

Ultrasound-guided glossopharyngeal nerve block for safe and effective anesthesia in a critically ill patient with acute myocardial infarction undergoing urgent endoscopy

Akut miyokard enfarktüsü olan kritik durumdaki bir hastada acil endoskopi için güvenli ve etkili anestezi sağlayan ultrason eşliğinde glossofaringeal sinir bloku

Ayda Turkoz¹, Myat Su Win², Mehmet Sari²

¹Department of Anesthesiology and Reanimation, Medipol Acıbadem Regional Hospital, İstanbul, Türkiye

²Department of Anesthesiology and Reanimation, Bezmialem Vakıf University Hospital, İstanbul, Türkiye

ABSTRACT

Glossopharyngeal nerve block (GPNB) can provide effective anesthesia for procedures involving the oropharynx and upper airway. Ultrasound-guided GPNB (UGPNB) may be particularly useful when conventional sedation or topical anesthesia is undesirable because of the risk of respiratory or cardiovascular complications. In this article, we report the use of UGPNB as an alternative anesthetic technique for gastroduodenal endoscopy in a 57-year-old male patient with AMI and gastrointestinal bleeding. In this patient requiring emergency endoscopy, UGPNB was performed via the peristyloid approach to provide oropharyngeal anesthesia while minimizing the need for sedation. The block effectively suppressed the gag reflex and provided adequate procedural conditions while maintaining hemodynamic stability. No procedure-related complications or adverse effects were observed, and the patient reported no discomfort following the procedure. In conclusion, UGPNB may be a useful alternative to sedation for endoscopy in high-risk cardiac patients.

Keywords: Endoscopy, glossopharyngeal nerve block, ultrasound, gastroduodenoscopy, acute myocardial infarction.

ÖZ

Glossofaringeal sinir bloku (GPNB), orofarenks ve üst hava yolunu ilgilendiren işlemlerde etkili anestezi sağlayabilir. Ultrasonografi eşliğinde GPNB (UGPNB), solunumsal veya kardiyovasküler komplikasyon riski nedeniyle konvansiyonel sedasyon veya topikal anestezinin tercih edilmediği durumlarda özellikle yararlı olabilir. Bu makalede, akut miyokard enfarktüsü (AMI) ve gastrointestinal kanama bulunan 57 yaşındaki erkek hastada gastroduodenal endoskopi için alternatif bir anestezi teknik olarak UGPNB kullanımı sunuldu. Acil endoskopi gerektiren bu hastada, sedasyon gereksinimini en aza indirmek ve orofarengal anestezi sağlamak amacıyla peristyloid yaklaşım kullanılarak UGPNB uygulandı. Blok, öğürme refleksini etkili bir şekilde baskılarken yeterli işlem koşulları sağladı ve hemodinamik stabilite korundu. İşleme bağlı herhangi bir komplikasyon veya advers etki gözlenmedi ve hasta işlem sonrasında herhangi bir rahatsızlık bildirmeydi. Sonuç olarak, UGPNB yüksek riskli kardiyak hastalarda endoskopi sırasında sedasyona alternatif olarak yararlı bir yöntem olabilir.

Anahtar sözcükler: Endoskopi, glossofaringeal sinir bloku, ultrasonografi, gastroduodenoskopi, akut miyokard enfarktüsü.

The glossopharyngeal nerve exits the skull through the anteromedial part of the jugular foramen, anterior to the vagus and accessory nerves, and within its own dural sheath.^[1] It then passes between the internal jugular vein and internal carotid artery, descends

deep to the styloid process, and runs along the stylopharyngeus muscle.^[2] Finally, it traverses the pharyngeal constrictor muscles to supply the tonsil, pharyngeal mucosa, posterior third of the tongue, vallate papillae, and oral mucous glands. In the oropharynx, it courses between the internal and

Corresponding author: Ayda Turkoz, MD.

E-mail: aydaturkoz@gmail.com

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external carotid arteries, where it can be targeted for regional anesthesia.

Glossopharyngeal nerve block (GPNB) provides effective oropharyngeal anesthesia, including the posterior third of the tongue, the pharyngeal surface of the epiglottis, and the vallecula, thereby suppressing the gag reflex. Severe complications are rare, particularly when low doses of local anesthetics are used, which reduces the risk of inadvertent cranial nerve blockade or intravascular injection. The introduction of ultrasound guidance has further improved safety by enabling real-time visualization.^[3] Traditionally used during awake intubations, GPNB may also serve as a feasible alternative to sedation for endoscopic procedures in the American Society of Anesthesiologists (ASA) Physical Status III and IV patients.^[4] In critically ill patients, even small doses of sedatives can induce cardiovascular and respiratory depression; therefore, GPNB with minimal or no sedation offers a safer option.

In this article, we describe a case demonstrating the efficacy and safety of ultrasound-guided GPNB (UGPNB) via the styloid process in a patient with acute myocardial infarction (AMI) requiring urgent endoscopy.

CASE REPORT

A 57-year-old male patient was admitted to the emergency department with gastrointestinal bleeding which started in the past 24 h and was accompanied by AMI. Coronary angiography performed one week earlier at another hospital revealed multiple coronary artery occlusions. Although coronary artery bypass

grafting and aortic valve replacement were planned, the patient decided to postpone surgery.

The patient was admitted to the coronary intensive care unit (ICU) and evaluated for anesthesia before an upper gastrointestinal endoscopy with duodenoscopy. He was conscious and cooperative, with a hemoglobin level of 6 g/dL. Laboratory tests showed elevated creatine kinase-muscle brain (CK-MB) (86 µg/L) and troponin (> 25,000 ng/L), while urea (44.5 mg/dL), creatinine (0.97 mg/dL), alanine aminotransferase (ALT) (38 U/L), and aspartate aminotransferase (AST) (50 U/L) were within normal limits. After transfusion of four units of blood, he was classified as ASA IV-E, and an UGPNB (12L-RS, 5-13 MHz; LOGIQ™ e Ultrasound System, GE Healthcare, Mountain View, CA, USA) was planned for the procedure.

Thirty min before the procedure, the patient received 1 mg of oral lorazepam (Ativan Expidet, Pfizer, İstanbul, Türkiye). He was monitored in the ICU with a 5-lead electrocardiogram, pulse oximetry, and invasive blood pressure measurement. Baseline vital signs were blood pressure 110/68 mmHg, heart rate 69 bpm, and peripheral oxygen saturation (SpO₂) 99%. A linear ultrasound probe was placed transversely between the mastoid process and the posterior edge of the mandibular ramus to visualize the styloid process. Color Doppler was used to identify the internal carotid artery and internal jugular vein. A bilateral UGPNB was then performed with a dental needle using an out-of-plane approach, placing the needle tip just posterior to the styloid process (Figure 1). After negative aspiration for blood or cerebrospinal fluid, lidocaine 1% 1.5 mL (Aritmal, Osel İlaç Sanayi ve Ticaret A.Ş., İstanbul, Türkiye) was injected on each side. A 5-min observation period followed to monitor for complications or side effects.

Ten min after the block, its effectiveness was confirmed by loss of the gag reflex, and the endoscopic procedure was started. The Richmond Agitation-Sedation Scale (RASS) score was 0. During the 8-min procedure, vital signs remained stable with no tachycardia or hypotension observed. Recorded values were blood pressure 100-118/59-67 mmHg, heart rate 58-63 bpm, and SpO₂ 98%. After the procedure, the patient reported no discomfort. A written informed consent was obtained from the patient for publication of this case report.

DISCUSSION

Ultrasound-guided GPNB provides a safer alternative to blind intraoral techniques. It is

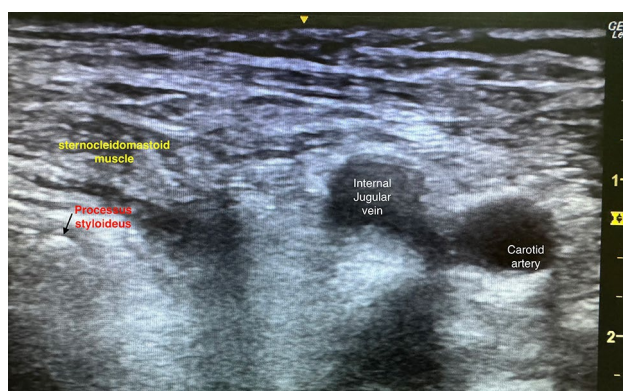


Figure 1. Ultrasound image obtained during the glossopharyngeal nerve block, showing the styloid process (arrow), sternocleidomastoid muscle, internal carotid artery, and internal jugular vein.

particularly useful in patients with high-risk coronary artery disease, low ejection fraction (< 30%), or limited cardiac reserve who may not tolerate sedation. Gastrointestinal bleeding may also complicate oral approaches, and ultrasound guidance further improves safety by reducing the risk of intravascular injection and allowing direct visualization of the glossopharyngeal nerve.^[4-6]

The glossopharyngeal nerve supplies sensation to the gag reflex pathway, the posterior third of the tongue, the oropharynx, the vallecula, and the anterior surface of the epiglottis. Blocking this nerve suppresses the gag reflex, lowers the need for additional anesthesia, and improves patient comfort during procedures such as endoscopy, dental interventions, tonsillectomy, and awake fiberoptic intubation.^[6]

The UGPNB is characterized by rapid onset, low drug requirement, and hemodynamic stability. Side effects are usually mild and temporary, such as short-term dysphagia, throat discomfort, or injection site pain. Rare but serious complications include intravascular injection, hematoma, airway obstruction from excessive local anesthetic spread, or unintentional blockade of nearby cranial nerves. Ultrasound guidance significantly reduces these risks by enabling real-time visualization of bone, soft tissue, and vessels, as well as confirmation of local anesthetic spread.^[5,7,8]

Several approaches have been described for UGPNB, including tonsillar, peri-styloid, carotid, and distal techniques. The distal approach selectively blocks the sensory branch and avoids vascular structures, thereby reducing complications, but it may be less effective. The peri-styloid approach, applied in this case, provides a more complete block but carries a higher risk of vascular injury. However, the use of ultrasound and color Doppler can help minimize these risks.^[3,5]

In most endoscopic procedures, topical lidocaine spray is used; however, it may not completely suppress the gag reflex, potentially resulting in tachycardia and hypertension. These hemodynamic responses are particularly undesirable in patients with AMI who are awaiting cardiac surgery. In such cases, deeper sedation may be required, increasing pulmonary and cardiovascular risks. Of note, UGPNB provides a reliable alternative, offering stable vital signs and greater safety compared with blind block techniques.^[9]

In conclusion, although the literature on the use of GPNB for outpatient endoscopy remains

limited, the present case suggests that UGPNB may be a valuable alternative to sedation-based strategies, particularly in critically ill patients at risk of respiratory or cardiovascular complications. By providing effective analgesia while preserving hemodynamic stability, UGPNB may also have potential applications in broader clinical practice. Further clinical studies involving larger patient populations are warranted to establish its safety, efficacy, and applicability in different clinical settings.

Author Contributions

All authors contributed to the preparation of the case report and manuscript writing and editing. Ayda Turkoz reviewed and approved the final version of the manuscript.

Conflict of Interest

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AI Disclosure

The authors declare that artificial intelligence (AI) tools were not used, or were used solely for language editing, and had no role in data analysis, interpretation, or the formulation of conclusions. All scientific content, data interpretation, and conclusions are the sole responsibility of the authors. The authors further confirm that AI tools were not used to generate, fabricate, or 'hallucinate' references, and that all references have been carefully verified for accuracy.

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