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Case Report

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Epidural Labor Analgesia and Epidural Surgical Anesthesia in a Patient with Idiopathic Intracranial Pressure with Lumbo-Peritoneal Shunt: A Rare Case Report

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ABSTRACT

Background: Idiopathic Intracranial Hypertension (IIH) is due to an increased intracranial pressure with no secondary cause of intracranial hypertension and normal Cerebrospinal fluid (CSF) composition. IIH's prevalence is high among obese women of childbearing age and subsequently coincides with pregnancy. Symptoms vary among patients and commonly present headaches and visual impairment. If untreated, it may steer persistent headaches and lasting visual impairment such as diplopia and scotoma or even blindness.

Case Report: We hereby present the uncommon case of an epidural anesthesia for cesarean section in a patient with idiopathic intracranial hypertension and Lumbo-peritoneal shunt that presented to our obstetrics department in labor. First, epidural labor anesthesia (ELA) with a catheter placed above the LP shunt scar was the chosen course of action. However, ELA was converted to an epidural surgical anesthesia (ESA) for acute fetal distress secondary to a placental abruption.

Conclusion: IIH usually occurs in pregnant women at any trimester. If undiagnosed or poorly managed, it can lead to drastic complications. As uncommon as it may be, all medical practitioners should be familiar with this pathology even though its diagnostic and treatment are exacting. While the optimal anesthetic management is still controversial, epidural anesthesia proved to be very effective.

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Abbreviations

IIH: Idiopathic Intracranial Hypertension
CSF: Cerebrospinal fluid
ELA: Epidural Labor Anesthesia
LP: Lumboperitoneal
ESA: Epidural surgical anesthesia
CT: Computed Tomography
OCT: Optical Coherence Tomography
ICP: Intracranial Pressure
OR: Operating Room

Introduction

Idiopathic Intracranial Hypertension (IIH) is due to an increased intracranial pressure with no secondary cause of intracranial hypertension and normal Cerebrospinal fluid (CSF) composition. IIH's prevalence is high among obese women of childbearing age and subsequently coincides with pregnancy. Symptoms vary among patients and commonly present headaches and visual impairment. If untreated, it may steer persistent headaches and lasting visual impairment such as diplopia and scotoma or even blindness. This article reports uncommon case of an epidural anesthesia for cesarean section in a patient with idiopathic intracranial hypertension and Lumbo-peritoneal shunt.

Case Report

We hereby present the uncommon case of a 36 years old multigravida referred to our emergency obstetrics department by a secondary care hospital for a high risk delivery because of a pre-existing Idiopathic Intracranial Hypertension (IIH). The patient had 3 former uneventful vaginal deliveries and now was in labor at 39 weeks 'gestation. She hadn't had any obstetrical follow up during the current pregnancy.

Two years ago, the patient was experiencing some intense headaches associated with photophobia, vomiting and gradual

visual loss. After reporting these symptoms to her family doctor, she was transferred to the neurology unit. Upon her complaints, the patient underwent many imaging and biological investigations. The final diagnosis was an Idiopathic Intracranial Hypertension. The first course of treatment was oral diuretics, specifically Acetazolamide. At her two months follow-up at the out-patient neurology unit, headache's persistence and visual loss progressiveness led her practitioners to appeal to surgical therapy. The patient underwent surgery and had a lumbo-peritoneal shunt put in. Her postoperative care was uneventful with a positive outcome: headaches disappearance and sight improvement. 10 months ago, her neurologist ordered a head and spine CT plus an Optical Coherence Tomography (OCT) that came back normal. Afterwards she was lost to follow-up.

In our emergency obstetrics department, the patient appeared to be in labor and mithered over mild headaches and nausea. She had 2 contractions every 10 minutes that lasted 20 seconds each. Gynecological examination showed a dilated cervix at 3 cm and a 70% effacement. Her obstetrical ultrasound and electrotocography were normal.

Preanesthetic examination revealed a well-oriented conscious patient, eupneic and apyretic with a Glascow Scale at 15/15. Her vitals were within normal range with a blood pressure at 120/75 mmHg, heart rate at 110 bpm with a normal sinus rhythm. The patient had a body mass index of 28 Kg/m2 alongside 2 criteria for probable difficult airway intubation: a thyromental distance at 4,5 cm and a Mallampati class 3 airway. Spine examination noticed a visible healthy scar matching the routing of the lumbo-peritoneal catheter from the spine to the abdomen, specifically between L4 and S2.

After a multidisciplinary emergency meeting of the doctors on call (anesthesiologist, gynecologist and neurosurgeon), the best course of action was vaginal delivery with scrupulous monitoring of intracranial pressure (ICP). The anesthetic plan agreed on an epidural labor analgesia so as to attenuate rises of the ICP and specifically between L2 and L3 above the lumbo-peritoneal shunt. Through the epidural catheter, we've administrated analgesic drugs: Lidocaine 1% 3cc plus 25 ug of fentanyl.

Three hours later, as the parturient was fully dilated, she developed painful vaginal bleeding associated with uterine hypertonicity and acute fetal distress. The diagnosis of placental abruption was suspected and the patient was immediately transferred to the operating room (OR) to undergo emergency cesarean for placental abruption complicated by an acute fetal distress. Therefore, epidural labor analgesia (ELA) was converted to an epidural surgical anesthesia (ESA) by following the hospital's protocol: adding Lidocaine 2% 10cc + 25 ug fentanyl. The green light was given to the surgeon after complete establishment of bilateral motor and sensory block meaning 3 minutes upon administrating the additional drugs. Surgery wise, given the circumstances, an extra-peritoneal cesarean was performed in order to preserve the peritoneal space of any septic risk and not to disrupt the catheter's trajectory (Figure 1). As a matter of fact, there was a massive placental abruption.

The procedure went smoothly and lasted for approximatively 40 minutes. Maternal postoperative care was uneventful with normal vision, no headaches no nausea or vomiting. Neonatal wise, the baby was a healthy boy weighing 3100g with an APGAR of 9, 10 and 10 respectively in the first, Third and 5th minute. Anesthesiology wise, the catheter was taken out immediately upon her arrival in postoperative care unit and the motor block resolved after 2 hours.

The patient came back to the out-patient unit one month after delivery, she had no complaints. There was no headaches nor vision troubles or photophobia. An optical coherence tomography was ordered and showed no papilledema.

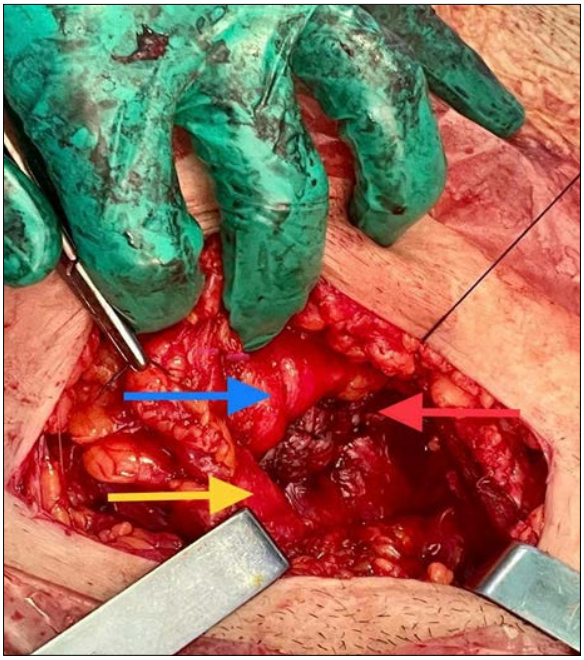

Figure 1: Perioperative Photography Showing the Extraperitoneal Cesarean Section

- Blue arrow : peritoneal pouch
- Yellow arrow : bladder
- Red arrow : hysterorraphy

Discussion

Known as "Meningitis serosa", Idiopathic intracranial hypertension (IIH) was first described by Quincke in 1893 [1]. It's a neurological disorder subsequent to an increased cerebrospinal fluid (CSF) pressure in the absence of any intracranial pathology or secondary cause of intracranial hypertension [2]. Its overall incidence approximates 1/100000 in the general population and 19/100000 in overweight patients [3]. IIH is diagnosed commonly around 30-40 years of age [4]. Ergo, it ineluctably occurs coincidently with pregnancy.

IIH's physiopathology remains blurry as many possible causes were theorized with no unquestionable proof. Many agree that a defect in arachnoid villi reabsorption is the main cause of CSF's accumulation. Besides, it seems that abnormalities in cerebral blood flow, cerebral edema or increased CSF production may be entailed [5,6]. Aside from the aforementioned causes, obesity is considered to be an important risk factor [7]. Regarding pregnancy, it's never been directly proven to be a risk factor. However, hyperestrogenemia, thrombophilia and hyperfibrinolysis -known as pregnancy characteristics- may be linked to promoting or worsening a pre-existent IIH [8].

Symptoms vary among patients. Nevertheless, generalized headaches more intense in the morning are common in 90% [9]. Typical symptoms of elevated intracranial pressure such as nausea, vomiting and photophobia are often reported alongside visual disturbances, varying from scotoms to loss of visual acuity or even

diplopia resulting from 6th nerve palsy [10, 11]. Papilledema is a cardinal sign that may be absent in certain cases [12]. Untreated properly, it steers blindness [13].

IT's mandatory to exclude secondary causes of intracranial hypertension. IIH is a diagnosis of exclusion [14]. Initially, diagnosis was based on the Dandy criteria published in 1937, later updated by Friedman and Jacobson in 2002 (figure 1) [15,16].

Table 1: The Modified Dandy Criteria for Diagnosis of IIH

Symptoms of raised intracranial pressure
No localizing signs with the exception of sixth nerve palsy
CSF pressure of 25 mmHg or greater measured in the lateral decubitus position
Normal CSF composition
Patient awake and alert
Normal neuroimaging studies without evidence of thrombosis, except for an empty sella
No other explanation for the raised intracranial pressure

Imaging investigations are within normal range. Magnetic resonance imaging (MRI) is the diagnostic testing of choice and should be carried out before a lumbar puncture (LP) [17]. CSF analysis must be normal [18]. LP is the cornerstone of IIH diagnosis as it assesses an opening of CSF above 25mmHg . Ophthalmologic examination and exploration is crucial to evaluate the impairment of the optic nerve ad monitor response to therapy [19].

Prompt and adequate management aims to reducing intracranial pressure in order to achieve two goals: symptomatic relief and prevent permanent visual loss. Therefore, the course of therapy includes diuretics as acetazolamide, repeated lumbar punctures or -in refractory cases- surgery including optic nerve sheath fenestration or CSF diversion procedures such as lumbo-peritoneal shunt in our patient [20].

IIH patients are found to be pregnant at the same rate as in the general population. IIH can occur at any trimester with the same rate of abortion and visual loss outcome. Subsequently, it's stated that pregnant women with IIH should be treated and managed the same way as non-pregnant women with IIH [6]. Therefore, no pregnancy termination is needed [6,7]. However, a codified therapeutic medico-surgical strategy is required: iterative lumbar punctures, a corticosteroid not crossing the placental barrier plus acetazolamide (after 20 weeks 'gestation) 1 to 2 mg a day [21]. However, imaging investigations and antidiuretics make professionals hesitant. As a matter of fact, Acetazolamide has proven to be teratogenic in the first trimester [14].

If the IIH is stable with no visual impairment, vaginal delivery associated with instrumental maneuvers alongside an epidural labor analgesia (ELA) are recommended to avoid excessive expulsive efforts leading to increasing of the ICP [22]. As it was in our case, the course of action was to perform a vaginal delivery alongside an ELA. The mode of delivery should be decided by obstetric factors only as normal vaginal delivery poses a negligible risk to women with IIH [6,23].

ICP increasing is related to skeletal muscle contractions in response to pain. Therefore, epidural analgesia can actually attenuate rises in ICP [24]. It has been proven that spinal anesthesia is safe and effective for patients with IIH without prior LP shunt [25]. Nevertheless, many were skeptical since large volume of local anesthetic might increase ICP [26,27].

In the case of an IIH patient with an LP shunt, there are conflicting recommendations. Some promote general anesthesia while others advocate the use of epidural or spinal anesthesia [28-30].

Inserting a catheter for epidural anesthesia in patients with LP shunts should be taken very seriously and impose special requirements. Obviously the epidural catheter should be inserted away from the LP level. Albeit imaging investigations to locate the tunneled LP shunt would be very helpful , It's not compulsory. There is a report case of a LP shunt inner path being higher than expected and another reported case of an epidural needle being inserted below the scar in a parturient with an implanted intrathecal pump [31,32]

Moreover, in a patient with a pre-existing LP shunt, the anesthetic may leak into the peritoneum through the shunt leading to inadequate anesthesia [25]. Besides, potential damage to the shunt during epidural setting justifies appealing to general anesthesia for cesarean section over epidural anesthesia. Neuraxial anesthesia, epidural or spinal has been successful for Cesarean delivery in patients with IIH As it was reported above, the duration and effectiveness of epidural analgesia/ anesthesia was uneventful and lasted a total of 3h45min [33].

Conclusion

IIH is prone to coincide with pregnancy as it has the highest prevalence among women of childbearing age. It is characterized by intracranial hypertension in the absence of intracranial pathology and normal CSF analysis. Management during pregnancy and labor is exacting. Strict maternal and fetal monitoring during labor are a must and IIH is not in itself an indication for Cesarean section.

Ethical approval

Ethics approval has been obtained to proceed with the current study.

Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Author contribution

NC: study concept and design, data collection, data analysis and interpretation, writing the paper. YL: study concept and design, data collection, data analysis and interpretation, writing the paper. HZ: study concept, data collection, data analysis, writing the paper. HL: study design, data collection, data interpretation, writing the paper. AS: study concept, data collection, data analysis, writing the paper.

Guarantor of Submission

The corresponding author is the guarantor of submission.

References

1. Quincke H (1893) Uber Meningitis serosa: Sammlung linische Vortra 67. Inn Med 23: 655-694.
2. Dandy WE (1937) Intracranial pressure without brain tumor: diagnosis and treatment. Ann Surg 106: 492-513.
3. Hamdallah IN, Shamseddeen HN, Getty JL, Smith W, Ali MR (2013) Greater than expected prevalence of pseudotumor

cerebri: a prospective study. Surg Obes Relat Dis 9: 77-82.
4. Radhakrishnan K, Thacker AK, Bohlaga NH, Maloo JC, Gerryo SE (1993) Epidemiology of idiopathic intracranial hypertension: A prospective and case-control study. Journal of the Neurological Sciences 116:18-28.
5. Huna-Baron R, Kupersmith MJ (2002) Idiopathic intracranial hypertension in pregnancy. J Neurol 249: 1078-1081.
6. Tang RA, Dorotheo EU, Schiffman JS, Bahrani HM (2004) Medical and surgical management of idiopathic intracranial hypertension in pregnancy. Curr Neurol Neurosci Rep 4: 398-409.
7. Kesler A, Kupferminc M (2013) Idiopathic intracranial hypertension and pregnancy. Clin Obstet Gynecol 56: 389-396.
8. Evans RW, Friedman DI (2000) The management of pseudotumor cerebri during pregnancy. Headache 40: 495-497.
9. Friedman DI (2008) Pseudotumor cerebri presenting as headache. Expert Rev Neurother 8: 397-407.
10. Giuseffi V, Wall M, Siegel PZ, Rojas PB (1991) Symptoms and disease associations in idiopathic intracranial hypertension (pseudotumor cerebri): a case-control study. Neurology 41: 239-244.
11. Wall M (2008) Idiopathic intracranial hypertension (pseudotumor cere- bri). Curr Neurol Neurosci Rep 8: 87-93.
12. Wang SJ, Silberstein SD, Patterson S, Young WB (1998) Idiopathic intracranial hypertension without papilledema: a case-control study in a headache center. Neurology 51: 245-249.
13. Aly EE, Lawther BK (2007) Anaesthetic management of uncontrolled idiopathic intracranial hypertension during labour and delivery using an intrathecal catheter. Anaesthesia 62: 178-181.
14. Friedman DI, Liu GT, Digre KB (2013) Revised diagnostic criteria for the pseudotumor cerebri syndrome in adults and children. Neurology 81: 1159-1165.
15. Dandy WE (1937) Intracranial Pressure without Brain Tumor: Diagnosis and Treatment. Annals of Surgery 106: 492-513.
16. Friedman DI, Jacobson DM (2002) Diagnostic criteria for idiopathic intracranial hypertension. Neurology 59: 1492-1495.
17. Friedman DI, Jacobson DM (2004) Idiopathic intracranial hypertension. J Neuroophthalmol 24: 138-145.
18. Kesler A, Kupferminc M (2013) Idiopathic intracranial hypertension and pregnancy. Clin Obstet Gynecol 56: 389-396.
19. Wall M (1990) Sensory visual testing in idiopathic intracranial hypertension: Measures sensitive to change. Neurology 40: 1859-1864.
20. Moore DM, Meela M, Kealy D, Crowley L, McMorrow R, et al. (2014) An intrathecal catheter in a pregnant patient with idiopathic intracranial hypertension: analgesia, monitor and therapy? Int. J. Obstet. Anaesth 23: 175-158.
21. Lee AG, Pless M, Falardeau J, Capozolli T, Wall M, et al. (2005) The use of acetazolamide in idiopathic intracranial hypertension during pregnancy Am J Ophthalmol 139: 855-859.
22. Thaller M, Wakerley BR, Abbott S, Tahrani AA, Mollan SP, et al. (2022) Managing idiopathic intracranial hypertension in pregnancy: practical advice. Pract Neurol 22: 295-300.
23. Mollan SP, Davies B, Silver NC, Shaw S, Mallucci CL, et al. (2018) Idiopathic intracranial hypertension: consensus guidelines on management. J Neurol Neurosurg Psychiatry 89:1088-1100.
24. Galbert MW, Marx GF (1974) Extradural pressures in the parturient patient. Anesthesiology 40: 499-502.
25. Abouleish E, Ali V, Tang RA (1985) Benign intracranial hypertension and anesthesia for cesarean section. Anesthesiology 63: 705-707.
26. Grocott HP, Mutch WA (1996) Epidural anesthesia and acutely increased intracranial pressure. Lumbar epidural space hydrody- namics in a porcine model. Anesthesiology 85: 1086-1091.
27. Hilt H, Gramm HJ, Link J (1986) Changes in intracranial pressure associated with extradural anaesthesia. Br J Anaesth 58: 676-680.
28. Kaul B, Vallejo MC, Ramanathan S, Mandell GL, Krohner RG (2002) Accidental spinal analgesia in the presence of a lumboperitoneal shunt in an obese parturient receiving enoxaparin therapy. Anesth Analg 95: 441-443.
29. Bagga R, Jain V, Das CP, Gupta KR, Gopalan S, et al. (2005) Choice of therapy, mode of delivery in idiopathic intracranial hypertension during pregnancy. MedGenMed 7: 42.
30. Kim K, Orbegozo M (2000) Epidural anesthesia for cesarean section in a parturient with pseudotumor cerebri and lumboperitoneal shunt. J Clin Anesth 12: 213-215.
31. Ku-mi Kim, Mauricio Orbegozo (2000) epidural anesthesia for sesarean section in parturient with Pseudotumor Cerebri and Lumboperitoneal shunt. J. Clin. Anesth 2: 213-215.
32. Tarshis J, Zuckerman JE, Katz NP, Segal S, Mushlin PS (1997) Labour pain management in a parturient with an implanted intrathecal pump. Can J Anaesth 44: 1278-1281.
33. Bedson CR, Plaat F (1999) Benign intracranial hypertension and anaesthesia for caesarean section. Int J Obstet Anesth 8: 288-290.