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An American Dentist Pioneered Anesthesia in Spain

To the Editor:—In perusing the daily press of Madrid for early 1847, we have found several references to Mr. Oliver Machechan, an American dentist in practice there who, according to extensive items in newspapers dated January 28–31, 1847,[1–6] had used ether anesthesia in performing dental extractions. The existence of these reports suggests that Machechan was the second to use sulphuric ether for anesthetic purposes in Spain (the first having been Professor Argumosa-Obregón of the Medical Faculty at Madrid, on January 13 of that year)[7]; and if claims concerning the efficiency of the anesthetic are true, Machechan's trials were the first to meet with complete success. For the good of his reputation, this positive outcome was fortunate, if an anonymous dentist promising painless extractions prior to January 20 was in fact Machechan.

Machechan is again mentioned in the Madrid press in 1848 as having performed some of the first Spanish trials of chloroform as an anesthetic (Gaceta de Madrid, February 10, 1848). Our attempts to delve further into the biography of this apparently highly considered dentist have so far been unsuccessful.

In his trials with ether, Machechan administered the anesthetic with a Harapath-Landsdown inhaler, as did the other Spanish pioneers Argumosa-Obregón and Mendoza (the latter in Barcelona on February 16, 1847) and many other Spanish surgeons who tried out ether before the year's end.[7] News of this inhaler, which consisted of an animal bladder with a mouthpiece, reached Madrid in the same letter in which a Dr. Forbes of London described the use of ether to a Sr. Barron, who immediately communicated with Professor Argumosa-Obregón.[8] The inhaler was even erroneously attributed to Machechan in a medical journal published in Cadiz, the *Revista de Ciencias Médicas* (February 10, 1847).

In conclusion, our recent research enables us to correct our own[7] and others' previous notions as to the early chronology of ether anesthesia in Spain, in that it now seems almost certain that the second exponent of this technique here was Machechan.

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Long-lasting Neuromuscular Blockade from Pipecuronium

To the Editor:—Pipecuronium is a long-acting nondepolarizing neuromuscular blocking agent without hemodynamic effects. These properties have led to its increasing use during anesthesia for coronary artery bypass graft (CABG) surgery. Studies have shown no untoward effects from doses of pipecuronium as large as $4 \times ED_{95}$[1,2] and similar mean durations of drug action in normal and renal-failure patients.[3]

We recently cared for a patient undergoing CABG surgery who, over a 5-h period, inadvertently received a pipecuronium dose of 520

μg/kg, or approximately 11 × ED_{95}.[4] The patient was also undergoing continuous peritoneal dialysis for renal failure induced by cholesterol emboli sustained during preoperative cardiac catheterization. His preoperative serum creatinine concentration was 7 mg/dl. Anesthetic and surgical courses were uneventful, with no observed hemodynamic difficulties related to the pipecuronium.

Postoperatively, the patient remained paralyzed for 3 days. Attempted reversal of neuromuscular blockade with neostigmine and pyridostigmine at 28, 37, and 43 h postoperatively produced only finger movement, one twitch on train-of-four stimulation, and no measurable inspiratory force. During this postoperative time period, the patient received ten peritoneal dialysis exchanges without detectable improvement. Finally, the patient started moving his extremities 70 h postoperatively, and his trachea was extubated without reversal agents 74 h after his last dose of pipecuronium.

The duration of action of pipecuronium is less than 1 h in most studies[4,5] and less than 2 h when given at 2 × ED_{95} and combined with balanced anesthesia.[6] Caldwell *et al.* measured a mean time of 103 min from injection of 70 μg pipecuronium to 25% recovery of twitch tension in patients with end-stage renal disease.[3] In addition, these authors reported that the duration of action of pipecuronium was more variable in renal-failure patients than in normal patients and reported a maximum duration of 267 min. Wierda *et al.* administered 200 μg/kg to patients undergoing cardiopulmonary bypass without apparent difficulty. They found 41% of the administered drug excreted unchanged in the urine and 15% excreted as a hydroxylated metabolite.[2]

Our experience demonstrates that high-dose pipecuronium does not produce deleterious hemodynamic effects, but that it can last a very long time and is poorly dialyzable.

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Treatment of Pain on the Surgical Ward Using Epidural Morphine

To the Editor:—Ready *et al.*[1] conclude "that postoperative pain can be safely and effectively treated with epidural morphine on the surgical ward." We also use epidural morphine to treat postoperative pain on the surgical ward, and we agree with their conclusions.

However, we are surprised that they use epidural morphine alone in a bolus technique. We use a continuous-infusion technique (with facilities for patient-controlled analgesia) for both preservative-free morphine and bupivacaine. Although nursing education regarding epidural analgesia remains important, the use of a continuous-infusion technique obviates the need for education in epidural dosing protocols.

At our institution for the 18 months prior to December 1990, epidural catheters were inserted in 1,289 patients on the acute pain service, with an incidence for severe nausea (unresponsive to standard antiemetics) of 1.1% and severe pruritus (unresponsive to diphenhydramine) of 5.4%. As in Ready *et al.*'s[1] report, respiratory depression (respiratory rate < 10 breath/min) was rare (0.4%), and no case led to clinical sequelae.

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