

Thunderclap Headache Caused by an Inadvertent Epidural Puncture During Oxygen-ozone Therapy for Patient with Cervical Disc Herniation

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To the Editor: A 54-year-old woman with no significant history of a headache or hypertension underwent epidural oxygen-ozone injection at a concentration of 30 µg/ml (3 ml) for cervical disc herniation at cervical vertebra (C6–C7) level. Throughout the procedure, the routine monitorings of blood pressure, heart rate, and blood oxygen saturation were performed. One minute following the end of the injection, the patient developed a high-intensity headache mimicking symptoms of a ruptured cerebral aneurysm. The patient described the location of a headache as present in the frontoparietal and occipital areas accompanied by nausea and vomiting. The presumptive diagnosis of inadvertent epidural puncture was made. The patient was immediately treated oxygen therapy and bed rest. Monitoring showed vital signs of blood pressure (149/83 mmHg), heart rate (86 beats/min), pulse oxygen saturation (SpO₂, 96%), blood sugar (6.3 mmol/L), and body temperature (36.6°C). Subsequently, metoclopramide 10 mg and midazolam 1 mg were injected intravenously. Thirty minutes later, the severe headache symptom significantly improved. An immediate brain computed tomography (CT) scan revealed a large air collection in the frontal horns of the lateral ventricles, and a smaller one in the third ventricle region [Figure 1a]. The patient was discharged from the pain treatment clinic after 4 h of observation with a blood pressure of 130/80 mmHg. There were no further symptoms in the following 2 months, and the brain CT scan revealed no significant abnormalities 1 month later [Figure 1b].

At present, oxygen-ozone therapy is an alternative option to treat cervical or lumbar disc herniation.^[1] Further, randomized controlled studies have documented proven effects.^[2] To date, only one case of a thunderclap headache after oxygen-ozone therapy was reported. In 2007, Devetag Chalaupka *et al.*^[3] reported a 27-year-old man as the first case of a severe headache due to pneumocephalus after epidural puncture of oxygen-ozone therapy. In this case, the symptom of a thunderclap headache and the image findings of pneumocephalus were similar to those reported by Devetag

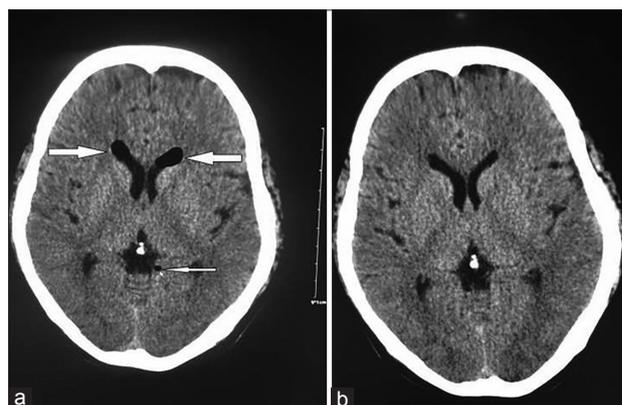


Figure 1: Axial view of nonenhanced cranial computed tomography scan. (a) Large air collection in the frontal horns of the lateral ventricles, and a smaller one in the third ventricle region (arrows); (b) No significant abnormalities 1 month later.

Chalaupka *et al.*^[3] Fortunately, both cases of thunderclap headache second to pneumocephalus (oxygen-ozone gas) resolved with no further symptoms. Physicians should be aware of this potential complication of minimally invasive oxygen-ozone therapy and be prepared to diagnose and treat this complication.

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