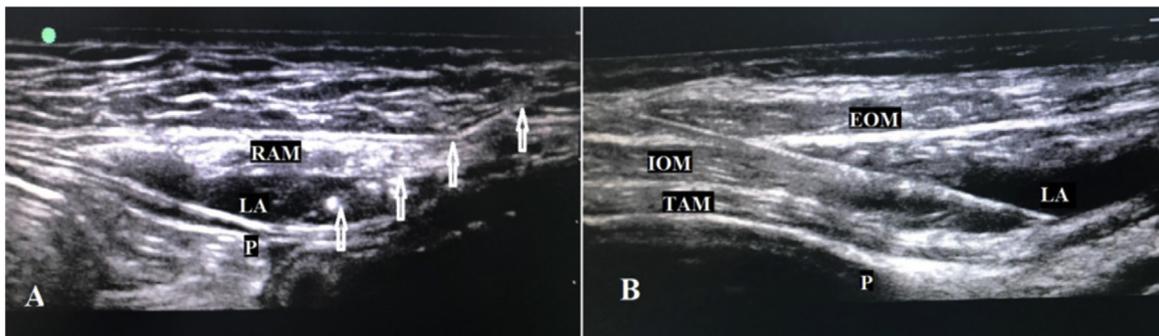


Figure 2 Ultrasonographic appearance of distribution of LA medication between RAM and posterior sheath with needle position for rectus sheath block. (A) Ultrasonographic appearance of distribution of LA medication between TAM and IOM with needle position for transversus abdominis plane block. (B) Arrows point to the needle. RAM, Rectus Abdominis Muscle; LA, Local Anesthetic; P, Peritoneum; IOM, Internal Oblique Muscle; EOM, External Oblique Muscle; TAM, Transversus Abdominis Muscle.

difficult and riskier to control bleeding due to CNA. However, as regional blocks administered in anesthesia practice do not provide sufficient anesthesia level for most surgical procedures, they are frequently chosen to provide postoperative analgesia.³ In this case, the surgeon informed the anesthesia team preoperatively that a paramedian incision would be made. Thereupon, it was decided to administer a combined lateral TAP and RS block to create sensory block of the right iliac region and the fascia of the RAM. Thus, while stretching pain that may occur in the midline during retraction of the abdominal wall was blocked with RS block, the T10–T12 dermatome was targeted with the TAP block, and sensory blockade of the medial and anterolateral parts of the anterior abdominal wall was achieved. The patient hereby did not feel pain from the surgical incision. However, feeling visceral pain was unavoidable and as a result, sedation was provided by ketamine and fentanyl during intestinal manipulation. Although gastric drainage is provided by NT in cases with intestinal obstruction, vomiting may occur in large volumes exceeding the capacity of NT and this situation creates a risk of bronchoaspiration in patients under sedation. Therefore, we applied conscious sedation in our case and deepened sedation was avoided with no requirements for any airway manipulation or intervention.

Regional blocks like erector spinae plane, paravertebral, and quadratus lumborum could be considered in this

case. However, blocks requiring entry into deeper compartments may increase the risk of bleeding and neurological complications in patients receiving anticoagulant treatment. At the same time, position changes in these patients involves a risk in terms of transmission. RS blockage anesthetizes somatic structures limited to the region of the RAM and is chosen for midline laparotomies. In the present case, RS block was applied in addition to lateral TAP block in order to include the rectus muscle fascia in the surgical incision and to block the pain that may occur due to retraction on the midline. As the surgical incision exceeded the limits of the RAM, TAP block with the lateral approach, in studies, was shown to provide better analgesic effect.⁴ Ng et al.⁵ combined sedation and regional blocks (TAP + RS + ilioinguinal + iliohypogastric block) for loop colostomy revision and successfully completed anesthesia management. Unlike NG et al., in our case, the location of the surgical incision was related to the higher lumbar and umbilical regions. Therefore, sensory (L1 dermatome) blockage of the inguinal and hypogastric region was not needed and ilioinguinal–iliohypogastric block was not administered in this case. In the literature, no case was presented previously with emergency ileostomy procedure under RA with mild sedation while receiving COVID-19 treatment. This case is the first in this area.

Conclusion

In the present day, when the COVID-19 pandemic has affected the whole world, administration of regional blocks accompanied by USG may be a good choice in terms of both employee and patient safety considering the operation site in COVID-19 pneumonia patients.

Conflicts of interest

The authors declare no conflicts of interest.

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