to prevent puncture of the iv catheter. The obturator needle is withdrawn with the catheter held in position over the distal end. When the obturator needle is completely removed, the catheter will be subcutaneously tunneled with its tip exiting at the epidural entrance site (fig. 1–C). The epidural needle is then removed and the epidural catheter is passed through the 16-G iv catheter (fig. 1–D). The iv catheter is removed and the epidural catheter is pulled until the catheter lies completely within the subcutaneous tunnel. A Steri-strip® may be required to close the site of the first skin nick.

This technique is useful for subcutaneous placement of epidural catheters for chronic use. In two steps, with a 5.25–inch iv catheter, an epidural catheter can be brought subcutaneously from the midline posteriorly to the anterior abdomen where the site can be more easily cared for in debilitated cancer patients. The risk of epidural infection from the skin is minimal since the skin exit site of the catheter is far removed from the epidural space.

The technique is also useful for situations where an epidural catheter for postoperative pain management might be in or near the surgical field. If a thoracic epidural catheter is placed preoperatively for management of pain following a thoracotomy, then a dressing over the epidural site may be within the surgical field if the incision is brought close to the midline posteriorly. I, therefore, routinely tunnel the epidural catheter 3–4 cm away from the operative side using a 2-inch iv catheter. This allows secure attachment of the epidural catheter to the skin with Steri-strips and a sterile dressing without encroaching on the surgical field.

The method described can be accomplished in less than 30 s and requires equipment already available in a clinic or operating room. For these reasons, I believe that it is a method of subcutaneous tunneling that is superior to those currently in use and is especially suitable for routine tunneling of catheters for treatment of postoperative pain.

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Airway Fires during Surgery with the Carbon Dioxide Laser

To the Editor:—We have successfully completed approximately 1,000 cases using the helium protocol[1] for airway CO_2-laser operations. In two cases, we experienced airway fires; in both cases a leak around the endotracheal tube necessitated an increased fresh gas flow. This resulted in an inadvertent increase in the F_IO_2, and a violation of the protocol. In order to prevent such mishaps, we are now using a premixed helium/oxygen gas (Heliox), containing 30% oxygen and 70% helium. When a leak makes a higher fresh gas flow necessary, it can be accomplished with Heliox, without affecting the 30% oxygen in helium mixture.

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Cerebral Venous Thombosis *Versus* Postlumbar Puncture Headache

To the Editor:—In a recent report, Bolton *et al.*[1] describe a seizure following epidural blood patch (EBP) and caffeine sodium benzoate (CSB) in a postpartium patient thought to have a postlumbar puncture headache. We feel that their patient had classic signs, symptoms, and clinical course of postpartum cerebral venous thrombosis (CVT) and that it was coincidental that a seizure followed the EBP and CSB.

We describe a very similar case in which the patient developed seizures following an EBP. The diagnosis of CVT was later established.

An 18-yr-old gravida 1, para 0, patient was admitted to the hospital for labor and delivery. Her past medical history included bronchial asthma and ear infections. Physical examination revealed mild edema in both the lower extremities. Her blood pressure was 110/80 mmH. She received an unventful epidural analgesia for labor and delivery. Two days later she was discharged from the hospital. Four days later, she developed frontal headache, nausea, and vomiting. There was no obvious dural puncture during insertion of either the epidural needle or the epidural catheter. However, since multiple attempts at insertion of the needle had been made, it was felt that her headache could have resulted from an unrecognized dural puncture. Therefore, she was administered an EBP. Twelve hours later she developed three episodes of grand mal seizures. The seizures were controlled with the administration of phenobarbital and phenytoin iv. Neurological exam and laboratory evaluations were normal. The CT scan was negative; however, magnetic resonance imaging (MRI) showed partial occlusion of the sagittal sinus. An EEG revealed focal slowing in the right frontal and temporal regions. Her blood clotting studies were within normal limits. The patient was then administered low-dose heparin. Six days later she was completely normal. She was advised to take the antiseizure medications for another 6 weeks.

Puerperal cerebral venous thrombosis was initially reported in 1962.[2] Since then several case reports have been published in several journals. It is characterized by the occurrence of severe generalized headaches in postpartum patients in 2–7 days following delivery. Rarely, it can occur during pregnancy or during labor and delivery. The headache may be followed by seizures and or focal neurological changes. The incidence is about 1 in 3000 pregnancies. It is believed that the pathogenesis of this entity is from the venous stasis, endothelial damage, and increased coagulable state that exists during the peripartum period. In some reports, some of these patients with CVT had received regional analgesias. Two of those patients had also been given EBP as they were thought to have had spinal headaches.* However, many more cases of CVT have occurred in patients who did not receive regional analgesia.[3] Fortunately, most of these patients improve significantly in a short period of time perhaps due to recanalization of the thrombosed vein.

If a postpartum patient who may have received spinal or epidural analgesia for delivery of tubal ligation presents with a headache, an anesthesiologist is more likely to think of it as "spinal headache." In the early stages it is very difficult to distinguish the headache of CVT from that of low-pressure spinal headache; however, there are some distinguishing features. With CVT, the headache may be more diffuse in location. It may not be associated with auditory symptoms. Usually, these patients are somewhat lethargic. The intensity of the headache does not vary significantly with the change of position of the patient. CT scan is generally negative. However, contrast CT scan or MRI may show evidence of CVT.

Reading through the clinical report of Bolen *et al.* one may get the misimpression that the use of CSB or EBP may have initiated the seizure in their patient. Based on our experience and our review of this entity, we feel that this may have been a case of CVT. Furthermore, Bolen *et al.* point out that their patient's headache was not typical of the spinal headache. In most of the reported cases of CVT the CT scans have been negative. The CSB had been administered several hours prior to the occurrence of the seizures. Until we have more definite evidence, the technique of EBP, or the use of CSB to treat spinal headache, should not be viewed as the cause of seizures in postpartum patients.

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* Gewirtz EC, Costin MC, Marx GF: Cortical vein thrombosis may mimic postdural puncture headache. Reg Anesth 12:188–190, 1987.

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In Reply:—We would like to thank Drs. Ravindran and Zandstra for adding cerebral venous thrombosis (CVT) to the differential diagnosis of postpartum seizures.

We would recommend (and feel that Drs. Ravindran and Zandstra would agree) that the diagnosis of CVT should be entertained when an epidural blood patch (EBP) does not relieve symptoms of what was thought to be postlumbar puncture headache that, in turn, may have presented with atypical symptoms.

Common symptoms of CVT include sudden onset of a severe headache, vomiting, focal neurologic deficits, and seizures but not hypertension.[1] In our patient,[2] vomiting and neurologic deficits were absent and hyptertension (presumably PIH) was conspicuously present. Our retrospective diagnosis of our patient's seizures was one of eclampsia.

It was not the intention of our report to infer that EPB or caffeine sodium benzoate (CSB) frequently cause postpartum seizures. In fact, we presented no evidence to suggest that the seizures were other than temporally related to the EBP. However, one question we attempted to raise was, given the presumed diagnosis of PIH, could the administration of intravenous CSB to a parturient reduce the seizure threshold or unmask a seizure disorder.

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