

# Rare Complication of Epidural Analgesia: Subcutaneous Cervical Emphysema

Shefali Tyagi<sup>1</sup>, Swapnil Bhagat<sup>2</sup>

## ABSTRACT

As the demand for “painless labor” increases, lumbar epidural analgesia is increasingly being used in labor. It is generally a safe procedure; however, some rare cases of complications like subcutaneous cervical emphysema have been reported. Most common differential diagnosis is from postdural puncture headache (PDPH), definite diagnosis of which can be done with computed tomography (CT) and magnetic resonance imaging (MRI). We present a case of 34-year-old primigravida who went for epidural analgesia, underwent uneventful vaginal delivery. However, she had severe neck and shoulder pain postdelivery, which did not respond to regular treatment. After CT and MRI, diagnosis of subcutaneous cervical emphysema could be established, and after treating it, she settled down and was discharged.

**Keywords:** Cervical emphysema, Epidural analgesia, Postdural puncture headache.

*Journal of South Asian Federation of Obstetrics and Gynaecology (2021): 10.5005/jp-journals-10006-1975*

## INTRODUCTION

Lumbar epidural analgesia is the gold standard in labor analgesia; however, some rare cases of complications like subcutaneous cervical emphysema have been reported.

We present a case of 34-year-old primigravida with this complication and describe the diagnostic approach, differential diagnosis/treatment, and suggested treatment for such cases in the future.

## CASE DESCRIPTION

A 34-year-old primigravida in first trimester of pregnancy was consulting for routine antenatal care (ANC) in out patient department (OPD). She had low-risk pregnancy and neither significant allergies or chronic conditions. She was a hypothyroid on 25 µg of levothyroxine. She came in labor at 38 weeks with pulse: 80/minute and BP: 120/70 mm Hg. At admission, the patient was OS 3 cm, 25% effaced, later progressed to 4 cm and asked for pain relief. Pulmonary and cardiac auscultations were noted to be normal, and there were no changes of the dorsal–lumbar spine. Blood count and clotting tests were also normal.

The patient was counseled for epidural analgesia; the risks and side effects were explained, and she signed the consent form. Local anesthesia was administered and the epidural needle was advanced through the skin, subcutaneous tissue, supraspinous, and interspinous ligaments. Once the ligamentum flavum was pierced, expected loss in resistance was noted while entering epidural space. Three to five milliliters of air was injected prior to satisfactorily locating the epidural space. No blood, cerebrospinal fluid, or air was obtained on aspiration. The epidural catheter was introduced 6 cm in the epidural space, without any difficulty. No clinical signs of subarachnoid block were detected after the injection of 2 mL of dose test of 2% xylocaine with adrenaline. Thereafter, an additional bolus of 10 mL (5 mL of 0.125% bupivacaine and 5 mL of normal saline + 25 µg fentanyl) was administered, resulting in good analgesic quality. The entire procedure was performed under the close supervision of a consultant anesthesiologist.

<sup>1</sup>Department of Obstetrics and Gynaecology, Cloudnine, Bellandur, Bengaluru, Karnataka, India

<sup>2</sup>Department of Radiology, Cloudnine, Bellandur, Bengaluru, Karnataka, India

**Corresponding Author:** Shefali Tyagi, Department of Obstetrics and Gynaecology, Cloudnine, Bellandur, Bengaluru, Karnataka, India, Phone: +91 9945342657, e-mail: shefali.tyagi@hotmail.com

**How to cite this article:** Tyagi S, Bhagat S. Rare Complication of Epidural Analgesia: Subcutaneous Cervical Emphysema. *J South Asian Feder Obst Gynae* 2021;13(6):436–437.

**Source of support:** Nil

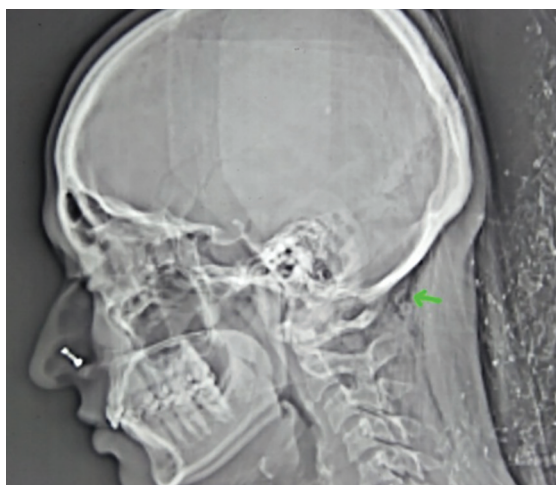
**Conflict of interest:** None

The labor progressed satisfactorily, and patient was fully dilated after 2 hours and delivered a healthy baby weighing 3.2 kg. However, the next day the patient complained of severe neck and shoulder pain. She had no other symptoms of dyspnea/vomiting/meningitis or limb weakness. Initially, she was treated for postdural puncture headache (PDPH), but when there was no improvement, neurological opinion was sought. Magnetic resonance imaging (MRI) brain with computed tomography (CT) correlative study showed no evidence of intracranial hemorrhage or acute infarct (Fig. 1). There were few foci of air in temporal horns of bilateral lateral ventricles. Subcutaneous cervical emphysema with few foci of air within visualized bony spinal canal indicating postinterventional changes. Magnetic resonance (MR) venography showed no significant abnormality. Correlative CT demonstrated multiple foci of air in subcutaneous plane, intermuscular plane, and within spinal canal (Fig. 2).

She was started on intravenous (IV) analgesics, high-flow oxygen therapy: 5 liter/minute via face tent with 100% non-rebreather mask, IV fluids, and bed rest in Fowler's position. She improved clinically, and after 48 hours, she was discharged in stable condition.

## DISCUSSION

Lumbar epidural analgesia is the gold standard in labor analgesia; however, some complications may occur. The complications



**Fig. 1:** Lateral neck scout tomogram: appeared within normal limits

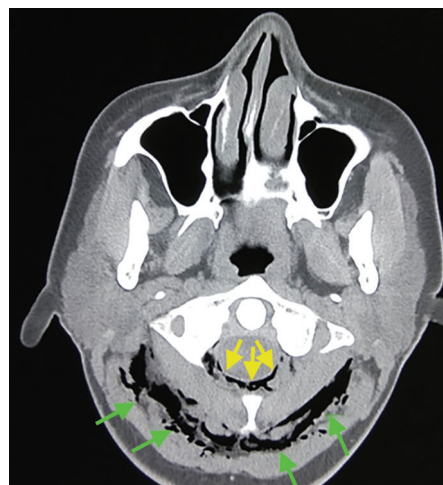
associated with this technique can include unilateral analgesia, extended epidural blockade, unplanned puncture of the dura or of a blood vessel, PDPH, subdural blockade, placement of the catheter out of the epidural space, and neurological complications.<sup>1</sup> The “loss of resistance” to air technique (LORA) is commonly employed for recognition of the epidural space. Nevertheless, one of its rare complications is pneumocephalus (hereinafter called PC).<sup>2</sup>

As this technique is widely used in order to avoid complications, it is very important to define and establish the volume of air that can be injected in the epidural space. Case studies show that complications are more likely to appear when larger volumes of air are injected; however, PC has been reported even after injecting just 3 mL.<sup>3</sup> PC when it occurs does not show symptoms, but when it does, headache is the most common symptom.

In case of PDPH, due to cerebrospinal fluid (CSF) outflow, the pain is exacerbated by sitting or standing, is alleviated by lying down, and manifests in occipital, frontal, and postorbital areas. It occurs mostly 24–48 hours after dural puncture and is longer lasting than in PC. Although there may be subtle clinical differences with PC, their symptoms usually are interchangeable so the differential diagnosis can be done through CT.

Symptoms of subcutaneous cervical emphysema can be edema, discomfort, and/or local pain and may be associated with odynophagia, dysphagia, dyspnea, wheezing, pneumothorax, or pneumomediastinum.<sup>4</sup> The diagnosis is made through physical examination (crepitation on palpation) and supported by imaging examinations, demonstrating trapped air in the region. Extracranial epidural emphysema is diagnosed most easily by CT and MRI. Radiography may also suggest the diagnosis of extracranial epidural emphysema if the air collection is large and a lateral view of the chest or spine is obtained.

Being usually a self-limited condition, the treatment is conservative (surveillance and analgesic support). Its resolution is dependent on the amount of air trapped and usually resolves in a few days. The treatment of PC consists of administration of 40–100% oxygen in supine position. This is to enable the reabsorption of intracranial air by intensifying the diffusion concentration gradient for nitrogen between the air collection and the surrounding cerebral tissue. In addition, we should administer aggressive hydration, caffeine, or analgesics. Epidural infusion or blood patch have no effect on PC.



**Fig. 2:** CT scan head: Image of the suboccipital region and visualized C1, C2 vertebral bodies; reveals continuous air density seen between and separating the superficial and deep muscles of the posterior neck (marked with green arrows). Incidentally detected, pneumorrhachis (postspinal anesthesia air within the spinal canal) (marked with yellow arrows)

Reabsorption of the air usually happens within 3–5 days from the epidural injection, and patients should improve without any neurological abnormalities. Our patient was discharged after clinical resolution on the 3rd day. If tension PC occurs, a neurosurgical emergency treatment may be necessary.

## CONCLUSION

One suggested way to avoid this rare complication can be the use of saline solution in the LORA process for identification of epidural space. We recommend that any patient, who is not settling with standard treatment and complaining of headache postepidural analgesia, should be considered for differential diagnosis of subcutaneous cervical emphysema.

Finally, close collaboration between obstetricians, radiologists, and anesthetists is needed for optimal, safe, and effective management of any labor-related complication.

## Compliance with Ethical Standards

All procedures performed on our patient were in accordance with the ethical standards of the institutional and/or national research committee.

## REFERENCES

1. Hsieh XX, Hsieh SW, Lu CH, et al. A rare case of pneumocephalus and pneumorrhachis after epidural anesthesia. *Acta Anaesthesiol Taiwan* 2015;53(1):47–49. DOI: 10.1016/j.aat.2015.01.002. PMID: 25702950.
2. Wang JC, Tsai SH, Liao WI. Pneumocephalus after epidural anaesthesia in an adult who has undergone lumbar laminectomy. *J Neurosurg Anesthesiol* 2014;26(3):261–263. DOI: 10.1097/ANA.0000000000000004. PMID: 24905032.
3. Nafu OO, Urquhart JC. Pneumocephalus with headache complicating labour epidural analgesia: should we still be using air? *Int J Obstet Anesth* 2006;15(3):237–239. DOI: 10.1016/j.ijoa.2005.10.011.
4. Sachdeva S, Sanwatsarkar S, Maheshwari M, et al. Pneumocephalus after epidural injection: a rare complication of a common procedure. *Indian J Pain* 2017;31(3):194–196. DOI: 10.4103/ijpn.ijpn\_75\_17.