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Epidural Blood Patch for Post Dural Puncture Headache Management: Our First Experience

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Case Report

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Abstract

Cerebrospinal fluid (CSF), the principle physiological pillar of brain. Floating in the sub-arachnoid space, presence of CSF resembles a castle surrounded by a moat, providing the neuronal tissue fortification it needs. Following a procedural dural breach, probable leakage of CSF may weaken this fortification, thus leading to most common and worrisome adverse effect i.e. post dural puncture headache (PDPH). Our case report presents one of the very first and successful epidural blood patches (EBP) technique for the management of PDPH in post-partum cases, being practiced in this leading tertiary care of the nation, Tribhuvan University Teaching Hospital.

Keywords: Cerebrospinal Fluid; Blood Patch; Epidural; Postpartum Period; Post-Dural Puncture Headache.

Introduction

Spinal anesthesia requires breaching of dura to deliver the anesthetic agent into subarachnoid space. This breach is often accompanied by CSF leakage resulting in traction of innervated tissues around the brain, thereby, resulting in headache. Notoriously this headache can make a patient moribund. Pathognomonic for PDPH is an aggravation of symptoms in an upright position with relief in a supine position [1]. For years multiple preventive and symptomatic approach to reduce this incidence has been tried and EBP is one of promising approach.

Case Report

31 years old parturient, ASA PS-2, without any underlying co-morbidities, underwent lower segment caesarean section delivery under single shot spinal anesthesia using 25 G dura cutting needle (Quincke's Needle). There was no peri-operative event and her recovery was acceptable. Following the institutional protocol, mobilization was started after 18 hours of complete rest. On mobilization, she developed frontal headache associated with nausea, dizziness. The headache was aggravated on standing up position and mobilization and was relieved on lying down. There was no fever and any clinically perceivable focal neurological weakness. She was reviewed by a team of neuromedicine and caffeine containing paracetamol formulation was prescribed including plenty of fluid and furthermore was encouraged for additional caffeine intake. Above advised strategy worked only for few hours and to our dismay even on third post operative day, symptoms wasn't improving and was similar to that of the first day. Thus, after a consultation with neurophysician team, we came to a decision for epidural blood patch and we planned and consented with patient party accordingly. On that very 3rd Post-operative day we

prepared her for Epidural blood patch. In sitting position, after the application of sterile techniques, Epidural space was identified by Loss of resistance (LoR) technique with Normal saline, with 18 G Tuohy's needle at L3-L4 space. We preferred to use the same site i.e. L3-L4 vertebral space for the Tuohy's needle application. In the meantime, with utmost sterile technique, 18ml of autologous blood was drawn from ante-cubital fossa which was then injected into the epidural space slowly over 60 seconds. She was then laid flat for about 3 hours. And to our wonder all her symptoms were relieved by the hour she was administered the blood patch. She was discharged the very next day with no post procedural or puerperal complications.

Discussion

EBP is one of the many modalities for the treatment of PDPH. It is the procedure of administration of autologous blood in epidural space in order to prevent the leakage of cerebrospinal fluid following inadvertent dura puncture of any cause as seen in spinal anesthesia, lumbar puncture(diagnostic or therapeutic), during epidural anesthesia or spine surgery. It is done especially when conservative treatment like bed rest, hydration, caffeine (IV/PO), analgesics (IV/PO) fails. It was initially suggested in 1960 by Gormley and later introduced by DiGiovanni and Dunbar. "Two theories have been proposed to explain efficiency in PDPH. First one suggests that the injected blood creates a clot in the dura mater directly and patch the hole, preventing CSF leak. The second theory suggests that the volume of blood injected in the epidural space increases CSF pressure, and reduces traction on brain and meningeal structures relieving the symptoms. Both theories have been found to be effective with rapid onset of symptoms relief."2 The epidural space is bounded anteriorly by the dura matter, posteriorly by Ligamentous flavum and laterally by the sides of vertebral walls. It extends from foramen magnum above to the sacral hiatus below. It contains tiny arteries, network of small valve less veins (Batson plexus), epidural fat and lymphatic's. Various studies suggested that the incidence of PDPH increases with the use of large diameter spinal needle ≤22 G up to 38% and decrease incidence if needle used with less diameter up to 15%.2 Risk factors include large needle size, dura cutting type, age ≤60 years, and female gender. It is commonly seen after 24 to 48 hours following a puncture [2]. The epidural space for EBP is identified when there is loss-of-resistance to air or saline. The injection site at the back, either from a previous procedure or a vertebral interspace one above or below is identified. If the space is difficult to find, the use of C-arm radiography or ultrasound guidance may be considered. When needle tip is placed in epidural space, needle is confirmed. Autologous blood that is withdrawn is slowly injected (30 to 60 seconds) to create a blood patch. Reports have shown to be successful with as little as 5 mL of autologous blood (range 5 to 25 mL); however, most practitioners use approximately 20 mL if possible.1 Complications that is problematic and frequently encountered in EBP includes, failure (15 to 20%), back pain, worsening by additional dural rents, infections etc.1In our case, she did not develop any complications. Contraindication for EBP includes coagulopathy or under anticoagulation, infection at the injection site, patient refusal or uncooperative patients. More than 90% of PDPHs are self-limiting and spontaneous resolution has been reported in 7 to 10 days. Some patients may opt for conservative treatment but this generally produces short-term relief. However, the majority of patients who elect to have EBP are those that cannot minimize activity like recent parturient with newborns or younger patients. Also, extremely symptomatic patients will likely to consent EBP with or without conservative treatment. One thing to be taken into consideration is not all headaches following post dural puncture are PDPHs, workup must be done before performing EBP. A prophylactic EBP following an inadvertent Dural puncture in parturient for epidural catheter placement has not been shown to decrease the incidence of PDPH.1 Epidural blood patch has now emerged as a potential treatment for PDPH with its high success rate of 70- 98% if carried out after 24 hours of dural puncture. In case of failure of first patching, the second patching can prove to be beneficial with almost similar success rate [3]. In our case, the success rate was 100%.

Conclusion

With emerging strong evidence of benefits and safety of epidural blood patch for the management of resistant post dural puncture headaches in post-partum females, this technique seems to be a milestone in successfully eliminating the worrisome side effect of dural puncture i.e. headache in post-partum cases in our country.

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