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CASE REPORT

Suprazygomatic Maxillary Nerve Block with Intravenous Dexmedetomidine Sedation for Endoscopic Septoplasty in a Patient with Coronary Artery Disease and Left Ventricular Systolic Dysfunction: A Case Report

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ABSTRACT

Endoscopic nasal procedures are traditionally performed under general anaesthesia (GA), which may increase the risk of perioperative major adverse cardiac events in patients with underlying cardiac disease. We report the successful use of ultrasound-guided supra-zygomatic maxillary nerve block (SZMNB) combined with intravenous dexmedetomidine sedation as the sole anaesthetic technique in a 38-year-old male with moderate left ventricular systolic dysfunction undergoing endoscopic septoplasty. Supplemental buccal oxygenation via a size 4 oral RAE tube ensured optimal oxygen delivery without obstructing the surgical field. The patient remained comfortable and hemodynamically stable throughout, with no requirement for airway instrumentation or postoperative opioids. This case demonstrates that SZMNB with dexmedetomidine sedation can serve as a safe and effective alternative to GA in selected high-risk cardiac patients undergoing nasal endoscopic surgery, ensuring perioperative cardiopulmonary stability and enhancing recovery.

Keywords: Suprazygomatic maxillary nerve block, dexmedetomidine, regional anaesthesia, endoscopic septoplasty, coronary artery disease, left ventricular dysfunction

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INTRODUCTION

Traditionally, endoscopic procedures involving the nasal cavity have been performed under general anaesthesia (GA) to ensure patient comfort and to facilitate the surgical approach. However, in individuals with significant cardiac disease, general anaesthesia may increase the risk of perioperative major adverse cardiac events.[1] Recent advances in regional anaesthesia techniques have introduced the ultrasound-guided suprazygomatic maxillary nerve block (SZMNB) as a novel alternative, capable of providing dense anaesthesia to the midface. SZMNB with intravenous dexmedetomidine may offer a safe and effective alternative that can avoid the stress response associated with the surgery and complications associated with GA in high-risk patients. This case report describes the successful use of SZMNB with dexmedetomidine sedation as the sole anaesthetic technique in a patient with coronary artery disease and left ventricular systolic dysfunction undergoing septoplasty.

CASE REPORT

A 38-year-old male, weighing 80 kg, with a known history of coronary artery disease, complicated with moderate left ventricular (LV) systolic dysfunction, hypertension, and type 2 diabetes mellitus, presented with nasal obstruction of three months duration. On clinical evaluation, he was found to have a deviated nasal septum, and endoscopic septoplasty was planned. His airway examination was unremarkable, and his effort tolerance was > 4 metabolic equivalent of task score (MET). His systemic examination and laboratory investigations were within normal limits. Echocardiography revealed moderate LV systolic dysfunction with antero-septum, anterolateral, and anterior wall severe akinesia with an ejection fraction of 39%.

Given the patient's underlying cardiac condition, the primary anaesthetic goal was to avoid myocardial oxygen supply-demand mismatch by minimising sympathetic stimulation and blunting the perioperative stress response. Therefore, ultrasound-guided suprazygomatic maxillary nerve block (SZMNB) combined with intravenous dexmedetomidine sedation was planned as the sole anaesthetic technique.

Informed written consent was obtained after explaining the anaesthetic plan and the associated risks. Carvedilol 3.125 mg and isosorbide dinitrate 40 mg were continued orally on the day of surgery. Clopidogrel 75 mg was withheld 7 days before the surgery, and metformin 500 mg and glimepiride 1mg were withheld on the day of surgery.

The patient was shifted to the operating room, and standard monitors were attached. A 20-G intravenous line was secured. A radial arterial line was placed for continuous hemodynamic monitoring, in view of impaired Left ventricular function.

Intravenous dexmedetomidine was administered at a loading dose of 1 µg/kg over 10 minutes, followed by an infusion of 0.5-1 µg/kg/hr. Under strict aseptic precautions, a bilateral ultrasound-guided suprazygomatic maxillary nerve block was performed. A high-frequency (8–13 MHz) linear probe was placed over the infrazygomatic region, and a 23-G needle was inserted at the angle between the posterior orbital rim and the superior border of the zygomatic arch, then advanced toward the pterygopalatine fossa under real-time ultrasound guidance using an out-of-plane approach [Figure 1]. A total of 5ml of local Anaesthetic solution (2.5 ml of 0.5% bupivacaine and 2.5 ml of 2% lignocaine with

adrenaline) was injected with 2.5 ml on each side in the pterygopalatine fossa to anesthetise the maxillary division of the trigeminal nerve on either side [Figure 2].

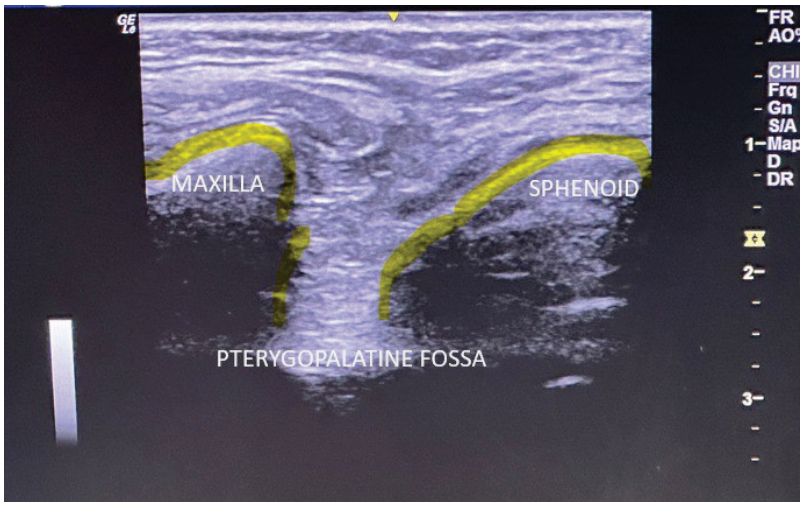

Figure 1: Sonoanatomy of the pterygopalatine fossa.

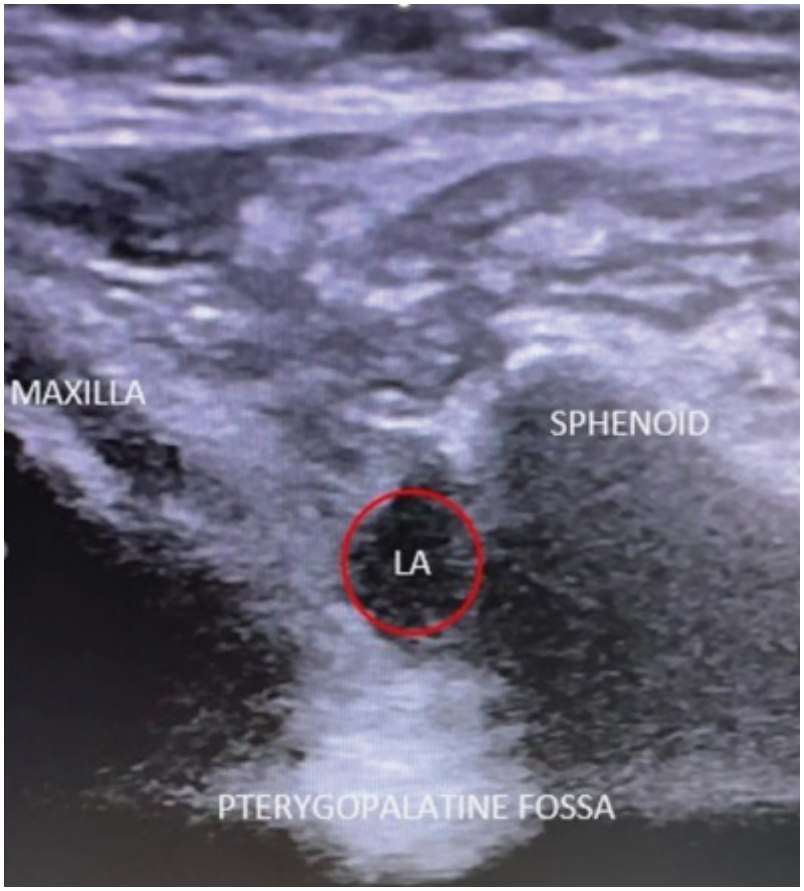

Figure 2: Sonographic picture showing the spread of local anaesthetic in the pterygopalatine fossa.

Adequate anaesthesia was achieved within 10 minutes. As the surgical field involved the nasal cavity, nasal oxygenation was not a feasible option. Therefore, supplemental buccal oxygen was provided via a size 4 oral Ring-Adair-Elwyn (RAE) tube, which allowed unobstructed surgical access while ensuring optimal oxygen delivery [Figure 3]. The intraoperative course was uneventful, with stable haemodynamics and adequate analgesia maintained throughout the procedure.

Figure 3: Size 4 oral RAE tube used for supplemental buccal oxygenation during septoplasty.

DISCUSSION

The maxillary nerve, the second division of the trigeminal nerve, is a pure sensory nerve that traverses the pterygopalatine fossa after exiting the foramen rotundum, giving rise to branches that innervate the midface, including the maxillary sinus, nasal cavity, palate, and upper teeth. Ultrasound-guided SZMNB targeting the maxillary nerve in the pterygopalatine fossa has emerged as a novel regional anaesthetic technique for providing effective analgesia in a variety of nasal and maxillofacial procedures.[2]

A recently conducted randomised controlled trial by Neupane A et al supports the efficacy of SZMNB as an adjunct to general anaesthesia in reducing postoperative pain, opioid consumption, and length of PACU stay in patients undergoing functional endoscopic sinus surgeries.[2] There are numerous other studies published in the literature quoting the efficacy of SZMNB as an adjunct to GA in reducing opioid requirements in procedures like cleft palate repair and paediatric adenotonsillectomies.[3,4]

Our patient, with a history of coronary artery disease and moderate left ventricular systolic dysfunction (EF 39%), was at increased risk of developing perioperative cardiac complications. In such patients, it is important to avoid sympathetic stimulation, tachycardia, and hemodynamic fluctuations, which are commonly associated with general anaesthesia.

By employing SZMNB with intravenous

dexmedetomidine sedation, we were able to achieve stable intraoperative haemodynamics, adequate surgical anaesthesia, and a smooth perioperative course. Dexmedetomidine, with its anxiolytic, analgesic, and sympatholytic properties, further contributed to cardiovascular stability by attenuating the stress response, thereby optimising myocardial oxygen supply-demand balance.[5] The absence of airway instrumentation further reduced the risk of major adverse cardiac events and postoperative pulmonary complications.[6]

A prominent aspect in the management of this patient was the innovative use of an oral RAE tube for supplemental buccal oxygenation, given the inaccessibility of the nasal route due to surgical requirements. This ensured adequate oxygenation throughout the procedure without compromising the surgical access.

The successful outcome in this case demonstrates the feasibility and safety of employing SZMNB as a primary anaesthetic technique in selected high-risk patients, aligning with the principles of Enhanced Recovery After Surgery (ERAS) protocols, which advocate for opioid-sparing and regional anaesthesia strategies to optimise perioperative outcomes.[7]

However, it is important to recognise the limitations of this approach. The efficacy of SZMNB as a sole anaesthetic technique may be procedure-specific and requires careful patient selection, particularly for surgeries of longer duration or greater complexity. Larger prospective studies are warranted to validate the generalizability of SZMNB in diverse surgical populations and to establish standardised protocols for its use as a primary anaesthetic modality.

CONCLUSION

This case highlights the potential use of ultrasound-guided SZMNB, in combination with intravenous dexmedetomidine sedation, as a safe and effective alternative to general anaesthesia in high-risk cardiac patients undergoing endoscopic procedures in the nasal cavity.

AUTHORS' CONTRIBUTIONS

Concept and design: SR

Literature review: SR, KM, SA, SK

Compilation of manuscript: PA, KM

Manuscript editing and proofreading: KM

DECLARATION OF CONFLICTS OF INTEREST

There are no conflicts of interest to be reported.

DECLARATION OF PATIENT'S CONSENT

Obtained consent from the patient for publication as a case report.

FUNDING

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