

## Neumoencefalo as Complication of Peridural Block: Report of a Case and Employee Treatment

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### Abstract

Complications arising under the stage of regional anesthesia, and in this case the central blocks (epidural and subarachnoid) cause sympathetic blockade, sensory analgesia and motor block at greater or lesser extent depending on the technique used, the dose, concentration, the volume of drug used. These are very useful techniques in lots of surgical procedures and for prolonged and effective postoperative analgesia. The debate about the safety, effectiveness and benefits of these techniques has increased since the late twentieth century, after widespread use. Major complications are rare, but when they appear, they result with serious complications. This is especially unusual in the obstetrical and gynecological procedures, in which patients are young and healthy and in which a complication or irreversible injury will be hardly understandable. There are very few recorded numbers of patients in which they have been affected by the complications related to neuraxial blockades. One of the biggest is including 500,000 patients who underwent epidural block for labor, estimating 1/47000 complications. The aforementioned complications are diverse in literature and the severity may vary.

A female patient of 38 years old with an extensive history of diagnosis of diabetes mellitus and hypertension, secundigesta, undergoing hysterectomy; follows immediately, her trans and postoperative period without major problems, but after 24 hours begins with severe headache that does not yield to the usual analgesics, and even increases as spend the next few hours, so it is taken to the service of Neurology, detecting meningeal data and severe pain, so a CT skull is made and detected pneumoencephalus.

**Keywords:** Epidural Block; Regional Anesthesia; Pneumoencephalus

### Introduction

Epidural anesthesia-analgesia (AAED) techniques have been used for many years. In some cases, it is the technique of first choice, as in analgesia for labor. On other occasions, we select it for the benefits it can offer, especially in major surgery, such as: better pain control

(superior to any other analgesia technique) and the reduction of postoperative morbidity and mortality in high-risk patients. However, we must assess the risk-benefit ratio because this technique is not free of complications. Some may be considered only adverse effects of the drugs used, while others are direct complications and may be serious, derived from a neurological injury by needle trauma, infections, toxic effect of the drugs applied, or spinal cord ischemia or compression for bruises or abscesses [1].

For decision making it is necessary to know well the risk-benefit relationship. Historically it has been said that the probability of a serious injury is from 0.005% to 0.7%, however, more recent series show that serious injuries derived from an epidural hematoma or an abscess can be observed in 0.6 obstetric cases out of 100 thousand, but up to 17 cases out of every 100 thousand in non-obstetric cases [2]. In another recent series, it was documented that the joint probability of hematoma or epidural abscess occurred in up to 1 in every 1,026 blocks.

Among the most important complications we have the following:

1. Post-puncture dural headache: (25%) is more frequent in young patients after accidental meningeal puncture. Its incidence has decreased due to the use of smaller, non-cutting trocars.
2. Back pain: (18 - 25%): It is a frequent cause of discomfort and rejection of patients to future regional anesthesia. It is usually a severe self-limiting pain.
3. Hypotension: (12 - 23%) have a systolic pressure below 100mmHg or a decrease in systolic pressure by 20% [1]. It is produced by the blockage of sympathetic preganglionic fibers; causing distal vasodilatation and is accentuated by the position that the patient must maintain after the application of the same (dorsal decubitus) [2].
4. Neurological Complications: have the lowest incidence, but are the main source of fear of patients before the procedure is performed; Clinically, it is characterized by nuchal rigidity, intense headache, local pain, fever, leukocytosis, weakness of the lower extremities (from the fourth day) and paraplegia (24 hours after weakness of the extremities). It is defined as permanent damage to the medulla and/or its nerve roots. The main etiological factors are the damage (direct or indirect) produced by trocar or catheter, neurotoxicity of local anesthetics, spinal cord ischemia due to hematoma or vasoconstriction and infection; producing temporary or permanent paralysis [2].
5. The pneumocephalus is a collection of air in the intracerebral compartment, intraventricular, subarachnoid, subdural or extradural. It is a rare complication of epidural anesthesia when accidentally injecting air into the subarachnoid space during its performance with the loss of air resistance technique. This technique has been associated with other complications such as compression of the cauda equina and a high rate of dural puncture. The pneumocephalus clinic includes frontal headache, paresthesias, meningeal data, changes in blood pressure, loss of consciousness and mydriasis. The diagnosis is confirmed with CT or MRI. It is usually reabsorbed spontaneously in less than 3 days if it has its origin in an epidural anesthesia [2-4].

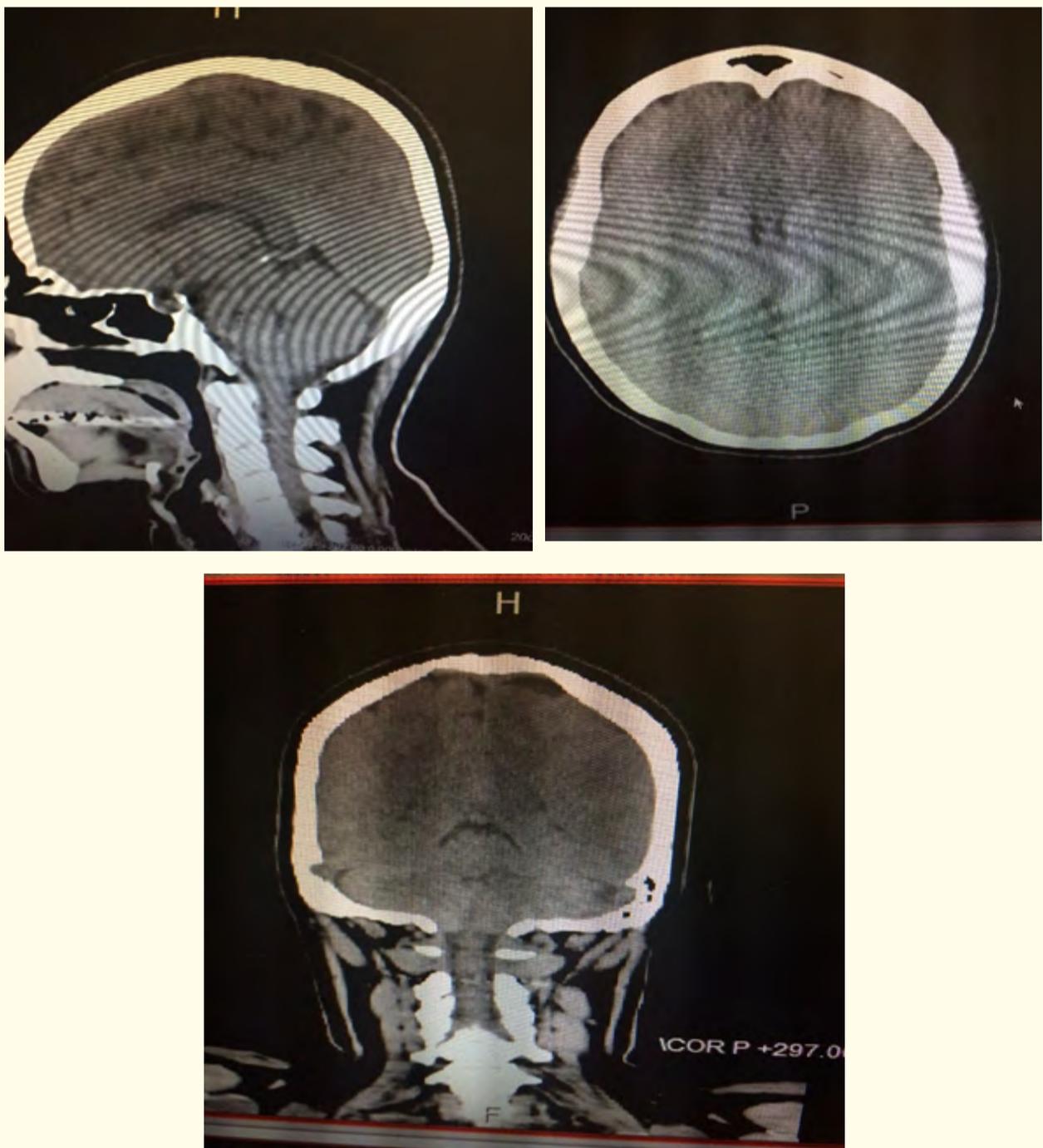
### Case Report

A 38-year-old female patient who underwent a hysterectomy due to the presence of uterine fibroids. A regional block using an epidural block is performed for the anesthetic procedure. This procedure is performed, carrying out the immediate postoperative period without complications of both the surgical procedure and the anesthetic. At 24 hours, in the hospital ward, the patient is suffering from severe headache on a 9/10 scale, dizziness and unsteadiness when walking. The Anesthesiology service proceeds to counteract these symptoms, not yielding to intravenous analgesia, as local patches, so it is requested interconsultation to the Neurology service. The patient is examined and a meningeal syndrome associated with intense headache is detected, a cranial tomography is indicated and the presence of air in the skull and spine is observed (Figures 1-3), so the diagnosis is made of pneumoencephalous and to start its treatment consisting of hydration, antibiotic therapy, intravenous steroids and consultation with the hyperbaric medicine service of the Central Military Hospital,

carrying out a session 72 hours into the session, using hyperbaric oxygen at 3 ATAS for 90 minutes in a multiplaza camera twice a day, causing an improvement in the symptomatology, by decreasing the headache at 30 minutes of session and decreasing the rigidity at 60 minutes of session, being discharged without complications; Tomography of the control skull was performed and the reduction of the amount of intracranial air was observed with respect to the first study (Figures 4-6).



Figures 1-3: Neuro-axis tomography with the presence of air before therapeutic measures.



Figures 4-6: Tomography after therapeutic measures, including hyperbaric chamber.

### Discussion

It is important that the patient is well informed about the procedure and its possible complications and the myths that exist, so that at the time of performing the puncture this cooperates. It should be used in the cases that are indicated, so that it really is a tool and not an extra complication to the procedure that is going to be carried out; You should always assess risk-benefit. Although there were multiple and varied complications mentioned, it should be noted that they are rare, so you should not be afraid to use epidural anesthesia, since it is a great advance in the branch of anesthesia, and a great help both for the patient and for the treating doctor. With respect to hyperbaric medicine, it is a complementary systemic treatment, in which 100% oxygen is breathed at an atmospheric pressure higher than normal atmospheric pressure (760 mmHg at sea level), in a pressurized environment (hyperbaric chamber), at pressures between 1.5 - 3.0 ATA (Absolute Pressure Atmospheres). It is a safe procedure with few side effects when used safely, by qualified medical and technical personnel and with an appropriate selection of patients. The first indications on the usefulness of the TOH were made in decompression sickness and gas embolism related to the practice of scuba diving and carbon monoxide poisoning; with subsequent application to different fields of medicine; and with respect to the pneumoencephalon, it can occur as a complication of surgical, diagnostic and therapeutic events (gaseous iatrogenic embolism) and in divers (less frequent), being the hyperbaric chamber one of the most effective options currently.

### Conclusions

Epidural anesthesia is a safe and effective technique, which does not mean that there are no risks, such as the ones we have already mentioned. Many of these complications can be avoided by performing an appropriate technique and especially having the knowledge of it. It is a special case to highlight the use of hyperbaric oxygen for the adequate management of air embolism, in this case in its pneumoencephalic modality, since this is a more effective and safe treatment to treat air embolism and its complications.

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