**Modified thoracoabdominal nerves block through perichondrial approach (M-TAPA) provides a sufficient postoperative analgesia for laparoscopic sleeve gastrectomy.**

Katsuhiro Aikawa[a], MD, PhD katsuhiro.aikawa@gmail.com,

Nobuhiro Tanaka[a], MD dorami1105@hotmail.com,

Yuji Morimoto[a], MD, PhD morim2@med.hokudai.ac.jp,

[a]Department of Anesthesiology and Critical Care Medicine, Faculty of Medicine and Graduate School of Medicine Hokkaido University, Kita-15, Nishi-7, Kita-ku, Sapporo 060-8638, Japan

Phone: +81-11-706-7861

Corresponding author: Katsuhiro Aikawa

Kita-15, Nishi-7, Kita-ku, Sapporo 060-8638, Japan

Phone: +81-11-706-7861

Running Title: M-TAPA for laparoscopic sleeve gastrectomy.

Disclosures: The authors received no funding for this study.

**Key words**

Obesity, bariatric surgery, modified thoracoabdominal nerves block, postoperative analgesia.

Dear editor,

Achieving sufficient postoperative analgesia in patients who undergo laparoscopic sleeve gastrectomy (LSG) is challenging. In fact, epidural anesthesia is technically difficult given the excessive subcutaneous fat, which increases the risk of serious complications. Moreover, patients with this condition often have comorbidities that require anticoagulation therapy. Although ultrasound-guided transversus abdominis plane (TAP) block may be beneficial, it is still a matter of debate [1].

Recently, modified thoracoabdominal nerves block through perichondrial approach (M-TAPA) has been reported as a novel and promising technique that provides effective analgesia in the anterior and lateral thoracoabdominal wall [2]. Herein, we present a successful case of LSG managed with M-TAPA.

A 46-year old female patient (156 cm, 99kg) with diabetes, sleep apnea syndrome, and hypertension was scheduled for LSG. Epidural anesthesia was avoided considering that she had undergone thoracic spine surgery. A bilateral M-TAPA was selected for opioid-spearing postoperative analgesia. Following an uneventful induction and intubation, a linear transducer was placed on the costochondral angle in the sagittal plane [3] (Fig. 1A). A total of 60 mL of 0.25% ropivacaine (30 mL for each side) was

bilaterally injected into the layer between the transversus abdominis muscle and the lower aspect of the costal cartilage (Fig. 1B). Anesthesia was maintained with 0.8 MAC desflurane and 0.15-0.35 μg/kg/min remifentanil infusion. Hemodynamic stability was maintained throughout the anesthesia. The operation time was 104 min, and the total dose of intraoperative fentanyl was 400 μg. She had no pain at discharge from the operation theater.

Although the patient was administered a continuous infusion of fentanyl to control visceral pain in the ward, the postoperative pain was adequately controlled. By performing repetitive pinprick tests, we revealed an excellent analgesic effect of the M-TAPA. At 7 and 24 h after the blockade, a complete sensory block of the T3-12 dermatomes from the posterior axillary line to the midline was demonstrated. At 36 h after the blockade, although the patient started to feel slight pain associated with movement, an almost complete sensory block of the T4-12 was still remained. Subsequently, the sensory block was observed to become incomplete (4 out of 10 as reported by the patient) and the affected area was cramped (T6-12) at 48 h. Finally, the effect of the sensory block disappeared at 56 h after the blockade.

This case has demonstrated an effective, broad, and long-lasting analgesic effect of the M-TAPA. Furthermore, by performing the repetitive pinprick tests, we demonstrated

the time course of the M-TAPA, which has not yet been investigated previously. The anesthetized area of the present patient was wider than previous reports [2, 4]. The larger volume of the local anesthetics used in the current case may be a reason behind such an observation. Although further research to reveal the spread of the local anesthetics and its mechanism is required, the M-TAPA can be a suitable option for LSG. Written informed consent was obtained from the patient.

## Declaration of interest

None.

## Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

## Conflicts of interest

None.

## Acknowledgements

**References**

[1] Ruiz-Tovar J, Albrecht E, Macfarlane A, Coluzzi F. The TAP block in obese patients: pros & cons. Minerva Anestesiol. 2019. https://doi.org/10.23736/S0375-9393.19.13545-6

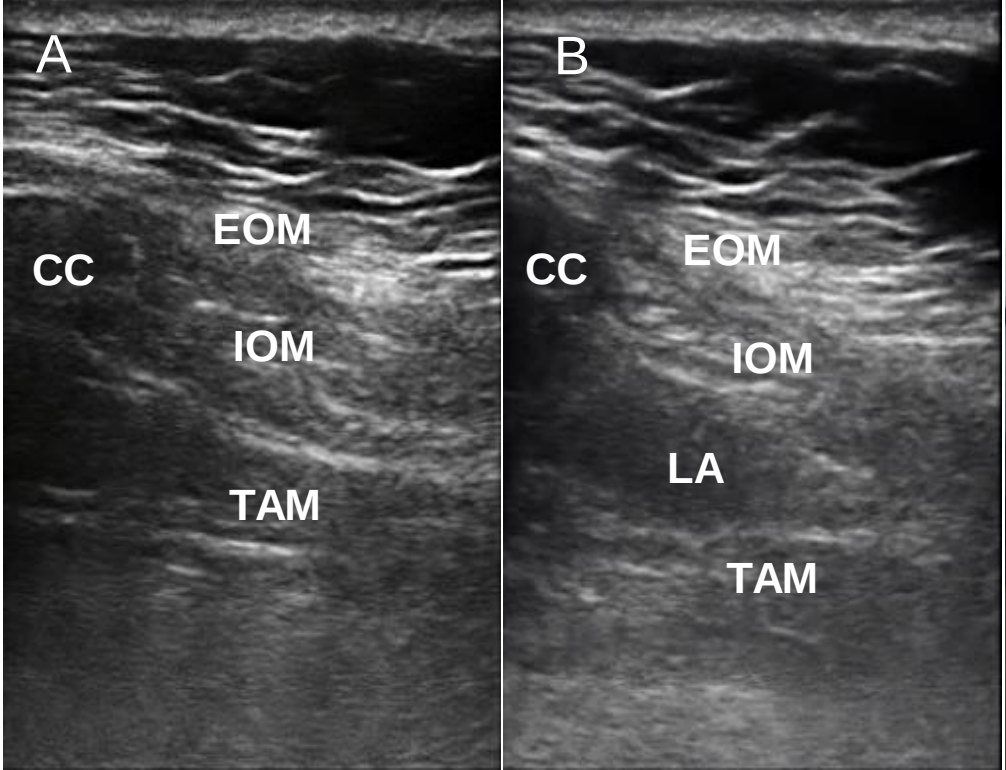
[2] Tulgar S, Selvi O, Thomas DT, Deveci U, Özer Z. Modified thoracoabdominal nerves block through perichondrial approach (M-TAPA) provides effective analgesia in abdominal surgery and is a choice for opioid sparing anesthesia. Journal of clinical anesthesia. 2019;55:109. https://doi.org/10.1016/j.jclinane.2019.01.003

[3] Tulgar S, Senturk O, Selvi O, Balaban O, Ahiskalioğlu A, Thomas DT, et al. Perichondral approach for blockage of thoracoabdominal nerves: Anatomical basis and clinical experience in three cases. Journal of clinical anesthesia. 2019;54:8-10. https://doi.org/10.1016/j.jclinane.2018.10.015

[4] Altıparmak B, Korkmaz Toker M, Uysal A, Turan M, Gümüş Demirbilek S. The successful usage of modified thoracoabdominal nerves block through perichondrial approach (M-TAPA) for analgesia of laparoscopic ventral hernia repair. Journal of clinical anesthesia. 2019;57:1-2. https://doi.org/10.1016/j.jclinane.2019.02.016

**Figure titles and legends**

Ultrasound image and postoperative abdominal wall. A, B. Ultrasound image of the perichondral area before (A) and after (B) local anesthetic solution was injected. C. Image of the postoperative abdominal wall. (CC: costal cartilage, EOM: external oblique muscle, IOM: internal oblique muscle, TAM: transversus abdominis muscle, LA: local anesthetic)


A
EOM
CC
IOM
TAM


B
EOM
CC
IOM
LA
TAM


C