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Horner's Syndrome Following Labor Epidural Analgesia: A Case Report

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Abstract

This case highlights the timely clinical diagnosis of Horner's syndrome, a rare complication of epidural labor analgesia in a pregnant woman with no comorbidities and normal body mass index. The parturient developed unilateral ptosis and miosis three hours after epidural placement and initiation of Programmed Intermittent Bolus (PIEB) of 0.2% Ropivacaine programmed to deliver 10 mL hourly with a 5 mL patient-controlled bolus, and a 20-minute lockout with no background infusion. She remained hemodynamically stable with no other associated signs and symptoms.

The PIEB was immediately discontinued and the patient was reassured of her clinical condition. Gradual resolution of her symptoms was noted after an hour and no other interventions and diagnostics were requested. However, the patient underwent emergency cesarean section for arrest of cervical dilatation. The same epidural was utilized to achieve surgical anesthesia using incremental doses of 2% lidocaine without manipulation of the epidural catheter. The patient remained hemodynamically stable during the emergency procedure, with no progression or recurrence of Horner's syndrome.

In conclusion, Horner's syndrome is a benign and self-limiting complication of epidural labor analgesia. Despite its occurrence, the epidural can still be utilized to provide surgical anesthesia with vigilant monitoring.

Keywords: Horner's syndrome, epidural, obstetrics, labor analgesia complication, case report

I. Introduction:

Lumbar epidural analgesia is considered the gold standard for labor analgesia and delivery.[1] However, it is not free from complications[2.] One rare complication is Horner's syndrome, which is characterized by unilateral ptosis, miosis, and anhidrosis.[3] These symptoms are commonly self-limiting and resolve completely as the neuraxial block regresses and usually without neurologic sequelae.[4]

We report a case of Horner's syndrome that developed after 3 hours of using Programmed Intermittent Epidural Bolus (PIEB) with ropivacaine 0.2%. for labor analgesia. The same epidural catheter was safely used to convert to surgical anesthesia for an emergency cesarean delivery.

II. Case Description

A 36- year- old pregnant woman, married, weighing 65 kg, measuring 165 cm in height, and Body Mass Index of 23.9, came in for vaginal spotting. She had no known medical comorbidities and no previous surgeries. Her previous pregnancy was delivered vaginally under epidural analgesia without fetal or maternal complications. Family history reveals hypertension on both paternal and maternal sides, while type 2 diabetes mellitus on the maternal side. She denied vices and works as a nurse.

She was admitted on November 2, 2025, with a diagnosis of G2P1 (1001) Pregnancy Uterine 42 weeks and 2 days age of gestation by early ultrasound, cephalic, in labor, post-term pregnancy, advanced maternal age. She was classified as American Society of Anesthesiologists (ASA) Physical Status II and was referred for labor analgesia at 5 centimeters cervical dilatation.

In the labor room, she was seen awake with a visual analog scale (VAS) pain score of 7/10, with the following vital signs: blood pressure 130/80 mmHg, heart rate 96 beats per minute, respiratory rate 20 breaths/ minute, oxygen saturation of 100% on supplemental facemask at 5 liters/minute. Airway assessment revealed a Mallampati score of 2, adequate mouth opening and thyromental distance, with no limitation on neck movement. Examination of the back showed palpable spinous process with no skin lesions.

Standard ASA monitors were applied. The epidural catheter was inserted at L4-L5 interspace using Tuohy needle gauge 18, with the epidural space identified using the loss of resistance to air technique. Five centimeters of the epidural catheter were left within the epidural space. After a negative test dose, the patient was positioned supine with a left uterine displacement. A loading dose of 10 mL of 1% lidocaine was given, resulting in improvement of the VAS score to 2/10.

One hour later, maintenance analgesia was started using a CADD Solis pump programmed for PIEB. The solution consisted of ropivacaine 0.2% delivered at 10 mL hourly, with a patient-controlled bolus of 5 mL and a lockout of 20 minutes, and with no background infusion.

Three hours after the initiation of PIEB, the patient was referred by the obstetrician due to the drooping of the right eyelid. On assessment, the patient was fully awake, not in cardiopulmonary distress, and complained of a sensation of heaviness in the right eyelid. Vital signs remained stable. Pertinent physical and neurologic examination revealed miosis of the right pupil and ptosis of the right eyelid. Sensory testing using ice showed decreased sensation to cold up to the dermatome level T6 on the right and T9 on the left. Other physical and neurologic examination findings were normal. There was no limb weakness, voice change, or hypotension. A clinical diagnosis of Horner's syndrome was made.

Figure 1. Ptosis of the right eyelid

Figure 2. Miosis of right pupil.

The PIEB infusion was immediately discontinued. The patient's vital signs were closely monitored, for any signs and symptoms of high or total spinal anesthesia. Continuous fetal monitoring via cardiotocography was maintained. The patient was appraised of her status and was reassured that it would spontaneously resolve after the local anesthetic has been metabolized.

Forty five minutes after PIEB discontinuation, the patient reported improvement in the sensation of the heaviness of the right eyelid although there was still persistence of miosis of the right pupil. One hundred minutes later, emergency cesarean delivery was called for due to arrest of cervical dilatation. The patient was brought to the operating room and attached to standard ASA monitors. The same epidural was used to convert to surgical anesthesia without any manipulation of the catheter. Lidocaine 2% was given in small amounts (5 cc every 5 minutes) until a T4 sensory level was blocked. Vigilant monitoring for recurrence of ptosis, miosis, and symptoms of total or high spinal anesthesia was done. This management avoided the risks associated with general anesthesia and repeat neuraxial attempts.

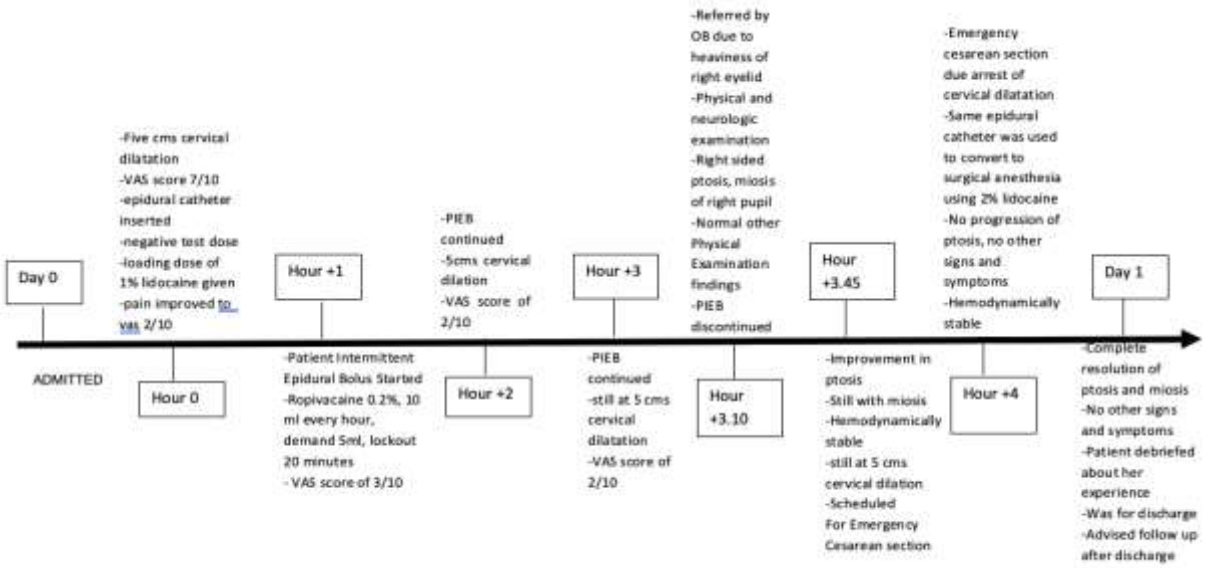
After a total of 20 mL of 2% lidocaine was given, surgical anesthesia was attained and the procedure proceeded uneventfully. The patient remained hemodynamically stable with no progression of Horner's syndrome.

Complete resolution of the right-sided ptosis and miosis was documented on postoperative day one. Debriefing was made regarding her case and was advised follow up after her discharge.

Figure 3. Pupils are equal in size, postoperative day one

Figure 4. Resolution of ptosis, postoperative day one

Figure 5. Chronological Summary of Events



III. Discussion

Horner's syndrome presents with a classical unilateral ptosis, miosis, and ipsilateral hemifacial anhidrosis. It is a rarely reported complication of epidural labor analgesia and anesthesia. It is considered a benign phenomenon and resolves spontaneously within a few hours.[5] Its occurrence is brought about by the high cephalad spread of local anesthetic disrupting the oculo-sympathetic pathway. This is a three neuron chain that begins in the hypothalamus and traverses downward to the spinal cord to the lower cervical and upper thoracic level, then travels to the chest cavity and apex of the lung, entering the orbit to innervate the pupillary sphincter as well as sending branches to the accessory muscle for eyelid retraction.[6-7]

Epidural-induced Horner's syndrome is commonly seen in the pregnant population with a rate ranging from 0.13% to 1.5% for labor analgesia[14,15] and up to 4% for cesarean delivery.[14-15] Several reasons have been implicated, including factors that promote the cephalad spread of local anesthetic, increased neuronal sensitivity to local anesthetic and anatomic differences in the epidural space.[8]

The physiologic changes of pregnancy alter the anatomic and physiological conditions of the spine leading to the spread of the local anesthesia cranially especially in the supine position.[6] Furthermore, there is a

reduction in the epidural space brought about by the increase in abdominal pressure, secondary to the gravid uterus exerting pressure to the inferior vena cava.[9]The uterine contractions and Valsalva maneuvers also contribute to further increase in epidural pressure promoting cephalad spread of local anesthetic.[6,16]
Furthermore, the higher incidence of Horner's syndrome in the pregnant population is due to the presence of high levels of progesterone during pregnancy making the nerve fibers more sensitive to local anesthetic.[11]
In one case series, it has been found that those parturients with presence of transverse and lateral septae predisposes them to high cephalad spread of local anesthetic.[12] It has also been found out that variation with the origin of some of the fibers innervating the pupil comes from the spinal cord as low as T4 level of the vertebra. Thus a high cephalad spread of the local anesthetic reaching T4 can affect the pupillary muscles.[16]
Patient positioning also affects the spread of the local anesthetic. In a study done by Apostolou, the lateral position can lead to a statistically significant difference on the onset, spread and duration of the anesthesia on the dependent side. Accidental subdural block can also cause Horner's syndrome and is associated with hemodynamic instability such as hypotension, bradycardia, and difficulty of breathing.[10] The occurrence of Horner's syndrome alone should not warrant the discontinuation of the use of epidural both for analgesia and anesthesia. Further diagnostic workup should be considered in patients with persistence of Horner's syndrome or with associated symptoms.[15]
In a systematic review done by Chambers, the development Horner's syndrome can occur in any local anesthetic used whether lidocaine, levobupivacaine, ropivacaine and chloroprocaine . It can also develop whether the local anesthetic was given in bolus, epidural bolus and infusion.[8] The concentration of the local anesthetics also did not matter. Both high and low concentration can also lead to its development. The mean volume of epidural anesthetic given before the onset of Horner's syndrome was at 18 mL. The timing of onset in majority of the cases was within an hour of a bolus dose. Meanwhile, the median time for the resolution was at two hours. Majority were unilateral at 96% and mostly were left-sided. Systemic hypotension was not observed in most of the cases.[15]Thus, epidural infusion or bolus administration can be safely continued. Despite of the continuation of the bolus or infusion, the Horner's syndrome resolved spontaneously.[13]
In our case, the parturient was initially given lidocaine 1% and was maintained on Ropivacaine 0.2% using PIEB. She developed unilateral right-sided miosis and ptosis after 3 hours of initiation of lumbar epidural labor analgesia. The development of the signs and symptoms was longer than the reported mean time to the development of Horner's syndrome which was 60 minutes. In terms of the volume of the local anesthetics given before the development of Horner's syndrome, our patient received 40 mL. This is higher than the mean recorded volume of 18 mL. This suggests a cumulative spread associated with PIEB dosing. Furthermore, her unilateral presentation is also consistent with other case reports. The patient had stable vital signs with no episode of hypotension, bradycardia, or difficulty of breathing indicating that the epidural catheter was not in the subdural space.
Although the PIEB was immediately discontinued after the development of the Horner's syndrome, the same epidural with no manipulation of the epidural catheter was used to convert from labor analgesia to surgical anesthesia for the emergency cesarean delivery. The patient's hemodynamic stability, presence of no comorbidities, and other associated signs and symptoms justifies the continuing of the epidural use for cesarean delivery. There was complete resolution of the Horner's syndrome on post op day one.

IV. Conclusion

In a parturient receiving epidural labor analgesia without comorbidities presents with ptosis and miosis consistent with Horner's syndrome, early recognition is important as it prevents unnecessary and extensive diagnostic workup. The condition is benign and resolves spontaneously after the local anesthetic has been metabolized. In case of emergency cesarean delivery, the epidural can still be utilized to provide surgical anesthesia with vigilant monitoring.

V. Informed consent

The patient read and signed, and possess a copy of their Informed Consent Form. She understood the terms and conditions relating to the writing and publication of the case report, but all her personal identification will remain confidential.

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