



Rhinorrhea due to Infusion of Dexmedetomidine during Rhinoplasty: A Case Report and Current Literature Review

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Abstract

Dexmedetomidine can be used to achieve controlled hypotension during surgery. A 26-year-old female with no medical history underwent rhinoplasty. The maintenance of the anesthesia was achieved with propofol and dexmedetomidine (1 mcg kg⁻¹ as a loading dose for 10 minutes, followed by 0.5 mcg kg⁻¹ hr⁻¹ as maintenance) infusion as total intravenous anesthesia. Propofol and dexmedetomidine infusion doses were adjusted to maintain a bispectral index of 40-60 and a mean arterial pressure of 55-65 mmHg. During surgery, rhinorrhea developed, which disrupted the view of the surgical field. An intravenous antihistamine and a topical decongestant were administered. However, rhinorrhea persisted, suggesting that it developed as a drug-related adverse effect. Dexmedetomidine was halted. Subsequently, the rhinorrhea decreased, and the quality of the surgical field improved. That was a temporary and reversible side effect, which resulted in no long-term sequela. To the best of our knowledge, this is the first patient who developed rhinorrhea as a side effect of dexmedetomidine infusion during rhinoplasty.

Keywords: Controlled hypotension, dexmedetomidine, rhinoplasty, rhinorrhea

Introduction

Rhinoplasty is one of the most commonly performed aesthetic surgical procedures. The nasal cavity is an area with a rich blood supply. Thus, bleeding is expected during surgery, which undermines the outcome of rhinoplasty. Reduction of bleeding and achieving the best visual acuity in the surgical field are critically important. Intraoperative controlled hypotension is one of the most common measures to reduce nasal bleeding during surgery. Several medications can be used to achieve controlled hypotension, including beta-blockers, magnesium sulfate, calcium-channel blockers, and many total intravenous and inhalational anesthetics. In this regard, interest in dexmedetomidine has increased recently, and we have used dexmedetomidine in rhinoplasty to achieve controlled hypotension. Many studies have evaluated the role of dexmedetomidine in the induction and maintenance of

controlled hypotension (1,2). However, to our knowledge, none of these studies has reported rhinorrhea as a side effect associated with dexmedetomidine.

Here, we present a case of rhinorrhea that developed as a side effect of dexmedetomidine infusion during rhinoplasty and discuss its management.

Case Report

A 26-year-old female patient with no medical history was referred to our institution for rhinoplasty. She was premedicated with 2 mg of midazolam. After standard monitoring, the patient was given oxygen via a face mask for 3 minutes. Intravenous anesthesia induction was performed with propofol (2-2.5 mg kg⁻¹), rocuronium bromide (0.6-mg kg⁻¹) and fentanyl (2 mcg kg⁻¹). After muscle relaxation, the patient was intubated. The maintenance of the anesthesia was achieved with propofol (0.1 mg kg⁻¹ min⁻¹) and dexmedetomidine (1 mcg kg⁻¹

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as a loading dose for 10 minutes, followed by 0.5 mcg kg⁻¹ hr⁻¹ as maintenance) infusion as total intravenous anesthesia. Propofol and dexmedetomidine infusion doses were adjusted to maintain a bispectral index of 40–60 and a mean arterial pressure of 55–65 mmHg.

The quality of the surgical field (1= bad, 2= acceptable, 3= good) and the satisfaction level of the surgeon (1= dissatisfied, 2= satisfied, 3= very satisfied) were evaluated throughout the surgery. At the 30th minute of the surgery, the quality of the surgical field was reported as 1, and the satisfaction level of the surgeon was reported as 1. The reason for this was rhinorrhea, which disrupted the visual acuity in the surgical field. Intravenous antihistamine (pheniramine maleate, 45.5 mg) and topical decongestant (oxymetazoline, 2 puffs on each side) were administered to manage rhinorrhea. Since rhinorrhea did not decrease after waiting for 30 minutes with these measures, a drug-related adverse effect was suspected. First, dexmedetomidine infusion was stopped, and remifentanyl infusion was started instead. After 15 minutes, the rhinorrhea terminated, the quality of the surgical field improved, and the operation was successfully completed. At the end of the procedure, the remifentanyl infusion was stopped, and the patient was given ibuprofen 400 mg for analgesia. The demographic and intraoperative data of the patient are provided in Table 1. Postoperative recovery was uneventful, and she was discharged with no other complications 1 day after rhinoplasty.

Discussion

Average blood pressure is a significant factor influencing bleeding during surgical procedures. In healthy individuals, the induction of controlled hypotension to a mean arterial pressure of 50 mmHg is not expected to have a substantial side effect. Dexmedetomidine, a potent and highly selective α -2 adrenoceptor agonist with sympatholytic, sedative, amnestic, and analgesic

features, can also induce hypotension. Dexmedetomidine was evaluated for hypotension in middle ear surgery, endoscopic sinus surgery, rhinoplasty, spine surgery, and laparoscopic colectomy (3). It was demonstrated that dexmedetomidine more effectively induces hypotension than esmolol, magnesium sulfate, and nitroglycerin (3). Therefore, we started to use dexmedetomidine to reduce bleeding in patients undergoing rhinoplasty.

The reported adverse effects of dexmedetomidine are excessive sedation, hypotension, hypertension, bradycardia, hypoxemia, nausea, vomiting, urine retention, respiratory depression, headache, shivering, pruritis, blurred vision, and neurological complications (4). However, these side effects are rare, and rhinorrhea has not been reported previously as a side effect of dexmedetomidine. In a systematic review by Lee et al. (5), dexmedetomidine, and placebo showed no difference in the incidence of perioperative side effects. However, considering the limited number of randomized studies reporting complications, the authors concluded that evidence for complications associated with dexmedetomidine was weak (5).

Rhinorrhea is a symptom in which the nasal cavity is filled with excessive amounts of mucus produced by the mucous membranes. It is a common symptom of allergies and some viral infections. Nasal irritation or inflammation can also cause rhinorrhea. It can be a side effect of crying, cocaine abuse, various genetic disorders, or medication. For managing rhinorrhea, antihistamines, decongestants, and saline nasal sprays may be used. These medications help either to cease the discharge of mucus or to limit its overflow. In this case, the first-line treatment for rhinorrhea was intravenous antihistamine and nasal decongestant. However, rhinorrhea did not stop, and we suspected a drug-related adverse effect. We terminated the infusion of dexmedetomidine and then the rhinorrhea halted. Rhinorrhea in this patient was a temporary and reversible side effect and resulted in no long-term sequela.

The autonomic nervous system controls the blood flow to the nasal mucosa and mucus secretion. The sympathetic system mediates the diameter of the vessels in the nose. Dexmedetomidine produces sedation by agonizing the central α 2-receptors. Stimulation of α 2-receptors also leads to decreased sympathetic nervous system activity and plasma norepinephrine concentrations. Dexmedetomidine-induced bradycardia is attributed to centrally mediated sympathetic withdrawal (6). The underlying mechanisms of rhinorrhea are not clear. It can be suggested that a decrease in sympathetic innervation causes venous dilatation and swelling of the nasal mucosa, hence leading to congestion and rhinorrhea. The total dose of dexmedetomidine and infusion duration may affect this side effect.

To the best of our knowledge, this is the first reported

	Patient
Age (years)	26
Gender	Female
Weight (kg)	63
ASA physical status	1
Total dexmedetomidine dose (mcg)	73
Mean arterial pressure (mmHg)	60
Mean heart rate (bpm)	75
Estimated blood loss (ml)	150
Duration of surgery (minutes)	150
Duration of anesthesia (minutes)	165

bpm: Beats per minute, ASA: American Society of Anesthesiologists

case of rhinorrhea developing after a dexmedetomidine infusion used to induce controlled hypotension. We conclude that rhinorrhea as a side effect of dexmedetomidine should be considered in the differential diagnosis of patients receiving dexmedetomidine and developing rhinorrhea. An antihistamine and a decongestant can be administered to reduce symptoms. Further studies are needed to assess the frequency of rhinorrhea after dexmedetomidine infusion.

Ethics

Informed Consent: Informed consent was obtained.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: T.U.Y., Y.O.A., Design: T.U.Y., Y.O.A., Data Collection or Processing: P.K., H.G., Analysis or Interpretation: Y.O.A., J.D.T., Literature Research: H.G., J.D.T., Writing: T.U.Y., Y.O.A.

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