

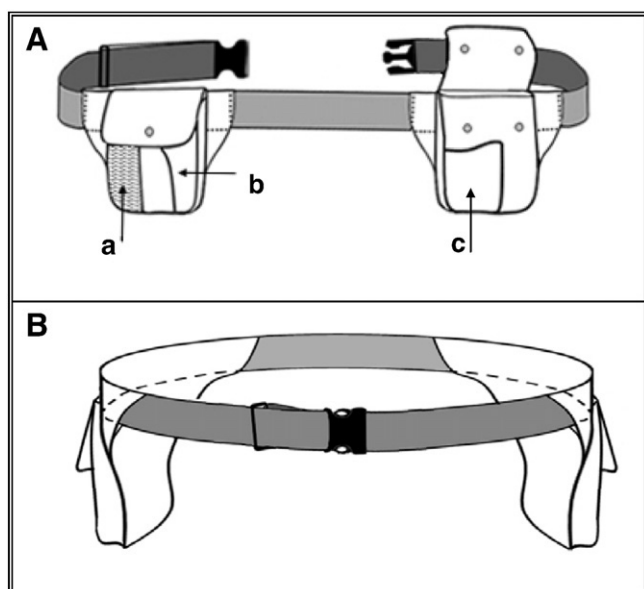


Fig. 2 Prototypes for external carrying and storage object positioned at the waist or hips. Samples of designated pocket units for specific uses: (a) scissors, (b) pen, (c) phone, iPod). A. Opened buckle, back view; B. Closed buckle, front view.

we used in our study, to accommodate local tradition and changing preferences.

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Cosmetic anaphylaxis?

To the Editor:

Baldo and Fisher have shown that substituted ammonium ions may serve as allergenic determinants in drug allergy [1]. The widespread prevalence of quaternary and tertiary ammonium ions in cosmetics, foods, and disinfectants has been suggested as a source by which sensitization can take place. The use of cosmetics has been suggested as an explanation for the much higher incidence of allergy to muscle relaxants in women. Similarly, the sixfold greater incidence of allergy to relaxants in Norway (compared with Sweden) has been linked to pholcodine exposure and supports the suggestion that exposure to other compounds may sometimes be the source of anaphylaxis to relaxants during anesthesia [2,3]. A patient in whom there was an association between the use of theatrical cosmetics and the subsequent development of anaphylaxis to rocuronium and succinylcholine without previous exposure is presented.

A 47-year-old man was admitted for coronary artery bypass graft surgery. Five weeks prior to admission, he had a silent non-ST elevated myocardial infarct with a positive troponin. His past history included type 2 diabetes with end-organ damage including retinopathy, nephropathy, peripheral neuropathy, and peripheral vascular disease. He was also hypertensive and hyperlipidemic. He was known to have an allergy to penicillin which resulted in a rash. This report is made with the informed consent of the patient.

His previous anesthetics included, at age 27, a left cataract extraction with insertion of intraocular lens with a general anesthetic, for which only pancuronium was used as the muscle relaxant. He had also had a left great toe amputated with a regional ankle block a few weeks prior to cardiopulmonary bypass (CPB). His coronary angiogram was done during local anesthesia with sedation. There was

no history of any anesthetic procedure with rocuronium or succinylcholine.

In the operating room, 16-gauge peripheral venous access was secured and the patient was sedated with intravenous (IV) midazolam two mg while an arterial catheter was inserted with lidocaine. Monitoring for the surgery included electrocardiograph, pulse oximetry, end-tidal capnography, vapor analyzer, invasive arterial and central venous pressure monitoring, nasal temperature, and bispectral index (BIS) monitoring.

The patient was preoxygenated and then induction commenced with a further three mg of midazolam IV, fentanyl 1,500 mcg, and rocuronium 50 mg. Following the induction, systolic blood pressure decreased from 170 to 70 mmHg and heart rate increased from 78 to over 180 beats per minute. Oxygen saturation decreased to 80% but there was no obvious bronchospasm. A bougie was used to expedite intubation.

Norepinephrine and epinephrine infusions were commenced and one liter (L) of albumin and two L of crystalloids were infused rapidly over 30 minutes. Anaphylaxis was suspected and a sample for mast cell tryptase was collected about one hour after initiation of the induction. After the initial resuscitation, he was deemed sufficiently stable hemodynamically for the surgery to proceed. Five grafts were performed.

Separation from CPB was uneventful and patient was transferred to the intensive care where his lungs were ventilated for a period of 24 hours and then his trachea was extubated uneventfully. The mast cell tryptase, which was taken about 60 minutes after the reaction, was 16 mcg/L ($N < 7$).

The patient returned to the hospital 6 weeks later for provocative testing. Intradermal skin testing was done on the right forearm. The drugs tested were fentanyl, succinylcholine, vecuronium, midazolam, rocuronium, gentamicin, and pancuronium in a 1:100 dilution, with saline as a negative control. A normal response is no wheal evident 30 minutes after injection.

Patient reacted to succinylcholine, producing a wheal/flare of 15/25 mm, and to rocuronium, with a wheal/flare of 10/25 mm. No reaction was found with the pancuronium or with the other drugs tested. As is our routine with all patients who have had an anaphylactic reaction, arrangements were made for the patient to receive a Medic-Alert bracelet, in this instance, stating "allergic to rocuronium and succinylcholine".

During the intradermal allergy testing the patient said that he used to work for an ambulance service. On further discussion, he said that as part of this work he was involved in training paramedics with moulage trauma scenarios. Moulage is the art of creating mock injuries for the purpose of training emergency response teams. Moulage may be as simple as applying pre-made rubber or latex "wounds" to a healthy "patient's" limbs, chest, head, etc., or as complex as using extensive makeup and

theatre techniques to provide elements of realism (eg, blood, vomitus) to the training simulation. For 14 years from 1990 to 2003, the patient was involved in 5 to 6 such moulage trauma training sessions each year, or a total of about 75 sessions. During these sessions, the makeup was worn all day and reapplied as needed. Red, blue, black, and purple grease paint and skin-colored powder were used to simulate the trauma scenarios.

Muscle relaxants are responsible for about 70% of the anaphylactic reactions that occur perioperatively [4]. The antigenic determinants of muscle relaxants are believed to be the tertiary and quaternary ammonium groups present in these drugs. These groups also confer the neuromuscular blocking properties upon the drug.

Quaternary and tertiary ammonium ions also occur widely in drugs, foods, cosmetics, disinfectants, and industrial waste. Baldo and Fisher described how IgE antibodies to quaternary ammonium muscle relaxant drugs also showed mark cross-reactivity with other compounds that have quaternary or tertiary ammonium ions in the molecule. They postulated that contact with compounds containing ammonium ions could lead to sensitization and thus explain why anaphylaxis sometimes occurs on first exposure [1]. In the French series, Mertes and Laxenaire noted that more than 12% of the patients studied had anaphylaxis to a neuromuscular blocking agent without a previous history of an anesthetic [5].

A review of the literature showed that there is a preponderance of female patients experiencing anaphylaxis with muscle relaxants. The use of cosmetics among women has been speculated to be the means by which sensitization could have occurred [6]. Patients who are allergic to one muscle relaxant may also react to another [7].

The association with cosmetics is one explanation for the markedly increased incidence of allergy to neuromuscular blockers in female patients. If it is the reason for the markedly higher incidence in adult women, then there may also be an increased risk in men who use heavy cosmetics extensively. This would imply that male actors and others such as television commentators who also frequently use cosmetics may be at greater risk of developing anaphylaxis to muscle relaxants during anesthesia.

The patient in our report is unusual in that the exposure to cosmetics as part of the moulage trauma scenarios may have been responsible for the sensitization to succinylcholine and rocuronium. It is also interesting that he did not show sensitization to pancuronium, even though chemically this drug closely resembles rocuronium, both being aminosteroids.

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Reliable block of the gag reflex in one minute or less

To the Editor

Our neuroanesthesia group performs frequent awake fiberoptic intubations due to a large number of cervical spine procedures. Patient tolerance of the awake intubation is greatly enhanced when the gag and cough reflexes are densely blocked. Not only is it a safety concern for the patient with an unstable cervical spine, but it eases the awake intubation performed for any indication.

Many approaches have been described to block the gag reflex, but we have found this simple injection into the palatoglossal fold to be safe, effective, and expedient. The lingual branch of the glossopharyngeal nerve mediates the gag response from tongue compression and courses through the palatoglossal fold. One or two milliliters of 2% lidocaine injected into the fold is all that is needed. The use of a spinal needle for the injection is advantageous because it improves visualization of the fold by keeping the syringe out of the patient's mouth (Fig. 1). A 25-gauge needle is the optimal size because it enters the fold without bowing or buckling and is of a small enough caliber to minimize or completely prevent mucosal bleeding.

We have been teaching this block for many years, but the intraoral location of the injection had forced each

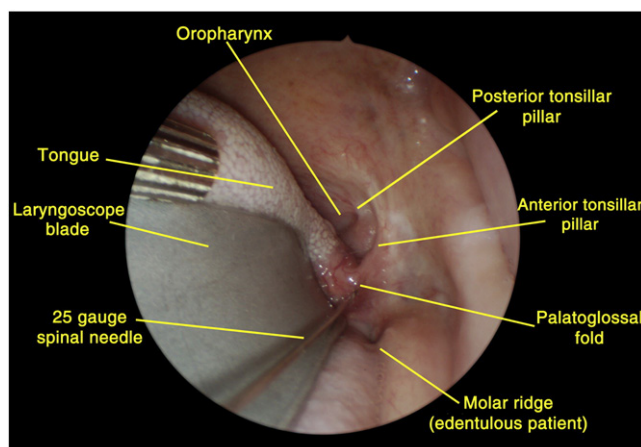


Fig. 1 Needle entering left palatoglossal fold.

resident to learn the block one-on-one, as they leaned over the shoulder of someone who exposed the palatoglossal fold. The quality of this particular image has helped us to bring a nebulous concept into clear focus. It is our hope that this picture may do the same for others who struggle with this aspect of awake intubation [1-4].

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