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Research Article

Combining Dexmedetomidine and Airway Blocks for Awake Airway Access: Insights from Three Clinical Cases

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INTRODUCTION

Airway management in patients with anticipated difficult airway anatomy poses significant challenges to anaesthesiologists. Techniques such as conscious sedation with dexmedetomidine and regional airway blocks offer an alternative to general anesthesia, providing adequate sedation while preserving spontaneous ventilation and airway reflexes. This case series presents three patients with challenging clinical case scenarios and airway anatomy managed successfully using combination of conscious sedation and regional airway blocks.

Case 1- Awake Rigid Bronchoscopy

64 years old male patient was diagnosed with severe subglottic tracheal stenosis at level of C6-T1, scheduled for elective endoscopic tracheal dilatation. He developed noisy & difficult breathing after 12 days of ICU stay on mechanical ventilator following road traffic accident. CT chest & neck revealed subglottic tracheal stenosis at level of C6-T1. The surgery was planned under combined airway blocks and conscious sedation. On airway assessment, there were no facial abnormalities, mouth opening more than three fingers, Modified Mallampati grade II, normal extension & flexion of neck. After written informed consent, he was planned for conscious sedation with dexmedetomidine & airway blocks. Patient was shifted to OT; all monitors attached according to ASA standard. Difficult airway cart was kept ready. One i.v. canula of 16 G was secured. Injection dexmedetomidine bolus was started at 1µg/kg for 10 minutes. At same time patient was nebulized with 2% lignocaine. 10% lignocaine spray was applied gently on the pharyngeal walls. Under aseptic & antiseptic precautions, superior laryngeal nerve block was given with 2 mL of 2% lignocaine on each side & intratracheal block was given with 5ml of 2% lignocaine. Inj. glycopyrrolate 0.2mg i.v. was administered for antisialagogue action to improve visualization & inj. dexamethasone 8 mg i.v. for prophylaxis against postoperative nausea and vomiting & any airway oedema post instrumentation. After ten minutes of loading dose, dexmedetomidine was maintained at 0.5 µg/kg/h. Patient was sedated but arousable to verbal commands with RAAS score of -2 after 15 minutes of dexmedetomidine infusion following which it was decided to go ahead with procedure. Oxygen was supplemented with nasal prongs at 5 L/min. Rigid bronchoscope was inserted by the surgeon during which oxygenation was maintained via ventilator circuit connected to it at 8 L/min. It was a smooth access till the vocal cords but when the stenosed area was reached, patient developed discomfort for which inj. propofol 40 mg i.v. bolus was given & dexmedetomidine infusion was increased to 0.7 µg/kg/h. The spontaneous effort was preserved throughout the procedure with RAAS score of -2 to -3. Tracheal dilatation was done for duration of 30 secs each at two sittings after which bronchoscope size 7.5mm could freely pass through the stenosed area (Figure 1). There were no signs of bleeding, oozing or bronchospasm. Hemodynamic parameters like heart rate, oxygen saturation & respiratory efforts of patient were maintained stable throughout the procedure except for two episodes of hypotension to systolic blood pressure of 90 mmHg which was managed with inj. mephentermine 6 mg i.v. bolus.

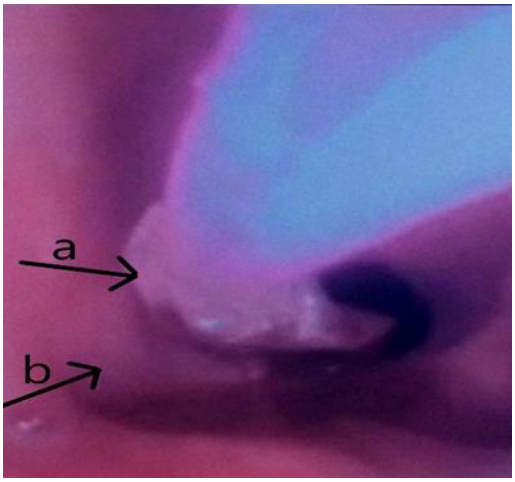

Figure 1. Showing Tracheal Lumen after Dilatation. A- Balloon over Guide Wire Used for Dilatation, B- Dilated Tracheal Area.

Case 2- Awake Intubation with Video Laryngoscope

50 years old male patient with alleged history of bike accident presented with closed fracture of proximal humerus and tibia on right side, planned for open reduction and internal fixation. He was a known case of ankylosing spondylitis for 15 years. Airway assessment revealed Modified Mallampati Grade IV, severely restricted neck movements, mouth opening of only 3 cm. After written informed consent, airway preparation was done in similar manner as previous case with airway blocks, inj dexmedetomidine infusion, inj glycopyrrolate and inj dexamethasone. RAAS score of -2 was achieved after 20 minutes of initiation of dexmedetomidine, which was continued at 0.5 µg/kg/hr. Preoxygenation was done with 100% oxygen for 3 minutes. Under video laryngoscope guidance, 8mm I.D. endotracheal tube was inserted (CL grade 3), [Figure 2]; cuff was inflated and position confirmed with bilateral equal air entry and capnography. General anaesthesia was then induced with inj. propofol 60 mg i.v., inj. fentanyl 100 µg i.v., inj. rocuronium 60 mg i.v. and maintained with O2, N2O, Sevoflurane and inj rocuronium. Dexmedetomidine infusion was then discontinued. Coughing and gagging only occurred during laryngoscopy, otherwise patient tolerated the endotracheal tube adequately. No incidence of hypotension, bradycardia or any other airway complication was recorded.

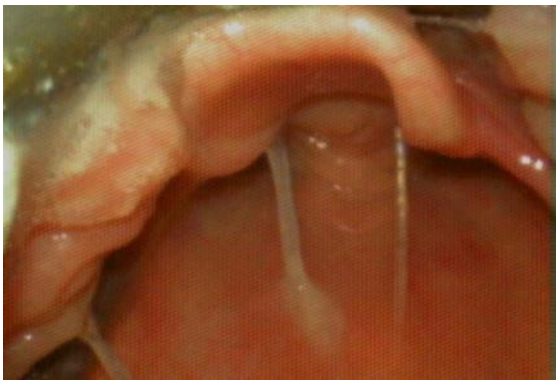

Figure 2- Video laryngoscopy view of glottis.

Case 3- Awake Fibreoptic Nasal Intubation

53 years old male patient with history of progressively increasing ulcerative growth over left lateral aspect of tongue for 2 years, planned for total glossectomy with segmental mandibulectomy under awake fibreoptic nasal intubation. He had ulcerative growth in oral cavity with Modified Mallampati Grade III, which was labile to bleed on oral manipulation. After written informed consent, airway preparation was done in similar manner as previous case with airway blocks, inj dexmedetomidine infusion, inj glycopyrrolate and inj dexamethasone. RAAS score of -2 was

achieved within 15 minutes after which it was decided to go ahead with awake fibreoptic nasal intubation with dexmedetomidine infusion continued at rate of 0.5 µg/kg/hr. Oxygen was provided at 6 L/min throughout the procedure via face mask. Successful intubation could be done in 10 minutes after visualizing the passage of bronchoscope into trachea below vocal cords (Figure 3). Flexometallic endotracheal tube of 6.5 mm ID was passed over bronchoscope into trachea and position was confirmed by ETCO2 and bilateral equal air entry. Patient could adequately tolerate the passage of bronchoscope but had cough only during railroading of endotracheal tube without hypotension, bradycardia or any other airway complication.

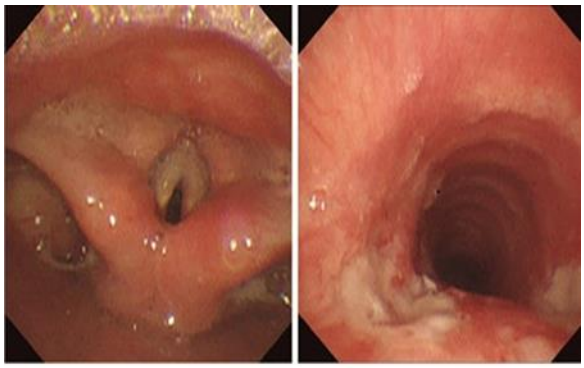

Figure 3. Pane A shows fibreoptic view of glottis. Pane B shows tracheal view.

DISCUSSION

These three cases illustrate combination of conscious sedation with dexmedetomidine and regional airway blocks for safe airway access, either for endoscopic intervention (rigid bronchoscopy) or definitive airway control (awake intubation), without the need for general anesthesia or neuromuscular blockade. The combination of regional blocks with dexmedetomidine infusion provide synergistic benefit: the airway blocks blunt reflexes in response to airway instrumentation [1] while dexmedetomidine reduces anxiety and need for sedation [2]. Observations from these three cases are consistent with previous randomised control trials advocating combination of dexmedetomidine conscious sedation with airway blocks [3-5]. One systematic review [6] inferred that dexmedetomidine use has less discomfort, airway complications and hypoxemia as compared to other sedatives (fentanyl, midazolam and propofol). Another systematic review [7] concluded less incidence of hypoxemia but more of bradycardia and no difference in incidence of hypotension, arrythmias and patient satisfaction with dexmedetomidine as compared to other sedative agents (propofol, midazolam, lignocaine, opioids). A randomised control trial by sharma et al [8], compared two different bolus doses of dexmedetomidine (1µg/kg vs 0.5 µg/kg) in cervical spine injury patients undergoing awake fibreoptic intubation and concluded that higher dose group of dexmedetomidine had higher sedation scores with no difference in endoscopy and intubation time, patient tolerance, vocal cord and limb movement and patient satisfaction score. Dexmedetomidine was associated with hypotension, as seen in our first case. Close monitoring and vasopressor readiness are therefore essential. Coughing and gagging still occurred in all the patients during airway manipulation at and below vocal cords but the patient tolerated the endotracheal tube adequately. No event of hypoxia, laryngospasm or bronchospasm were noted.

CONCLUSION

The combination of dexmedetomidine conscious sedation with airway nerve blocks is well supported by current literature and was effectively utilized in three different clinical scenarios. Future large and multicentric randomised control trials are needed to compare the effects of dexmedetomidine with other sedative agents and to guide effective dose of this drug in combination with airway blocks for awake airway management.

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