

The management of Post-Dural Puncture Headache; a prospect from a low and middle-income country: A viewpoint.

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Running title:

The management of Post-Dural Puncture Headache; a prospect from a low and middle-income country.

Post-Dural Puncture Headache (PDPH) is a recognized and treatable complication following an intentional or accidental dural puncture. In our institutional audit, the incidence of PDPH in the obstetric population following spinal anesthesia and epidural labor analgesia is 13% and 3%, respectively. Among those patients, 98.62% of cases recovered with physical and pharmacological management, and 1.38% of patients required the epidural blood patch (EBP). The worldwide incidence of PDPH after intentional dural puncture and accidental dural puncture (ADP) varies from 0.1 to 36% and 80-86%, respectively.[1] The epidural blood patch is the definitive treatment for PDPH with an approximately 98% success rate. [2] This is a sterile procedure, requiring two providers, where one withdraws autologous blood, and the other injects it into the epidural space.

Dr. James Gormley in 1960, a general surgeon in Berwick, Pennsylvania, first introduced the epidural blood patch. Dr. Gormley injected 2-3 ml of autologous blood into the epidural space.[3] Dr. Anthony DiGiovanni, an anesthesiologist, in San Antonio, Texas popularized the technique of injecting 10 ml of autologous blood instead of 2-3 ml.[4] In 1980, Crawford JS reported that the earlier practice of 6-10 ml blood as the epidural blood patch did not produce satisfactory results. While the subsequent increase in volume up to 20 ml resulted in an improved outcome.[5] The volume needed for the patch is recommended as 20 ml in the recent practices.[6]

There is extensive data available worldwide on the incidence, prevention, and management of PDPH. On the contrary, there are only a few publications on PDPH from low and middle income country.[7][8][9]

We believe that post-dural puncture headache and its management have been overlooked in our and many low and middle-income countries. PDPH is obnoxious to the patient. It will increase the hospital stay and add a financial burden to the patient. The patient will have an unpleasant experience for the rest of their life as well. Unless we do not treat the patient diagnosed as PDPH on time, they can develop postpartum complications that can be fatal, e.g., seizures, cerebral venous thrombosis, subdural hematoma from traction on dural veins, hypopituitarism, syringomyelia, herniation, coma, and even death.[10] Inappropriately managed PDPH increases the workload to the anesthesiologist and delays admission-discharge turnaround time.

Why do we have a lack of candor on the management of PDPH and practicing EBP? The reasons are multifold for the problem. First, the attending surgeon and anesthesiologist do not realize the PDPH as the problem. Second, the patients are unaware that there are options for the treatment of PDPH. Third, workload and shortage of workforce restrict anesthesiologists to work outside the operative room, and fourth, standard operating protocols (SOP) are not well established in our part of the world. We should take into some general measures to address the chasm. We design a system approach to the management of PDPH (figure 1). We should increase awareness of PDPH among the service providers, e.g. Anesthesiologists, obstetricians, surgeons, nurses, and hospital managers. The patients should be counseled beforehand. We should develop a workflow distribution plan and inclusion of a pain link nurse in the acute pain management program. The acute pain management program should include a clinical pathway for the management of complications as PDPH. Each institute should identify processes and outcome indicators for tracing the effectiveness of the program. Finally, we should develop a nationwide anesthesia outcome registry.

We took the facts into the consideration and initiated an Acute Pain Management System (APMS). The system includes a director, educator, pain physician, pain link nurse, anesthesia nurse, and ward nurse. Each individual bears the defined responsibilities according to organograms and SOPs. In addition to ensemble modal anesthesia practice, we ensure proper postoperative follow-up of our patients, so we could timely detect and manage complications of anesthesia. We have defined an operating pathway for the management of PDPH.(figure 2)

In our institute, we follow all patients on the first postoperative day who have received anesthesia. If any signs and symptoms suggestive of complications of anesthesia prevailed, we turn on the pathway for the respective complications. Similarly, if a patient develops a headache post neuraxial anesthesia or analgesia, we activate the PDPH pathway. As stated in the clinical pathway, the pain link nurse will attend the call immediately and will inform the anesthesiologist on duty. If clinical features correlate with the diagnosis of PDPH, the anesthesiologist counsels the patient about different options available to treat it. The anesthesiologist will start conservative and pharmacological management. The management includes adequate hydration, caffeinated drinks, bed rest, abdominal binder, and analgesics such as a combination of paracetamol and codeine, and NSAIDs. If symptoms are not relieved within the next twenty-four hours, then the patient is counseled for Sphenopalatine Ganglion Block (SPB) or EBP according to the clinical features of the patient. The SPB is a minimally invasive procedure with a success rate of approximately 69% in treating PDPH.[xi] The EBP is the definitive management of PDPH with an approximately 98% success rate if done after 48 hours. (ii) In our experience, this has been true and rewarding.

Going back to Zemba, we have to start planning right during the pre-anesthesia checkup (PAC). The attending anesthesiologists should be aware of possible complications and counsel and assure the patient that those complications are treatable. We should develop the mechanism to follow-up patients and diagnose complications and treat them accordingly. We could educate the nurse as pain link nurses, allow them to follow up with the patients, and consult with the anesthesiologist as per need. Furthermore, each hospital and individual department should define the clinical indicators to measure process and outcome, and we should implicate the process nationwide so that we could establish a multi-center coordination and data collection system. Anesthesia Outcome Registry can play a vital role to follow the complications of anesthesia as data is the record of our work, and we can utilize the data for the analysis as well. The process will serve to coalesce all that happened into one connected whole, which will give on to improve the quality of the healthcare system and patient safety.

We realize the need for a system, led by the anesthesiologists, which should define the process of the identification of anesthesia complications and their treatment in the view of overlooked management of PDPH despite the EBP being the gold-standard treatment worldwide.

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