ISSN- O: 2458 - 868X, ISSN–P: 2458 – 8687
National Library of Medicine - ID: 101731606

International Journal of Medical Science and Innovative Research (IJMSIR)
IJMSIR : A Medical Publication Hub
Available Online at: www.ijmsir.com
Volume – 10, Issue – 6, December – 2025, Page No. : 94 – 97

Ambuscope-Assisted Intubation and Opioid-Free Anesthesia with Open Cervical Plexus Block in Oral Cancer Surgery with PMMC Flap and Oral Submucous Fibrosis: A Rare Anesthetic Challenge

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Citation this Article: Dr. Sakshi Singh, Dr. Upendra Kumar, Dr. Pratibha Rathore, Dr. Raksha Bairwa, Dr. Joel Selvin Mony, "Ambuscope-Assisted Intubation and Opioid-Free Anesthesia with Open Cervical Plexus Block in Oral Cancer Surgery with PMMC Flap and Oral Submucous Fibrosis: A Rare Anesthetic Challenge", IJMSIR - December – 2025, Vol – 10, Issue - 6, P. No. 94 – 97.

Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

Background: Oral submucous fibrosis (OSMF) is a precancerous condition associated with trismus and a high risk of oral squamous cell carcinoma (SCC). Anesthetic management is challenging due to airway restriction and prolonged surgery requiring flap reconstruction. Opioid-free anesthesia, though increasingly explored, remains rarely reported in this complex context.

Case: We report the perioperative management of a 31-year-old male with OSMF and infiltrating SCC of the oral cavity, posted for wide local excision, modified radical neck dissection (MRND), and pectoralis major myocutaneous (PMMC) flap reconstruction. Anticipating difficult airway, nebulisation and airway block were given, followed by Ambuscope-assisted nasotracheal intubation with a 7.5 mm flexometallic tube. An opioid-free anesthetic plan was executed using dexmedetomidine infusion, sevoflurane, and non-opioid adjuncts. At the end of surgery, an open superficial cervical plexus block was administered under direct surgical vision for postoperative analgesia. Surgery lasted 6 hours with stable intraoperative hemodynamics. Postoperatively, the patient was electively ventilated in ICU for 2 hours, extubated uneventfully, and remained comfortable with paracetamol and diclofenac as rescue analgesia. No opioids were used intraoperatively or postoperatively.

Conclusion: This case demonstrates the feasibility of a multimodal opioid-free anesthetic strategy in major oral cancer surgery with flap reconstruction and difficult airway. The novel use of an open cervical plexus blocks further enhanced postoperative analgesia, making this an educational and rarely reported anesthetic scenario.

Keywords: Oral submucous fibrosis; Oral squamous cell carcinoma; Ambuscope; Opioid-free anesthesia; Dexmedetomidine; PMMC flap; Open cervical plexus block; Difficult airway

Introduction

Oral submucous fibrosis (OSMF) is a chronic precancerous condition linked to areca nut chewing and characterized by progressive trismus. It significantly increases the risk of malignant transformation into oral squamous cell carcinoma (SCC). Anesthetic management in such patients is difficult due to airway restriction and the need for prolonged reconstructive procedures. Modified radical neck dissection (MRND) with pectoralis major myocutaneous (PMMC) flap reconstruction is associated with long operative duration, high nociceptive input, and postoperative airway vulnerability.

Traditionally, opioids have been the mainstay for intraoperative and postoperative analgesia. However, opioids are associated with delayed extubation, respiratory depression, flap edema, and impaired recovery. Dexmedetomidine, an α2-adrenergic agonist, provides analgesia and sympatholysis without respiratory depression, making it an attractive option for opioid-free anesthesia. While ultrasound-guided cervical plexus blocks are described for thyroid and neck surgeries, reports of open cervical plexus block under direct surgical vision for postoperative analgesia are scarce. We report the use of Ambuscope-assisted intubation and a multimodal opioid-free anesthetic regimen, including open cervical plexus block, in a young patient with OSMF and oral SCC undergoing MRND with PMMC flap reconstruction.

Case Report

A 31-year-old male (67 kg), chronic areca nut chewer, presented with a non-healing ulcer in the buccal mucosa for 2 months, associated with progressive trismus and ~4 kg weight loss. Examination revealed mouth opening <2 fingers, poor oral hygiene, and features of OSMF. He was diagnosed with infiltrating SCC of the oral cavity and scheduled for wide local excision, MRND, and PMMC flap reconstruction.

Preoperative evaluation: ASA class III. Baseline vitals: BP 88/80 mmHg, pulse 138/min, SpO_2 98% on room air. Airway: Mallampati grade III, restricted mouth opening, cervical spine mobility normal, nasal patency adequate. Laboratory investigations, ECG, and chest X-ray were within normal limits.

Anesthetic management: Standard ASA monitors were attached. Nebulisation and airway block were performed to facilitate airway management. Dexmedetomidine infusion (loading 1 µg/kg over 10 min, maintenance 0.5 µg/kg/hr) was started. Induction was achieved with glycopyrrolate, midazolam, propofol, and suxamethonium. Ambuscope-assisted nasotracheal intubation was performed using a 7.5 mm flexometallic tube, with backup difficult airway devices kept ready. Anesthesia was maintained with sevoflurane (MAC 1.5), oxygen, air, dexmedetomidine, and cisatracurium. Intraoperative arterial line and CVP monitoring were established. Surgery lasted from 8:30 am to 2:00 pm (~6 hours). Intraoperative blood pressure ranged 90/60–100/70 mmHg and pulse 88–94/min. Estimated blood loss was 400 ml. Intraoperative analgesia was maintained solely with dexmedetomidine and two doses of paracetamol infusion. No opioids were administered.

Postoperative course: Before wound closure, under direct surgical vision, an open superficial cervical plexus block was administered by infiltrating 10 ml of 0.25% bupivacaine along the exposed cervical plexus at the posterior border of sternocleidomastoid. The patient was shifted intubated to ICU, electively ventilated for 2 hours, and extubated uneventfully. Postoperative vitals: HR 102/min, BP 130/90 mmHg. Analgesia was maintained with paracetamol and diclofenac. No opioids were used postoperatively. The patient remained pain-free in the immediate postoperative period, flap perfusion was adequate, and recovery was smooth.

Discussion

The coexistence of OSMF and oral SCC creates significant anesthetic challenges due to restricted airway and the requirement of long-duration reconstructive surgery. Airway management is often complicated, and strategies such as fiberoptic intubation, Ambuscope use, or tracheostomy are frequently considered. In our case, Ambuscope-assisted intubation ensured a safe and atraumatic airway approach despite severe trismus. Opioid-free anesthesia has been increasingly advocated in onco-anesthesia to avoid opioid-related complications such as respiratory depression, delayed extubation, and flap edema. Dexmedetomidine provides sedation, analgesia, and sympatholysis, allowing stable hemodynamics and reduced need for opioids. In our patient, intraoperative analgesia was adequately maintained with dexmedetomidine infusion and paracetamol, without the use of opioids. Regional anesthesia techniques like cervical plexus blocks are well described for thyroid and carotid surgeries, usually performed under ultrasound guidance. However, in this case, an open cervical plexus block was administered under direct vision at the end of MRND, providing excellent postoperative analgesia. To our knowledge, such an open approach in the context of major oral cancer surgery with flap reconstruction has not been reported previously. This novel step strengthened the opioid-free protocol and ensured effective multimodal pain management. Thus, the combination of Ambuscope-assisted intubation, dexmedetomidine-based opioid-free anesthesia, and open cervical plexus block represents an innovative multimodal strategy for managing complex head and neck surgeries in patients with OSMF.

Conclusion

This case highlights the successful management of a young patient with oral SCC and severe OSMF undergoing MRND with PMMC flap reconstruction, using Ambuscope-assisted intubation, dexmedetomidine-based opioid-free anesthesia, and a novel open cervical plexus block for postoperative analgesia. The combination of difficult airway, prolonged surgery, flap safety, and an opioid-free strategy makes this an educational and rarely reported anesthetic scenario.

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Legend Figures

Figure 1: Ambuscope-assisted nasotracheal intubation view showing vocal cords in a patient with oral submucous fibrosis and oral squamous cell carcinoma.

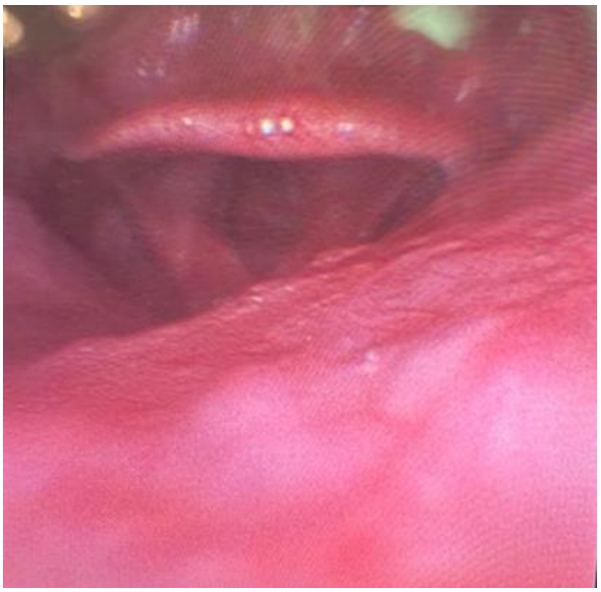

Figure 2: Airway preparation with bilateral superior laryngeal nerve block performed using local anesthetic infiltration to facilitate intubation and perioperative analgesia.

Figure 3: Schematic illustration of open cervical plexus block. Injection of local anesthetic at the posterior border of sternocleidomastoid provides spread to cervical plexus branches.