

Figure 1. A view of the cervical spine from posterior, which demonstrates the “bony backstop” formed by the pars intervertebralis, the articular columns, and the short spinous processes of the vertebrae. A 18-gauge insulated Tuohy needle is shown demonstrating anteromedial and caudad placement before lateral advancement towards the cervical nerve roots.

An alternative approach for blocking the C2-4 dermatomes is a single injection posterior cervical paravertebral block performed at the C4 level, based on techniques described by Pippa et al. (2) and later modified (3). This posterior approach enjoys a bony “backstop” that eliminates the risk of vascular involvement (Fig. 1). Moreover, by relying on spread along the paravertebral space (Fig. 2), the block can be performed as a single injection at one level.

With the patient in lateral decubitus position and after skin and subcutaneous tissue infiltration of local anesthetic agent, a 17- or 18-gauge insulated Tuohy needle (StimuCath™; Arrow International, Reading, PA), attached to a peripheral nerve stimulator set at

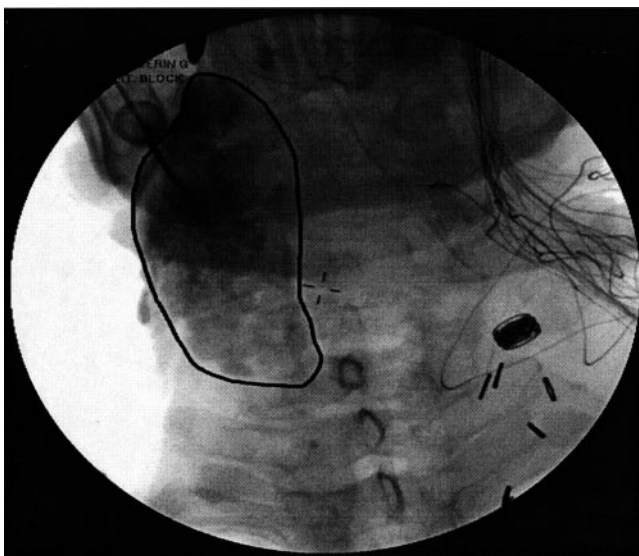


Figure 2. This anteroposterior view of the neck shows the paravertebral spread of C4 injected contrast medium (encircled) from the base of the skull to the area of the fifth cervical vertebra. The wires are electroencephalography leads.

1.5 mA and 200 μ s pulse width, is introduced at a point at the level of the angle of the jaw, 4 cm caudad to the mastoid process where the anterolateral border of the trapezius muscle and posteromedial border of the levator scapulae muscle form a natural groove overlying the cervical transverse processes. The needle is then advanced in an anteromedial and caudad direction, aiming for the “Adam’s apple,” until it comes in contact with the pars intervertebralis of C4. A loss of resistance syringe is then attached and the needle “walked” off the bone in an anterolateral and caudad direction until loss of resistance to air occurs (representing the paravertebral space), followed immediately by muscle twitches in the lateral neck. After negative aspiration 15 mL ropivacaine (0.75%) is injected slowly.

We have obtained excellent results with this technique in a number of patients and further evaluation is ongoing.

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Major Post-Partum Hemorrhage and Treatment with Recombinant Factor VIIa

To the Editor:

Major postpartum hemorrhage is a severe complication that accounts for the highest rate of maternal morbidity, with a frequency of 6.7 per 1000 births (1). After all other therapeutic options have been exhausted, emergency hysterectomy often remains the only effective therapy. We administered recombinant factor VIIa (rFVIIa) in three women with major postpartum hemorrhage to avoid hysterectomy.

Case 1: A 31-year-old woman experienced atonia of the uterus after caesarean section and massive bleeding resulting in hemorrhagic shock, metabolic acidosis (pH 6.94; normal range, 7.35-7.45), and impaired coagulation with an International Normalized Ratio (INR) of 1.73 (normal up to 1.3), activated partial thromboplastin time (aPTT) 43 s (normal, 26 to 42 s), and fibrinogen 78 mg/dL (normal range, 150 to 450 mg/dL). Platelet count was $265 \times 10^3/\mu\text{L}$ (normal range, 130 to $400 \times 10^3/\mu\text{L}$) and hemoglobin 4.5 g/dL (normal range, 12 to 16 g/dL). After 7 U of packed red blood cells, 9 U fresh-frozen plasma, and extensive drug therapy, a relaparotomy was performed with intracavitary oxytocin injection into the uterus followed by ligation of both uterine arteries and placement of B-Lynch sutures. Before relaparotomy, 120 $\mu\text{g}/\text{kg}$ rFVIIa was given followed by a further dose of 120 $\mu\text{g}/\text{kg}$ after 60 min. After the second administration of rFVIIa the coagulation parameters showed considerable improvement and bleeding diminished continuously.

Case 2: A 30-yr-old woman with placenta praevia marginalis delivered spontaneously. She had experienced episodes of vaginal bleeding during pregnancy and birth. There was a delayed detachment of the placenta, circulation instability, and impaired coagulation (INR, 2.26; aPTT, 58 s; fibrinogen, 74 mg/dL; platelet count, $78 \times 10^3/\mu\text{L}$, hemoglobin, 3.9 g/dL; pH 7.34). One hour after curettage, intensive vaginal bleeding occurred that could not be stopped by uterine massage, prostaglandin F $_{2\alpha}$, and a second curettage. Before severe acidosis could develop, two doses of 60 $\mu\text{g}/\text{kg}$ rFVIIa were administered within 3 h. The bleeding stopped after the second dose. In total, 10 U packed red blood cells and 13 U fresh-frozen

plasma were administered. The patient received 2 U platelet concentrate, as the platelet count was $35 \times 10^3/\mu\text{L}$ even after the second dose of rFVIIa.

Case 3: A 28-yr-old patient delivered her baby by vacuum extraction and experienced massive vaginal hemorrhage caused by serious laceration of the vagina, necessitating surgical intervention. Oxytocin and prostaglandin F₂ α were used for therapy of the uterine atonia, to no effect. There were signs of consumptive coagulopathy with an INR of 1.86, aPTT of 77 s, fibrinogen 102 mg/dL, antithrombin 58% (normal range, 80% to 120%), platelets $76 \times 10^3/\mu\text{L}$, and hemoglobin 6.5 g/dL. There was mild acidosis with a pH of 7.24. Although 120 $\mu\text{g}/\text{kg}$ rFVIIa was administered, slight seeping hemorrhage from the vagina still continued. After a second dose of rFVIIa the blood coagulation variables had almost been completely restored with the exception of a decrease in platelet count ($36 \times 10^3/\mu\text{L}$). In total, 13 U packed red blood cells, 16 U fresh-frozen plasma, and 2 U platelet concentrates were transfused.

In summary, major postpartum hemorrhage was stopped after two doses of 60–120 $\mu\text{g}/\text{kg}$ rFVIIa, and emergency hysterectomy could be avoided. All three patients recovered without residual disorders. The improvement in the coagulation parameters was considerably delayed in patient 1, who had severe acidosis. *In vitro*, a decrease in pH to 7.0 led to a reduction in the FVIIa activity on phospholipids by 90% and the FVIIa/tissue factor complex was restricted in its effectiveness by more than 60% (2). Binding of rFVIIa to phospholipid structures on the surface of the activated platelets mediates a main mechanism of action causing direct activation of factor X (3). Our experiences indicate that severe acidosis reduces the efficacy of rFVIIa *in vivo*. Therefore, rFVIIa should be administered before severe acidosis occurs or after correction of the acid-base status. In the case of treatment failures, analyses should include disorders that might have reduced the effect of rFVIIa, such as low fibrinogen levels, thrombocytopenia below $20 \times 10^3/\mu\text{L}$, and acidosis.

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Treatment of Postoperative Nausea and Vomiting with Dolasetron Versus Ondansetron: Is There a Conflict of Interest?

To the Editor:

In reading the article by Meyer et al. (1) suggesting that dolasetron (12.5 mg IV) "provided significantly greater efficacy for treatment of postoperative nausea and vomiting than ondansetron (4 mg IV) because of the need for less rescue therapy," I was

surprised to note that Charles H. McLeskey, MD (the senior author) was a member of the Department of Pharmacy at the Texas A&M University System Health Science Center College of Medicine in Temple, Texas. For the past several years, Dr. McLeskey has worked in the medical department at Abbott Laboratories. As Abbott currently markets dolasetron (Anzamet[®]) for the treatment and prevention of postoperative nausea and vomiting, this would seem to suggest a potential conflict of interest. Curiously, Dr. McLeskey's association with Abbott was not mentioned anywhere in the manuscript.

Another major concern regarding the authors' conclusions relates to the fact that the study design was seriously flawed because the use of prophylactic antiemetics was not strictly controlled in either of the two treatment groups. Given the fact that all well-controlled, prospective comparative studies involving dolasetron and ondansetron have failed to find any differences between these two 5-HT₃ antagonists with respect to their antiemetic efficacy (2–4), the current findings are even more surprising. Hopefully, the results of this study will be confirmed by independent investigative groups without potential conflicts.

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In Response:

As Dr. White has correctly observed, Dr. McLeskey is currently employed by Abbott Laboratories. However, when the referenced study was designed, conducted and completed, Dr. McLeskey was on faculty at Scott and White. Coincidentally, however, his title as published in the article, Director of Pharmacy, is in error. On the title page originally submitted with the manuscript Dr. McLeskey was correctly identified as Chairman of the Department of Anesthesiology at Scott & White. For some reason this information was dropped during the copyediting process and not discovered in the review of the proof. The authors and publisher have agreed to publish an erratum.

In his letter, Dr. White also raises the concern that our study was conducted without the strict control of prophylactic antiemetics. Interestingly, Tunis et al. (1) describe a specific class of clinical trials, practical clinical trials, as those that select clinically relevant interventions to compare, and include a diverse population of study participants. They state that these practical clinical trials have the potential to alter clinical decisions profoundly because they are derived from practical choices facing clinicians. "[Currently] few studies provided data on the . . . outcomes of patients in typical practice settings." "These gaps in evidence undermine efforts to improve the scientific basis of health care decisions. . ." We agree with Dr. White that prophylactic antiemetic administration to some patients can be a confounding variable and that controlling it might make scientific sense. However, though not as scientifically rigorous as a study without prophylaxis control, this lack of control was intentional and, as Tunis et al. emphasize, meant to replicate a real-world situation so that practicing clinicians might draw a conclusion applicable to their individual practices. We leave it to the readers to decide if the study design was "seriously flawed." Finally, this study evaluated the treatment of patients with established postoperative nausea and vomiting in distinction from most other studies that compare the prophylactic administration of these two drugs.