

## Epidural blood patch for the treatment of post dural puncture headache in pregnant women

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### Abstract

**Objective:** Postdural puncture headache (PDPH) is still a considerable problem and it is one of the most common complications of neuro axial anesthesia. Efficiency of the blood patch performed for the patients who developed postdural headache following spinal and combined spinal-epidural anesthesia carried out in our hospital was retrospectively investigated.

**Material and Methods:** Postdural puncture headache (PDPH) is one of the complications commonly encountered after epidural anesthesia and analgesia with occurring of dural penetration. In this study, efficiency of the epidural blood patch (EBP) was discussed in the patients with postdural puncture headache who did not give response to medical therapy. A total of 55 patients who developed PDPH following caesarean section performed under spinal and combined spinal-epidural anesthesia between January 2009 and January 2014 in Erzincan State Hospital and Erzincan Mengücek Gazi Training and Research Hospital was included in the study.

**Results:** Among the 1,110 undergone spinal and 1,749 combined regional anesthesia patient, 55 patients have been developed PDHA and 34 patients who did not give response to medical therapy who applied epidural blood patch.

**Conclusions:** In the cases of PDPHs which don't give response to medical therapy within 24 hours, EBP should be administered, considering not only the mothers, but also the infants.

**Key words:** Postdural puncture headache, epidural blood patch, caesarean section

### Introduction

Risk of post dural pain headache (PDPH) is present in all the patients undergone dural puncture (1). The most important disadvantage for dural tears development for the patients is postdural puncture headache that may commonly develop (2).

The International Headache Society (IHS) has defined a PDPH as a bilateral headache that develops within 7 days after lumbar puncture and disappears within 14 days after the lumbar puncture (1).

PDPH is a crucial condition which develops due to a reduction in cerebrospinal fluid (CSF) pressure resulted from the loss of CSF through leakage from the hole opened by the used needle in the dura membrane (3).

A sudden reduction in cerebrospinal fluid (CSF) lead to stress in the pain sensitive structures such as dura mater, cerebral arteries and venous sinuses, resulting headache to clinically emerge (4, 5).

Today cesarean section attempts are mostly performed under epidural or spinal anesthesia (6,).

Frequently use of regional anesthesia in cesarean attempts increases risk of PDPH; Postoperative pain management is important not only for mother but also for infant because of the breast milk.

Objective of the present study is to share our experiments about epidural blood patch which is used as a therapy method in PDPH patients following cesarean section attempts.



## Materials and Methods

This retrospective study was approved by Erzincan University Medical Faculty Ethics Committee. A total of 2,859 patients administered central block and operated in Erzincan State Hospital and Erzincan Mengücek Gazi Training and Research Hospital between January 2009 and January 2014 were included in the study. Patients who developed PDPH after the applied central block were advised bed-rest, oral or IV (intravenous) fluid therapy and caffeinated analgesics for 24 hours. Thirty-four patients who did not give response to conservative medical treatment and have a Visual Analogue Scale (VAS) of 4 or higher were administered epidural blood patch. Sixteen of the patients who receive EBP had been administered spinal and 18 combined regional anesthesia. EBP was carried out in the hospital to all the patients. Patients were taken to the operating room and monitored, while the vascular access was achieved with a 18 G branule from the antecubital region and 500 ml of crystalloid fluid was given. After the patients were given a sitting position, skin was sterilized with povidone iodine. Following local anesthesia, operation was introduced with a 18 G Tuohy end epidural needle entered from a lower level of previous regional anesthesia region using loss of resistance with saline. After the loss of resistance was felt and epidural space was observed; antecubital region of the patient was cleaned under sterile conditions with povidone iodine solution. Autologous blood was drawn and 20 ml of it was given into epidural space.

Success of the EBP implementation was measured as complete relieve (resolving of all the symptoms), partial relieve (ability to clinically fulfill daily activities) or failure (persistence of the severe symptoms).

## Results

Of the 2,859 cesarean section with 1,110 undergone spinal and 1,749 combined regional anesthesia, 55 patients developed PDHA. EBP was administered in 34 patients who did not give response to the conservative medical therapy and in PDPH was not resolved. While 27 G pencil-pointspinal needle was used in all 18 patients undergone combined regional anesthesia, 25 G Quincke needle was used in 16 patients undergone spinal anesthesia (Table 1).

In addition to the post-dural headache, nausea and vomiting were seen in 2 patients and, dizziness and neck pain in 3 patients, while no any additional symptoms were seen in 11 patients (Table 2). Complaints of PDPH were resolved in 34 patients within minutes after the first EBP administration. However, a second injection was carried out in one patient after the 24 hours of EBP due to the recurrent complaints despite the resolve of the complaints following the first operation. The complaints were resolved within minutes in this patient following the second EBP administration. No complication was observed in these patients. Patients who underwent EBP were monitored for an additional 2-3 hours and discharged since there was not seen any problem.

**Table 1:** PDPH and Epidural Blood Patch applied patient statistics

	Epidural Blood Patch (n:34)	PDPH (n:55)
<b>Combined Spinal-Epidural Anesthesia</b>	18	24
<b>Spinal Anesthesia</b>	16	31
<b>27 G pencil-point</b>	18	24
<b>25 G Quincke</b>	16	31

**Table 2:** Sypmtoms for Epidural Blood Patch

Symptoms	Epidural Blood Patch (n:34)
<b>No</b>	11
<b>Nausea</b>	5
<b>Vomiting</b>	2
<b>Dizziness</b>	4
<b>Backache</b>	2
<b>Tinnitus</b>	1
<b>Neck-shoulder pain</b>	14

## Discussion

PDPH is an important complication disturbing the patients which is accepted to develop due to a reduction in cerebrospinal fluid CSF pressure resulted from the loss of CSF through leakage from the hole opened by the used needle in the dura membrane. The most important factors in its occurrence are accepted to be multiple interventions and the type and thickness of the used needle (5). In this study, 55 of 2,859 cesarean section patients undergone spinal-epidural anesthesia developed postdural headache, while 34 of them were administered EBP since they did not give response to conservative medical therapy. The blood given to epidural region was demonstrated to diffuse toward 6 segment cephal and 3 segment caudal (7). It is reported that success rate of EBP is related to the proximity of the dural puncture, and therefore EBP is suggested to be performed to be carried out from a high, same or a low-level (8). In this study, we performed EBP from one level lower of a regional administration level of EBP. In a study, success rate of EPD was reported as 85% after the first and 98% after the second epidural blood patch administered (9). In our study, second EBP was applied after 24 hours in only one patient since PDPH did not resolve. It was suggested in the literature that epidural blood patch should be applied after 24 hours of the dural puncture (10). Loesner et al. (11) reported that EBP performed within the first 24 hours of the dural puncture resulted in failure by 71%, while EBP performed after 24 hours of the puncture resulted in failure only by 4%. In a study by Van Kooten F et al. (12) the authors reported that EBP was superior to the conservative medical therapy in the treatment of PDPH. In our study, EBP was administered after 24 hours of conservative medical therapy and only 2% of EBP administration was observed to be failed. There is still no complete certainty about when to apply EBP postoperatively. There are studies proposing the use of EBP within 3-4 days of unresponsive period to the conservative medical treatment (13).

In our study, EBP was found to be superior to the conservative medical therapy since the success rate of medical therapy was found as 38% with the conservative medical therapy and 97% with the first performed EBP. There is no any consensus on the most suitable blood volume advised for EBP. There is a wide range between 2 and 20 ml of volume suggested in the literature (14-15). Jung et al. (16), suggested use of 12-40 ml in the lumbar region, 11-20 ml for the thoracic region and 6-13 ml in the cervico-thoracic junction. Whereas we injected an autologous blood of 20 ml in our patients when EBP was administered and did not encounter with a symptom of back or leg pain. In our study besides headache, complaints were stated such as nausea, vomiting, neck-shoulder pain and tinnitus. Neck-shoulder pain was the most common complaints among the complaints followed by nausea. These complaints were reported as the symptoms to be seen together with PDPH (7-17). Incidence of PDPH differs according to the type and size to the needle between 0% and 37% (18). In this study incidence of PDPH was found as 1.9%. In the literature, there are numerous studies, indicating that pencil-point and small diameter needles decrease the incidence of PDPH (19-20). In a study by

Westbrook et al. (21) less CSF loss was shown with pencil-point needles and this was related to the design of the needles. In a study (Ready et al (22)) which conducted with pencil-pointed and sharp-pointed needles which have equal external diameters, less loss of CSF was found using pencil-point needles and needle design has been found to have important effect in headache. In their study with Quincke (sharp-point) and Whitcare (pencil-point) 27 gauge needles, Santanen et al. found the incidence of headache as 2.7% in the Quincke group (23). In our study, incidence of PDPH was found as 1.3% with 27 G pencil-point needles, while this rate was 2.7% in the patients in whom 25 G Quincke needles were used. Consistently with the literature, incidence of PDPH was found to be lower in the pencil-point needle used patients.

In conclusion; development of PDPH following the administered anesthesia is a distressing condition for patients. Postoperative pain management is a crucial condition not only for mothers, but also for infants since it increases morbidity and negatively affect the breast feed of mother in obstetrics. Although there is no certainty about when to use EBP following the PDPH, thinking about the baby's health, EBP should immediately be applied after 24 hours to the patients who do not respond to the conservative treatment after caesarean procedure. We believe that further controlled studies are needed in order to use this method more safely and more frequently.

**Acknowledgement:** None

**Conflict of Interest:** The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

**Author's Contributions: OB, UK:** Research concept and design; data collecting, analysis and interpretation of data. Patient examinations, Treatment **OB:** Preparation of article, and Revisions. All authors approved the final version of the manuscript.

**Ethical issues:** All Authors declare, Originality and ethical approval of research. Responsibilities of research, responsibilities against local ethics commission are under the Authors responsibilities. The study was conducted under defined rules by the Local Ethics Commission guidelines and audits.

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