Differentiating Interstitial Fluid from Cerebral Spinal Fluid

To the Editor:—Recently, an 89-year-old man with severe chronic obstructive pulmonary disease underwent emergency surgery for intestinal obstruction at our hospital. An epidural catheter was placed in the immediate postoperative period to provide pain relief with intermittent epidural morphine injections. It was hoped that the high degree of analgesia characteristic of this technique would help to prevent the occurrence of pulmonary complications. Catheter placement in the epidural space was confirmed when, after a negative aspiration test, injection of 5 ml xylocaine 1.5% produced a T-10 analgesic band unaccompanied by paresis of the lower extremities.

Twenty-four hours after insertion, copious amounts of crystal clear fluid began leaking through the puncture site and around the catheter. Although fluid could not be aspirated from the catheter itself, a cerebrospinal fluid leak was strongly suspected and the catheter was removed. Several hours later, deep pitting edema was noted in the lumbosacral area, and large amounts of fluid continued to leak from the former epidural puncture site. The question was raised as to whether this was cerebrospinal fluid or interstitial fluid.

Samples of the unknown fluid, cerebrospinal fluid (obtained by lumbar puncture), and blood were submitted to the laboratory. Although the values for BUN, creatinine, and sugar were similar in the three samples, the protein concentration of the unknown fluid was 326 mg/100 ml and that of the cerebrospinal fluid was 46 mg/100 ml.

Since the concentration of protein in the unknown sample was about 600% greater than that of the spinal fluid, and since it is well known that the concentration of protein in the interstitial space is normally much higher than that of the cerebrospinal fluid, it seemed reasonable to assume that the interstitial space and not the subarachnoid space was the source of the fluid. Increased usage of epidural catheters for postoperative pain relief in the elderly and debilitated may well give rise to this problem more frequently in the future. A determination of protein concentration in the suspected fluid can provide valuable information with respect to such patients.

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An Alternate Method to Manage Patients with Protamine Hypersensitivity for Cardiac Surgery

To the Editor:—In a recent issue, Campbell et al. reviewed their experience and knowledge of the management of cardiac surgery patients with known protamine hypersensitivity. We present an alternate technique that we deployed for a cardiac patient with a documented history of an anaphylactic reaction to protamine.

A 61-year-old, 56-kg woman had an uneventful carotid endarterectomy that included protamine reversal of bovine heparin. Two months later, she had an aortofemoral bypass during which she had a severe hypersensitivity reaction to protamine reversal of bovine heparin. The extreme hypotension necessitated a brief period of external cardiac massage as well as appropriate fluid and pharmacologic therapy, and she later had both adult respiratory distress and Dressler's syndrome develop. Six months later she was scheduled for aortic and mitral valve replacements. As with the second patient of Campbell et al., she was pretreated with steroids and antihistamines, although our plan of management intended to avoid, if possible, the need for protamine.

Upon exposure of the heart, a canula was placed in the right atrium and connected to two 1,000-ml citrated blood donor bags via a Y-designed collecting system. During several minutes 2,000 ml of