Transient Headache Immediately Following Epidural Steroid Injection

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Most headaches subsequent to spinal or epidural anesthesia are related to dural puncture, appear one to three days after the procedure, and persist for one to five days.1,2 We have seen several headaches of a different character among Pain Clinic patients following epidural steroid injections. These headaches occur shortly after the procedure, usually upon the patient's sitting up, are partially relieved by lying down, and subside spontaneously within a few minutes to several hours. We have documented eight such headaches over a two-and-a-half-year period among a total of 604 epidural anesthetics. The following case reports illustrate the problem.

REPORT OF TWO CASES

Patient 1. A 56-year-old woman was seen in the pain clinic for low-back pain radiating into the right leg. A diagnosis of L5 radiculopathy was made, and the patient was treated with a lumbar epidural steroid injection at L4–5. No adverse effect ensued, and she experienced marked relief for three weeks. Some pain then recurred, and the epidural steroid injection was repeated at the same level. With the patient in the right lateral position, an 18-gauge Hustead[6] needle was introduced by use of a loss-of-resistance technique with about 3 ml air in a glass syringe. Cerebrospinal fluid was not seen on aspiration. The patient experienced a mild frontal headache shortly after the epidural space was entered. Injection of 5 ml lidocaine, 1 per cent, and 25 mg triamcinolone diacetate was accomplished with no change in the headache. After 20 min, sensation was decreased in the L4 and L5 dermatomes. Motor blockade was not evident. After another 20 min, the patient was allowed to sit up, at which time the headache became severe and more generalized. An upright lateral roentgenogram of the skull revealed very small amounts of intracranial air, probably in the basilar cisterns (fig. 1). The headache was partially relieved by placing the patient supine. It lasted another 30 min, after which the patient could remain upright without discomfort. No subsequent headache was reported by the patient.

Patient 2. A 50-year-old woman was evaluated for persistent low-back and right-thigh pain of four years' duration, present since a lumbar fusion. A presumptive diagnosis of chronic lumbar radiculopathy was made. Lumbar epidural anesthesia was performed with the patient in the right lateral position. An 18-

![Upright lateral roentgenogram of the skull, obtained 40 min after epidural steroid injection, showing small quantities of air, probably in the basilar cisterns.](image)

A likely explanation of the early, transient cephalgia in these two patients is the introduction of air into the lumbar subarachnoid or subdural space, cephalad spread of the air in the upright position, and irritation of the intracranial meninges. The radiologic literature indicates that during pneumoencephalography, 20–25 ml air must be injected before headache occurs in most patients.3 However, unlike our pain clinic patients, most patients undergoing invasive radiologic procedures have been fairly liberally pre-
Avoiding the Hemodynamic Consequences of Aortic Cross-clamping and Unclamping

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The management of patients undergoing abdominal aortic surgical procedures represents a major challenge for the anesthesiologist. The typical victim of aortic disorders is advanced in years and has generalized arteriosclerotic vascular disease, including coronary-artery and/or cerebral vascular insufficiency, as well as concurrent hypertension, diabetes mellitus, and renal dysfunction. The surgical procedure may last many hours, with significant blood loss, volume shifts, and electrolyte and temperature changes. Aortic cross-clamping and unclamping are particularly hazardous events during the course of abdominal aortic operations. Hypertension, myocardial ischemia, and arrhythmias have been reported to occur after application of the aortic cross-clamp, and recently some of the hemodynamic changes associated with these problems have been elucidated. Removal of the cross-clamp often results in severe hypotension, with sub-