

Letter to the Editor



Spinal Anesthesia and Not Pneumorrhachis as Cause for Temporary Paraplegia

TO THE EDITOR:

I wish to offer an alternative theory for the temporary paraplegia referenced in the letter to the editor rather than that of air entrapment. (Dalmau-Carola J. An old complication of a new technique: Pneumorrhachis from caudal epidural pulsed radiofrequency. *Pain Physician*: November/December 2014; 17:E783-E806).

A 70-year-old woman with chronic lower back pain radiating to the left lower extremity underwent caudal epidural pulsed radiofrequency (CEPRF) using a Racz catheter as an RF probe. It was entered into the caudal canal and passed upwards to treat the dorsal root ganglion at L3. The first treatment was concluded with injection of 2 mL of bupivacaine 0.25% with addition of 40 mg of triamcinolone. No contrast medium was injected prior to this injection. The outcome was a 75% reduction of pain 2 weeks later.

Later, a second CEPRF procedure was done using the same method. Immediately, the patient developed several hours of paraplegia, consisting of bilateral weakness and anesthesia of the lower limbs and pudendal area and a transient minor headache. The report shows a single axial computed tomography scan of the lumbar spine through the L3-L4 level. A dark elliptical area was seen occupying about 15-20% of the area of the spinal canal representing an air bubble. The report unfortunately does not include information as to the extent of air at other levels or sagittal/coronal views. The bubble location appears ventral, central and slightly to the right. It appears subarachnoid, not epidural.

There is no explanation as to how air entered the spinal canal.

From reading the report one cannot determine the pattern of onset or resolution of sensory/motor deficit. Bupivacaine could have greatly delayed voiding and walking. In one spinal anesthesia study using a hyperbaric technique and 15 mg of bupivacaine, the mean duration of sacral analgesia was 7.5 +/-1.7 hours. Re-

turn to voiding and full ambulation frequently exceeded 6 hours (1). Apparently the patient was given 5 mg of bupivacaine at the closure of the procedure through the Racz catheter along with triamcinolone. Although the patient received a small bupivacaine dose, her older age or another patient factors may have prolonged the block from bupivacaine. The report suggests that the transient minor headache may have come from the leakage of spinal fluid and also suggests that local anesthetic may have entered the subdural space.

It is my opinion that the best explanation for this neurological dysfunction was dural perforation by the Racz catheter and inadvertent injection of bupivacaine into the spinal fluid, producing spinal anesthesia. The prevalence of dural puncture is as reported by one retrospective study to be 4.4%, using the Racz catheter for epidural neuroplasty (2).

Iatrogenic pneumorrhachis is usually from excessive air injection while using air for the loss of resistance method to access the epidural space or can occur from injecting air in a spinal catheter. It can cause temporary neurological dysfunction or pain. However, there is not enough information to determine that air caused this neurological dysfunction. Spinal anesthesia is more likely.

A fluoroscopically guided, radiographic contrast medium injection through an epidural catheter to rule out an intrathecal location of the catheter before administering bupivacaine might have helped prevent this complication.

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2. Talu GK, Erdine S. Complications of epidural neuroplasty: a retrospective evaluation. *Neuromodulation* 2003; 6:237-247

In Response:

I appreciate the interest in my letter "An Old Complication of a New Technique: Pneumorrhachis from Caudal Epidural Pulsed Radiofrequency (CEPRF)" published in Dec. 2014 (1) in which I report a case of pneumorrhachis that developed after CEPRF and resolved spontaneously. I think it is worth reflecting about the information given and causality.

The air bubble was localized only at the L3-L4 level, as we described in our paper, from L1 to S1 on computed tomography scans.

In relation to the mechanism of air penetration, the literature also shows that peridural or epidural administration of anesthesia involving lumbar puncture can also cause pneumorrhachis, as in my case (2)

I agree, as is stated in the report, that the best explanation for this neurological dysfunction was dural perforation and consequent subdural penetration of

anesthesia. Nevertheless, it is important to bear in mind that, although very uncommon, entrapped intraspinal air under pressure might cause tension pneumorrhachis requiring intervention. Pneumorrhachis may be a neurological emergency or an epiphenomenon that resolves spontaneously, as probably occurred in our case. Certainly, as I suggest in the report, it would be useful to inject contrast agents during all CEPRF procedures.

I might be mistaken, but my intention was to explain the facts. The interpretation is another story.

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