



# LETTERS

## **Asystole During Laryngoscopy of a Patient With Pleural and Pericardial Effusions**

**To the Editor:** The February 2008 *AANA Journal* contained an interesting case report that questioned the association of laryngoscopy with an asystolic event.<sup>1</sup> The origin of this asystole may have involved the interplay of several factors, the most significant of which was the administration of succinylcholine before the laryngoscopy. The association of succinylcholine and cardiac dysrhythmias was not mentioned as a likely causative factor in this article.

Bradyasystolic events following a single dose of succinylcholine in adults, although a rare event, has been well-documented in the older literature. Sorensen et al<sup>2</sup> published a case series of 20 patients who experienced either bradycardia (n = 18) or asystole (n = 2) following thiopental, succinylcholine, fentanyl, pancuronium, or gallamine induction. All patients had a normal electrocardiogram preoperatively. Only 1 patient was noted to have taken a beta blocker preoperatively, which was salbutamol aerosol for management of asthma. Twelve of the patients received what today would be considered large doses of droperidol at the time of induction (5-20 mg). None of the patients were premedicated with atropine, and 4 received morphine and scopolamine "subcutaneously." There was no notation of laryngoscopy during the time course of

these events. Treatment involved atropine, 0.5 to 1.0 mg (n = 16); precordial thump (n = 3); external cardiac massage (n = 1); or, most interesting of all, nothing (n = 3). The patients who received no treatment at all included the 2 patients in the series who experienced asystole. All patients recovered without sequelae.

Another case series reported by Inoue and Reichelt<sup>3</sup> involved 46 patients who received fentanyl, etomidate, and succinylcholine for induction. Bradycardia was described as severe in only 1 patient, and 2 experienced asystole. All of these patients had significant cardiovascular disease and were scheduled for coronary artery bypass grafting. Only 1 patient had been taking a beta blocker regularly (metoprolol), and this was discontinued 2 days before surgery. Preoperative medication included morphine (n = 2) and morphine and diazepam (n = 1). No antimuscarinic agent was given preoperatively. The bradyasystolic events were described as occurring 30 seconds to 1 minute following the injection of succinylcholine. All patients received external cardiac massage, and 2 received atropine, 1.0 mg. It is of interest to note that one of the asystolic patients did not receive atropine. The heart rates improved after 10 to 15 seconds of the event. In all cases, the remainder of the anesthetic and the surgery proceeded without event.

Rivard and Liebowitz<sup>4</sup> present a case report of a 10-second episode of asystole following an alfentanil,

pentothal, curare/succinylcholine induction. The patient took no prescription medication and had received only midazolam preoperatively. The event was described as occurring "immediately before laryngoscopy." The patient was intubated, and the pulse and blood pressure returned without pharmacologic or other intervention.

Two case reports of bradyasystolic events associated with electroshock therapy attribute the cause to the administration of propranolol preoperatively in an effort to reduce electroshock therapy-associated dysrhythmias.<sup>5,6</sup> Both reports note that "the standard administration of atropine was omitted."<sup>7</sup> Anesthesia was then induced with succinylcholine and thiopental. One patient was treated with cardiopulmonary resuscitation, with return of normal sinus rhythm after 15 seconds of asystole. The second case was treated with "thump pacing," with return of normal sinus rhythm after 15 seconds of asystole. Both patients recovered uneventfully. Succinylcholine, rather than propranolol, may have been the trigger for these asystolic events.

Protection against succinylcholine-induced bradycardia can be achieved by the preoperative administration of an antimuscarinic agent. Both glycopyrrolate and atropine have been noted to be equally protective, and 1 paper suggests the protective effect of glycopyrrolate is "similar to or greater than that of atropine."<sup>8</sup>

This information strongly suggests the authors of the *AANA Journal* case

report<sup>1</sup> experienced a succinylcholine-mediated bradycardic event. Preoperative administration of an antimuscarinic agent can prevent such an event from occurring. How should such an event be treated once it arises? It is intriguing that some patients in the above-cited series, including those in the asystolic group, received no therapy at the time of the event and recovered in the same time frame when compared with those who received a treatment of some kind.

One could speculate whether the presence of other vagotonic factors could have an additive effect, predisposing a patient to experience succinylcholine-induced bradycardia. Such factors during the induction period include the administration of narcotics, beta blockers, and drugs with presumed vagal ganglionic stimulating effects, such as succinylcholine. In addition, the process of laryngoscopy involves the stimulation of up to 2 cranial nerves, the glossopharyngeal and vagus, which can precipitate a bradycardiac response. Other events that can occur during the operative period with known vagal effects include the oculocardiac reflex, carotid sinus massage, peritoneal traction, and electric shock, effectively managed by cessation of the stimulus and administration of an antimuscarinic agent.

This was a very interesting case report, presenting a scenario that every anesthesia practitioner will encounter at some point in his or her career.

#### REFERENCES

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#### **Geraldine Syverud, CRNA**

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**Response:** We would like to thank Geraldine Syverud, CRNA, for her insightful and informative response to our article, "Asystole during Laryngoscopy of a Patient with Pleural and Pericardial Effusions: A Case Report." We agree that the administration of succinylcholine may predispose the patient to bradycardic events but did not consider this a factor in our case. Our patient did not become asystolic until laryngoscopy was performed. Once the laryngoscope was withdrawn, the patient fully recovered. When laryngoscopy was attempted again, the patient became asystolic. The laryngoscope was withdrawn, the patient recovered fully, and atropine was administered before the next laryngoscopy, which was uneventful. For this reason, the administration of succinylcholine was ruled out as the probable cause of asystole in our patient.

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#### **Correction**

In an April 2008 *AANA Journal* article titled "Nerve Agents: Implications for Anesthesia Providers," the word "pneumonic" should have been "mnemonic." "Pneumonic" appears on page 95, right column, 4 lines from the bottom, and on page 96, left column, ninth line. The AANA website version of the article has been corrected.